

CLASSIFICATION
PROJECT EVALUATION SUMMARY (PES) -- PART I

Report Symbol U-447

1. PROJECT TITLE Community Forestry AIP	2. PROJECT NUMBER 698-0410.35	3. MISSION/AID/W OFFICE AAO/Conakry
	4. EVALUATION NUMBER (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY) <input checked="" type="checkbox"/> REGULAR EVALUATION <input type="checkbox"/> SPECIAL EVALUATION	

5. KEY PROJECT IMPLEMENTATION DATES			6. ESTIMATED PROJECT FUNDING A. Total \$ _____ B. U.S. \$460,000	7. PERIOD COVERED BY EVALUATION From (month/yr.) 11/82 To (month/yr.) 5/84	
A. First PRO-AG or Equivalent FY 81	B. Final Obligation Expected FY 81	C. Final Input Delivery FY 85		Date of Evaluation/Review 5/14-5/28/84	

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIO, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
1. Procurement ASAP of soils scientist/forester for two month TDY. --Identification of procurement method, request and approval of necessary waivers. --Issuance of PIO/T --Approval of PIO/T --Negotiation of contract --Arrival of soils scientist	USAID/Guinea Branson REDSO/J.Cloutier USAID/Guinea Branson REDSO/Cloutier AAO M.Wentling USAID/Guinea Branson	6/30/84 7/10/84 6/30/84 7/15/84 8/15/84 9/1/84
2. Submission of revised budget and request for PACD extension. Approval of above	REDSO/Cloutier	7/30/84
3. Submission of PIO/Cs for additional procurement Approval of above	USAID/Guinea Branson REDSO/Cloutier	7/30/84 8/30/84
4. Conducting of in-country training forestry agents.	USAID/Guinea Laframboise	12/31/84
5. Planning and procurement documentation for final evaluation team (Branson)	USAID/Guinea	1/31/85

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS

<input type="checkbox"/> Project Paper	<input checked="" type="checkbox"/> Implementation Plan & C. CPI Network	<input type="checkbox"/> Other (Specify) _____
<input checked="" type="checkbox"/> Financial Plan	<input checked="" type="checkbox"/> PIO/T	_____
<input type="checkbox"/> Logical Framework	<input checked="" type="checkbox"/> PIO/C	<input type="checkbox"/> Other (Specify) _____
<input checked="" type="checkbox"/> Project Agreement	<input type="checkbox"/> PIO/P	_____

10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT

A. Continue Project Without Change

B. Change Project Design and/or Change Implementation Plan

C. Discontinue Project

11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)

G. Branson, *G. Branson* Project Support Officer, USAID/Guinea

M. Wentling, AID Affairs Officer, USAID/Guinea

12. Mission/AID/W Office Director Approval

Signature *Mark G. Wentling*

Typed Name Mark G. Wentling

Date July 23, 1984

13. Summary

Notwithstanding a lengthy delay in fielding technical assistance, the project has made significant progress toward meeting objectives identified in project documentation. The project calls for thirty months of field level activity. After eighteen months, many of the final outputs contained in the Project Agreement have been either met or surpassed. One of the principal reasons for project success has been tremendous local support.

Both the Project Paper and the Project Agreement emphasize the establishment of village level block plantations for domestic fuelwood purposes. Thus far, the project has successfully concentrated efforts on this activity. The project area is also suitable for forestry interventions that were identified, but not detailed in the project documentation (forage, soil enrichment and erosion control). Since part of the value of an AIP project is the experimentation with relevant activities in order to form a base for development of future interventions, the project should now begin to experiment with new species and techniques in the area of agro-forestry.

After a thorough review of project progress and requirements, the evaluation team recommends the following:

--the PACD should be extended from 5/31/85 to 9/30/85 to permit an orderly finish to the planting season and the execution of a comprehensive final evaluation;

--the project should engage ASAP the services of a soils scientist/forester for a two month TDY to assist in the necessary preparations for the next planting season;

--the project budget should be revised at the same time that the PACD is extended in order to provide for procurement of some additional commodities necessary for project implementation;

--the project should make a significant effort to increase contact with and support of the regional Water and Forest Service Office (WFS); this should include in-country training of all WFS agents in the Pita region.

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14. Evaluation Methodology

The purpose of this mid-term evaluation was: (1) to measure progress at the end of phase one of this two phase project, and (2) to advise project personnel concerning second phase activities in an effort to maximize the value of this pilot project. Personnel participating in the evaluation included representatives from the Republic of Guinea's Water and Forest Service (WFS), the AID/W Africa Bureau Office of Technical Resources Division for Special Development Problems (AFR/TR/SDP), the Project Development Office for AID located in Abidjan (REDSO/WCA/PDO), and the AID Affairs Office in Conakry (AAO/Conakry).

The Project Agreement, signed in August 81, called for a total of thirty months of field level activity under the supervision of a resident forester. This period was further divided into two distinct phases: phase one (18 months) was primarily devoted to testing and developing an appropriate and extendable technical package consisting of multi-purpose fast growing species; and phase two (12 months) was to be devoted to the village level extension of the technical package. For reasons that remain unclear, the resident forester was not contracted until November 1982. Because of this initial delay, the Project Assistance Completion Date (PACD) was extended to May 31, 1985 to allow a full 30 months of field level activity. Therefore, the timing of this evaluation (May 14-28, 1984) corresponded with the transition from phase one to phase two of the project.

15. External Factors

In March of 1984, President Sekou Toure died, and shortly after his death a coup d'Etat resulted in a new government composed primarily of military officers who had participated in the coup. One of the first acts of the new government was to dissolve the Guinean Democratic Party. The party had a significant role in government at the village level, and the abrupt demise of the party resulted in an organizational vacuum that will effect the ability of the villages to undertake communal activities for several months. It is anticipated that the project will have to greatly reduce the number of woodlots planned for the 1984 planting season (July-August), and instead concentrate on maintenance of those already planted. Since the evaluation team has recommended that the project de-emphasize the planting of woodlots and emphasize experimentation with agro-forestry techniques and tree species, this lull in planting of woodlots will not have a negative effect on project outputs; especially in view of the fact that the project has already surpassed the number of hectares required. Early indications are that the new government is extremely supportive of the project, and other than the initial disruptions discussed above, the change in government is not likely to have a negative impact on project activities.

16. Inputs

As previously mentioned, there was a significant initial delay in the fielding of resident technical assistance; however, once activities got underway, there were no further disruptions and the project has progressed smoothly. Obtaining the right kinds and amounts of seed at the right times has proven difficult, but the problem seems largely resolved. The GOG has in the past had difficulty in supplying some of the commodity inputs included as part of the host country contribution; this is especially true in the case of fuel. One encouraging note is that since the advent of the new government, there has been a marked improvement in the amount of fuel allocated to the project. There needs to be some minor adjustments in the project budget to reflect the need for some additional commodities, but in general project financing seems quite adequate and necessary adjustments will be between line items.

One significant input that should take place ASAP is the fielding of a soil scientist/forester for approximately two months. The soil scientist will advise the resident forester re experimentation with agro-forestry techniques to improve soil fertility; this will include identification of some additional tree species for testing purposes. The project budget contains sufficient funds for this purpose.

17. Outputs

The Pro Ag defines the major project output as a technically sound, culturally appropriate, economically feasible and easily accessible set of technical interventions. Specific outputs are defined as:

--two experimental nurseries producing seedlings for transplanting to demonstration plots plus a surplus to reforest an additional 30 hectares of village lands;

--three experimental village demonstration plots in sectors (groupings of villages) selected on the basis of willingness to participate and on ecological "representativeness" to test soil conditions and planting techniques;

--forestry training for the Guinean project director and forestry agents responsible for the care of the nurseries; this training to take place at the Centre National de Recherches Forestières, Sénégal;

--soils classification system for the limited project area;

--composting techniques to provide desperately needed organic fertilizer for family crops;

--acquisition of new skills: planting, seed selection, and composting for the 4,000 villagers in the six sectors representing 450 families in the project zone.

The project at this mid-term stage, has already met or surpassed outputs in number of functioning nurseries, village demonstration plots and number of hectares planted. In addition to the above, the project has demonstrated creative flexibility in taking advantage of targets of opportunity. The project has rendered assistance to a private sector Guinean to help him expand his tree nursery business, and assisted an enthusiastic village in the establishment of a village level nursery that was not contemplated in the project design.

The technical package that the project is extending to the villages is workable and very appropriate for purposes of fuelwood supply; however, the evaluation team felt that further refinement through experimentation with additional species, planting and composting techniques should be undertaken, with guidance by a soils scientist, in order to directly address the areas soil depletion problems.

Training as a whole has surpassed outputs; nevertheless, the evaluation team felt that some of the rather vaguely described in-country training has been neglected. The project should make a concerted effort to increase contact with and training of Pita forestry personnel who are not directly involved in project activities.

The project's contact with and training of villagers, although difficult to quantify, has been impressive. By PACD date the villagers who have benefited from project activities will have far surpassed the required output. One of the most impressive aspects of the project is the rapport developed with the villagers in the project zone.

18. Purpose

The approved project purpose is:

to develop a technically sound, culturally appropriate, economically feasible and easily accessible set of innovations to provide villagers of the Pita region with fast growing trees for fuelwood, forage, soil enrichment and erosion control.

There are no specific End-of-Project-Status in the Pro Ag, and those appearing in the Project Paper are of limited value due to the significant changes made by REDSO/WCA (see Abidjan 07521) prior to approval of the Pro Ag. It is obvious that outputs and subsequently the End-of-Project-Status will have been met in quantitative terms by the PACD. From a qualitative point of view, some work remains to be done to meet the broad spectrum of needs that the above project purpose assigns to the technical package. With the TDY assistance of a soils scientist/forester, further refinement of technical package to meet the soil enrichment and forage requirements, will ensure that the project purpose will be fully met.

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19. Goal/Subgoal

The Project Paper states that the ultimate goal of the project is the improvement of the well-being of the villagers in the Fouta Djallon region of Guinea by creating a better harmony between agricultural exploitation and locally available resources. The PP further states that this goal cannot be achieved within the life of the project. A subgoal of the project is to assist the GOG to build a foundation on which expanded forestry activities can be based.

At this point in time it is impossible to attempt to measure the project's progress toward the ultimate goal in any substantive way. The only available indicators are the project outputs, and the linkage between the outputs of this very limited project and this very broad goal is superficial at best.

The subgoal is much more tangible, and the project has made significant progress toward building a base toward an expanded forestry program in the Fouta Djallon region. This is especially true in terms of contacts with villagers and general community acceptance. A PID for a follow-on project will be developed in 4th quarter of FY 84. The new project will focus on increasing agricultural production through land improvement and agro-forestry techniques.

20. Beneficiaries

The principal beneficiaries of the project are the approximately 4,000 villagers who have participated in the village woodlot program. In addition to the physical benefit of fuelwood production, the villagers will have acquired special skills that will serve them whether they plan to plant trees for fuelwood, forage or fruit production. One village has benefited from the establishment of a totally village owned and operated nursery, and it seems likely that other villages will follow suit. One private sector Guinean has benefited from the establishment of a private nursery business.

The Guinean Water and Forests Service (WFS) of the Ministry of Agriculture has benefited from the establishment of two state run nurseries. Three WFS agents benefited from training in Senegal. The WFS Project Director has benefited from attendance in U.S. at the University of Pittsburgh Francophone Management Seminar. Several WFS agents in the Pita region have benefited from on-the-job training at the project sites.

It is further anticipated that during the remaining time the project will emphasize agro-forestry techniques to increase food production. This has tremendous potential benefit to the small-holder producer in the project area.

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21. Unplanned Effects

An interesting and unplanned for effect of the project has been the interest of a private sector Guinean in the production of seedlings (fuelwood and forage purpose) for sale on the local market. This individual had for a long time been involved in production of fruit tree seedlings, and it will be very interesting to see whether production of seedlings for other purposes is economically viable.

22. Lessons Learned

It is too early to give any significant lessons learned, other than the fact that it seems to take AID an inordinately long time to place technical assistance in the field, and that this long delay is rarely taken into consideration in the project implementation schedule.

23. Special Comments or Remarks

This project is currently the only AID financed project in Guinea that is implemented by the Ministry of Agriculture; therefore, it serves as a major point of contact with GOG personnel directly involved in the agricultural sector. This is clearly pointed out by a recent visit to the Fouta Djalon region by the new Minister of Agriculture and a host of ministry and regional government employees, during which one of the project nurseries was visited and project personnel interviewed by the Minister. The Minister was pleased by the project and stated that it represented an appropriate approach, in view of Guinea's limited resources, to the area's forestry and soil depletion problems.

24. Recommendations

(See Annex I)

Annex I

General Observations and Recommendations

1. The project, at PACD, is to leave a replicable set of forestry interventions that villagers can use and the WFS can extend. In order to accomplish this by PACD, the project must deepen and expand its collaboration with the WFS. The in-country training of the regions WFS agents in nursery, plantation and extension techniques has been limited to those who have been assigned to the project; however, it should be noted that of the total 28 agents assigned to the Pita region, 4 are assigned to the project and additional 5 are assigned to the FAO project where presumably they benefit from similar training. The project has been somewhat hampered in its effort to broaden ties with the regional WFS personnel, due to the absence of the WFS Regional Director who has been in training. It should also be noted that the in-country training envisaged the participation of WFS agents from the adjacent Labé region. The Pro Ag (see Abidjan 07521) limited the scope of the project to the Pita region.

It is the recommendation of the evaluation team that the AID financed Project Manager, the GOG Project Director and the Acting WFS Regional Director should identify all WFS agents in the Pita region; schedule and conduct training for them in village, private and state nursery operations, plantation installation and maintenance, and methods of contacting and extending tree planting techniques to villages and individuals. The project should also contact regional WFS office in Labé and invite the WFS agents in the Labé region to participate.

2. Lack of transportation is one of the main constraints to effective WFS activities. The evaluation team recommends that Pita area WFS agents participating in the in-country training program be furnished either a bicycle or mobylette by the project. The financing of these vehicles would be subject to: (1) availability of project funds for this purpose; (2) the agreement of the regional WFS office to supervise use and maintenance; and (3) the understanding of all parties concerned that other than an initial limited supply of spare parts, responsibility for recurrent costs would be borne by the regional WFS office and not the project. Since the number of WFS agents in the Pita region is small, the costs of this effort will not be significant, but could have a significant impact on the integration of project activities into the regional WFS organization.

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3. The project should program a shift toward selling trees to villages and individuals. This is essential if private nurseries are to be started and sustained. Establishing the acceptability of buying trees will also lead people away from only using species which easily regenerate themselves, and increase use of species such as pine; pine appears to be most successful in acid soils and in heavy browsing areas, is fast growing and multipurpose, but must be replanted.

4. The WFS should increase the work force to at least four permanent workers per nursery. If recruitment of people is difficult because of low official salaries, then the GOG should supplement salaries via indemnités, as is currently done in the FAO project, to make the job more attractive.

5. Although project activities enjoy enthusiastic GOG and local support, with all hoping for continuation of activities via a follow-on project, the project's physical presence does not convey a sense of permanence. The project office is rented by FAO and loaned to the project; and office furniture and equipment are old and in poor condition. Pending AAO budget revision which should reallocate remaining project funds, and REDSO/WAAC approval of budget revision, the project should:

--procure office furniture;

--request that FAO make available a second room as originally planned;

--procure some additional office equipment;

--finance some modest remodeling of the project office;

--request WFS to supplement the salaries of the Project Director and his assistant via an "indemnité de responsabilité" using GOG owned counterpart funds;

--request WFS to hire a temporary secretary/administrative assistant using GOG owned counterpart funds.

6. The project has thus far concentrated its effort on Government run nurseries to grow fast growing tree species and assist villagers develop small plantations, mainly for domestic use. The PP emphasized this activity and primarily based the project justification on it. Subsequent reductions in the scope of the project, took away areas where this type of activity was most appropriate (Labé). Left in the project were areas (Pita) probably more suited for other activities mentioned, but not detailed, in the PP (soil enhancement, soil erosion control, forage production, village nurseries). Though village block plantations in the existing project area are important, fuelwood for domestic use should not be their only raison d'être; nor, should communal involvement be a major factor when planning for and organizing out-plantings. The following is a set of recommendations as to how the project should diversify and suggested means of implementation.

a. Block plantations: Individual land owners, construction firms and brick makers should be contacted and convinced it would be profitable to invest in tree plantings for future and convenient supplies of construction materials and brick firing fuel. This option would be most viable near Timbi Madina, Pita and other rapidly expanding urban centers.

The experimental tobacco processing plant near Timbi-Madina will need large quantities of wood for drying if it is to be successful. The Project Director should determine the status of the institution and suggest ways the project can assist in assuring a continuous wood supply. Options are:

- (1) Company owned and operated nursery and plantations;
- (2) WFS owned nursery furnishing a company plantation;
- (3) Company or WFS run nursery supplying private or village owned plantations;
- (4) Private or village owned nurseries and plantations.

Other special interests should be identified and assisted whenever possible.

b. Private and non-project financed nurseries: The project is fortunate that Mr. Barry in Bantiniel-Hollade asked for technical assistance in producing fast growing fuelwood species. His activities should be monitored very carefully. He presents a, thusfar, unique opportunity to examine the real economics of nursery and possibly private plantation operations. This enterprising individual can also offer insights on species selection for purposes other than fuelwood. Because results will probably not be forthcoming until after the PACD. the Project Manager and Director should work closely with the WFS regional Director in setting-up the monitoring program.

The Commandant in Timbi-Touni is another person the project should watch closely. His initiative in using district funds to operate a nursery is commendable. Whether or not his old guard manner (making decisions for villages and expecting them to do the work voluntarily and enthusiastically) works or damages the project will require close attention.

In general, this type of "extension" has not worked elsewhere in West Africa but should not automatically be discounted here. The Commandant's experience and background in agriculture may prove to be a significant ingredient to a successful village woodlot project.

c. Soil rehabilitation: Some tree planting techniques have shown promise in increasing agricultural productivity on seriously depleted soils. Increasing population demands that all usable lands be put under production. There are an estimated 40,000 hectares between Pita and Timbi-Madina where cereal cropping is being done year after year without the benefit of traditional fallowing to regenerate the soil productivity. The soils can grow only fonio at present.

The project should install experimental plots which demonstrate:

--the effects of 10m x 10m spaced Acacia albida; and,
--windbreaks, two rows of 3m x 3m spacing every 75 meters using species tolerant to acid, heavy and moist soil conditions (species suggestions are under the technical recommendations).

d. Soil stabilization: In much of the arrondissement of Bantiniel and in the western portion of Timbi-Madina farmers are being forced to clear forested steep slopes for agricultural purposes. The usual method of clearing an area is by burning; this often results in very large deforested areas, only a small part of which is actually put under cultivation. Soil erosion, especially in the cultivated part, is severe. The project agents, in the course of village contacts, should strongly denounce the wastefulness of this practice and offer help in rationally developing these lands. Because this practice is illegal (no enforcement is possible though) only one small area (preferable near Mr. Barry's farm in Bantiniel-Hallade) should be considered for "slope development". The project should furnish 4 or 5 backpack fire fighting pumps and instruct the villagers in their use. One farmer should be found who has decided to expand his/her field in the slope should be found just after the coming cropping season. The area should be delimited and a 2 meter firebreak scraped around it felling trees whose crowns fall within in the wind break. The project agents should try to convince the farmer to harvest as many trees in the plot as possible, noting species preferred and asking why they were chosen and what he intends to do with them. A fire should be set on a calm morning at the upper part of the slope at a time before the area is completely dried out. The lower edge of the newly burned field should be 30 to 50 meters above the slope bottom to minimize stream siltation. Small (30 to 40 cm high) lateral dikes should be placed every 20 to 30 meters and biologically reinforced with low shrubs, aloes or congo beans. The project should carefully monitor the soil dynamics during the following rainy/cropping season.

In areas where uncontrolled burning has already cleared large tracks of steep slopes, persons responsible for the action and villagers nearby should be convinced to implement the soil conservation measures described below.

e. Forage: Much of the cleared 40,000 hectares around Timbi-Madina has been cultivated for so long, it is only suitable for the meagre forage, it can produce, for animals. The project should attempt to introduce species tolerant to these poor soil conditions which could be used as animal fodder. Three demonstration plots of no more than 2 hectares each should be planted with Altissima spp, Prosopis spp, Cajanus cajan (Congo bean) and local species preferred by animals. Vegetation around each tree should be cleared for at least 2 years and a 3 meter fire break around the plots should be maintained during that time. Basic fire fighting equipment should be given to people who stand to benefit most from the demonstration plots.

7. Due to the lack of locally available exotic seed, the project nurseries have not been able to produce in a timely manner, quantities of seedlings sufficient to meet the demands of the villagers. Since seed procurement is an AID financed input, and since cabling around West Africa has not proven a satisfactory method of obtaining required seed, the project should provide funds for the Project Manager and counterpart personnel to visit appropriate countries in West Africa in order to examine, procure and transport seeds. If possible such visits should include on-site visits to similar projects. Three recommended sites are Banjul (neem and gmelina), Ouagadougou and Dakar (other exotic species).

8. It now appears likely, subject to REDSO/WCA approval of PACD extension recommended by the evaluation team, that the final evaluation will take place in the 4th quarter of FY 85. The team should consist of:

(1) a forester familiar with the state-of-the-art of forestry technology in francophone West Africa;

(2) a sociologist with West African experiences in discerning the difference between what people mean and what they think they are expected to say;

(3) a natural resource economist with experience in land use planning.

9. It is strongly recommended that the project proceed ASAP with procurement of a soils scientist. The soils scientist will be needed for a two month TDY which should be completed prior to November, 1984 in order to impact upon the preparations for the 1985 planting season. Funds are available, and have been identified for this purpose.

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Annex II

Technical Observations and Recommendations

Seedling and transplant mortality is the most serious problem face by the project to date. In nurseries, termites can strip a planche of seedlings overnight. It is important when constructing new nurseries and for minimizing the problems in old ones to completely remove all vegetation above and below the ground. Dead roots one meter below ground will draw termites to the nursery like a magnet. To minimize termite problems in the nursery, the soil should be dug up to a depth of at least one meter. All roots should be taken out and burned. Tap roots should be dug out as cleanly as possible. Wooden fence posts should be treated and/or set away from the beds as far as possible. Organic amendments to the soil must be completely composted, not merely decomposed as this is good termite food.

On plantation sites, it is unrealistic to expect villagers to be as thorough as professionals can be in a nursery; nevertheless, villagers should be expected to dig out any dead trees and knock over termite mounds. Where possible, the village should provide or rent a tractor capable of turning the soil over at a depth of at least 40 cm; afterwards, manually raking and piling exposed roots for burning. The project should be allowed to utilize AID funding to procure insecticides. The use of Deldrin^R and HCH has been approved for use against termites in tree plantations if strict precautions are taken. AAO/Conakry should cable the Africa Bureau Environmental Office for details before purchasing these materials in Dakar.

The lack of adequate hardening-off before transplanting to plantations can seriously retard growth or kill seedlings. A suggested, though more labor intensive, method to ensure hardy transplant stock, is the following:

- a. Plan for older seedlings (8 to 9 months old);
- b. Trim lower branches regularly;
- c. After 4 or 5 months, trim all lower branches and leaves. With a shovel, loosen dirt along the rows of trees. In the evening of the same day, gently pull the trees and trim any lateral and tap roots longer than 25 cm; replant in same bed and water immediately;

d. The same should be done again in the 7th month. If the original beds were limed and the plantation is not going to receive the same treatment, the seedlings should be transplanted into a more acidic bed, then immediately watered. The nursery planner should allow for at least 25 percent mortality using this method.

Observations appear to indicate that stumping of Gmelina may not be productive. A simple 50 percent stumped vs non-stumped test should be done to confirm this. Bending or cracking the stumps during transplanting might also have a direct bearing on mortality.

The poor performance of Leucanea in plantations suggests it may not be suited to the soil acidity and heavy browsing conditions. Even protected until it is two meters tall is not a guarantee that a cow or sheep would not knock it down to eat the leaves. It is recommended that Leucanea be transplanted only in areas permanently protected from browsing (fenced fields and inside concession walls). The project should experiment with natural soil amendments (lime or woodash) to determine if acidity is a real problem. The project should also experiment with older stock, both in pots and bare root, stumping the later at 1.5 meters before transplanting into termite free areas.

Some other techniques worthy of experimentation are:

--the costs/benefits of mixing 50 percent compost into the transplant holes;

--the feasibility of collecting and composting fresh animal manure (high nitrogen content) near nurseries and plantation sites;

--transplanting on mounds and in sandy soils vs heavy waterlogged areas;

--introduce new species for site testing, such as neem and albizzia.

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