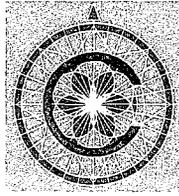


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CHEMONICS INTERNATIONAL INC.



VOLUME I
TECHNICAL ASSISTANCE REPORT TO DEVELOP THE NIALAMA FOREST
TECHNICAL MANAGEMENT PLAN
GUINEA NATURAL RESOURCES MANAGEMENT PROJECT

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National and local forestry officers of *La Direction Nationale des Forêts et de la Faune* (DNFF) were supportive of the mission's aims. The attendance of selected officers at the training course and seminar is testimony to their commitment to the community-based management of natural forests in Guinea. Facely Mara and Cheikh Sylla from DNFF, Conakry, and of B. Bah, Director of Koundou Watershed should especially be mentioned.

I am indebted to agroforester Tom Erdmann, a member of the Tropical Research and Development (TR&D) technical assistance team. He introduced the task and, at the end of the mission, scrutinized the draft report, suggesting valuable improvements that I incorporated.

I worked closely with the international social forestry consultant, Paula Williams, who was preparing proposals for the community-based management of Nialama Forest. The simultaneous development of the technical and social dimensions of the management plan ensured that the technical proposals were feasible.

The members of the forest committee, which represents the local communities, exchanged many ideas about forest management. This contact was facilitated by Oulin Diallo, whose nongovernmental organization *Union Guinéenne de Volontaires de Développement* (UGVD) was responsible for moderating some of the meetings.

I provided 50 days of technical support to assist in developing a natural forest management plan, which was drafted by Guinean DNFF staff with participation from community members in the Nialama region. My work derived, in part, from earlier work by Mr. Denys Bourque conducted in the Nialama Forest Reserve.

Dr. Nguyen Son, USAID natural resources adviser, has given his strong support to the management of natural forest resources in Guinea. I would like to express my appreciation to USAID for their approval and funding of the mission. Finally, I thank TR&D and Chemonics for their efforts on my behalf.

ACRONYMS

BRP	Bassin Représentatif Pilote
CIRAD	Centre de Coopération Internationale en Recherche Agronomique pour le Développement
CTFT	Centre Technique des Forêts Tropicales
DBH	diameter at breast height
DNFF	Direction Nationale des Forêts et de la Faune
FAO	Food and Agriculture Organization of the United Nations
GIS	Geographic Information System
GNRM	Guinea Natural Resources Management
NGO	nongovernmental organization
NWFP	non-wood forest products
PGRN	Projet de Gestion des Ressources Naturelles
stere	stacked cubic meter; approximately 0.66 m ³ solid volume
TR&D	Tropical Research and Development, Inc.
TREECD	Tree-CD ROM; bibliographic database, University of Oxford
UGVD	Union Guinéenne des Volontaires de Développement
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

Le Projet de Gestion des Ressources Naturelles (PGRN) has adopted a twin approach to community-based forest management of the Nialama Forest Reserve in Guinea. One track develops the community and social structures needed to negotiate and implement a management contract, and the other, which this present report addresses, focuses on the technical aspects of forest management that have determined management options.

This report is based on extensive fieldwork, the analysis of a completed forest inventory, training exercises, and a seminar on natural forest management, all of which culminated in a preliminary technical management plan.

The preparation of a technical management plan in support of a possible co-management contract between local communities and the State breaks new ground in Guinea. Although management plans elsewhere in Guinea envisage peoples' participation, the plan for Nialama Forest goes further, and is more radical, than anything so far attempted.

With its emphasis on what villagers want from the forest (cultivable land) rather than what foresters think they should want (wood), the plan taps into a powerful motivating force. By linking this force to fire management, the plan seeks to engage the local community in an agroforestry system that is compatible with long-term conservation of the forest.

The field training, which involved government service foresters and local community representatives, focused on issues important to both local communities and the State. This field training provided each party to the proposed co-management contract with an appreciation of the role and responsibilities of the other, thereby contributing toward constructive negotiations.

The seminar provided a much-needed forum for foresters to discuss the challenges of natural forest management. The importance of this subject should be viewed in the context of the current orthodoxy in Guinea, which favors tree planting over management and regeneration of existing forest cover.

The preliminary technical management plan (see Volume 2) remains to be finalized. It will include a discussion and confirmation of village zones as the basis of forest block organization, the further registration of *bas-fond* cultivation areas, and the revision of the forest map.

A separate review of the forest inventory of Nialama Forest is included in this report as Annex B. Besides deriving the necessary justification for the proposed management interventions (for example, the sustainable harvest levels), Annex B suggests ways in which the inventory of this type of natural forest in Guinea could be modified.

This report contains twenty-two recommendations on aspects of natural forest management. These are primarily technical in content and follow the requirements stated in the scope of work. They fall into the following broad categories: forest inventory design, revision of forest maps, silvicultural management, applied research, and follow-up.

The preliminary management plan will provide the technical basis for the negotiation of a contract between local communities and the state for the co-management of Nialama Forest Reserve. Both parties in this negotiation will need the continued material support, technical assistance, training opportunities, and encouragement from the project and USAID.

Recommendations

The following summarizes the 22 recommendations included in the text of this report. All recommendations refer to the technical proposals for management planning in natural forests in Guinea. The recommendations are addressed primarily to DNFF as the responsible technical authority in Guinea. We suggest that the recommendations also be reviewed to other, relevant, reserved forests in Guinea that have the same dry forest type, face the same management problems, and have similar management objectives.

Forest map

1. Forest classifications used in the forest map should distinguish vegetation types and land-use categories.
2. The forest map of Nialama should be revised to conform with the list of revisions contained in Annex I.

Inventory design

3. For a management-level inventory, sampling intensity should be 3 percent.
4. The measurement of regeneration should be prioritized in inventories of natural forests.
5. Inventory design should incorporate sub-plots for measuring trees of smaller size.
6. Information on heights is not required for silvicultural management at the stand level, and should be omitted from future inventories for all trees less than 35 cm DBH.¹

Management plan content

7. A management plan should be kept simple and should rely on local source material.

Fire management

8. Fire management should involve early burning to reduce fuel loads, burn temperatures, and duration, but it should not seek to eliminate fire from the forest.

¹That is, tree heights should only be measured in the merchantable timber classes (over 45 cm DBH) and in the immediate two classes below (35-39 and 40-44 cm). Correspondingly higher thresholds would apply in the case of felling limits of 55 cm.

Regeneration strategy

9. Natural regeneration should be the first choice in all areas of the forest, and tree planting should be confined to identified "problem" areas where natural regeneration has failed or is likely to fail.

Agroforestry

10. Managed rotational fallow coupled with the acceptance and protection of natural regeneration should be introduced to parts of the forest not classified as protected areas.
11. The areas in cultivation at any time under the aegis of an agroforestry program should not exceed 5 percent of the entire forest area.

Cultivation of *bas-fonds*

12. The possible future expansion of *bas-fonds* should be subject to a limit of 5 hectares per year for five years.
13. No agrochemicals (pesticides, herbicides, or inorganic fertilizers) should be permitted in the *bas-fonds*.

Productive management of Bani (*Pterocarpus erinaceous*)

14. The annual allowable harvests of Bani should be reviewed every five years.
15. Selection felling of Bani for timber and selective thinning of class C trees for firewood should be carried out in parts of the forest that are not classed as protected areas.
16. The selection rules for trees and the annual allowable cut should govern all harvesting of Bani.

Productive management of bamboo

17. A pilot operation to market bamboo poles should be carried out through a sales outlet in Komba.

Applied research

18. Research activities should concentrate on monitoring the implementation and effects of prescribed treatments, and not include any long-term commitments or broader areas of interest.
19. Five annual assessments of changes to forest cover of Nialama Forest Reserve should be carried out on the basis of SPOT satellite images.

Follow-up

20. With the cooperation of DNFF local staff, the project should continue to refine the provisional forest blocks in consultation with the forest committee and in accordance with management plan guidelines.
21. The registration of all existing *bas-fond* areas should be made final before the management contract comes into effect.
22. Mapping revision should be carried out at the Bureau Technique in Conakry according to the list in Annex I.

SECTION I INTRODUCTION

A. The Mission

Tropical Research and Development, Inc. (TR&D) provided the services of Peter Lowe, specialist in natural forest management, to Le Projet de Gestion des Ressources Naturelles (PGRN) for 50 working days from August 8 through October 4, 1996. The technical assistance included 1.5 days in Oxford to conduct a literature review in fulfillment of his terms of reference; 43.5 days at the duty station (Labé), of which 13 days were at Nialama Forest Reserve; and 1.5 days in Conakry for briefing and debriefing.

Mission objectives, given in the terms of reference (Appendix A1), were to:

- Assess the current forest resource in Nialama Forest
- Determine an appropriate silvicultural system for the natural vegetation
- Devise a draft technical management plan accordingly

Five deliverables were specified in the terms of reference, namely:

- Submission of a draft technical management plan
- Submission of a draft work plan
- Training a group of three to five selected DNFF staff in natural forest management
- Training of a group of approximately 10 selected villagers on the basics of natural forest management
- A seminar for DNFF personnel on the basic principles of natural forest management and related aspects

B. Work Plan

The scope of work in the terms of reference specified 14 activities. After a draft work plan (Annex B), was submitted to the technical assistance team (deliverable 2), the team decided to de-emphasize institutional capabilities and policy obstacles (deliverables 12 and 14, respectively) because these activities did not fulfill any of the three objectives or five deliverables specified for the assignment. Even so, there remained 12 specified activities. Additional activities were also required for the preparation and implementation of:

- The training courses for DNFF employees and villagers
- The seminar

USAID-Conakry requested comments on the environmental assessment carried out by USAID in May 1996.

Implementation of the work plan was severely disrupted by a government edict restricting employees to their duty stations between August 28 and September 15. This high-level decision was intended to facilitate a census of government employees but delayed the training course for DNFF employees until September 10, leading to a subsequent delay in the seminar presentation (see Annex C for the official notification of the census of government employees). The timetable

was revised, and the mission was extended by two days to accommodate changes to the work plan.

The changes did not negatively affect the work plan. The change gave time to better understand forest conditions and prepare preliminary technical proposals before the start of the training course. However, the four working days remaining after the seminar, before traveling from Labé to Conakry, restricted the time needed to write a polished report and management plan and arrange for their translation into French.

C. Training Courses in Natural Forest Management

A two-part training course for DNFF employees on the management of natural forest (deliverable 3) was organized and presented. There were five DNFF participants, two from national headquarters in Conakry and three from the prefecture level (see Annex D, list of DNFF participants). The course was held in Labé September 10–13, 1996, and in Nialama Forest September 16–20. The timing had been delayed by the census of state employees. Consequently, attendance was truncated, with an attendance rate of 29 person-days out of a possible 45.

The consultant also organized training in basic forest management issues for ten members of the forest committee (deliverable 4) to overlap with the training of DNFF personnel in Nialama Forest (see Annex D for a list of forest committee participants). Their attendance rate was very high. The training was to last two days, but enough villagers were interested to continue for a third day.

The objectives of the training were to:

- Bring together the various participants in the management planning process—the consultant, DNFF personnel, and the forest committee
- Provide training for the two groups in the principles of natural forest management and assessing and interpreting information (especially air photos, maps, and inventory results), to address the issues to be resolved in the Nialama Forest plan
- Collaborate on the preparation of a draft technical management plan for Nialama Forest

The first session, for DNFF personnel only, was held in Labé and concentrated on preliminary desk studies and the structure and contents of the proposed management plan. The second session, held in Nialama Forest, emphasized practical fieldwork, including the identification of forest problems and possible technical solutions (see Annex E for a list of topics covered in the training course).

Despite the problem of attendance by DNFF personnel, they showed a high level of interest. The field training course brought together participants who differed in their opinions on the proposed management plan. Participants included members of the forest committee, and DNFF staff from headquarters, prefecture, and cantonnement levels. The course provided an opportunity for these participants to appreciate the attitudes, experience, and aspirations of others concerned about management of Nialama Forest, and was a valuable step in the process of developing a mutually acceptable technical management plan for the forest.

In addition, the consultant was able to use the training course as an opportunity to sound out his preliminary technical proposals with experienced local people in the field.

D. Seminar on Natural Forest Management

The consultant organized a seminar (deliverable 5) on the management of natural forest in Labé, held September 25–26, 1996. The timing had to be delayed due to the census of state employees (see Annex F for a list of seminar participants). The 29 invited participants were professional and technical foresters, categorized as follows:

Table I-1. Categories of Seminar Participants

Category	Number
DNFF, Conakry	2
<i>Chef Section/Chargés Forêts Préfectures</i>	11
<i>Chef de Cantonement Forestier</i>	4
<i>Directeurs, Bassin Representative Pilote (BRP)</i>	2
<i>Agroforestiers, BRP</i>	3
Other projects	2
PGRN (project)	5
TOTAL	29

The objectives of the seminar were to:

- Review the principles underlying the management of natural forests
- Discuss the relative merits of natural regeneration and artificial planting, especially of exotic species
- Present technical proposals for critical evaluation of a management plan for Nialama Forest Reserve

The format adopted for the seminar was comprised of 20 short presentations given by 8 people and grouped into 6 sessions, followed by intervals of discussion. At the end of the last session and discussion, two reporters summarized the proceedings (see Annex G for a program of the seminar). A list of the sessions follows:

- Approaches to management planning of forests
- Area organization, protection, fire control, and regeneration
- Agricultural activities in the forest reserve
- Harvesting forest resources
- Aspects of administration and implementation

The participants' high level of interest and commitment and the intense debates that ensued caused the seminar to run over by up to 3 hours each day. The seminar provided a much needed forum for professional and technical foresters to discuss common concerns about the management of natural forests in Guinea.

The reason for restricting participation to state forestry personnel should be explained. The seminar formed an integral part of a process leading to co-management of Nialama Forest Reserve, which is a key project outcome for the project. During the previous weeks, the consultant had attended meetings with the forest committee and had worked in the field with members of the committee, becoming well informed about their priorities. Indeed, the consultant's presentation of his draft technical proposals to the full forest committee (September 20, Linsan Saran) reflected some of their aspirations, particularly with respect to cultivation within the forest. The seminar provided a timely opportunity for foresters to have a formal discussion about the technical proposals, keeping mind that DNFF is mandated to submit management plans for ministerial approval.

Guinean foresters are entrenched in the belief that they should control natural processes rather than take advantage of them. The most prolonged and animated discussion related to the perceived necessity to plant trees in the natural forest, a practice the consultant does not believe to be technically sound. Thus, the consultant's proposal that the management plan rely on natural regeneration, except where evidence indicates this is not possible, met with counterproposals based on enrichment planting.

On this and other topics, a pattern emerged where, rather than evaluate technical solutions already presented, some participants proposed alternative ones. Instead of permitting the seminar participants to propose their own management plans for Nialama, each was invited to express on a ballot any legal or technical objections to possible technical proposals prepared on behalf of the project (see Annex H for the ballot form and a list of "test" proposals presented to test possible objections). Although this exercise was not completely successful, the ballot forms indicated that no substantive legal or technical objections were raised.

In conclusion, the seminar was highly successful. The primary value of the seminar was that it provided the opportunity for lively debate among professionals. Although the practices of Guinean foresters are clearly orthodox, many are adjusting to new technical ideas and new policy directions. In developing the management plan proposals, some seminar participants recognized the link between the role of communities in fire management and cultivating forest land under a managed system.

SECTION II CURRENT FOREST RESOURCES

An assessment of the current forest resource base (see Volume 2, Annex D) is a prerequisite for preparing a technical management plan for a forest.

A. Background Documentation

The available maps and aerial photographs of the Nialama Forest Reserve were carried out under the FAO project in 1989 late in the dry season, the least-appropriate time of year to interpret vegetation. Also, photo coverage applies only to that part of the forest (approximately 60 percent) that overlaps the Koundou Watershed Catchment Area (BRP #9). A photo mosaic and local topographic maps (with scale 1:5,000) were also prepared for BRP #9.

In 1996, the Bureau Technique of DNFF prepared a draft forest map at an approximate scale of 1:42,000 based on the photo mosaics and supplemented by the national topographic map (scale 1:200,000) for the western part (about 40 percent) of the forest that does not lie within BRP #9.

The main value of this draft map lies in its preliminary forest classifications, the compilation of which was facilitated by the use of SPOT satellite images. These classifications are based on vegetation types and land use categories. This practice, however, has the potential to mislead, and could lead to problems in allocating forest land to a unique class.

The draft forest map contains numerous errors and needs updating to incorporate the findings and prescriptions contained in the management plan (see Annex I for a list of required revisions to forest map). This process has been initiated.

Forest Map

Recommendation 1. Forest classifications used in the forest map should distinguish between vegetation type and land use category.

Recommendation 2. The forest map of Nialama should be revised in accordance with the list in Annex I.

B. Summary Review of Inventory Results

This review summarizes the conclusions required to support a number of recommendations concerning the inventory and presents the implications for the management plan.

B1. Design

The technical assistance team provided the consultant with the raw data for the 1996 inventory of Nialama Forest, as well as their preliminary calculations. The consultant analyzed several aspects of the inventory, including plot characterization (vegetation, terrain, and soil), species composition, regeneration, stand parameters, diameter distributions, and potential harvest volumes of Bani.

Because the allocation of sample plots in the inventory was not stratified or randomized, the consultant made no attempt to calculate statistical error of the population estimates. Assuming a forest area of 10,000 hectares, a sampling intensity of 0.3 percent is sufficient only for a reconnaissance level inventory. In a forest of this type and size, sampling intensities of 1 percent for a resource inventory and 3 percent for a management level inventory would be indicated. For this reason, the consultant did not rely too much on these estimates. The main value of this inventory has been to provide indicative figures for the forest as a whole. However, the inventory cannot be used to estimate population parameters for particular forest type classes or territorial subdivisions. Although an estimate of merchantable volume has been derived, the inventory could not be used to locate and assess potential harvest areas.

The inventory was directed toward the measurement of wood (trees exceeding 10 cms diameter at breast height [DBH]), and was not designed to estimate the number of smaller trees or degree of regeneration (although regeneration was reported qualitatively). Information of that kind is essential for manipulating and monitoring the development of natural forest. An important criterion of sustainable forest management is that the silvicultural system ensures adequate regeneration, particularly in relation to harvesting interventions.

The plot size (0.5 ha) used in the inventory was appropriate for sampling relatively few larger trees. The inventory fieldwork could have proceeded more quickly, however, if measurements of the more numerous smaller trees and of regeneration had been confined to subplots. For example, regeneration could have been assessed on four subplots of 0.01 ha each, located at the corners of the main plot. Also, smaller trees (5-15 cms DBH) could have been measured on four subplots of 0.05 ha.

Excessive fieldwork was devoted to the measurement of tree heights. Although needed to compute volumes of trees exceeding 35cms DBH,¹ or for the construction of local volume tables, information on heights is not required for silvicultural management at the stand level.

<p>Inventory Design</p> <p>Recommendation 3. For a management-level inventory, sampling intensity should be 3 percent.</p> <p>Recommendation 4. The measurement of regeneration should receive high priority in inventories of natural forests.</p> <p>Recommendation 5. Inventory design should incorporate subplots for measuring trees of smaller size.</p> <p>Recommendation 6. Information on height is not required for silvicultural management at the stand level, and should be omitted from future inventories for all trees less than 35 cm DBH.</p>
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¹ That is, tree heights should only be measured in the merchantable timber classes (over 45 cm DBH) and in the immediate two classes below (35-39 and 40-44 cm). Correspondingly higher thresholds would apply in the case of felling limits of 55 cm.

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B2. Species Composition

The species composition of the forest features 77 tree species. However, Bani predominates (26 percent of trees measured), and the five most common species account for approximately 50 percent of measured trees. The fact that the other 50 percent of measured trees belong to 71 other species serves to illustrate the importance of species diversity in Nialama Forest.

The species mix is more diverse in the smaller-diameter classes than in the larger-diameter ones in which Bani predominates. Among larger-sized trees, the prevalence of a few species, such as Bani, illustrates the higher mortality of other species, and is consistent with the development of a fire-conditioned ecology in which a relatively small number of tree species dominate. It should also be borne in mind, however, that some species are inherently small, regardless of competition or environment.

Species of high timber value, such as *Khaya senegalensis*, *Milicia regia*, *Azelia africana*, and *Borassus aethiopum*, are comparatively rare.

The regeneration recorded in the inventory is dominated by three species, *Piliostigma thonningii*, *Markhemia tomentosa*, and *Combretum* spp. These are rapid colonizers, able to recover quickly after the passage of fire and out-compete invasive grass species.

B3. Stand Parameters

Calculations of stand parameters, such as mean stocking, DBH, height, and basal area, showed extreme variability. Owing to the lack of *a priori* stratification by forest vegetation, the number of sample plots in some vegetation types was too few to provide a basis for analysis.

The consultant, however, has proposed a tentative characterization of six forest vegetation types of Nialama Forest in terms of indicative basal area limits. Since basal area is a measure of stand density and provides a good index of woody competition, the application of such limits could serve as a yardstick to measure forest degradation of the respective vegetation classes.

B4. Harvesting Potential

Only Bani is sufficiently widespread in the forest to allow sustainable wood harvesting. During the inventory, Bani trees were assessed for merchantability using a three-class scale.² Only about 16 percent of the Bani trees measured could be considered for eventual timber use (classes A and B); the remaining trees were judged suitable only for firewood (class C). The diameter distributions of Bani trees show that class C trees are relatively more abundant in small DBH classes than in larger diameter ones.

According to calculations based on the inventory results, the annual allowable cut of Bani is 200 trees (approximately 300 m³) of class A and B, and 1,200 trees (approximately 2,000 stere³) of class C. This calculation is based on key assumptions relating to the production area available in the forest; the free growth rotation of Bani; the average time trees take to pass between

² Quality Classes: A - prime timber; B - suitable for secondary timber uses; C - suitable only as firewood.

³ A stere is a stacked cubic meter, approximately 0.66 m³ solid volume.

successive diameter classes; and minimum diameters for harvesting of trees in the different quality classes. The figures for allowable cut have also been adjusted upwards to counteract the development of an overmature growing stock.

The annual allowable harvest of Bani needs to be recalculated every five years, taking into account the ease or difficulties reported in locating harvestable trees, the actual rate of harvesting compared to the planned rate, and periodic fresh inventories of the Bani resource.

Annual Allowable Harvest

Recommendation 7. The annual allowable harvest of Bani should be reviewed every five years.

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SECTION III
PREPARATION OF A PRELIMINARY TECHNICAL MANAGEMENT PLAN

The central focus of activities during this mission was to prepare of the preliminary technical management plan for Nialama Forest Reserve (objective 3). In addition to carrying out the assessment of forest resources (objective 1), appropriate silvicultural systems (objective 2) also had to be identified.

A. Review of Background Documentation

A1. Overseas Literature Review

The consultant received draft results of the inventory for Nialama Forest and made contact with the Centre de Coopération Internationale en Recherche Agronomique pour le Développement. The professional staff and the library services of CIRAD were not available because they were on vacation.

The consultant, however, was able to carry out a brief literature search at FAO in the documentation center of the Tropical Forestry Action Plan unit, visit the Commonwealth Forestry Library in Oxford, England, perform bibliographic searches on TREECD, and consult various sources, including "Bois-et-Forêts des Tropiques," a CIRAD publication. A total of 710 references were identified from the databases and 15 articles were extracted.

A2. Local Background Information

The project staff supplied copies of all relevant background documents. These included forest legislation, previous consultants' reports, interim reports and terms of reference of the consultant on community-based management, management plans for other forests, aerial photographs, and maps.

The information provided by these documents was more than adequate and was used directly in the draft management plan. In retrospect, the consultant relied heavily on material already in Labé and scarcely needed to refer to material acquired outside Guinea. This agrees with the consultant's view, expressed before the literature search was performed, that a management plan would stand a better chance of implementation if it relied on locally available information and did not attempt to introduce academic or research findings only available abroad.

Management Plan Content

Recommendation 8. A management plan should be kept simple and rely primarily on local source material.

A3. Community-Based Management

A cooperative effort involving two consultants and a local NGO took place the same time as the consultant's mission, and proved very fruitful. This management plan benefited greatly from the work of international consultant, Paula Williams (social forester); national consultant, Boubacar Thiam (extension specialist); and NGO consultant, Oulin Diallo of UGVD, in helping villages set priorities for the uses of their forest.

B. Forest Visits

To obtain first-hand knowledge of the present state and ecology of the forest, four visits were spread over 13 working days. During the first two forest visits, the consultant was accompanied by the technical assistance team agroforester. Six days in the forest involved field excursions with members of the forest committee. On three of those days, consultants' involvement in community-based management of natural resources allowed insights on forest management to be shared as a community-based activity.

C. Structure of the Management Plan

The management plan is comprised of four sections:

- Background
- Analysis and strategy
- Intervention programs
- Economic and financial analysis

Section I provides background on the forest, supplemented by maps and the forest inventory. Section II analyzes the problem, proposes objectives, and indicates a strategy for developing solutions. This section also includes proposals for forest area organization, co-management and administration arrangements, and monitoring and evaluation. Section III describes the intervention programs in terms of directives concerning the definition of treatments and schedules of quantities, location, timing, and responsible parties. Section IV compiles the resource budgets, including a revenue plan, and lists the expected benefits. The schedules in Section III are not yet complete, and require further refinement. Section IV is incomplete.

Sections I and III will become reference documents during plan implementation, whereas Sections II and IV will be used when submitting the plan for approval and during periodic evaluations and revisions. Thus, Sections II and IV will only require amendment as a result of fundamental changes in plan orientation, while Sections I and III will be updated periodically in light of accumulated experience.

D. Forest Protection and Conservation

In line with the declared objectives, the management plan includes measures to enhance forest protection and conserve the extent and quality of forest resources, including wildlife.

D1. Fire Management

The role of communities in fire management is central to the proposed co-management contract between the forest committee and DNFF.

Although eliminating of fire from the forest would result in a different species mix, particularly among larger trees, the consultant does not advocate fire exclusion. This would lead to an accumulation of combustible matter in the forest, which would exacerbate the temperature, severity, and duration of any forest fire. Such an event could have catastrophic consequences for the entire range of vegetation, and also destroy wildlife and their habitats.

The management plan proposes a program of early burning, organized on the basis of village zones, which takes advantage of natural firebreaks.

Fire Management

Recommendation 9. Fire management should involve early burning to reduce fuel loads, burn temperatures, and duration; it should not seek to eliminate fire from the forest.

D2. General Limitations on Production Activities

The plan gives the criteria for defining protected areas in Nialama Forest. These criteria include water courses, gallery forest, slopes, regeneration areas, and habitat areas for protected mammals and their transit routes.

Production activities may take place only in areas within the forest production category, which is the remaining forest area, after excluding areas that fall into protection categories and *bowal*. The plan also sets out criteria for determining which trees to cut.

E. Silvicultural Systems for Forest Production

The term "forest production" is used in its widest sense to include wood products, non-wood forest products (NWFPs), game meat, agricultural outputs, and forest services. Production should be viewed in reference to demand, which may be for subsistence consumption or commercialization. A tenet of the management plan is that all production should be carried out on a sustainable basis by conserving and protecting the forest resource base.

E1. Forest Regeneration

Any silvicultural system used in natural forest management must ensure regeneration and recovery of the forest after any proposed exploitation.

Ample evidence indicates that natural regeneration thrives throughout the forest, except on *bowés* and isolated patches of old fallow (*jachère*) that invasive grasses have overcome. Where natural regeneration does prevail, maintenance costs are minimal, and after an initial period of fire protection, a policy of benign neglect may be practiced. The high initial stocking provided by natural regeneration offers some insurance against mortality losses.

In comparison, tree planting technically and economically is a high-risk strategy. For several reasons, tree planting is likely to fail. First, little technical knowledge exists on the nursery requirements of native species. Second, this lack of knowledge may be accompanied by poor species-to-site matching. Third, planted trees face all the dangers that beset natural regeneration, such as competition, lack of weed control, fire, and grazing.

Economically, the physical and financial resources to sustain a planting program of significant size are not likely to be available in the foreseeable future from DNFF, the forest committee, or any donor project. Even if such resources were available, the long rotations involved, especially in the case of the high value species such as *Milicia regia*, *Khaya senelegalis*, and *Azelia africana* would retard or prevent any positive economic rate of return on the planting.

Another factor weighing against tree planting by villages in the forest is that, under traditional law, tree planting may confer right of occupancy.

Regeneration Strategy

Recommendation 10. Natural regeneration should be the first choice in all areas of the forest, and tree planting should be confined to identified "problem" areas where natural regeneration has failed or is likely to fail.

E2. Working Circles

There are separate silvicultural or management systems proposed for each of four working circles on areas of forest within the forest production category. These working circles are:

- Agroforestry
- Cultivation of *bas-fonds*
- Productive management of bani
- Productive management of bamboo

E3. Agroforestry

Fire management, essential for the reversal of forest degradation, is inescapably linked to access to cultivable land in the forest. Even though fire management should be the top priority for DNFF, all consultations with the forest committee have shown that cultivable land is one issue that dwarfs all others. Indeed, the credibility of the forest committee hinges on its success in negotiating this access with DNFF. Additional use rights, such as harvesting of timber, have a relatively low priority, and this must be fully recognized by DNFF in contract negotiations.

In the opinion of local forestry staff, nearly all savanna areas of Nialama forest are also fallows of varying ages (see Table I-1 of Volume 2 for classifications of forest vegetation type). Because savanna types are the dominant vegetation, it may be concluded that shifting cultivation has been a prevalent land use in the forest, even at the time of reservation in 1943. Certainly, shifting cultivation has been the traditional land management practice in most parts of Africa for centuries. Nevertheless, as noted above, natural regeneration thrives in most of the Nialama forest.

When practiced on a rotational fallow, shifting cultivation can be managed as a sustainable agroforestry system. The only difference between managed rotational fallow and taungya¹ is the acceptance of natural regeneration rather than reliance on the high-risk strategy of tree planting.

Uncontrolled cultivation in the forest will lead to forest degradation. Therefore, the management plan proposes a strict management regime. This makes the successful protection of areas regenerating from fire and grazing, a condition for new areas for cultivation. Such areas

¹Taungya is an agroforestry system that combines the temporary cultivation of agricultural crops on under-used land with the establishment of permanent tree cover. Tree establishment under taungya has usually featured planting exotic species. When the trees have been successfully established (typically 2 to 4 years), cultivation is no longer feasible and farmers must abandon those plots.

would exclude protected areas. Furthermore, to provide flexibility in application, the extent of agroforestry areas would be limited.

Agroforestry

Recommendation 11. Managed rotational fallow, coupled with the acceptance and protection of natural regeneration, should be introduced in selected parts of the forest not classed as protected areas.

Recommendation 12. The areas under cultivation at any time in the agroforestry system should not exceed 3% of the total forest area.²

E4. Cultivation of *Bas-Fonds*

The *bas-fond* areas of Nialama present a special challenge to the management of the forest. They are situated along water courses that, according to the objectives of the management plan and the reservation document, should be protected from production activities. Cultivation of the *bas-fonds* is therefore incompatible with the objectives of management.

Although seemingly contradictory, some cultivation rights were granted at the time of forest reservation in 1943 and restricted to the *riziculture marais* or rice grown in marsh or semi-inundated land. This definition has proved elastic, and the practice of cultivating the *bas-fonds* has the potential to expand uncontrollably unless the management plan and co-management contract specifies limits.

A hazard associated with intensive cultivation of the *bas-fonds* is the possibility of polluting water supplies through the use of agrochemicals. This hazard was first identified in the environmental assessment.

Cultivation of *Bas-fonds*

Recommendation 13. The possible future expansion of *bas-fonds* should be subject to a limit of 5 hectares per year for five years.

Recommendation 14. No agrochemicals (pesticides, herbicides, or inorganic fertilizers) should be permitted in the *bas-fonds*.

E5. Productive Management of Bani

According to the inventory results, sustainable production of timber and firewood from Bani is possible. This would be carried out by selective felling of timber trees and thinning of poor quality trees for firewood. Harvesting would only be allowed in areas not classified for protection. Owing to the low number of stems per hectare and the low-impact technologies available, no special guidelines concerning harvesting methods are required.

Selection felling and thinning would be governed by a minimum diameter limit. According to market requirements and local sawing techniques, Bani trees harvested for timber (classes A and B) should have diameters of 45–55 cm DBH at the time of felling. Trees

²This limit was reduced from 5 percent to 3 percent on the advice of the Natural Resources Adviser, USAID, Conakry.

exceeding 55 cm DBH are too large for manual harvesting methods. For the firewood market, smaller diameters are preferred (10–35 cm). The selective thinning of lower quality trees should favor the development of trees in class A and B. However, to prevent possible removal of trees with commercial potential, the management plan places a lower harvesting limit of 35 cm DBH on trees in class C.

Productive Management of Bani

Recommendation 15. Selective felling of Bani for timber and selective thinning of class C trees for firewood should be carried out in parts of the forest not classified as protected areas.

Recommendation 16. The selection rules for trees and the annual allowable cut should govern all harvesting of Bani.

E6. Productive Management of Bamboo

Although the inventory assessed the presence of bamboo, the locations and extent of the bamboo resource are not well defined. The most remarkable aspect of bamboos is that flowering is rare but, when it occurs, the parts of the plant above ground will die. According to the consultant's understanding of the species (*Oxytenanthera abyssinica*) concerned, flowering takes place at intervals of between 15 and 30 years. Regular harvesting of all stems on a plant might inhibit flowering and prolong its productive life.

The bamboo is used locally for house construction and maintenance. According to information received directly from villagers, supplies are adequate for that purpose. Bamboo might be commercialized by local villagers as material for making furniture. Such a plan, however, seems highly problematic. Although one enterprise in Conakry is reported to use bamboo, utility furniture is usually made from rattan rather than bamboo. Efforts to add value to primary products at a distance from the end-market are likely to involve problems of stock control and cash flow. More importantly, the necessary skills and appreciation of market conditions do not exist locally.

An alternative approach, based on the test-marketing of bamboo poles and proposed in the management plan, would involve setting up a sales outlet at Komba, on the national highway.

Productive Management of Bamboo

Recommendation 17. A pilot operation to market bamboo poles should be carried out with a sales outlet in Komba.

SECTION IV CONCLUSION

A. Research Needs

The forest types and resources that exist in Nialama are only just beginning to receive the attention of researchers and scientists. Funds, means, and personnel are currently lacking. Accordingly, only very simple "applied" research is proposed, oriented to monitoring the implementation and effects of treatments prescribed in the intervention programs of the management plan. In this way, the results of treatments based on incomplete knowledge and understanding can be monitored and adjusted as experience is gained.

The environmental assessment (1996) suggests that some or all of the sample plots used in the inventory of Nialama Forest be demarcated as permanent sample plots. The consultant disagrees with this suggestion. While there are many examples of permanent monitoring plots in various countries of Africa, the maintenance and long-term commitment needed to sustain them is rarely present. Even if a statistical analysis of auto-correlated plot observation occurred over 25 years, the attendant statistical errors might render the testing of any hypothesis or model problematic.

A preferred alternative to permanent sample plots is periodic assessment (e.g., every five years), using SPOT satellite images to interpret changes in forest cover. This could be done under the auspices of the Bureau Technique of DNFF.

Applied Research

Recommendation 18. Research activities should concentrate on the monitoring of the implementation and effects of prescribed treatments, and not include any long-term commitments or areas of wider interest.

Recommendation 19. Five annual assessments of changes to forest cover of Nialama forest should be carried out on the basis of SPOT satellite images.

B. Environmental Assessment

In May 1996, a team from USAID carried out an environmental assessment of the proposal for an action plan for the management of Nialama Forest.¹ USAID requested the author of this report to comment on the draft report (see Annex J for the complete comment).

The consultant's primary concern about the draft report related to the timing of the environmental assessment, which preceded the formulation of the management plan proposals. Although the environmental assessment was to take into consideration the proposals contained in the project's action plan, some of those proposals had not been developed, and new ones had been included. Also, some of the environmental assessment's recommendations lay outside the

¹ "Management of the Nialama Forest Reserve: A Proposal for an Action Plan," Tom Erdmann, Guinea Natural Resources Management Project, January 1996, and "Environmental Assessment of Proposed Action Plan for the Management of the Nialama Forest Reserve," Wayne McDonald, Dantily Diakit , Ibrahim Sory Seck, and Son Hoang Nguyen, USAID, August 1996.

scope of a technical management plan. Even though the environmental assessment constitutes a formal procedure on behalf of USAID, not all the recommendations were accepted.

The consultant commented on each of the recommendations contained in the environmental assessment. Too many recommendations related to wildlife and habitat (mainly chimpanzees), and too few related to the interventions proposed under the action plan. For example, no recommendations were made concerning the principle of productive harvesting. The environmental assessment's acceptance of the taungya system appeared to be based on the condition of size—not to exceed 30 hectares. Because the management plan proposes rotational fallow involving larger areas as an agroforestry system, it would have been helpful to know USAID's position on this.

C. Current Status of the Management Plan

The preparation of the preliminary technical management plan represents the latest step in a dual process beginning with the action plan proposal in January 1996. This process has involved the concurrent creation of a forest committee capable of negotiating with DNFF on the co-management of Nialama Forest.

Key events in developing the technical management plan have been:

- Preparation of the proposals for an action plan in 1996
- Forest inventory during 1995–1996
- Environmental assessment in May 1996
- Training courses in natural forest management in September 1996
- Seminar on natural forest management in September 1996

The next steps in this process will be:

- Finalization of the technical management plan proposals
- Submission of the plan to DNFF for technical approval
- Negotiation between the forest committee and DNFF of the clauses and conditions of a co-management contract, which will include the management plan as an annex
- Ministerial approval of the management contract and management plan

D. Conclusions

The preparation of a technical management plan in support of a possible co-management contract between the forest committee and DNFF breaks new ground in Guinea. Although there have been some management plans elsewhere in Guinea that envisage peoples' participation, the planning process for Nialama Forest goes further, and is more radical, than anything so far attempted in Guinea.

By emphasizing what villagers want from the forest (cultivable land) rather than what foresters think they should want (wood), the plan taps into a powerful motivational force. By linking cultivable land to fire management, the plan seeks to engage the local community in the long-term conservation of the forest.

The plan proposals are deliberately simple to facilitate implementation and maintain a sharp focus on priority interventions.

Field training provided the opportunity for fruitful interactions between the forest committee and DNFF at headquarter and prefecture levels. This helped each party involved in the proposed co-management contract to appreciate the roles and responsibilities of the other, thereby contributing to positive negotiations.

The seminar provided a forum for foresters to discuss the challenges of natural forest management in a context that favors tree planting over the management and regeneration of existing forest cover.

E. Follow-up

The technical management plan is preliminary. As noted above, certain aspects still need to be finalized.

After the preparation of the preliminary management plan, the major piece of technical work outstanding is the finalization of the forest blocks based on village zones. This work began during the training course, and a draft map now exists. However, the allocation of villages or groups of villages and the choice of boundaries for these zones is provisional. The forest committee must examine this map, and fully understand the responsibilities and additional use rights it confers. New zones for the villages of Gaoul (perhaps called *sous-prefectures*), which have recently indicated an interest in helping co-manage the Nialama Forest, also need to be included.

Criteria for the determination of these forest blocks have been laid out in the management plan (see section D2 of Section II of Volume 2). It is important that the finalization of the forest blocks conforms as closely as possible with those guidelines.

As proposed in recommendation 13, the future expansion of *bas-fond* areas will be controlled. For this to be effective, an agreed-upon base for the existing areas of *bas-fond* must be established. This process has already commenced as part of the forest inventory exercise, and a complete registration is needed as an annex to the co-management contract for the forest.

As noted above, the forest map contains numerous errors and needs updating to incorporate findings and prescriptions contained in the management plan. Further changes to the map, which exists in digital format on the GIS at the Bureau Technique, will undoubtedly be necessary to incorporate the final limits on the village zones within the forest.

Follow-up

Recommendation 20. The project, with the cooperation of local DNFF staff, should continue to refine the provisional forest blocks through consultation with the forest committee, and in accordance with management plan guidelines.

Recommendation 21. The registration of all existing *bas-fond* areas should be finalized before the management contract comes into effect.

Recommendation 22. Mapping revision should be carried out at the Bureau Technique in Conakry according to the list in Annex I.

ANNEX A
SCOPE OF WORK

A. Background

The Guinea Natural Resources Management Project (GNRMP) operates in three watersheds in the region known as the Fouta Djallon. The project began field activities in the three watersheds in January of 1993. A National Forest Reserve (*la Forêt Classée de Nialama*) occupies approximately half of one of the project's watersheds (Koundou). This Reserve is a dry tropical forest (avg. annual rainfall roughly 1400 mm). However, it has undergone severe degradation during the past three decades (mainly clearing for agriculture and mining of valuable timber species) and has probably suffered from destructive, late dry season fires for much of the last century. It should be noted that an official enclave, encompassing two villages, exists within the interior of the forest.

Since early 1994, the project has been exploring management options for this Reserve. The first consultant to examine the forest during the project contributed an excellent analysis of varying management options. The only scenario that she found to be viable, both in the short- and long-term, was that of co-management or participatory management (McLain, 1994). This implies shared management responsibilities between the Guinean Government and the local population. Subsequently, based on this consultancy and two others, an Action Plan for participatory management of the forest was developed by GNRMP personnel.

Traditionally, the local population has farmed in the forest (despite the illegality of this activity). Most farming in the forest stopped, however, in February of 1995, due to draconian measures taken by the Guinean Forest Service (*Direction Nationale des Forêts et de la Faune — DNFF*) to preserve the national forest heritage. To recompense the population for this loss, the Action Plan proposes that they selectively extract economic products from the forest (mainly timber and bamboo). In return, the DNFF gains a labor source for management activities (under normal circumstances, the DNFF lacks the means to manage its many *Forêts Classées*). Additionally, lowland gardening and rice farming is proposed in appropriate areas of the forest as foreseen in the original *classement* documents.

Presently, the GNRMP desires to move forward with the Action Plan on two fronts: technically and socially. Broadly, the Action Plan proposes natural forest management (NFM) as a guiding vision for the management of the Reserve. Technical issues that need to be resolved include silvicultural treatments (harvest levels, regeneration methods, etc.), protective measures, and details of a proposed taungya system in cleared areas. It should be noted that an inventory of the forest began in October of 1995 in anticipation of an eventual technical management plan. Over half of the inventory has been completed to date and the remainder should be finished in late June of 1996. Additionally, an environmental assessment of the proposed Action Plan is scheduled to take place in May of 1996 under the supervision of the USAID/REDSO's (Abidjan) environmental officer.

B. Justification and Objective

Management of the Nialama Forest Reserve (FR) demands a sound technical foundation. To build this foundation, an analysis of the natural ecology, an assessment of the potential for selective harvesting, and recommendations for protective and rehabilitative measures are

required. Given the logical vision of natural forest management outlined in the Action Plan, the components of the natural forest and their life cycles must be taken into account. Presently, the expertise for analysis of the forest type found in the Nialama FR and a general knowledge of natural forest management, do not exist within the GNRMP or the DNFF. A consultant with this expertise is sought to help the GNRMP develop a technical management plan and to train DNFF employees in various aspects of NFM.

Broadly, the objective of the assignment is *to assess the current forest resource found in the Nialama FR and, accordingly, to devise a draft technical management plan based on an appropriate silvicultural system for the natural vegetation.*

C. Scope of Work

Specifically, the consultant in Natural Forest Management will:

- Perform a literature search in the U.S. on the tropical dry forest type found in the Nialama Forest Reserve as well as the major species found there (results from the inventory to date will be provided for this purpose);
- Contact the *Centre Technique des Forêts Tropicales* (CTFT) at Nogent-sur-Marne in France concerning the literature needs cited above; if contact results are favorable, visit CTFT on the way to Guinea and obtain copies of the pertinent literature;
- Review pertinent background documents on the forest as well as maps and aerial photos;
- Review and analyze inventory data collected to date with respect to species composition, volumes, and potential harvest areas;
- Visit major sectors of the Reserve to obtain first-hand field knowledge of the present state and ecology of the forest;
- Based on the above reviews and analyses, formulate a preliminary silvicultural system for the Nialama Forest Reserve for the short-, medium- and long-term time frames, paying particular attention to harvest levels (especially for *Pterocarpus erinaceus*, including selection criteria), regeneration methods, and other pertinent technical aspects (e.g., taungya system) proposed in the Action Plan;
- Make recommendations on protective and rehabilitative measures to implement in the Reserve, especially with respect to fire, gallery forests (riparian zones), the proposed taungya system (location of zones, species choice and seedling establishment), direct seeding of lateritic zones, and non-timber forest products (NTFPs);
- Examine the bamboo resource in the Reserve and make recommendations concerning its management and sustainable harvest as well as its transformation into useful items (furniture, etc.);
- Analyze the potential for selective timber harvest of the 5 major species and the 6 minor species enumerated in the Action Plan and, subsequently, make appropriate recommendations;

- Assess and make recommendations concerning research needs (e.g., permanent plots, natural regeneration observations, etc.) for the Nialama FR management initiative;
- Assess and make recommendations concerning the potential extraction of non-timber forest products (NTFPs) from the Reserve (based on the work of Sow regarding economic products originating from the FR);
- Assess and make recommendations concerning local and state institutional capabilities for forest management, including training needs and an analysis of which institution is best suited for a given activity;
- Collaborate with the CB-NRM specialist on identifying local uses of the forest and sharing operational insights on implementing natural forest management as a community-based activity;
- Identify and suggest solutions to any and all policy obstacles (legislated, operational, administrative) that may preclude the successful implementation of the Nialama Forest Management Plan or its possible replication elsewhere in Guinea.

D. Deliverables

Before leaving Guinea, the consultant will:

- Devise a preliminary technical management plan for the Niamala Forest Reserve including details on the recommended silvicultural system (including rehabilitative and protective measures that respond to the whole range of forest uses) for the short-, medium- and long-term time frames;
- Two weeks after the consultant's arrival in Guinea, submit a draft work plan to the TA team detailing the assignment schedule, revising the SOW and clarifying outputs;
- Conduct a seminar (in Labé or Conakry) for DNFF personnel on basic principles of natural forest management, including an in-depth presentation of the pros and cons of planting and managing exotic versus natural species, an introduction to the idea of biodiversity, and the need to consider all uses of the forest including those for NTFPs;
- During field work, train a select group of DNFF employees (3 to 5) in natural forest management, including analysis and assessment techniques and basic silvicultural considerations; and
- Similarly, train a select group of villagers (approximately 10) in the basics of forest management and natural forest management (this may take the form of several field days accompanied by a short seminar).

Additionally, before leaving Guinea, the consultant will submit a draft final report to the project management unit (PMU) and USAID/Conakry. Among other elements, the report will contain a presentation of findings and recommendations (especially those specified in Section III above) and a draft of the management plan as an annex. The consultant will also conduct one debriefing at USAID/Conakry, and another at the DNFF, presenting the major results and conclusions of the consultancy before her/his departure. A final report, incorporating PMU and

USAID/Conakry comments, will be submitted to Chemonics no later than one month after the consultant's return home.

E. Qualifications

The selected candidate should have at least five years of experience in Africa in forestry, preferably in natural forest management or tropical forest ecology. An advanced degree in forestry as well as fluency in French is also required. Capability in Pular is highly desirable.

F. Logistics

The assignment will be carried out over a eight week period starting in late May or early June. The consultant will spend two to three days in the U.S. and France to carry out the literature search. Subsequently, the consultant will spend about four working days in Conakry (at the start and end of the assignment), and the rest of the time in the field (Labé and the Koundou watershed). The PMU in Labé will be responsible for providing all logistical support to the consultant while (s)he is in country, including accommodation, transportation, and making initial contacts/appointments. The Chemonics' home office will provide a laptop computer; the printer and the photocopy machine at the PMU/Labé will be made available if necessary. A six-day work week is requested.

ANNEX B
REVISED WORK PLAN, AUGUST—OCTOBER 1996

Revised Work Plan: August - October 1996					
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<u>Conakry</u> August 12 <ul style="list-style-type: none"> • Briefing (DNFF & USAID) • Travel to Labe 	<u>Labe</u> 13 <ul style="list-style-type: none"> • Travel to Koundou • Forest Committee Meeting 	<u>Koundou</u> 14 <ul style="list-style-type: none"> • Forest reconnaissance 	<u>Koundou</u> 15 <ul style="list-style-type: none"> • Forest reconnaissance • Travel to Labe 	<u>Labe</u> 16 <ul style="list-style-type: none"> • Orientation • Desk work 	<u>Labe</u> 17 <ul style="list-style-type: none"> • Document review • Briefing (GNRMP)
<u>Koundou</u> 19 <ul style="list-style-type: none"> • Document review • Travel to Koundou 	<u>Koundou</u> 20 <ul style="list-style-type: none"> • Forest Committee field trip 	<u>Koundou</u> 21 <ul style="list-style-type: none"> • Forest reconnaissance • Review of air photos 	<u>Koundou</u> 22 <ul style="list-style-type: none"> • Forest Committee field trip • Travel to Labe 	<u>Labe</u> 23 <ul style="list-style-type: none"> • Review of inventory 	<u>Labe</u> 24 <ul style="list-style-type: none"> • Review of inventory
<u>Labe</u> 26 <ul style="list-style-type: none"> • Draft silvicultural plan 	<u>Koundou</u> 27 <ul style="list-style-type: none"> • Travel to Koundou • Forest Committee Meeting • Travel to Labe 	<u>Labe</u> 28 <ul style="list-style-type: none"> • Draft silvicultural plan 	<u>Labe</u> 29 <ul style="list-style-type: none"> • Draft silvicultural plan 	<u>Labe</u> 30 <ul style="list-style-type: none"> • Draft management plan 	<u>Labe</u> 31 <ul style="list-style-type: none"> • Draft management plan
<u>Labe</u> Sept 2 <ul style="list-style-type: none"> • Report writing 	<u>Labe</u> 3 <ul style="list-style-type: none"> • Report writing 	<u>Labe</u> 4 <ul style="list-style-type: none"> • Preparation for training course 	<u>Labe</u> 5 <ul style="list-style-type: none"> • Preparation for training course 	<u>Labe</u> 6 <ul style="list-style-type: none"> • Preparation for seminar 	<u>Labe</u> 7 <ul style="list-style-type: none"> • Preparation for seminar
<u>Labe</u> 9 <ul style="list-style-type: none"> • Preparation for training course 	<u>Labe</u> 10 <ul style="list-style-type: none"> • Training for DNFF 	<u>Labe</u> 11 <ul style="list-style-type: none"> • Training for DNFF 	<u>Labe</u> 12 <ul style="list-style-type: none"> • Training for DNFF 	<u>Labe</u> 13 <ul style="list-style-type: none"> • Training for DNFF 	<u>Labe</u> 14 <ul style="list-style-type: none"> • Review and revision
<u>Koundou</u> 16 <ul style="list-style-type: none"> • Travel to Koundou • Training for DNFF 	<u>Koundou</u> 17 <ul style="list-style-type: none"> • Training for DNFF • Training for villagers 	<u>Koundou</u> 18 <ul style="list-style-type: none"> • Training for DNFF • Training for villagers 	<u>Koundou</u> 19 <ul style="list-style-type: none"> • Training for DNFF • Training for villagers 	<u>Koundou</u> 20 <ul style="list-style-type: none"> • Training for DNFF • Presentation to forest committee • Travel to Labe 	<u>Labe</u> 21 <ul style="list-style-type: none"> • Report writing
<u>Labe</u> 23 <ul style="list-style-type: none"> • Preparation for seminar 	<u>Labe</u> 24 <ul style="list-style-type: none"> • Preparation for seminar 	<u>Labe</u> 25 <ul style="list-style-type: none"> • Seminar on NFM 	<u>Labe</u> 26 <ul style="list-style-type: none"> • Seminar on NFM 	<u>Labe</u> 27 <ul style="list-style-type: none"> • Report writing 	<u>Labe</u> 28 <ul style="list-style-type: none"> • Report writing
<u>Labe</u> 30 <ul style="list-style-type: none"> • Submission of draft report 	<u>Labe</u> Oct 1 <ul style="list-style-type: none"> • Revision of report 	<u>Labe</u> 2 <ul style="list-style-type: none"> • Project debriefing • Travel to Conakry 	<u>Conakry</u> 3 <ul style="list-style-type: none"> • DNFF map department • Debrief USAID • Depart Guinea 		

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ANNEX C

**OFFICIAL NOTIFICATION OF CENSUS OF
GOVERNMENT EMPLOYEES**

REGION ADMINISTRATIVE DE LABE

REPUBLIQUE DE GUINEE

Travail - Justice - Solidarité

PREFECTURE DE L'ELOUMA

N° 140 / P / LMA / 96

LE PREFET DE L'ELOUMA

MONSIEUR

LE CHEF DU PROJET P.G.R.N - LABE

Suite à votre Ordre de Mission sans numéro du 26 Août 1996, demandant le 1er Chargé des Forêts, accompagné par un ou deux autres cadres de la Section Protection Forestière et Faune de Lélouma, de se rendre à Labé; pour le Plan d'Aménagement de la Forêt classée de Nyalama, je porte à votre connaissance qu'un communiqué radio-diffusé des Ministères : des Finances, du Budget et de l'Emploi et de la Fonction Publique en date du 26/08/96 demande de suseoir tout mouvement du Personnel Administratif face à un contrôle des Fonctionnaires de l'Etat pour compter du 28/08/96 au 15 Septembre 1996.

Vous comprendrez aisément le souci qui m'anime face à l'importance dudit contrôle qui est physique.

Je vous serai gré des bonnes dispositions que vous prendrez afin de reporter ces importants travaux d'aménagement à partir du 15 Septembre car les missionnaires sont attendus aujourd'hui même dans les Préfectures.

Je sais compter sur votre bonne compréhension et vous prie de croire à l'expression de mes sentiments de franche collaboration.

L'ELOUMA, LE 28 AOUT 1996

LE PREFET



Traore Moussa
TRAORE MOUSSA

" Magistrat "

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ANNEX D
DNFF AND FOREST COMMITTEE PARTICIPANTS

**TRAINING COURSE IN
NATURAL FOREST MANAGMENT**

10-20, September, 1996
Labé, Guinée

List of DNFF Personnel Attending

Mr. Diawa Kèma	SPFF, Lélouma
Mr. Simon Adios Tinkiano	SPFF, Lélouma
Mr. Barry Madadou Oury	Forestry Agent, Lafou
Mr. Mamady Facely Mara	Chief, Classified Forests Section Management Division DNFF, Conakry
Mr. Mohamed Cheick Sylla	Chief, Inventory Section, Management Division DNFF, Conakry

List of Forest Committee Members Attending

Souleymane Bah	President
Mamadou Alpha Diallo	Vice-President
Elhadj Issa Nimaga	Treasurer
Ibrahim Sory Bah	Secretary
Ibrahim Laho Bah	
Sadiouma Bah	
Kemo Camara	
Kante Mamadou Korka	
Dian Mala Camara	
Amadou Kouro Kanté	

ANNEX E
TOPICS COVERED IN TRAINING COURSE

**TRAINING COURSE IN
NATURAL FOREST MANAGEMENT**

10-20 September, 1996
Labé, Guinée

LIST OF TOPICS

A. Objectives

A1. Bring together the various participants in the management planning process

- The consultant
- DNFF personnel
- Members of the Forest Committee

A2. Provide training in:

- The principles of natural forest management
- The assessment and interpretation of information (especially air photos, maps, and inventory results)
- Various key issues to be resolved in the plan for Nialama Forest

A3. Collaborate on the preparation of a draft technical management plan for Nialama Forest

B. Expected Outcomes

- **Awareness** among participants of the principles of natural forest management
- **Resolution** of various key issues involved in the management plan for Nialama
- **Draft management plan**, based on course activities
- **Preparation for seminar** on principles of natural forest management
- **Plan for follow-up activities**

C. Topics Covered in Study Sessions (LABÉ)

C1. Management plans:

- Different types and functions
- Component parts of the management plan
- Legal requirements

C2. Forest Reservation Document

- Legal status of Nialama Forest

- Defined boundaries and legal covenants

C3. Geographic Data

- Study of available air photographs, topographic and forest maps
- Practice in using stereo aerial photos
- Introduction to use of GPS

C4. Forest Inventory

- Aspects of inventory design
- Review of forest classification systems used
- Detailed examination of inventory results
 - Forest classification
 - Soils, topography
 - Species composition
 - Regeneration
 - Diameter distributions

C5. Forest Use Survey

- Examination of results obtained by social forestry mission

C6. Synthesis

- Examine proposed action plan prepared by project
- Review of options for management

D. Topics Covered in Field Session (FOREST)

D1. Fire Management

- Influence of fire on forest ecology and vegetation
- Forest regeneration and fire regimes
- Past experience in fire management
- Future options

D2. Forest Cultivation

- *Bas-fonds* as permanent cultivation areas
- Transient cultivation and *jachères*
- Site criteria for acceptability for cultivation
- Past history and options for management

D3. Management of Bamboo

- Site factors in bamboo occurrence and productivity
- Harvesting and regeneration strategies
- Utilization and marketing

D4. Wildlife Protection

- Identification of chimpanzee habitats
- Restrictions on production activities

D5. Boundary Demarcation

- Practical use of GPS in locating gazetted boundary points, including those of the enclave villages
- Provisional identification of village zones as forest blocks within the forest reserve

D6. Wood harvesting

- Species, sizes, and amounts of commercially usable timbers
- Harvesting and regeneration strategies
- Use and marketing
- Restrictions on production activities

ANNEX F
SEMINAR PARTICIPANTS

PGRN LABE
ATELIER SUR LA GESTION DES FORETS NATURELLES
DU 25 AU 27 SEPTEMBRE 1996

Liste des invités

N°s	Prénoms et Noms	Adresses
1	Dr. Paula J Williams	S/C PGRN Labé
2	Boubacat Thiam	S/C PGRN Labé
3	Morlaye Keita	PGRN Labé
4	Mamady Facely Mara	DNFF
5	Mohamed Cheick Sylla	DNFF
6	Diawara Kèma	S.E.F. Lélouma
7	Koulako Damba Camara	S.E.F. Kindia
8	Alpha Bacar Bah	Directeur BRP Koundou
9	Adama Kourouma	Chef Cantonement Sougueta
10	Ibrahima Koggui Diallo	Chargé des Forêts Kindia
11	Bangaly Kanté	Chef Projet Guétoya
12	Yakouba Camara	Agent Cantonement Linsan
13	Balla Kourouma	Chef Section E/G Gaoual
14	Simon Adios Tinkiano	Chargé Forêts Lélouma
15	Nyankoye Nieba	Chef Section FF p.i. Tougué
16	Mamadou Dia	Chef Section FF Labé
17	Mamadou Bady Baldé	Chef Canton. F. Kouratongo
18	Morlaye Keita	Chargé A/F BRP n° 7 Dissa
19	Thomas Erdmann	Agroforestier PGRN
20	Sana Sambry	Chef Section P/F Mamou
21	Mamadou Coumbassa	Chargé A/F BRP Diaforé
22	Mamadou Yero Sow	Chargé A/F BRP Koundou
23	Sékouba Souaré	Chef Can For. Kounsiteil
24	Morikey Camara	Chef Section E/F Kindia
25	Peter Lowe	PGRN, Labé
26	Dantily Diakité	PGRN, Labé
27	Souleymane Diaby	BABV/Haute Gambie, Labé
28	Thierno Saadou Bah	Chef Servic A.I.F.D. Labé
29	Pe Vincent Gamy	Directur BRP Dissa Sougueta

Catégorie	Nombre
DNFF, Conakry	2
Chef Section/Chargés Forêts Préfectures	11
Chef de Cantonnement Forestier	4
Directeurs BRP	2
Autres Staff BRP	3
Autres Projets	2
PGRN	5
TOTAL	29

**ANNEX G
SEMINAR PROGRAM**

Projet de Gestion des Ressources Naturelles (PGRN)

**SÉMINAIRE SUR L'AMÉNAGEMENT
DE LA FORÊT NATURELLE**

(Labé, 25-26 Septembre, 1996)

Modérateur: Diakité Dantily
Rapporteurs: (1)
(2)
(3)

1^{er} Jour: Mercredi, 25 Septembre

09.00 **Introduction** *[présenté par Diakité Dantily]*

- ▶ Souhait de bienvenue
- ▶ Les objectifs du séminaire

09.30 **1^{ère} Séance: Planification de la Gestion des Forêts**

- ▶ L'expérience en Guinée *[présenté par Mr. Cheik Sylla et Mr. Mara]*
- ▶ Le Processus suivant la Proposition pour un Plan d'Action
pour la Forêt Classée de Nialama *[présenté par Tom Erdmann]*
- ▶ Le Processus de Co-gestion de la
Forêt Classée de Nialama *[présenté par Mme. Paula Williams]*
- ▶ Les Objectifs d'Aménagement pour
la Forêt Classée de Nialama *[présenté par Peter Lowe]*

DISCUSSION

11.00 **Pause Café**

11.15 **2^{ème} Séance: Zonage, Protection, Contrôle des Feux et Régénération**

- ▶ Zonage forestier et les Zones protégées *[présenté par Peter Lowe et Mr. Barry]*

- ▶ Gestion des Feux *[présenté par Peter Lowe et Mr. Barry]*
- ▶ Foncier de la terre et des arbres *[présenté par Thiam Boubacar]*
- ▶ Reboisement et régénération dans une forêt naturelle
[présenté par Tom Erdmann et Mr. Kema Diawara]

DISCUSSION

13.00 **Déjeuner**

14.00 **3^{ème} Séance: Les Activités Agricoles dans la Forêt Classée**

- ▶ Gestion des jachères *[présenté par Peter Lowe]*
- ▶ Culture en bas-fonds *[présenté par Tom Erdmann]*
- ▶ Pâturage *[présenté par Mr. Simon Tuikia]*

DISCUSSION

15.15 **Pause Café**

15.30 **4^{ème} Séance: Ressources Informatiques**

- ▶ Les cartes et les photos aériennes *[présenté par Mr. Marra]*
- ▶ Inventaire: objectifs et méthodologie *[présenté par Mr. Cheik Sylla]*
- ▶ Inventaire: résultats *[présenté par Mr. Peter Lowe]*

DISCUSSION

16.45 **Fin du jour**

- ▶ Résumé des conclusions 1^{er} jour *[présenté par Diakité Dantily]*

Projet de Gestion des Ressources Naturelles (PGRN)

**SÉMINAIRE SUR L'AMÉNAGEMENT
DE LA FORÊT NATURELLE**

2^{ème} Jour: Jeudi, 26 Septembre

09.00 **5^{ème} Séance: Exploitation de la forêt**

- ▶ Ecologie des forêts, la dynamique des populations et le système sylvicole *[présenté par Mr. Peter Lowe]*
- ▶ La gestion productive des arbres *[présenté par Peter Lowe]*
- ▶ La gestion productive du bambou *[présenté par Tom Erdmann]*

DISCUSSION

11.00 **Pause Café**

11.15 **6^{ème} Séance: Aspects d'Administration et Exécution**

- ▶ Partage du revenu *[présenté par Cheik Sylla]*
- ▶ Les rôles des contractants et co-contractants *[présenté par Diakaté Dantily]*
- ▶ Recherche appliquée, le suivi et évaluation *[présenté par Peter Lowe]*

DISCUSSION

12.30 **Fin du jour**

- ▶ Résumé des conclusions 2^{ème} jour *[présenté par Diakaté Dantily]*
- ▶ Clôture du séminaire

ANNEX H
"TEST" PROPOSALS AND BALLOT FORM

Projet de Gestion des Ressources Naturelles (PGRN)

**SÉMINAIRE SUR L'AMÉNAGEMENT
DE LA FORÊT NATURELLE**

(Labé, 25-26 Septembre, 1996)

Liste des Propositions

1. **Objectifs**
 - 1a. type & nombre

2. **Le contrôle du feu**
 - 2a. coopération avec le Comité Forêt
 - 2b. calendrier

3. **Les zones protégées**
 - 3a. définition

4. **La gestion des jachères**
 - 4a. Une rotation de 16 ans (deux ans aux cultiver);
 - 4b. Revenir/retour à la même parcelle
 - 4c. Une limite de 5% de la forêt entière (10,000 ha) sous la culture;
 - 4d. Une limite de 10% de la forêt entière (10,000 ha) sous la culture;
 - 4e. Système de régénération naturelle;

5. **La gestion des bas-fonds**
 - 5a. Une limite de 25 hectares;
 - 5b. Permettre d'étendre à une limite de 5 hectares chaque année

6. **Le pâturage**
 - 6a. Permettre partout (sauf dans les zones de régénération)
 - 6b. Permettre seulement dans les zones près des pistes et des pas-de-feu

7. **L'exploitation du Bani**
 - 7a. Une limite de 45 cms pour les classes A & B
 - 7b. Une limite de 35 cms pour la classe C
 - 7c. Une limite de 200 arbres à couper chaque année.

8. **L'exploitation des autres Essences**
 - 8a. Ne pas couper les essences de valeur, mais faire un revue en cinq ans;
 - 8b. Couper les autres avec diamètre de plus de 45 cms.

9. **L'exploitation du bambou**
 9a. Couper toutes tiges chaque tuft
 9b. une rotation de 2-3 ans

**SÉMINAIRE SUR L'AMÉNAGEMENT
 DE LA FORÊT NATURELLE**

(Labé, 25-26 Septembre, 1996)

Proposition:	Objection légale	Objection technique
Raison:		

Proposition:	Objection légale	Objection technique
Raison:		

Proposition:	Objection légale	Objection technique
Raison:		

35

ANNEX I
REQUIRED REVISIONS TO FOREST MAP

Bureau Technique
DNFF, Conakry

Assistance avec la carte de la Forêt Classée de Nialama

Il est entendu que vous avez une carte digitalisée de la Forêt Classée de Nialama installée dans le système GIS qui se trouve aux bureaux techniques. Nous aimerions demander votre assistance pour adopter certaines modifications avant d'imprimer des copies de la carte.

Modifications:

Données nouvelles

- (1) bornes de classement
- (2) bornes actuelles
- (3) zones villageoises

Echelle:

L'échelle de la présente carte semble être environ 1:42000.

- (4) Veuillez choisir une échelle exacte (e.g. 1:40,000), parce que cela sera plus facile pour utiliser sur le terrain;
- (5) Veuillez imprimer l'échelle spécifiée sur la carte;

Coordonnées

Les coordonnées qui sont utilisées à présent contiennent les nombres décimaux pour identifier les longitudes et les latitudes.

- (6) Veuillez choisir les coordonnées de l'Univers Transverse Mercator (UTM/MTU) en kilomètres, parce que les autres cartes du Bassin Versant de Koundu utilisent ce système.

Couleur

Les couleurs utilisées pour les catégories de végétation forestière de la *Savane Arborée Dense* et de la *Forêt Péri-Villageoise* sont trop similaires.

- (7) Veuillez choisir une autre couleur pour la *Forêt Péri-Villageoise* (e.g. marron). De même, nous ne pouvons pas identifier les tapades; existent-elles?

Présentation

Veuillez inclure:

- (8) l'échelle
- (9) le mot "provisionnelle" au-dessous du titre
- (10) la date d'élaboration de la carte au-dessous du titre

Merci pour votre assistance.

Peter Lowe
Projet de Gestion des Ressources Naturelles (PGRN)
Labé

ANNEX J
COMMENTS ON ENVIRONMENTAL ASSESSMENT

GUINEA
FORÊT CLASSÉE DE NIALAMA

Comments on the
Environmental Assessment of the proposed Management Plan
for Nialama Classified Forest, Guinea.
(USAID, 1996)

A. General Comments

A1. Scope

It is understood that a tropical forestry environmental assessment (TFEA) was subsumed under the environmental assessment (EA). These comments will not distinguish between the two assessments.¹

It is assumed that an environmental assessment was applied to the document "Management of the Nialama Forest Reserve: A Proposal for an Action Plan," which was prepared by project personnel in January 1996. This is not stated or referred to in the EA. There is a reference to a "scoping statement," a term not defined and not immediately understandable.

These comments are important from the viewpoint of what may be incorporated in the proposed technical management plan for Nialama Forest. More general issues may be considered during negotiations for co-management.

A2. Timing

Since the technical management plan is only now being prepared (by the consultant and a team from DNFF), the EA may have been premature. What if this process results in some new proposals?

A3. EA Structure and Balance

The role of the EA is to review the proposed interventions for the management of Nialama Forest, provide guidelines, and flag unacceptable actions. The EA is not structured to reflect the proposal under scrutiny, but focuses instead on critical issues. This approach lacks clarity for the reader trying to cross-match and assimilate the recommendations. It has also resulted in some imbalance in emphasis among the recommendations. For example, seven of the ten recommendations relate directly or indirectly to the maintenance of the habitat for the chimpanzee populations within and around the forest. There are more important functions served

¹These comments were prepared by P. Lowe, consultant, PGNR project, Labé. The comments below include proposals for the technical management plan that at the time of writing reflect some of the preliminary suggestions of the consultant, but which have not been discussed with or approved by colleagues in DNFF.

by the forest (as defined by policy), including the protective role in water catchments, but these are not explicitly addressed.

Some of the recommendations are too lengthy. (See, for example, the one on local community rights, which is about 300 words.)

A4. Presentation

The EA would be easier to reference with pagination, numbering of recommendations, and more detailed section numbering.

A5. Definitions

The definition of primary tropical forest quoted in the EA is meaningless, even if the word "natural" is defined. Can a "secondary" forest not have natural characteristics and functions?

B. Specific Comments

The ten recommendations contained in the EA are addressed below.

B1. TFEA Issue—Timber Harvesting

Recommendation 1: Field study on chimpanzee food and habitat. The proposal in the management plan (currently under preparation) for selective harvesting of trees for timber and firewood relates mainly to Bani (*Pterocarpus erinaceus*). The most common tree in the forest, it is not a significant food source for chimpanzees, although they sometimes eat young leaves.

The plan will not permit any destructive harvesting within the identified chimpanzee habitat areas. One such area, which lies partially in the unclassified enclave, is currently identified. This will not preclude the identification of other areas in due course.

The plan will not permit cutting of *Parkia biglobosa*, which is an identified source of food for both humans and chimpanzees. Recognition will be given to any other food-source trees identified.

During the planning process, on-site consultations to finalize the information concerning habitat locations and food sources will be made with the chimpanzee project expert (Rebecca Ham), who is currently working in Guinea. Because her work already addresses the issues of food and habitat, the requirement for a separate field study before any timber harvesting would only serve to delay progress toward the implementation of a co-management agreement for the forest.

Summary of Comments on TFEA

- ▶ The plan will take account of this issue.
- ▶ Recommendation 1 is not necessary.
- ▶ It would have been useful to receive guidance on the acceptability of clearing shrubs and so on in old fallow areas prior to the introduction of taungya.

B2. Issue 1: Biological Diversity Loss

Recommendation 2: Training program. One of the plan's objectives for the forest will be the maintenance of biological diversity through an emphasis on natural regeneration and protection of forest cover.

It is not clear how the inclusion of a training program in the plan would contribute to this objective or relate to proposed actions. However, as part of the negotiation process leading to a contract for co-management of the forest, it is expected that the project will engender full discussion and appropriate knowledge concerning the Forest Code.

Issue 1: Biological Diversity Loss

- ▶ The plan will take account of issue 1.
- ▶ Recommendation 2 is not directly related to any proposed actions; this might fit better under issue 5 (local community rights) or 8 (environmental education).

B3. Issue 2: Threatened/Endangered Wildlife and Habitat Loss

Recommendation 3: Restrictions on agriculture. The recommendation combines the issue of rice culture in *bas-fond* areas with that of shifting agriculture on steep slopes. The plan accepts the need to ensure that: (a) cultivation (including rice) does not spread into the upper riparian areas; and, (b) that cultivation does not occur on steep slopes. However, the imposition of a blanket ban against agriculture on land of elevation exceeding 250 meters would be neither necessary nor sufficient to ensure the required protection. Furthermore, there has been no assessment of the extent of area which would be affected.

Recommendation 4: Land swap. The plan will: (1) identify all *bas-fond* rice areas; (2) recognise the need to maintain vegetation in the gallery forest areas and around stream heads; (3) seek to restrict agriculture on steep slopes (> 30 degrees); and, (4) incorporate an option to make a specified swap of chimpanzee habitat within the enclave village area for agricultural land elsewhere in the forest. (This option will need to be agreed as part of the co-management contract, since the formal legal processes to make formal amendments to the classified area could involve lengthy delays).

Recommendation 5: Classification of additional forest areas. Any proposal to expand the current boundaries of Nialama Forest (e.g., to include Mt. Kokolou) would impose an inordinate delay to the approval of the management plan.

Furthermore, it should be emphasised that, at present, the local village populations co-exist with the chimpanzees, and respect their protected status. Caution should be exercised to avoid imposing alien ideas about protection which might appear to give priority to animals over humans. Such an imposition might provoke a counterproductive backlash.

Issue 2: Threatened/Endangered Wildlife and Habitat Loss

- ▶ The plan will take account of issue 2 raised in respect of recommendations 3 and 4, but not for recommendation 5.
- ▶ Recommendation 3 is considered to be misdirected and unquantified.
- ▶ Recommendation 4 will be incorporated, but not in respect of Mt. Kokolou.
- ▶ Recommendation 5 is considered to be counterproductive.

B4. Issue 3: Forest Plantings

No recommendations. The EA favors reliance on natural regeneration rather than planting, and considers the impact of limited taungya activities, but makes no recommendations.

The issue of using natural processes is important from the viewpoint of ecological processes and cost-effectiveness. A recommendation in this area would have been useful.

The area likely to be managed under taungya in principle could exceed the nominal amount quoted of 30 hectares. A fuller analysis of the issue and a recommendation in this area would have been useful.

Summary of comments on issue 3: Forest plantings

- ▶ The plan will rely on natural regeneration as the major strategy for regenerating the forest; enrichment planting will be comparatively minor in extent.
- ▶ Taungya will be managed to encourage natural regeneration, as well as provide much needed cultivatable land.

B5. Issue 4: Livestock

Recommendation 6: Livestock management. The EA included several proposals under a single recommendation. These relate mainly not to forestry but to animal husbandry practices that will need to be accepted by villages during the negotiation process. Although the recommendation would seek to limit access to "sensitive areas," it does not envisage the need for pasture/range management within the forest.

Pasture management within the forest can have two beneficial effects: (1) to protect regeneration areas, and (2) to reduce fuel loads prior to the onset of the fire season.

Issue 4: Livestock

- ▶ The technical plan will not include issue 4 or the associated recommendation 6.
- ▶ The plan will incorporate pasture management in certain areas of the forest.

B6. Issue 5: Local Community Rights

Recommendation 7: Changes in land allocation. The issue of taungya is raised again here, duplicating the discussion under Issue 3. The recommendation also partially duplicates recommendation 4, but presents options rather than a single recommendation. These options

include (1) relocating villagers' farmland outside the forest, (2) relocating the enclave villages outside the forest, or (3) a simple land swap (as in recommendation 4).

The first two options would be totally unacceptable to the local people. The last paragraph in section B3, above, emphasizes the importance of placing humans before other primates.

Issue 5: Local Community Rights

- ▶ The plan will not include the options of dislocating peoples' farmland or entire villages outside the forest.
- ▶ The plan will incorporate a limited land swap proposal within the forest (as in recommendation 4).

B7. Issue 6: Buffer Zones

No recommendations. As the EA reports, considering the current pressures for land within the forest, the introduction of buffer zones around the forest boundaries is not a viable option.

Issue 6: Buffer Zones

- ▶ External buffer zones would be unacceptable to the local people.

B8. Issue 7: Forest Policy

No recommendations. The discussion under this heading is equivocal. The EA is unclear as to whether local peoples should carry out activities within the forest or be excluded, as suggested by the EA under issue 5, above.

On the issue of taungya, raised here and on issues 3 and 5, the EA apparently supports the eventual exclusion of farmers from all villages other than the enclaves, yet the EA reports that the exclusion of local populations may jeopardize forest protection.

Issue 7: Forest Policy

- ▶ The plan will endeavor to assimilate *on a sustainable basis* people's needs for cultivation within the forest through a managed system of taungya on degraded and fallow areas.

B9. Issue 8: Environmental Education

No recommendations. Although there are no specific recommendations for environmental education, recommendation 2, above, concerns a training program that would be better placed under the current issue. The major environmental issue that impinges on local peoples is water supply from the local springs, and this topic might be received more enthusiastically than abstract concepts of biological diversity.

Issue 8: Environmental Education

- ▶ The technical plan will not propose environmental education.

B10. Issue 9: Environmental Monitoring

Recommendation 8: Forest survey for chimpanzees. Surveying for wildlife is not easy due to their heterogeneous distributions, and the Chimpanzee Conservation Project (headed by Rebecca Ham) does not have a budget allocation for the training envisaged in the EA.

An alternative approach to a comprehensive chimpanzee survey would be to ask local peoples where the chimps are. But local people might become antagonistic to chimps if they are led to understand that chimps can displace humans.

Recommendation 9: Permanent sample plots. Permanent sample plots as an informational tool in natural forest management are fine in theory, but rarely work in practice. The budget and dedication required to maintain and measure the plots over long time periods (e.g., 20-40 years) is rarely sustainable. Moreover, the quality of information (precision and type) is usually such that sampling errors are too high for interpretation. Finally, answers to management questions are often not forthcoming.

Some form of environmental monitoring is essential, however. A more effective approach would be to monitor forest cover through satellite imagery (e.g., SPOT) and to supplement this with treatment-related observations. The management plan will incorporate monitoring of treatment areas (for application and results). Treatments will include prescribed burning and selective harvesting. Observations will cover regeneration, species composition, and so on.

Issue 9: Environmental Monitoring

- ▶ The plan will incorporate monitoring of treatments and effects.
- ▶ Ideally, periodic comparisons of SPOT satellite images would be undertaken (outside the plan).
- ▶ Recommendations 8 and 9 are not viable.

B11. Issue 10: Forest Management Plans

No recommendations. Although there are no specific recommendations here, the EA reports that comparable proposals for the co-management of forests in Guinea have never been implemented.

The guiding principle for the management plan at Nialama must be simplicity. There must also be an economic payoff from state to community if the community is to be persuaded to shoulder responsibilities for forest protection and conservation.

Issue 10: Forest Management Plans

- ▶ The plan must avoid complexity and sophistication.
- ▶ Environmental protection must be paid for with economic benefits.

B12. Issue 11: Riparian Zones

No recommendations. On close examination, this issue really addresses the role of the forest in water catchment, which is already partially addressed under issue 2. Although there are no specific recommendations here, the EA does contain several suggestions which could well

have been presented as formal recommendations. Recommendation 3 could equally apply to the current issue.

These suggestions will be reflected in the plan. For example, timber exploitation will not take place in gallery forests, and both gallery forest and slopes in the upper riparian zones will be protected from cultivation. Rice cultivation areas will be definitively demarcated, carefully managed, and monitored for possible creeping expansion.

The use of inorganic fertilizers will be prohibited in *bas-fonds* (rice areas).

Issue 11: Riparian Zones

- ▶ The plan will prioritize water protection in appropriate areas of the forest; in line with recommendation 3.

B13. Issue 12: Institutional Capacity

Recommendation 10: Assistance to community with contract process for co-management. The management plan will take account of the limited institutional capacity of both the state and community. This will be done by keeping the plan simple. Recommendation 10 lies outside the domain of a technical management plan.

Issue 12: Institutional Capacity

- ▶ One of the best ways to deal with weak institutional capacity is to keep the plan simple and unsophisticated, as noted under Issue 10.
- ▶ Recommendation 10 is not part of the technical management plan.

B14. Issue 13: Non-timber Products

No recommendations. Because firewood is “non-timber,” it is better to use the collective term “non-wood forest products” (NWFPs).

Although there is no recommendation here, the EA usefully suggests that government should not obstruct the small-scale commercialization of NWFPs.

Issue 13: Non-timber Products

- ▶ The draft plan will include this aspect for approval by DNFF.