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Report 685.0247

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JOINT AFRICARE/AID/PC EVALUATION

MID-PROJECT REVIEW

"VILLAGE WOODLOT FIREWOOD PRODUCTION"

685-0247

AID/afr-6-1690

Project review/evaluation report
per Personal Services Agreement
AFRICARE, 27 OCT. 81

Submitted by : Fred R. Weber
To: AFRICARE/SENEGAL
R.J. BENN

Summary

At the beginning, the project's basic idea was to provide the Senegalese Forest Service with the necessary inputs to develop a formula for government-local collaboration to address basic, village-level forestry and conservation needs and issues.

A project management format was developed in which AFRICARE, together with the Forest Service would implement a series of pilot activities in the field where local agents, assisted by PCV's, would undertake a series of tree-planting and conserv tion efforts in clos cooperation with the local population who would contribute all necessary labor on a voluntary, self-help basis.

Résumé

Au début, l'idée principale du projet était de mettre les moyens nécessaires à la disposition du Service des Eaux et Forêts de développer une formule de coopération entre les agences techniques et administratives du gouvernement et la population rurale pour permettre d'entreprendre des activités forestières et en conservation visant les priorités et problèmes du milieu rural.

Un schéma de gestion de projet a été mis sur place dans lequel l'AFRICARE en collaboration avec le Service des Eaux et Forêts, pouvait lancer par l'intermédiaire des agents techniques de terrain, renforcés par des volontaires Peace Corps, des activités ponctuelles en reboisement et conservation en collaboration avec la population locale qui fournirait du main d'oeuvre sur une base d' auto- assistance volontaire et non-recompensé.

The first year's results in terms of tree survival alone, are not very encouraging. Fewer than 30% of the trees planted are still alive.

This is mainly due to some critical start-up delays. However, the project is now well under way, less than 12 months after the initial agreements were signed. Our field visits clearly showed that local villagers are well pleased with the first year's attempts and have seen enough potential to want to continue, if not expand the efforts.

Of primary importanceto next year's success is to provide temporary assistance (from now til June 82) in form of a full-time project assistant administrator who should begin work immediately to assure that last year's delays do not occur again.

Other recommendations cover various technical points; the most important suggests nursery short courses at Bandia for field technicians and local villagers involved in nursery work.

Les résultats de la prémière campagne en termes d'arbres survivants est peu encourageant. Moins de 30% des arbres plantés sont encore vivantes.

La raison principale pour ces échecs était des delais divers dans la la mise en marche de l'organisation du projet . Par contre, il est à noter que le projet maintenant est en bonne marche même que les accords relatifs étaient signés il y a moins que 12 mois. Notre visite sur le terrain a montré sans doute que la population est satisfait et encouragé par les resultats de la prémière année et aperçoit un potentiel considerable. Les gens ont l'air d'être bien pret à continuer leurs efforts et même les étendre.

Le succés de la campagne future reste premier lieu sur la mise en place d'un assistant administratif temporaire (des maintenant jusqu'en Juin 1982) pour éviter les blocages de la dernière année.

Autres recommandations couvrent divers aspets techniques: le plus important prévoit des cours de courte durée en technique de pépinière (àBandia) pour les techniciens de terrain si bien que les villageois qui s'occupent des pépinières sur le terrain.

In view of last year's difficulties, it is recommended that next year's efforts should concentrate on re-doing the 1981 planting surfaces and to extend project efforts on a small scale and only where conditions are especially favorable.

En vue du difficultés de l'année dernière nous recommendons aussi de d'abord reprendre les superficies plantées en 1981 et d'étendre les activités de projet peu et seulement là, où des conditions bien favorables existent.

In the final conclusion another project review is proposed for September 1982. If results are positive, the project should be extended for another two years, possibly at a slightly higher funding level

La conclusion finale envisage qu'un autre bilan de travaux sera à exécuter en septembre 1982. Si à ce moment les résultats sont positifs, une extension du projet devrait être envisagée pour deux années supplémentaires à un niveau d'appui légèrement elevé.

II BASIC PROJECT IDENTIFICATION DATA

1. COUNTRY: SENEGAL

2. PROJECT TITLE: VILLAGE WOODLOT FIREWOOD PRODUCTION

3. PROJECT NUMBER: 685-0247

PIO/T NUMBER: 685-0247-3-00024

GRANT NUMBER: AID/afr-G-1690

AFRICARE PROJECT NUMBER: 2702

4. PROJECT DATES:

GRANT AGREEMENT

PACD: 31 DEC, 82

5. PROJECT FUNDING:

AID GRANT: $211,344

OTHER MAJOR DONORS: US PEACE CORPS

HOST COUNTRY COUNTERPART FUNDS: SENEGAL FOREST SERVICE

6. MODE OF IMPLEMENTATION:

AFRICARE-SENEGAL FOREST SERVICE: 21 NOV. 80

7. PROJECT DESIGN:

IN STAGES: PCV-PC-AFRICARE (AIP FORMAT)

8. RESPONSIBLE MISSION OFFICIALS:

MISSION DIRECTOR: DAVID SHEAR

PROJECT OFFICER: JOHN BALIS

CONTRACT PROJECT MANAGER: CAROL ULINSKI

9. PREVIOUS EVALUATION REVIEWS:

NUMEROUS REPORTS, MEMOS: PC, AFRICARE, AID/SENEGAL

10. COST OF PRESENT EVALUATION: CONTRACT: SALARY

PER DIEM & TRAVEL

OVERHEAD

III. GENERAL PROJECT FRAMEWORK

A. THE BASIC IDEA

It may be well to point out at the onset that the original idea for this project was to "somehow" find a way to tie forestry and conservation efforts closer to interests and participation of the rural population than some of the larger, "industrial" plantation schemes that were at various discussion stages during the same period. One major activity, planting Acacia albida in privately farmed fields, had already been successfully carried out repeatedly as early as the 1930's. The experience gained during these campaigns was encouraging enough to look at a wider picture than "just" acacia albida: fire-wood, soil conservation, village woodlots, agro-forestry, etc;.

The initiative for this project goes back to a first idea-paper written by a forestry volunteer (ca. 1977). The first draft strongly supported by the Forest Service, envisaged a goverrment: local farmer cooperative effort. It addressed basic local needs in conservation as well as wood production on a broad basis. Accent was to be placed on whichever of the many needs and issues were of greatest priority to the people at the different sites.

At that time it was already clear that large scale, orthodox tree planting projects would be quite expensive in terms of initial planting costs as well as subsequent necessary maintenance. Perhaps, the reasoning went; the basic dommittment the farmers already had shown during earlier Acacia albida campaigns could be dombined with pressing soil conservation and wood product needs and a formula might be found to successfully carry out an increasing number of small scale village-level forestry efforts that would not only be cheaper but also more beneficial to rural residents.

Project design was based on the assumption that all labor would essentially be provided by the interested local population at no cost on a voluntary, self-help basis.

It was further assumed that the Forest Service structure already in place could provide general project "coverage" for relatively little additional cost.

Where technical expertise at various local sites was scarce, Peace Corps Vols could possibly fill the gap temporarily and help train villagers in nursery, planting and protecting techniques. This would reduce future recurrent protection and management costs various government agencies involved otherwise somehow had to absorb.

The major concern then shifted,as reflected in the project title, to the ever increasing need for firewood and the inevitably following additional pressures on the area's natural vegetation.

The first, minimal cost design (under $200.00/ha) was modified several times. A staff vehicle (for the Forest Service) together with some of the operation and maintenance funds were added. Equipment and material like plastic nursery pots,hand tools, etc. were also included but the basic idea that all work would be provided free and on a voluntary basis was retained.

At this time, a basic project paper (more or less in AIP format) was submitted to AID/Dakar by PC. Independent from that, AFRICARE, based on experience in other Sahelian countries, expressed an interest in getting involved in forestry/conservation programs also in Senegal. After additional discussions and deliberation had taken place, a project management formula was adopted which provided AFRICARE with AID funds to carry out together with the Forest Service, in turn assisted by forestry PCVs in the field, project activities in the Peanut Basin. A brief summary of the agreement tying the various inputs together follows:

B. AFRICARE, FOREST SERVICE AGREEMENT (21 Nov. 1980)

"REFORESTATION IN THE DIOURBEL REGION"

Pertinent elements of this agreement cover:

- Reforestation of 432 ha to benefit the Rural Communities of the Diourbel Region as follows:
  - ...N'Goye district: increase firewood resources on 216 ha with a basic spacing of 4 x 4 m totaling 625 trees/ha.
  - ...N'Dindy district: Agro-forestry efforts to stabilize and improve (farm) soil conditions and to re-establish forestry resources on 216 ha. Basic 10 x 10 m spacing, 100 trees/ha.
- For the first two or three years after planting, a crew appointed by the Rural Council will, during at least two months each year carry out maintenance, that is: weeding and surveillance, on a self-help basis (investissement humain).
- AFRICARE funding for direct costs:

  first year: $ 69,746 covering 8 villages

  second year: $ 97,324 covering an additional 32villages.
- The Forest Service will prepare and furnish AFRICARE with project progress reports every two months.
- Any changes to these conditions would as the need arises be suggested by the Forest Service and submitted to AFRICARE for approval.

C. USAID GRANT AGREEMENT (Submitted: June 80; signed: Sept. 6, 80)

"VILLAGE WOODLOT FIREWOOD PRODUCTION"

- Present cutoff date: December 31, 1982.
- In a total of 40 villages (8 the first, 32 the second year) "individual woodlots" containing 9 ha each would be established; after 5 years, a total of 270,000 trees were to be planted.
- Village level "quasi-cooperatives" are to contribute land and labor on a self-help basis.
- A land use plan will be developed by Africare for each village and an agreement on the distribution of benefits will be signed by each village cooperative and the Forest Service prior to planting of any trees.
- During the first year, the village quasi-cooperatives will be organized and their members trained in all woodlot production activities.
- Africare will be the primary administrator and manager of external aid...and will coordinate activities of the Forest Service and Peace Corps and provide for technical assistance consultancies as needed.
- The implementation of the project is to be carried out by the Forest Service's Regional office (Inspection of Diourbel.
- The project has two components:
  - a plantation reforestation system and
  - a intercropping reforestation system
- The village quasi-cooperatives are the primary mechaniam for village participation. Collaborative involvement of local population in establishing and maintaining the reforested areas is assumed.

- Reporting requirements: Africare is to provide a technical and financial report on a semi-annual basis.
- Funding:

first year	$ 69,750	(overhead not included)
second year	$ 97,320	(overhead not included)
total	$167,070	

IV. PRESENT PROJECT STATUS/ACCOMPLISHMENTS

A. GENERAL

Twelve months after the USAID:AFRICARE grant agreement was signed, the project is well under way. A total of 31.300 trees have been planted during the last rainy season, no small accomplishment in view of the fact that operations had to be started in November from scratch.

Of the funds AFRICARE has received to carry out field project activities about $70,000 have been spent or are presently committed for payment (purchase orders, outstanding bills, etc.). Thus, for the rest of the project (one more year) $97,000 remain.

The Forest Service's Regional structure is covering project implementation activities and has assigned 5 technicians to the project on a more or less full-time basis.

Peace Corps has been able to provide a total of 6 PCVs one of them a forestry graduate, the others with backgrounds relating at least somewhat to forestry: three arrived in March '81, three in Nov. '81.

A considerable amount of "local participation" in form of self-help and other non-recompensated labor has been provided in each of the eight villages involved. It is understandable that the exact amount of these efforts in terms of total hours is not known. No accurate records have been kept. It would be most interesting to know just how much input so far has been provided in this manner.

B. NURSERY & PLANTING EEFORTS

The following table summarizes past nursery and planting efforts as well as survival rates at the different project sites. Additional details are given in a report APCD Ken Barber submitted to the PCD, 6 Oct. '81.

DISTRICT	VILLAGE, NURSERY LOCATION	SURFACES PLANTED	No of TREES PLANTED 2)	SURVIVAL RATE END NOV. 81
N'GUYL (Bambey)	BARI N'DONDAL SESSENE N'DIMB 1) BATTEL	36 ha one block (4 x 9 ha)	3,800 7,600 5,300 3,900	30% 3)
N'DINDY (Diourbel)	DIONGO 1) LAYABAYE 1) N'DINDY GUEYE PALEENE 1)	10.5 ha 7.5 " 8.5 " 9.0 "	3,300 2,600 1,700 3,100	30% 3)
		71.5 ha	31,300 4)	

1) Windbreak trials

2) Includes individual shade or fruit trees distributed

3) Forest Service estimate:

PCVs estimates are considerably lower: average survival 15%; 75% of trees died from lack of water (late planting), another 10% died since or have been severely stunned by grazing.

4) "equivalent area" at 625 trees/ ha: 50.0 ha.

C. ACHIEVEMENTS & SHORTFALLS

Analyzing the accomplishments further, a number of observations can be made at this time that provide additional in-sight and guidance to future efforts: next year's and - possibly- beyond. :

1) OVERALL PROJECT ORIENTATION

Basic conceptual differences in what the project is to accomplish still exist. Our visits to village sites conclusively showed that as far as the villagers (and with them: the Rural Communities as well as the Forest Service) are concerned, neither firewood nor woodlots for individual villages are foremost in their minds. Rather, what is important to the local population are points not covered by the project documents: shade trees in family compounds, food - or fruit trees, smallclump of trees in unused corners, public places, etc. Since these kind of tree planting efforts can make just as valuable a contribution, not only in wood production but also in socio-economic as well as ecologic terms, why not shift project accents in this direction? Particularly if that is what people prefer. Their interest in caring for these type of efforts seems far greater than their personal committment to a woodlot where theeventually accruing benefit distribution is yet to be determined. The results of our dialogue with villagers as well as different statements received from local government officials strongly indicate that project efforts specifically aimed solely at "firewood production" and "village woodlots" should not be further persued. Rather, the accent should be re-oriented to the concept advanced in the first stages of project development: "whichever of the many forestry

1) which can simultaneously produce both shade and wood!

and conservation needs and issues are of greatest priority to the local people at the different sites".

One of the first orders of business imposing itself is to change the project's title "Village Woodlot Firewood Production": "Communal forestry and conservation" would seem more appropriate. This, by the way, also is the theme the Forest Service has adopted for two new communal-type projects, funded by Sweden and Finland, respectively.

A second point supports this change of outlook(and title): a full half of the project's effort has been directed toward planting of A. albida from the onset. Here, the primary purpose is not wood production but soil conservation: to reverse the present trends of declining farm soil fertility. Though this kind of an approach may not yield as much firewood as a woodlot would, it certainly can not be passed aside for not directly meeting the results implied in the title of the present grant agreement.

2)ADMINISTRATION & ORGANIZATION

Project activities have been started and-with some delays- basic nursery production and tree planting activities have been carried out as originally planned. There are many parties involved:for the relatively small project size (210,000 $ over 2 years: USAID, AFRICARE US PEACE CORPS, Senegalese Forest Service, local population as well as the government's administrative structures (Rural Communities, Sous-Prefects, etc.)

It is not surprising that a number of misunderstandings and lack of communication at the onset delayed start-up activities considerably. Often, particular actions were assumed to be the responsibility or one of the other parties. From the beginning, serious efforts were made to resolve communication difficulties; memos, reports (both formal and informal) show that everyone tried to develop a smooth project management model.

Yet, one party was seldom able to make contact with all of the others at the same time. Often it was the one who was not present whose responsibility it bec me to resolve a particular issue. In spite of that, the project got under way and was able to cover, in general terms and with not more than 6 to 8 weeks of slippage the targets set for the first twelve months. This delay though short incomparison to start-up lags of most other, larger projects,however, was the single, most important reason for the relatively high mortality of trees that were planted.

Successful tree planting operations in this part of the world are critically tied to seasons. Of greatestimportance is proper planting time: if trees can not be planted out within ten days to two weeks of the most optimal moment, their ability to survive the first dry season is seriously impaired. Unfortunately this is what is happening right now. Considerable efforts were made to make up for lost time: trees were planted before they were their usual size, only minimal ground preparation was carried out to speed up planting operations. These factors further lowered the chances of survival: the net-result, as indicated on the preceeding table, thus fell below expectations inspite of concentrated and dedicated efforts to save the situation.

Many important lessons were learned by all involved. Last year's experience will certainly sharpen everyone's awareness to the basic principles and necessities that must be adhered to.

If these lessons are conscientiously and effectively incorporated into next year's operation, satisfactory results are still possible, in fact: more likely than before.

3) NURSERIES

Lay-outs and locations are practical and sensible at all sites. Obviously, nurseries should be a close as possible to watering points, yet not interfere with the daily use of them. Traditional techniques

and locally available material were used to provide the necessary protective fencing. Surfaces areas are adequate and permit establishment of a few garden beds together with the trees. However, overall efficiency in producing trees has not been nearly as good as hoped for and considerable improvements are yet required.

4) PLANTING

Tree planting was carried out against some rather formidable odds, throughout the project area planting operations were quite late. A number of factors were involved:

Treestock was not available any sooner;

Due to the well-known and understandable labor bottleneck caused by required farm field work, necessary manpower was not always available.

Ground preparation (deep holing, clearing individual planting spots, etc.): because of pressing time-needs was not carried out well enough everywhere to give the trees a good start.

Though individual A. albida trees, once planted, were marked with stakes, untreated wood or bamboo was used which succumbed rather quickly to the ever-present termite population of the area.

Maintenance Protection and surveillance against grazing animals in one form or another is an absolute must in these areas. The coming six months dry season is just beginning, something must be done to prevent excessive animal damage. Freeing the trees from competing weeds (which also present a fire hazard) also has not yet been carried out as well as it should have been. Especially during the first few years, competition for water between trees and the surrounding natural cover is fierce: clearing and aerating the surfaces around the freshly planted trees, as past experience elsewhere has amply proven, is indispensible.

5) LOCAL PARTICIPATION:

The experience of the first year's efforts are encouraging. A good start has been made but serious questions still remain to be

answered. As work progressed, people more and more began to ask for some form of "compensation" for their inputs. The most basic question is how much free work can reasonably be expected from the people, one family, one village? Obviously this depends on the individual's motivation. This in turn depends to a great extent on how much personal interest the contributor has in the efforts: what's in it for him? (or his family, his village, etc.) If participation is occasional and does not require a lot of work, more self-help time can be expected than if frequent inputs are necessary involving considerable efforts, like a daily walk to and from the tree planting area at N'Dieman that is 8 km away from the nearest village.

V. DISCUSSION/RECOMMENDATIONS

A. GOALS, OBJECTIVES

The Senegalese Forest Service looks at this project as a pilot effort that hopefully will, in part through experimentation with different formulas of government-local collaboration, provide the most practical, efficient approach to design and implementation of communal forest and conservation activities in accordance with the most urgent and pressing needs of the local population.

As briefly pointed out above (page 11), last year's experience and recent, continuing contacts with the local people strongly indicate that the project's focus should be expanded from the basic "Village Woodlot Firewood Production" level to encompass other forestry and conservation activities. Basic needs thatcan be carried out by individuals or communities essentially on a voluntary, non-reimbursable self-help basis should be addressed in more general terms.

Recommendation 1: CHANGE THE PROJECT'S TITLE TO: "COMMUNAL FORESTRY AND CONSERVATION"

Recommendation 2: ENLARGE SCOPE OF PROJECT TO INCLUDE ALL FORESTRY AND CONSERVATION ACTIVITIES OF PARTICULAR INTEREST TO THE LOCAL PEOPLE, INCLUDING FOOD-AND FRUIT TREES, SHADE PLANTATIONS, WINDBREAKS, PROTECTION OF NATURAL VEGETATION, SOIL CONSERVATION, ETC.

B. ORGANIZATION

Last year's experience of administrative, communication and logistic delays has taken a heavy toll on planting success. During our visit time did not permit adequate sampling of various plantations to accurately establish survival rates. The Forest Service's estimate of 30%, however, seems overly optimistic. Perhaps the PCVs assessment of 10% leans toward the other extreme. Given the apparent lack of adequate protection so far envisaged for the forthcoming dry season, present survival rates mean relatively little either way. What will count is how many trees will still be alive next year at the beginning of the rainy season! Present projections call for a substantial enlargement of activities: 32 more villages with correspondingly more planting surfaces are planned to be included in next year's planting efforts. This amounts to a multiplication factor of four from one year to the next. There is no question in anyone's mind at this time that this is impossible to attain. In addition there are these considerations:

---- after the necessary amounts are subtracted for last year's efforts, only $97,000 are available for next year. Present yearly inflation rates here are in the order of 15%. Straight proportioning indicates that therefore only a maximum of 60 ha can be planted unless unit costs can be lowered.

the percentage of self-help labor. based on last year's experience is, at present at least, not as high as originally assumed. Some labor will have to be paid in order not to fall behind schedules, though no provisions in the budget exist for such expenses. The available funds therefore will not stretch as far as they did last year.

---- The six PCVs presently on site have their hands full and can not adequately cover much more area than they did last year.

---- The Forest Service personnel available for project activities also can not be expected to cover more ground under presently prevailing circumstances.

A positive note: Neighboring villages continue to express a desire to participate in project activities and have repeatedly assured their readiness to collaborate.

Recommendation 3: RE-DO[1] LAST YEAR'S PLANTING EFFORTS? TAKE ALL NECESSARY PRECAUTIONS (INCLUDING IF NECESSARY SOME PAYMENT OF WAGES FOR LABOR WHERE CRUCIAL) TO ACHIEVE BETTER NURSERY OUTPUTS, BETTER TIMING OF OPERATIONS, AND ADEQUATE PLANTING AND SUBSEQUENT PROTECTION RESULTS. AS TIME AND FUNDS PERMIT, A MODEST EXPANSION EFFORT SHOULD BE INCLUDED IN NEXT YEAR'S PLAN WHERE EXCEPTIONALLY STRONG LOCAL INTEREST AND GOOD SITE CONDITIONS ARE AVAILABLE.

1) One exception: do not re-plant A. albida in fields where natural A. albida regeneration already exist. Encourage and help farmers protect existing plants & replant elsewhere.

Earlier this year serious consideration has been given to provide a full-time forestry technician to this project in order to-above all-assure that no delays occur next year in providing the field staff with the necessary equipment, funds, material, etc. Given the present staffing patterns and personnel workloads of the various parties involved, additional coverage in administration, logistics, fund-handling, etc. is indeed needed. Two points seem to be of critical importance:

---- additional administrative coverage is needed quickly: NOW. To avoid another series of planting delays, all nursery materials must be in place no later than end February.

---- skills needed for this job are: basic familiarity with procurement procedures (both GOS and AID), in-country money-transfers and money handling, knowledge of logistic and transport capabilities and limitations between Dakar and the project sites.

Recommendation 4: A FULL-TIME PROJECT ADMINISTRATIVE ASSISTANT TO HANDLE PROJECT FUNDS, MATERIAL PROCUREMENT, TRANSPORT PROBLEMS IS URGENTLY NEEDED UNTIL END OF JUNE. FIRST TASKS INCLUDE TRANSFER OF GOS SIGNATURES FROM KANE TO NDYAE AND TRANSFER OF (SOME) PROJECT FUNDS TO DIOURBEL.

Recommendation 5: HOLD REGULAR MONTHLY MEETINGS OF REPRESENTATIVES FROM USAID, AFRICARE, FOREST SERVICE (BOTH: DAKAR AND DIOURBEL), PEACE CORPS (BOTH: APCD & PCV REP.) TO CLEAR ALL ADMIN. AND ORGANIZATIONAL PROBLEMS, DELAYS & MISUNDERSTANDINGS.

C. TECHNICAL

1.) NURSERIES

Serious difficulties were encountered in several of the N'Goye district nurseries. High salt content of irrigation water, bad seeds, inadequate watering techniques all have been suspected as causes. Based on the detailed account on how Eucalyptus were germinated (repeatedly without success) leaves me to believe that the main reason for failure is improper watering during the first ten days after sowing.

Eucalyptus seeds apparently were sown directly into plastic pots; where germination occurred, sometimes ten trees or more came out of the ground together. For a discussion of pros and cons of various eucalyptus germinating techniques, see the Arid Land Reforestation Manual.

Water salinity can, of course, be a problem; however, the same source was used to germinate other species without difficulties. According to our experience, soluble salt contents up to 500 micromhos/cm are tolerable as long as the nursery mix is permeable and systematic leaching (overwatering once a week) is carried out. Water samples from the critical wells should be analyzed for soluble salts, sodium and boron content, which would settle the uncertainties once and for all. As a rough guide, the water can be assumed useable for tree nurseries if at the same time, tomatoes, carrots, onions or lettuce can be grown. Radish and green beans have an even lower salt tolerance: if they can be grown, the water certainly can be used for trees. (See PC's P&T Journal N° 8).

Recommendation 6: TEST WATER FOR SALT CONTENT OR TRY GROWING SOME TOMATOES, ONIONS, RADISH AND GREEN BEANS ALONGSIDE THE TREES.

Detailed discussion of various nursery and germination techniques indicated that some uncertainties still exist in regard to the best way to raise trees (especially Eucalyptus). Mixed results also are reported

from other forestry-planting projects in other parts of the country. Several of them, however, seem to have an excellent success-rate. Among them is the USAID Bandia project where a germination technique is used that also yields a large number of plants for the quantities of seeds used.

Recommendation 7: ARRANGE FOR SEVERAL TWO TO THREE DAY SHORT COURSES IN NURSERY TECHNIQUES WITH ACCENT ON EUCALYPTUS FOR FIELD AGENTS (INCL. PCVS) AND LOCAL NURSERY PERSONNE (CREW CHIEFS, WORKERS) THEN USE THE BANDIA TECHNIQUES IN THE PROJECT NURSERIES.

A few additional comments on the subject:

---- Have your Eucalyptus seeds sown by end of March. High temperatures and low air humidity in the weeks following rapidly increase difficulties.

---- Out of a few cinder blocks, angle irons and a sheet of clear plastic, a small 'green house' can be built, Use it to germinate problem-species and to get cuttings started; to keep the soil surface moist, a sprayer (trombone pump will do, no need to buy the whole works) should be used to produce the necessary mist.

---- Nursery mixes used throughout the project area seem rather heavy and compact. Especially where water salinity is a problem, the mix should be loose (sandy) to allow good downward flow. Increase sandy portion, avoid soils with too much silt and clay. Make sure organic contents (sieved manure) is relatively high. Also: Pots can be topped with millet "son". If salt accumulates on top, this layer can easily be removed and replaced from time to time. Another nursery trick used successfully in Morocco: mix into the soils up to 15% of charcoal waste. Incompletely burnt wood chunks ("coals") also

work. This increases water holding capacity and absorbs a certain amount of salt.

---- See collection and storage: It is most important that seeds are carefully selected from high- quality parent trees: healthylooking, tall,vigorous growth, etc. Applied genetics start right here. This is a point of major importance also with A. albida. After collection, have seed immediately extracted, then store and keep in dry dark place, the cooler the better.

2.) TERRAIN

Not surprising for a region where land pressure has been extremely high for manyyears, it is very difficult to find land to successfully grow trees. Valuable, productive agricultural land can not and should not be taken out of production for food crops. This often leaves the well intended forester with submarginal sites unsuitable also for trees, or too far away from where people live.

Nature and extent of this crunch led to the suggestion (and inclusion in the Grant Agreement) that one should look first at an entire village area to see how land presently is being used and what arrangements in long range land use planning can be worked out to use the available surfaces for the best (optimal) management balance (production and conservation) of all the available land resources.

We know that this is extremely difficult especially at the beginning. But increasing dialogue and trust hopefully created by project activities between the local people and government agents should reduce these problems at least to where ultimately sufficient, reasonable land can be set aside for wood production (and other forest products) to compliment purely agricultural development.

In the meantime, it is evident that the villagers do appreciate trees and have their own notions of where they can be blended into their land-use patterns. Their efforts to introduce trees into courtyards, along roads, in public places or small lots unfit for crops should be encouraged fully. This may mean different species as well as different nursery techniques (two year neems raised in openroot beds, planted as striplings, for instance).

Since more often than not, only marginal land is available, it may not be possible to plant relatively demanding species like eucalyptus everywhere. Recent experience and research (O. Hamel and C.R. Bailly, 1981. Prémières observations sur les potentialités de l'Eucalyptus au Sénégal) indicate that the following basic criteria must be met, otherwise other species must be considered: Prosopis, acacia spp, perhaps cassia, tamarindus, etc.

---- A rootzone of at least 1 m (the deeper the better) consisting of relatively loose, light soils must be available. Eucalyptus must be able to put its roots out (and down) without too much physical resistance.

---- Often in contradiction with this first requirement is the observation that eucalyptus in depression, where surface runoff can concentrate (and organic contents are higher), will rapidly outgrow their neighbors planted on higher elevations which do not have the advantage of accumulating water.

---- Available groundwater can greatly enhance yields. Water tables between 5 and 20 meters seem to be ideal.

In addition to soil properties and groundwater factors, practical geographic and socio-economic factors also are important. The experience in N'Goye clearly shows that distance to the woodlot plays a majorrole in what can be expected in terms of local participation.

3.) MAINTENANCE

Planting a tree is one thing, keeping it alive for the next critical three to five years is another. The inputs and care required once the tree has been planted are often overlooked or grossly underestimated.

This is a particular problem with trees planted as individuals in small groups or in long rows (windbreaks) or farm fields (A. albida) where surveillance and protection costs per tree are far greater than where trees are established in blocks.

Important social factors enter into it: after the harvest, a lot of the village-owned animals are allowed to roam freely in the fields near the villages. To ask that these animals henceforth be herded, involves-apart for more labor- a complete changein mentality on the part of the people. Besides, free roaming animals in farm fields have their benefits; to suppress them has definiteeconomic and ecologic disadvantages.

This coming dry season will be the first time, on-site experience can be gathered. The problems and pressures are certainly there. Our visit to the one A. albida plantation where we were met by a substantial goat herd in the middle of the trees prove that.

What can be done? Elsewhere many different systems have been tried. There is no short answer. Much depends on sociological factors. Economics enter into it, location in reference to the nearest group of housing, the nearest well, etc. all are variables that determine which, of the many options is the most practical.

A wide range of methods and approaches can be considered, most of them have turned out to be the best somewhere. The two extremes for protecting trees are:

---- fencing entire fields and establish a watchman (Niger)

---- fencing individual A. albida with sticks (treated against termites) and thorn branches (Chad).

.26

Another scheme tried in different parts of the Sahel is to simply pay farmers a "premium" at the end of the dry season for each tree that is still alive. One problem with this approach is that A. albida can stay alive for years in a bushy stage, each year being nibbled on and loosing only what the annual growth should or could have been. This way the farmer gets his premium til the donor's patience has run out: the tree stays alive, but it's size remains the same: a bush whose annual growth is consumed each year by goats and sheep!

Freshly planted A. albida must be marked. A stake of some sort normally is placed near by. Two problems: termites eat the stakes. Then- as long as they are already nearby- they go after the tree that just has been planted. Stakes either should be well treated (old crankcase oil and a bit of dieldrin) or short pieces of reinforcing rods (or equal) can be used. The latter, however, have also found ready acceptance by local handymen in search for scrap metal or by local blacksmiths who make attractive speartips (for fishing, etc.) out of them.

An entirely different problem are the weeds that will quickly surround the trees. Especially during the first two or three years, trees easily are choked out by grasses-which when dry- also constitute serious fire hazards. The upshot of it is that trees, once planted must be kept free of undesirable growth, the question is what is the best and easiest way to get rid of them? There again a number of alternatives are available, none, however, are easy or cheap.

Theoretically, at least, one should at the beginning of planning a tree planting operation separate the available inputs into planting and maintenance. Human nature, being what is is, nudges us to consistently plant more than we can maintain. Especially where local participation is involved, first year trials should be kept relatively small to ensure adequate maintenance. Then when all involved have the experience and

know what it takes to properly protect a young tree, the decision can be made as to how much more to do the following year. Certainly the people who are expected to provide the necessary labor for maintenance (on their own and for free!) should participate in the decision making. If, at the beginning, too much is planted and subsequently salaries have to be paid to protect the investment, small wonder people henceforth will insist that labor for maintaining trees can not be done on a self-help basis.

[illegible] MOTIVATION

This, by far, is the most complex, least understood and most important subject for the project. The first year's experience already has yielded some important lessons:

---- There are limits to what can be expected from free, voluntary contributions in form of labor. Only experience and trial and error approaches will ultimately produce the final answers.

---- Some experience already sheds some light into what reactions to expect from the local population:

1) Depth to water at nursery well. If water tables are below 4 to 5 m, more effort is required to lift water by hand to water the plants of the nursery work. Raising water over 5 m by hand is more than what can be expected by self help inputs. "Encouragement" should focus on improvements such as introducing pulley and donkey or hand-or wind operated small piston pumps, rather than paying wages or subsidizing motor pumps.

2) Distance to planting site. 2 km seem to be the outer limit people will walk-to and from to a planting site on their own. For concentrated, one-shot activities (fence building or tree planting), additional distances might be [illegible]. The problem however arises when grinding,

boring and lonely day-after-day maintenance and protection routine becomes necessary. Assistance here can provide carts and animals for traction. Beware of installing people permanently at the site (day and night). If there is no water nearby, it will have to be hauled in. This not only is costly but will, slowly but inevitably, lead to bringing a family, then a few chickens, later perhaps some animals, ultimately defeating the purpose of the operation.

3) Providing food for work has advantages, but also detrimental disadvantages if not properly managed. On one of the sites food for a midday meal was served with the hope that people would eat, then put in another two or three hours of work. Instead they ate some or put it in their pockets and left early anyway. This established the precedent: if I go out there to work (in the morning) I will be paid in kind. In all fairness, it must be pointed out that the retail value of the portions handed out, amounted to only 125 CFA/day, hardly enough of an incentive to look at the arrangement as a "paying job"!

The basic problem still exists: provided someone considers to participate in the project activities and commits himself (or his kids) to work for free. What is there in it for him?

Government agents tend to dispense this question with statements that once the people have learned, they'll know the work is in their interest and they will contribute without hesitation. Looking into these aspects further, the inevitable question (at least for us, the outsiders) is what can a participant expect in turn of eventual benefits however far ahead?

Here, we have to distinguish between the two project components: A. albida in farm fields eventually will be profitable first and foremost to those who have the surface use rights of the land. The benefit-distribution problem here is minimum; the whole thing essentially is a family affair and if they think it is worth the input, benefits (increased soil productivity, pods for livestock supplement, a few occasional lopped-off branches, etc.) will all stay in the family as uncontested private property and goods.

In "woodlots" the situation is less clear. In the first place virtually everybody contacted in the field looks at tree planting efforts and their eventual benefits as an <u>income generating</u> activity, not an effort that could supply some families with much needed wood and other tree or forest products.

This being the case, who then will eventually benefit? Returns may be in form of cash or perhaps a communal decision to deepen a well, or to buy some medicine for the local clinic. How will the benefits be split up? At present, not everybody is contributino free labor in equal amounts. In fact, in some places in another USAID project, only a few families in a particular village so far have "contributed".

ONCE THE FIRST BENEFITS HAVE BECOME AVAILABLE AND HAVE BEEN DISTRIBUTED, WILL THOSE (FEW) WHO HAVE CONTRIBUTED IN THE FIRST PLACE BE WILLING TO DO IT AGAIN?

We have pursued this question with officials and villagers to the edge of their tolerance. Yet, their answers are-to us (that is impor - tant)-still unsatisfactpry. Our conclusion is that, under the circumstances, the best thing to do is to keep trying and see what happens. Fortunately, once a stand of trees has been successfully established, the first tangible results are not too far off: eucalyptus seem to obtain their maximum growth within 4 to 8 years on these sites; rotation cycles therefore can be (and should if economic criteria are the major

concern) cut as early as five to eight years after they have been planted.

Once exploitation is completed, the income used, it will quickly be evident how this affects the motivation of those who did the work and what should or could be done to continue the efforts. If a sustained committment to local participation can be developed by the prospects of some profit (and-we still say: the equitable distribution thereof), the basis of a "movement" will have been created that will make communal forestry and conservation efforts an on-going and continuing thing. Government and local people can then collaborate for the common good of everybody involved: the basic and essential goal of the project.

VI CONCLUSION

Seen from the perspective of a pilot project, the first year's bottom line results, the low survival rates, leaves much to be desired.

On the other hand, a solid start has been made in establishing an implementation structure firmly including the local population. As a result, considerable collaboration has already been and presently is taking place. As our field visits have clearly shown, the local people who provided a substantial amount of self-help, voluntary labor during the last season, are still very optimistic about the eventual success of these efforts, even if-as a first priority-last year's planting effort, in essence, will have to be re-done.

The Senegalese Forest Service too is not only hopeful, but confident that last year's lessons will help making next year's efforts more successful.

As far as the development of a working model goes, that can eventually serve as a basis for future, much farther reaching activities, the general forecast and outlook is quite optimistic. Though not without some problems and unresolved questions, a format for interaction between villagers and government agencies has been put in place within it, improvements in the desired directions are possible.

Therefore initial stage of the working model, presently in its first year, deserves continued support and inputs from the outside. The project management mechanism: PVO/PC - Forest Service, though also needing further refinement, basically has been successful and is functioning now.

Much will depend on how timely and efficiently next year's campaign is implemented. If delays and management problems again will cause massive plantation losses, continuation of this approach will have to be very carefully analyzed and seriously questioned. If on the other hand, a smooth and technically correct tree planting season

can be carried out, this means that the initial difficulties have been resolved and additional, and more distant challenges can be aimed at.

In the final analysis, continued support of this project is recommended, provided next year's tree planting season is successful:

---- More than 50% of the work done by free, voluntary self-help, local labor.

---- End of planting season (September) survival rates: 60% or better.

---- Total of direct-costs cash outlays of both: AFRICARE and Forest Service not to exceed $1,500 per ha (at 625 trees).

Recommendation 8: ANOTHER PROJECT REVIEW BE HELD SEPTEMBER 1982 TO DETERMINE SUCCESS OF 1982 PLANTING SEASON AND - IF SUFFICIENT POSITIVE RESULTS HAVE BEEN ACHIEVED - THE PROJECT BE EXTENDED FOR ANOTHER TWO YEARS AT A SLIGHTLY HIGHER FUNDING LEVEL.