PD-AAG-105

UNITED STATES GOVERNMENT

memorandum

DATE: July 17, 1979

REPLY TO ATTN OF: AFR/DR/SFWAP, Todd Crawford

SUBJECT: Gambia Forestry Project 635-0205

TO: See Distribution

A Project Review Meeting for the subject project has been scheduled for July 24 at 2:00pm in Room 1408 NS. A copy of the Project Paper is attached.

Tuesday July 24 2:00 PM; 1408 NS

Project Committee July 17, 1979

Distribution:

AFR/DR, John Koehring
AFR/DR, Norm Cohen
AFR/DR/SFWAP, Jonathan McCabe
AFR/DR/SDP, John Blumgart
Sally Patton*
Jack Nixon
AFR/DR/ARD, Quincy Benbow
Dillard Gates*
AFR/SFWA, Jeanette John
Owen Lustig*
Judy Shampain
Donald Miller
Jim Kelly
AFR/SFWA/SDP, Tom Greathouse
GC/AFR, Ed Dragon*
SER/CM, Jim Anderson
AFR/DP, Jim Govan
AFR/DR/EHR, Frank Moore*
AFR/DR/ENGR, M.J. Morgan*
AFR/DR/EHR, Peggy Shaw
✓AAA/AFR, Gayleatha Cobb

* Project Committee Member; PP already received

OPTIONAL FORM NO. 10
(REV. 7-76)
GSA FPMR (41 CFR) 101-11.6

635 Ψ02Ψ3
ΦΦ42Φ1

UNCLASSIFIED

DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D. C. 20523

GAMBIA FORESTRY PROJECT

635-0205

- PROJECT PAPER -
PROPOSAL AND RECOMMENDATIONS
TO THE
PROJECT REVIEW COMMITTEE

UNCLASSIFIED

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT PAPER FACESHEET

1. TRANSACTION CODE: A (A = ADD, C = CHANGE, D = DELETE)

PP

2. DOCUMENT CODE: 3

3. COUNTRY/ENTITY: The Gambia

4. DOCUMENT REVISION NUMBER: N.A.

5. PROJECT NUMBER (7 digits): 635-0205

6. BUREAU/OFFICE: A. SYMBOL: AFR; B. CODE: 06

7. PROJECT TITLE (Maximum 40 characters): Gambia Forestry

8. ESTIMATED FY OF PROJECT COMPLETION: FY 84

9. ESTIMATED DATE OF OBLIGATION: A. INITIAL FY 79; B. QUARTER 4; C. FINAL FY 79 (Enter 1, 2, 3, or 4)

10. ESTIMATED COSTS ($000 OR EQUIVALENT $1 -)

A. FUNDING SOURCE	FIRST FY B. FX	FIRST FY C. L/C	FIRST FY D. TOTAL	LIFE OF PROJECT E. FX	LIFE OF PROJECT F. L/C	LIFE OF PROJECT G. TOTAL
AID APPROPRIATED TOTAL						
(GRANT) SH	(823)	(752)	(1,575)	(823)	(752)	(1,575)
(LOANS)	( )	( )	( )	( )	( )	( )
OTHER U.S. 1.						
OTHER U.S. 2.						
HOST COUNTRY					233	233
OTHER DONOR(S)						
TOTALS	823	752	1,575	823	985	1,808

11. PROPOSED BUDGET APPROPRIATED FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE C. GRANT	PRIMARY TECH. CODE D. LOAN	E. 1ST FY 79 F. GRANT	E. 1ST FY 79 G. LOAN	H. 2ND FY ___ I. GRANT	H. 2ND FY ___ J. LOAN	K. 3RD FY ___ L. GRANT	K. 3RD FY ___ M. LOAN
(1) SH	744	061		1,575					
(2)									
(3)									
(4)									
TOTALS				1,575					

A. APPROPRIATION	N. 4TH FY ___ O. GRANT	N. 4TH FY ___ P. LOAN	Q. 5TH FY ___ R. GRANT	Q. 5TH FY ___ S. LOAN	LIFE OF PROJECT T. GRANT	LIFE OF PROJECT U. LOAN
(1) SH					1,575	
(2)						
(3)						
(4)						
TOTALS					1,575	

12. IN-DEPTH EVALUATION SCHEDULED: MM 03 YY 83

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PID FACESHEET.

[ ] 1 = NO, 2 = YES

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE: Douglas P. Brown

TITLE:

DATE SIGNED: MM DD YY

15. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM 07 DD 13 YY 79

AID 1330-4 (3-78)

PROJECT DESIGN TEAM

Todd W. Crawford
Project Design Officer
Sahel and Francophone West Africa
Projects Office
AID/Washington

William N. Darwin, Jr.
Forest Products Technologist
U.S. Department of Agriculture
Forest Service
State and Private Forestry-Southeastern Area
Doraville, Georgia

Thomas E. Greathouse
Silviculturalist
U.S. Department of Agriculture
Forestry Service
On detail to Sahel Development Program Team
AID/Washington

Fred Kaiser
Staff Economist - Resources Planning and Assessment
U.S. Department of Agriculture
Forestry Service
Washington, D.C.

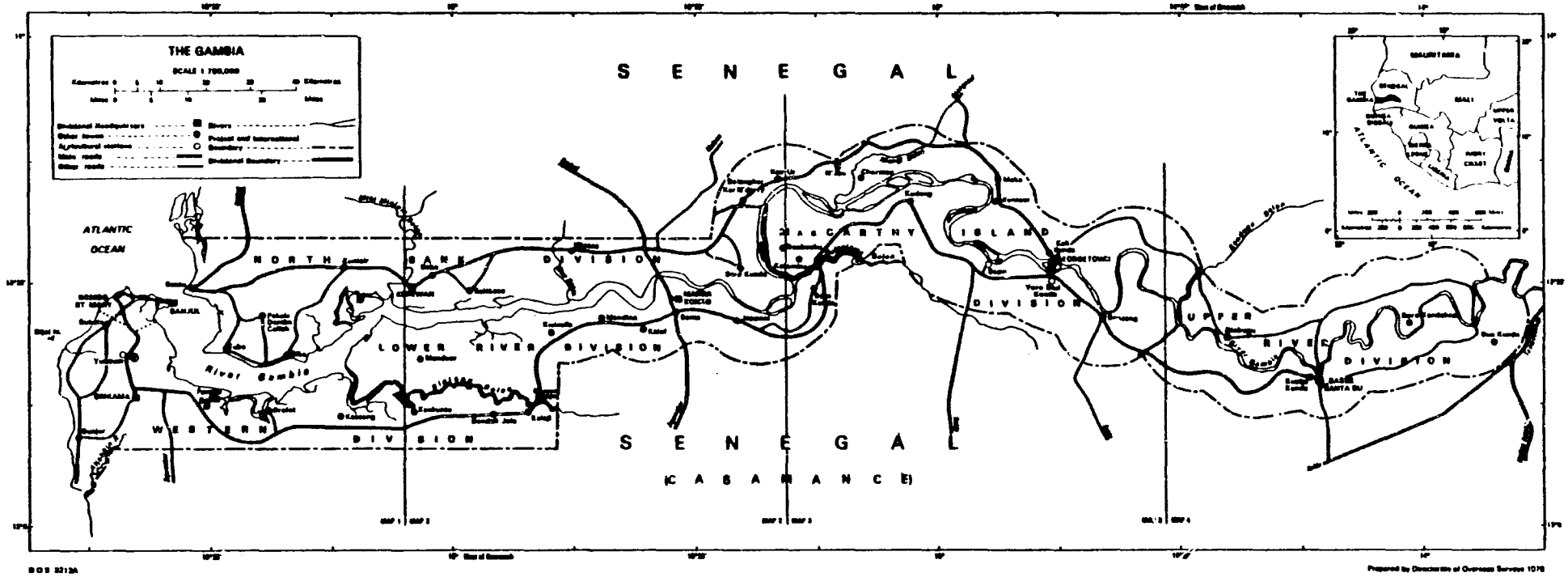
Steven P. Reyna
Social Anthropologist
Regional Economic Development Services Office
for West Africa
Abidjan, Ivory Coast

Fred Zobrist
Chief Engineer
Africa Bureau
AID/Washington

1:750,000

LOCATION MAP

TEXT MAP 1



Prepared by Directorate of Overseas Surveys 1976

TABLE OF CONTENTS

I. Project Description

A. Introduction to the Forestry Sector in The Gambia

The Gambia is one of the smallest countries in Africa, with a total surface of only 10,356 square kilometers. It lies within the basin of the Gambia River, stretching about 360 km inland from the Atlantic to its eastern border with Senegal. The country is mainly flat, particularly near the sea, but nowhere does it rise more than 90m above sea level. The Gambia lies within the Sudanic-Sahelian climatic zone which is characterized by a seven month dry period and an intense five month rainy season. The average yearly rainfall in The Gambia ranges from 900mm in the north to 1,300mm in the south-west.

The bulk of the forested area can be described as Savanna Woodland with grass and shrub understories, while the moister southwest is described as Forest Savanna Mosaic or Sudano-Guinea Forest Savanna. This area contains some species that are characteristic of Forest rather than Savanna-Woodland eco-types. Also, along the Gambia River and its tributaries to the maximum limits of salt water intrusion 240 km upstream there are pure strands of tall mangrove, Rhizophora racemosa.

Nearly all of The Gambia was fairly heavily wooded and forested until the beginning of the 20th century. Clearing for agriculture was of limited extent and the long fallow periods that were involved did not lead to a depletion of the forest resources over the area which is now The Gambia.

However, with the six-fold increase of people and cattle since 1900, the forest resource has been heavily depleted. By 1968, based on an aerial survey of land cover, the forest was reduced to about 46% of the total land area, or 471,745 ha. The forest cover at that time was composed of the following types:

- closed forest	7,200 ha.
- woodland	155,280 ha.
- woodland savanna and bush fallow	242,495 ha.
- mangrove	66,770 ha.

Although no reliable estimate of forest and woodlands has been made since 1968, all indicators point towards a continued depletion of the forest resource. These indicators include: increasing demands for forest products from the growth in population; increasing clearing of forest areas for shifing agriculture; continued damage of wooded areas as a result of uncontrolled fires started in order to prepare land for grazing and cultivation; soil dessication and wind and water erosion; and the area's increasing vulnerability to drought. Using the best available information, it appears that the forest resource in The Gambia will be completely exhausted within the next 16 years if the population continues to expand at the present rate of 2.8% per annum, if there is no increase in the rate of reforestation or natural forest regeneration, and if per capita wood consumption levels do not decline.

Presently, most Gambians rely on the forest for fuel and building materials. Firewood accounts for about 75% of the wood used. Firewood is used mainly by the rural population and is gathered daily by villagers who, in many instances, must now travel 2 to 4 hours to gather wood. Also, several licensed dealers fell and transport firewood in bundles for sale in large rural villages and towns.

Another 15% of the wood is used to make charcoal. Licensed charcoal masters and their work gangs harvest dead wood throughout the country and convert it to charcoal at the felling site. The charcoal is bagged and transported to the urban areas where it is sold by dealers, either by the bag or the tin. The charcoal industry is the best developed of the non-government timber-using industries.

The remaining use of wood is mainly for building and fencing materials. Machine-sawn timber is used primarily by the urban and suburban population. Official statistics indicate that 75% of the needs for sawn timber are met by imports, although the government sawmill does manufacture approximately 900 m3 lumber per annum. These statistics understate actual imports since they do not include sawn timber and window and door frames imported largely for tax-exempt commercial building, such as hotel construction. A very small number of pit-sawyers in the rest of the country saw some K. Senegalensis and Chlorophora Regia for rural use.

The rural population uses quite a lot of hewnwood for construction. People cut their own wood and rough saw and hew it with adzes to the desired size. Roughly half of the dressed wood used in The Gambia is rough hewn.

Rhun palm is also often used both in urban and rural areas as a building material. This wood cannot be sawn but is split and hewn. Because of the lack of other sources of sawn material in most areas, rhun palm is presently in very short supply. The very rapid rate of depletion of the rhun palm caused it to be declared a protected species in the 1950s, a classification which the Government of The Gambia (GOTG) confirmed in recent legislation.

Forestry in The Gambia is very young, starting in 1951 with the formation of a Forestry Division in the Department of Agriculture within the Ministry of Agriculture and Natural Resources. The first Gambian educated to the Masters level in forestry graduated from Duke University in 1978. However, other Gambians have received technical training in forestry in England and Nigeria.

All exploitation of forest products is controlled and licensed by the Forestry Inspectorate of the Forestry Department, though evasion is widespread. The current forestry law was written in 1977, requires licensing of all commercial forest exploitation, and gives the Department full authority to control such activities anywhere in the country. The regulations also include a list of protected species which may not be felled if they are under certain size and

TABLE 1

Forest Parks in The Gambia, 1979, Area in Hectares

Western Division	
Finto Manareg	1012
Kati Lenge	324
Bama Kuno	931
Nyambai	202
Kabafita	243
Furuyar	405
Bamba	380
Salagi	312
Bijilo	48
North Bank Division	
Lohen	95
Kasagwa	202
Kumadi	283
Mirike	174
Bobo	704
Jalobiro	58
Pakala	1161
Ngeyen	612
Lower River Division	
Sutukung bani	6
Jambang kunda	356
Beri kolon	1052
Tabuning sita	16
Tamba jung	752
Se Ulumbang	523
Nyunaberi	1198
Jabisa	16
Kaiaf	36
Knoworo	67
Jollifin	430
Mutaro kunda	309
Brikama	356
Faba	567

MacCarthy Island Division	
Belel	405
Jumbe yake	227
Njama	32
Njau	364
Kahi hadi	1485
Niani Maru	607
Gassang	53
Sibikuroto	36
Ngongonding	1250
Tanu	2667
Dobo	28
Kuta	4
Kiberi	389
Sanbo tumang	738
Bankuba	850
Kaolong	2379
Kunkilling	142
Madina demba	2373
N'jassong	2347
Jawara	579
Sikunda	445
Sallo kuto	3
Bilobi	217
Upper River Division	
Mamto konto	431
Sakaru dalla	261
Mamdulai	112
Sihikuroto	138
Helakunda	101
Gambisara	308
Subbi	73
Jeloki	358
Jundala	437
Koina	1
Kusur	316

rules for control of bush fires. Although the law is adequate, the material and financial resources to ensure its enforcement are at the present less than satisfactory. For example, Forest Guards and Scouts generally do not have the mobility necessary for adequate surveillance of the reserved areas for which they are responsible.

The Government of The Gambia (GOTG) has established 66 forest reserves covering 34,027 ha., or 3.2% of the country (Table 1). Management of these areas has generally been limited, although over 1,000 ha. of Gmelina arborea plantations have been established in forest parks within the Western Division.

Last year the GOTG began an annual National Tree Planting Festival in the first week of July. About 250 thousand seedlings were distributed for planting along roads and in compounds and fields throughout the country by the Forestry Department. Survival rates are not yet known.

The use of forest products varies between the rural and urban populations. The rural population depends largely on locally produced indigenous materials which, for the greater part, they cut or gather for themselves. The urban population, partly because it is more affluent and because it is further removed from the sources of wood, tends to use more processed materials which are usually bought from a dealer/wholesaler.

B. Project Strategy and Purpose

The central fact to be retained from the general description of the Gambian forestry sector in the proceeding paragraphs is that, based on available data concerning the rates of wood production and utilization in The Gambia and given no change in those rates, the forest resources there will be completely depleted within the next 15 years. Immediate action is critical yet, unfortunately, personnel, resources, and data do not presently exist which would enable The Gambia to undertake a major forestry sector project. This situation has attracted the attention of various donors (see section I.E. below) whose efforts, taken singly and together, will contribute to the objective of preparing The Gambia for the scale and scope of forest sector activities required to meet its future needs for wood and wood products. The activities proposed below for AID financing have all been designed to contribute to that objective by building on the resources which presently exist in The Gambia and by supplementing inputs supplied by other donors.

C. Project Description

The project consists of a grant of $1,575,000 to the GOTG to finance implementation over a five-year period of the activities described below. The principal objective of the activities to be undertaken is to improve the efficiency of wood production and utilization in The Gambia, keeping in mind the constraints imposed by current availabilities of skilled personnel, resources, and technical data. The specific project activities recommended are as follows:

1. The training component will add to the Forest Department's pool of personnel skilled with respect to establishment and management of village and large scale plantations, village level and commercial scale wood utilization; and techniques of forestry extension and village outreach.

2. The outreach component will involve preparation or purchase of films, slides, posters, flip charts, and radio programs in order to: (a) carry out a media campaign aimed particularly at the rural inhabitants and concerned with the vital economic and environmental importance of trees and woodlands; and (b) begin an extension program concerning establishment, management, and utilization of woodlots and other village plantings.

3. The technical assistance component will entail collection and analysis of data with respect to the technical, economic, and social feasibility of exploiting mangroves, a hitherto virtually untapped source of wood in The Gambia, as well as concerning social and economic aspects of wood production and utilization. Limited short-term technical assistance will also be financed in connection with the production and utilization components described below.

These three components have been designed keeping in mind the objective of increasing The Gambia's capacity to absorb assistance to its forestry sector. However, the need to increase the level and efficiency of Gambian wood production as quickly as possible using available data, technologies, and manpower is also obvious. The fourth and fifth components have been designed with this objective in mind.

4. The production component will support The Gambia's on-going program of establishing large-scale plantations to meet the needs of the urban and periurban populations and reduce pressure on less productive, fragile woodlands by providing financing necessary for the addition of 1,300 ha. planted in fast growing species. This component will also support a pilot program to integrate tree planting into the economic life of rural areas by establishing ten village woodlots.

5. The utilization component is focused essentially on the Forestry Department's Nyambai Utilization Unit and will provide for purchase and installation of a small quantity of logging and milling equipment once the necessary training programs have been completed.

D. Relationship of Project to GOTG and CILSS Priorities and to AID Strategy

1. The GOTG - Recent statements of the objectives of the Forestry Department include the following:

a. To reserve and maintain a national forest resource capable of minimizing soil dessication and erosion caused by wind and water, maintaining riverbank stability, and providing an adequate supply of wood and other forest products to meet industrial needs as well as those of the rural population;

b. To promote planting by individuals as wind breaks in fields, along roads, and in compounds and woodlots to increase supplies of tree products in rural areas;

c. To develop the economic use of forest products by local industry; and

d. To instill among Gambian people an understanding of the value of trees and forests and the need for their development and rational exploitation.

Tangible evidence exists of the priority assigned by the Government to improved production, management, and utilization of its forest resources. Although hampered by extremely limited professional and technical personnel and by uncertain finances, The Gambia nonetheless has managed to plant some 1,250 ha. of trees in the forest reserves near Banjul, for fuelwood production and for sawn timber. In 1976, the Forestry Division of the Ministry of Agriculture and Natural Resources was reorganized and upgraded to become a Department, reporting directly to the Permanent Secretary rather than to the Director of the Agriculture Department as was previously the case. The Government has steadily expanded the personnel and budget allocated to the Forestry Department in keeping with the increased importance accorded to activities in the forestry sector. The Government has also financed out of its own revenues training of Gambian professional and technical personnel in the U.S. and in Nigeria. In 1977, new forestry legislation was promulgated to provide the legal basis for the Forestry Department's expanded responsibilities and to bring some 34,000 ha. of forest parks under its direct control. Finally, President Jawara launched an annual National Tree Planting Festival in July 1978 and traveled throughout The Gambia to stimulate personally a greater national awareness of the importance of preservation and rational use of trees and forests.

2. CILSS and the Club - Programs of tree planting and reforestation have been called for by the member states of the Comite Intertat pour la Lutte Contre la Secheresse au Sahel (CILSS) and by the Club des Amis du Sahel. At a meeting in April/May 1976, representatives of the Sahelian forestry services endorsed a plan of action which called for meeting the people's needs for fuelwood and construction timber as its first priority and took cognizance of the significant relationship between careful management of forest cover and maintenance of the productivity of cropping and grazing lands.

3. AID - The project is directly linked to AID's strategy set forth in the most recent Country Development Strategy Statement (CDSS). In accordance with the expressed wishes of the GOTG, AID's assistance is to feature projects to better manage The Gambia's soil, water, and vegetative resources, thus contributing to the eventual reversal of the resource degradation which presently constitutes an increasingly significant determinant of poverty in The Gambia.

AID's only agriculture/natural resource activity in The Gambia at this time is the Soil and Water Management Unit (SWMU) Project, 635-0202. Approval of a second major project, the Mixed Farming and Resource Management Project, 635-0203, is anticipated during FY 1979.

The SWMU Project's objectives include: (1) halting or reversing the environmental damage caused by present patterns of natural resource exploitation; and (2) increasing the production of food and cash crops, forage, and forest products. The Unit will be located in the Ministry of Agriculture and Natural Resources and will include 3 expatriates financed under the grant: A Conservationist, a Soils Scientist, and a Plant Ecologist, the latter of which has academic background and working experience in forestry and management of grazing and woodlands. The Unit will develop a village planning and action program responding to problems of soil and water management for implementation in 10-15 villages. Among the possible village-level solutions to those problems identified in the Project Paper are planting of trees as wind breaks or in woodlots. The Unit will attempt, through this planning and action process, to increase the rural inhabitants' understanding of the impact which practices of crop and livestock production and forest exploitation have on the sustained productivity of natural resources. This project has an approved funding level of approximately $2.5 million. The technical assistance team is scheduled to take up residence in The Gambia on or about September 1, 1979.

The Mixed Farming Project is aimed at improving crop and forage production and management and at integrating livestock more fully into the cropping system. Considerable attention will be given to developing a management plan for lands which are grazed and to lessening the pressure on those areas through introduction of forage species into the crop rotation and better use of crop residues. Sufficient data to plan and successfully implement the desired changes in patterns of resource utilization do not presently exist in the appropriate form. Therefore, the Mixed Farming Project will finance aerial photography at a scale of 1:25,000 and subsequent photo interpretation to produce a comprehensive set of land classification maps for each of The Gambia's five administrative divisions. Soil types and the three precipitation zones which influence vegetative cover will be identified on the maps as well as existing cropping patterns and forest cover. From a separate source, AID is also financing socio-economic research with respect to patterns of land, vegetation, and water resources use.

The resource inventory and cartography component of the Mixed Farming Project has excited the interest of several GOTG Ministries and Departments. The maps provided will also be a critical input into the detailed forest inventory to be carried out with German assistance. It is expected that the German technical assistance team as well as personnel of the Gambia Forestry Department will participate in the ground verification of the photographs necessary for preparation of the forest cover maps.

E. Relationship to Other Donors' Activities

A number of other donors are sponsoring activities in The Gambia's forestry sector. This project has been carefully designed to complement those efforts.

The United Kingdom's Overseas Development Ministry (ODM) has provided steady support over the past several years in the form of equipment, scholarships, technical assistance, and operational funds for reforestation. It presently finances one professional forestor who, as Conservator of Forests, is the Director of the Forestry Department. ODM has financed a feasibility study for a bridge/barrage across the Gambia River, which, following closure, will inundate some 8,000 ha. of tall mangroves in the upstream areas. ODM has also financed a preliminary forest inventory for the entire country, a detailed survey of the mangroves upstream of the planned barrage, and intends to execute a similar inventory in the down-stream areas following the upcoming rainy season, June to September.

The Federal Republic of Germany (FRG) attended the Club/CILSS forestry sector meeting mentioned above. Following up on the interest it expressed at that time, the FRD, through its technical assistance agency, Gesellschaft fur Technische Zusammenarbeit (GTZ), has completed the field work for a project amounting to approximately DM 3.0 million ($1.5 million), expected to be available in CY 1980. This project will provide for a detailed forest inventory, site and species trials with exotic and indigenous species as required, and demarcation and fire protection of the existing 66 forest parks. The grant will finance approximately 8 person years of technical assistance primarily in connection with the inventory and the trials, construct necessary housing and offices, and purchase vehicles and a limited amount of other equipment.

The forest inventory, apart from being a catalogue of species, will also include data on size, incidence, estimated yields, etc., for the principal species in the parks. Recommendations for future management and utilization of the forest parks for productive, protective and/or recreational, and educational purposes will also be made. The West German Government has also agreed to make a separate grant of approximately DM 400,000 ($200,000) for the immediate purchase of equipment urgently required by the Forestry Department for its operations. Included are logging equipment and bicycles to provide mobility to the 66 Forest Scouts. A detailed list is contained in Annex L.

The United Nations Food and Agriculture Organization (FAO), and the Arab Development Bank, (BADEA), have agreed jointly to grant D23,000 ($120,000) to finance establishment of forest nurseries in North Bank, Upper and Lower River, and MacCarthy Island Divisions. These nurseries and the trucks which will also be provided are critically needed to support the annual National Tree Planting Festival and also the site and species trials to be conducted with German assistance.

II. Summary of Analyses

A. Technical Analyses

1. Strategy - The proposed project reflects the pool of skilled Gambian and expatriate personnel presently or soon to be available in The Gambia and the experience and information accumulated to date with respect to the establishment of plantations, the effectiveness of different species, etc. The project also takes into consideration the number of students graduating from secondary schools in The Gambia, or who possess Bachelors degrees with appropriate science backgrounds, and who are likely to be available for additional academic or technical training in forestry. The project pays particularly close attention to the activities of other donors, notably ODM, the FRG, FAO, and the BADEA, so as not to duplicate plans already made to finance technical assistance, equipment, research, and studies but, rather, to focus on the remaining high priority areas for which financing is not yet available.

A conscious decision was made to avoid the use of expatriate technical assistance wherever possible by designing a project which can be well managed by the Forestry Department as it presently stands. Expatriate technical assistance is very costly; an estimate commonly used for long-term personnel is $100,000 per annum. In addition, in The Gambia, it has frequently proved necessary to construct and furnish housing for expatriate advisors, which can entail a delay in excess of one year in the arrival of the technicians. Furthermore, most schools have long waiting lists for admission and existing medical facilities in the greater Banjul area are already overtaxed by the present urban population, two factors which enormously complicate the family lives of expatriate personnel assigned to The Gambia and, hence, the task of recruitment.

The decision to avoid use of expatriate technical assistance also reflects the Project Design Team's observation of the difficulties encountered in transferring skills and managerial expertise from expatriate to national personnel. In situations where experienced, well-trained nationals are in short supply, as they are in The Gambia, when an expatriate is available to perform a particular function, those nationals who would be capable of working on an equal footing with the expatriates tend, as a result of the very shortage of such nationals, to be assigned by their ministry to the many other priority tasks for which technical assistance is not available. Later departure of the expatriate, thus, frequently leaves the same technical or managerial gap which he arrived to fill two years earlier.

The decision to minimize use of technical assistance, thus, permits this project to focus in a significant manner on training Gambians for employment in the Forestry Department in order to extend and deepen the pool of skilled Gambians able to plan and manage future forestry sector activities, thereby lessening the need to rely upon expatriate talent.

2. Production - The project has two production-oriented activities, establishment of large-scale plantations within the confines of existing forest parks and a pilot program to establish woodlots in ten villages.

The project will establish 1,300 ha. of plantation in locations within approximately 56 kilometers south and to the east of Banjul along the Banjul-Mansa Konko Road. These areas are within the existing forest parks at Pinto Manareg (1,000 ha.) and Salagi (300 ha.), which were chosen because of their ease of access and their proximity to the Banjul-Kombos-St. Mary area which is the principal concentration of demand in the country. Transportation costs in connection with establishing the plantations and marketing the produce thereof will, therefore, be minimized. Since the areas to be planted are within existing forest parks, establishment of the plantations will not involve displacement of food crop producers. Ample labor will be available from nearby villages.

The principal species chosen for the plantation is the fast-growing Gmelina arborea. This choice was based on trials which have been conducted over the past 30 years with several species to determine which perform best in The Gambia and what yields can be expected. Gmelina has proven best to date in competition with two species of eucalyptus, teak (Tectona grandis), and the so-called dry-zone mahogany (Khaya senegalensis). Gmelina is not susceptible to termites and, therefore, the need for use of pesticides such as dieldrin, required for plantations elsewhere in the Sahel, will be obviated. Gmelina can be sown directly, thereby eliminating the need for nurseries in the vicinity. Based on data collected at plantations established for some time in the area, Gmelina can be expected to yield between 15 and 20 cubic meters per annum.

The technique to establish the plantations described below is the distillation of decades of accumulated experience. The Forestry Department contracts with local timber cutters to fell and remove trees and bushes from the site. Seeds are collected at conveniently located Gmelina plantations established elsewhere five or more years previously. Farmers from neighboring villages sow the seeds at 1m by 1m intervals. In return for this labor and that involved in weeding, the farmers are permitted to plant food crops between the rows of seedlings. During the second year, the seedlings are thinned to 2m by 2m spacing and weeded twice by labor obtained under contract from the villages. A final weeding is required during the third year.

The plantations are fenced to protect them against domestic animals who find the tender Gmelina seedlings an irresistibly succulent dry-season browse; they are also patrolled by a Forest Guard assigned for every 500 ha. or so after the farmers have removed their crops at the end of the first year. The plantations are established in 25 ha. blocks between which there are firebreaks 10 m in width.

As noted above, Gmelina can be expected to yield between 15 and 20 cubic meters of wood per hectare. Of this yield, existing data suggest that approximately 75% will be used directly as fuel or converted into charcoal, the remainder being used for poles and saw timber. The typical rotation will have a duration of approximately 15 to 20 years. Thinnings during the second, fifth, and tenth years will produce fuelwood and, as the trees mature, poles for fencing, construction, and other uses. The harvest will occur during the fifteenth year, although a portion of the better trees will be preserved for harvest until the twentieth year to produce larger timber for construction. Since Gmelina coppices, that is, produces new shoots following cutting, the rotation may be repeated during a second 15 to 20 year period, using the original root systems, thereby significantly increasing the benefit/cost ratio of plantation establishment.

Gmelina is the only species with which the Forestry Department has sufficient experience to confidently predict its technical and economic success in plantation use. Furthermore, based on actual experience, Gmelina yields drop significantly when it is planted in the drier regions in the northern and eastern regions in the country. These two factors constrained the design of the production component, dictating the choice of Gmelina and, consequently, the choice of plantation sites within the wetter Western Division. However, the sites and species trials to be conducted over the next five years with assistance from the FRG will assist the Forestry Department to identify species suitable to the drier regions of the country and, thus, to begin establishing plantations outside of the Western Division, closer to secondary concentrations of demand.

AID direct inputs to this activity consist of the costs of plantation establishment and the second-year weeding for 1,300 ha. These costs total $501,800 in 1979 dollars and $671,495 in inflated dollars, the actual amount which will be obligated during the five-year life of the project. These costs are broken down by year in Table V of the Financial Plan and discussed in more detail in the Economic and Financial Analysis, Annex F. The amount of $671,495 includes the estimated cost of approximately 97,500m of barbed wire ($16,500 delivered Banjul), the only commodity required for plantation establishment which will be imported from the U.S. The balance of the $671,495 will consist of local currency expenditures for fence posts and labor costs.

Training and technical assistance to be financed by the project in support of the plantation establishment are discussed in separate sections below.

GOTG inputs to the plantation establishment consist primarily of the value of the 1,300 ha. to be used and the portion of Forestry Department personnel costs which may be attributed to this activity. The personnel costs total approximately D150,000 ($78,125) over the life of

the project. The GOTG will also contribute D22,250 ($11,590) to cover the costs of additional fire control. The value of the land was costed out at D100 per hectare and, therefore, equals D130,000 ($67,700).

During the life of the project, the Forestry Department will undertake to work with ten villages in order to establish approximately 50 ha. of woodlots. This will have the nature of a pilot program; The Gambia has no relevant experience and experts' opinions with respect to the potential technical, economic, and social feasibility are often widely divergent. Experience accumulated in other Sahelian countries such as Chad and Upper Volta sheds little light on the question since ecological and social conditions in those countries vary greatly from those encountered in The Gambia. Nonetheless, a modest investment is warranted since the feasibility questions will never answer themselves in a vacuum and woodlots are a potentially attractive means to place a small supply of wood products within easy reach of villages.

The Forestry Department has recommended two villages for the location of the woodlots to be established during the first year of the project. These are: Illiasa, in the Upper Baddibui District, on the North Bank between Farafenni on the east and the Pakala Forest Park on the west; and Penjemu approximately 40km away from Banjul and south of Brikama in the Kombo Central District of the Western Division. This recommendation is based on the Forestry Department's previous contacts with the two villages and their expressed interest in participation. These villages are also close to nurseries which have been or are soon to be established.

The other eight villages will be selected as the project advances. Selection criteria which are firm include: expressed interest in participation, as indicated primarily by the willingness to allocate suitable land and labor; a clearly articulated method for organizing the labor and for distributing the eventual products of the woodlot; and relatively easy access to nurseries and the operational base of mid- to upper-level Departmental personnel, who will provide information and assistance to the villagers.

Other selection criteria which have been advanced, while possibly valid in theory, are arguable, sometimes conflicting, and should be applied cautiously. For example:

1. disadvantaged in terms of availability of government services and experience with previous development activities;

2. no accessible source of fuelwood ready at hand; and

3. possessing surplus land.

The first implies that the village is likely to be remote, poor, and, perhaps, inexperienced in mobilization to achieve a common

goal. The village's remoteness would complicate the Forestry Department's task of providing materials and technical support; its possible lack of organizational ability would also operate against successful completion and use of the woodlot; and its poverty suggests that wood production would rank low on the village's list of priorities relative to assistance for food crop production, provision of health services, etc.

The second criterion would, in theory, place wood production high on the village's hierarchy of wants. However, the absence of an accessible source of fuelwood could easily be the result of high population density with attendant pressure on the land base and severe competition among the alternate land uses such as crop production and grazing. In this case, it is readily understandable that the village would be reluctant to reallocate land from such immediately productive uses to a woodlot which would not begin to produce significant benefits until its fourth or fifth year.

Thus, the second criterion stands in likely conflict with the third. Likewise, the third criterion could be the result either of low population density and, hence, its remoteness, and/or it could imply that the village is relatively privileged in terms of a major determinant of wealth in The Gambia, which is, of course, land.

Fence posts and wire will be provided to participating villages free, as will be seeds and seedlings. For their part, the villagers will clear land, if necessary, construct the fences, and plant and tend the trees. The labor requirement is estimated to be on the order of one day per hectare per season from 75-100% of the adult male equivalents in the village, a requirement which is felt to be reasonable.

Species to be used will include Gmelina, neem (Azadirachta indica), cashew (Anacardium), and other fruit trees such as mango and citrus which are appropriate to the local soil and climatic conditions. Villages interviewed all enthusiastically expressed a desire for fruit trees. It is hoped provision of these trees, plus the fencing materials, will constitute sufficient immediate incentive for villagers to perform the necessary work. If not, other incentives will be tried, most likely a meal for the labor force on work days, such as is traditionally offered in certain areas of The Gambia to communal work forces. Use of P.L. 480 Food for Peace commodities was considered, but rejected for the moment because of the limited amount and periodicity of the labor required. Should these commodities eventually become the most desirable incentive, the Catholic Relief Services (CRS) representative in Banjul, who oversees Food for Peace activities in The Gambia, and the Regional Food for Peace Officer posted in Dakar have both indicated their willingness to incorporate woodlots into the Country Program.

Yields are extremely difficult to predict. However, for Gmelina, yields equivalent to half those likely on large-scale plantations appear reasonable. Likewise, for neem, yields on an average of 8 to 10 cubic meters may be expected.

Because of the small scale proposed for the woodlots, benefits such as reduced wind and water erosion and stabilization of river banks will not occur from this activity. These benefits are more likely to occur as a result of trees planted in connection with the annual National Tree Planting Festival. With the arrival of the Plant Ecologist on the technical assistance team for the Soil and Water Management Unit Project, the Forestry Department will have an additional resource at its disposal to help orient the activities of the Planting Festival towards resource management objectives.

AID direct inputs to the woodlot program consist of approximately 50,000m of barbed wire at an estimated cost of $8,438 CIF Banjul and a portion of 1.3 million polyethelene sacks at an estimated cost of $29,700 CIF Banjul for seedling production at the nurseries. (The remaining portion of these sacks will be used in connection with the National Tree Planting Festival throughout The Gambia.)

Other donors are providing inputs which will support the woodlot program. FAO and the BADEA will finance establishment of the nurseries as well as some operational costs. Vehicles financed by the FRG will assure mobility of Forestry Department personnel who will be active in promoting the program as well as timely distribution of seedlings, an operation which was the source of some difficulty during the 1978 Tree Planting Festival.

The fence posts used for the woodlots will be obtained by the Forestry Department from existing Gmelina plantations. The Forestry Department will also provide the seedlings. Should an incentive such as the traditional meal eventually be required in addition to those presently planned, the Forestry Department will also bear the costs thereof, which are estimated to be minimal.

Use of Peace Corps Volunteers to assist with the woodlot program, performing extension/supervisory functions, was considered but appears not to be feasible. By itself, this supervisory/extension role would not be enough to occupy a PCV full time and, furthermore, would not combine easily with other volunteer activities presently being planned by The Gambia.

Training and extension equipment and materials which will indirectly support the woodlot program are described in separate sections below.

3. Utilization - The Forestry Department's Utilization Unit located at Nyambai near Yundum is described in detail in Annex D. Briefly, however, its principal elements consist of the following: one 60-inch circular headsaw, one circular resaw, and one cross-cut saw housed under a shed; a covered lumber drying and storage area; a fence-maker and a hot and cold creosote bath for treating posts. The majority of logs sawn at the mill are cut by licensed contractors in forest preserves within 60km of Nyambai under Forest Department Supervision and are brought by the Department to the mill two at a time on a tractor-pulled flat-bed trailer. Exclusive use of the axe by the

contractors rather than saws reduces the volume of timber reaching the mill by 8 to 10%. Inappropriate and poorly maintained equipment at the mill reduces the volume of sawn timber by at least 30%.

In order to improve the output/input ratio, training, limited technical assistance, and additional equipment and supplies are required. The training and technical assistance are discussed in separate sections below. The equipment recommended for project financing is as follows:

1 Bolter saw with blower, log deck, lumber deck, and power unit	$25,000
1 Lumber resaw and edger	3,500
1 Lumber planer	10,000
Saw filing equipment and supplies	10,000
Supplies for sawmill alignment	5,500
3 "Big-stick" loaders and wood racks	5,500
TOTAL	$59,500

Inflation, shipping and insurance, purchasing agent's fee and bank charges will increase this total to $88,358. The bolter saw, resaw and edger, and planer will be housed in a covered shed with concrete pad of approximately 185 square meters, the construction cost of which is estimated to be approximately $18,500 at $100 per square meter, or $22,000 including inflation and contingencies.

The bolter saw is suitable for cutting small diameter, short logs, which are the principal product of the Gmelina plantations; it will also be suitable for sawing limbs and other topwood of trees such as the valuable Khaya senegalensis which are presently wasted. The important characteristics of the bolter saw are that it produces straight-grained, high-quality lumber from crooked, low-quality trees and that it requires less log handling than does the much larger circular headsaw presently employed at Nyambai. The resaw and edger and the planer will contribute to greater productivity per man-day, a higher quality product, and conversion of material which is presently wasted or turned into low-value charcoal into short pieces suitable for local use in making furniture and other wooden household products.

The "Big-stick" loaders and wood racks will be purchased for use with the two Unimog logging trucks to be financed by the FRG. Their use will enhance the safety of lumber transport from the logging site to Nyambai and will increase labor productivity and lower operating costs by reducing the amount of time and number of trips required to move a given number of logs to the mill.

Wood consumption has been estimated to be 1.7 cubic meters per capita in The Gambia. This is substantially higher than estimates made in other Sahelian countries. However, this figure would not be

high if it were interpreted to be the rate at which the forest resource is being cut. Field observations made by the project design team provide evidence that a considerable portion of the wood which is cut in the forest by villagers for their personal use is never actually so used. The axe is the only tool employed and hence, the smaller, more easily-cut portions of the trees are used first, leaving behind the larger, more valuable sections and a growing pile of dry, flammable chips. Thus, because of frequent brush fires, the major part of a tree is often lost.

The difficulties of introducing alternate technology into rural areas are discussed in more detail in Annex D. Nonetheless, it is recommended that, in an initial, experimental approach to this problem, hand saws and maintenance equipment be purchased and supplied, with appropriate training, to the villages participating in the woodlot program. The project budget provides $3,504 for this purpose.

Use of the bolter saw to cut the annual harvest of Gmelina logs from the existing 1250 ha. of plantation and to cut the annual harvest of Khaya senegalensis, plus better maintenance of the present milling equipment, will result in increased output of sawn timber. This incremental output is equivalent to the annual harvest which could be obtained from 103 ha. of Gmelina if the entire stand produced trees which were suitable for sawing. Improved utilization, therefore, translates directly into an extension of the forest resource.

4. Outreach - The outreach component of this project will have an impact on the village woodlot program and will also support the annual National Tree Planting Festival. Funds will be provided for purchase of Super-8 and 16mm films and for production of films, radio programs, posters, and other extension aids. These materials will be used by Forestry Department personnel to sensitize villages participating in the woodlot program and the general public with respect to such themes as the harmful effects of brush fire, impact of forests and other tree plantings on soil fertility and crop production, how to organize to establish and care for a woodlot, etc.

A limited number of appropriate films with soundtracks in Jula, Fula, Wollof, and Mandinka are presently available from SODEVA, the Senegalese extension agency responsible for agricultural development in the Groundnut Basin of Senegal, and will be purchased from that source.

The Extension Aids Unit of the GOTG's Ministry of Agriculture and Natural Resources will be responsible for production of radio programs, films, graphics, and other materials to be used in connection with the woodlot program and the Festival and will receive technical guidance from the Forestry Department in that regard.

The Extension Aids Unit, which is located in the same Ministry compound as the headquarters of the Forestry Department, has the staff necessary to produce the desired programs and materials. It has several mobile cinema vans which will be used to present films throughout the country. It will also receive additional equipment under the Mixed Farming and Resource Management Project (635-0203). The proposed

project will finance purchase of one 16mm film editing machine required to complement the Unit's existing equipment and planned acquisitions.

The funds allocated for the purposes described above total $8,243, including shipping and inflation, in accordance with Table VII in Part III, Financial Plan.

Training in support of the outreach component is described in the following section.

5. Training - One of the critical constraints on The Gambia's ability to absorb assistance to its forestry sector is the lack of trained manpower. There is, at present, only one Gambian with a professional degree in forestry, the Assistant Conservator of Forests, who received an MS in forest economics and management from Duke University in 1978. One additional Gambian is presently enrolled in a degree program at the University of Dar es Salaam, at the conclusion of which in 1980, he will receive a BS in forestry with a minor specialization in apiculture. By July 1979, nine other secondary school graduates will have received a diploma from the Forestry Institute at Ibadan at the conclusion of an 18-month program it offers covering such topics as forest management, nursery development, silviculture, extension work, and soils science.

Training is needed in the following fields: silviculture, including reforestation, thinning, and other practical application techniques; forest management at the administrative and field level; wood products utilization, including logging and sawmill management and maintenance; and forest economics. Accordingly, this project provides a total of $362,875 in current dollars (see Table VI of the Financial Plan) to finance the anticipated costs of: 8 person-years training to the BS level for two candidates at a U.S. or African university; 2 person-years to the MS level for one candidate at a U.S. or African university; 7.5 person-years training at the Forestry Institute at Ibadan for five candidates; 45 person-months special technical training pertaining to wood products utilization in the U.S. for five candidates; and 9 person-months special academic training in the U.S. for one candidate in the field of extension communications to strengthen the outreach component and the village woodlot program.

In selecting trainees, priority will be given to qualified employees of the Forestry Department with some years working experience. Three candidates have already been identified for the special short-term technical training in wood products utilization and one candidate for the training in extension communications. The project design team is confident that the Forestry Department will be able to provide candidates for the remaining slots over the life of the project either by drawing on its existing staff, as in the case of the undergraduate training in the U.S., or by recruiting secondary school graduates, as in the case of the diploma training in Nigeria.

The bid documents for the sawmill equipment will stipulate that the supplier must furnish four weeks in-country training for the pertinent supervisory, operational, and maintenance personnel at the

Nyambai Utilization Unit. In-country training will also be offered by the Chief of the Utilization Unit to field staff who will be responsible for training villagers participating in the woodlot program in the use and maintenance of handsaws. Further in-country training should be arranged for personnel such as Forest Guards and Scouts in such fields as nursery operation, reforestation, tree improvement, pest control, and utilization of forest products. This training should be given by senior staff of the Forestry Department or by expatriate advisors, for example, those connected with the Soil and Water Management Project or the forest inventory to be financed by the FRG. The short-term consultants financed by this project in forest management and forest products utilization (see Section 6 below) will be expected to make training recommendations and to assist the Department to prepare a training plan.

Additional details and background information are provided in Annexes C and D.

6. Technical Assistance - The project provides $60,000 for six months short-term consultancies, three in the field of forest production and management and three in the field of forest products utilization. The principal task of the forest management consultant will be to assist the Forestry Department to develop a management plan for the 1,300 ha. of Gmelina to be established during the project. Follow-up visits will focus on revising the plan as indicated by recent developments.

The forest products utilization consultant will make a preliminary visit to prepare final specifications for the sawmill and logging equipment to be procured and to assist the Chief of the Utilization Unit to plan the layout of the shed to shelter the new equipment. Periodic follow-up visits will review production records of the Utilization Unit, assist in identifying more efficient methods, and resolve operational and maintenance problems which may have arisen.

AID's primary input into the technical assistance component is $180,000 to cover the costs of a study of the technical, economic, and social feasibility of exploiting the mangrove resources of The Gambia. The anticipated level of effort is 18 person-months distributed as follows:

4 months - utilization specialist
3 months - production/management specialist
3 months - forest economist
2 months - anthropologist
2 months - industrial engineer
2 months - soils scientist
1 month - environmentalist
1 month - regional/rural planner

The study will examine questions of management, extraction, processing, and marketing with emphasis on the tall mangrove, Rizophora racemosa, in the pool area above the proposed bridge and anti-salinity barrage at Yelitenda.

The project design team's work in London with ODM and Coode

and Partners, the engineering firm responsible for the feasibility study of the bridge/dam at Yelitenda, in Frankfurt with GTZ, and in The Gambia resulted in the formulation of certain perameters for the mangrove feasibility study.

It is estimated that 1.0 million cubic meters of mangrove is standing on 8,700 ha. in the pool area upstream of Yelitenda. Although this is a sizeable quantity, greater than the annual wood consumption of The Gambia, it may be necessary for the study team to formulate a plan for sustained management and harvest of the mangrove in the downstream areas as well in order to justify economically the capital expenditure which may be required to tap the upstream mangrove resource.

The suggestion has been made that the upstream resource should be extracted prior to the anticipated closure of the anti-salinity barrier in 1985. Studies conducted elsewhere indicate that an operation of this nature would be highly capital intensive, require an investment on the order of $8,000,000 in logging equipment alone, not to mention the cost of transportation infrastructure, would require the presence of approximately 200 highly skilled workers, predominately expatriate, to operate and manage, and would have a significant, adverse environmental impact. Therefore, the study team should focus on labor intensive technologies which will create direct benefits for The Gambia. In addition, attention should be given to development of a water management scheme above the dam which will allow a slower rate of harvest of the resource following closure of the dam.

The source and seasonal availability of labor and the magnitude of the labor requirement itself merit close study, particularly if harvesting is to begin while the dam is still under construction. Arrangements to house, feed, and provide medical attention and other social services to the influx of labor to the area should be contemplated.

Conversion of the mangrove into particleboard is frequently mentioned. The project design team has estimated that the capital investment for a particleboard plant would be on the order of $23,000,000, that 80 highly skilled employees, probably expatriate, would be required to manage and operate the plant, and that the plant would consume two to three times more electricity than is currently generated in The Gambia. Such a venture should be undertaken cautiously, if at all, and the study team should focus, again, on possible uses which would generate more employment and other benefits for The Gambia. Use of the resource as fuel or in speciality products for export such as wooden agricultural bearings should be carefully investigated.

More detailed background information and a draft terms of reference for the study are included in Annex E.

B. Economic and Financial Analysis

A survey carried out in 1973 by Openshaw indicated that the wood consumption of The Gambia was 877,900 cubic meters in that year. To obtain this quantity from natural woodland would require a mean annual increment of 2.2 cubic meters per hectare. While no data are available concerning natural woodland in The Gambia, the mean annual increment of ecologically comparable areas in Nigeria is 1.4 cubic meters per hectare. Data collected in The Gambia on Gmelina plantations indicate that their mean annual increment is on the order of 15 cubic meters per hectare. Therefore, one hectare of plantation can substitute for the production of 10.7 ha. of natural woodland.

Based on data recording actual experience, the cost of one hectare of Gmelina plantation totals D840 ($438] during its first five years and D570 ($296] thereafter for a total of D1,410 ($734] for the complete 30-year rotation. The return from that hectare during the same period is estimated to be D4,585 ($2,388] giving a net return of D3,175 ($1,654]. Other, ancillary benefits include $260 per hectare accruing to charcoal makers using wood cleared from the land prior to sowing the Gmelina seeds and to farmers cultivating crops in between the rows during the first year.

The benefit to the environment is also important, although it has not been quantified for this analysis. Research has shown that maintenance of the natural forest cover is one of the front-line defenses against desertification; and the annual product of one hectare of Gmelina can substitute for the offtake from 10.7 hectares of natural woodland, thus preserving that defense. Second, in the project area, the plantations will afford a cover which will protect the soil from wind, sun, and torrential rains. With proper weeding, infiltration of rainfall will be improved.

In calculating the internal rate of return for the plantation, a basic rotation was used consisting of a combination of firewood, charcoal, poles, and lumber production. Based on actual experience, a yield of 15 cubic meters per hectare per annum was used, to which a value of D10 ($5.21] per cubic meter was attributed. For the plantations to be developed during this project, the IRR for the basic rotation is 10.0%. In a sensitivity analysis reducing the yield to a conservative 12 cubic meters, the IRR dropped to 8.1% for the basic rotation. In an analysis of a purely fuelwood rotation (involving higher yields per hectare, but lower product value], the IRR dropped to 7.9%. When the effects of improvements in the efficiency of the sawmill and logging operations were factored into an additional sensitivity analysis, the IRR increased to 11.1% for the basic rotation.

Thus, the analysis demonstrates that, in a situation of increasing pressure on the land, the proposed plantation of 1,300 ha. of Gmelina is an economically sound response to the growing wood crisis.

Table 2 , in Annex F, presents a cash flow projection for the 1,300 ha. plantation. The net annual return is positive beginning in the sixth year of the plantation. The breakeven point is passed between the eleventh and twelfth years. The net cumulative return to the GOTG by the end of the rotation on which this projection is based totals D2,570,574 ($1,340,000). Costs directly associated with plantation maintenance to be borne by the GOTG during the five-year life of the project total only D22,250 ($11,590), since project financing will defray the bulk of the costs of establishing the plantation. Since the GOTG will not pick up the full cost of maintaining and operating the plantation until the sixth year when the net annual return becomes positive, the financial viability of this plantation system is clear.

Economic and financial analyses have not been conducted for the proposed village woodlot program, in view of the total absence of data which would permit sound analysis in The Gambian context. Neither the economic return nor the financial outcome will be as favorable as in the case of the large-scale plantation. Because of the small size and probable inefficient configuration of the village woodlot, the cost of fencing will assume more imposing proportions. In addition, it appears unreasonable to expect that yields from the woodlots will approximate those of the Gmelina plantation although the produce of the fruit trees will undoubtedly improve the balance sheet. An important element of the woodlot program will be the collection of data to permit later evaluation of the costs and benefits of that kind of village planting.

C. Social Soundness Analysis

The Social Soundness Analysis attached as Annex G focuses on a comparison of village woodlots and large-scale plantations in terms of six key variables: (1) beneficiaries; (2) resource access; (3) benefit incidence; (4) participation; (5) socio-economic consequences; and (6) replicability. The analysis concludes that it is appropriate to support the establishment of both large-scale plantations and village woodlots. The essential points of the analysis are summarized below and additional information and commentary are offered to reinforce its conclusion.

Beneficiaries - The direct benefits of the proposed Gmelina plantations, expressed in terms of a mean annual increment of 15 cubic meters per hectare, are assured and will accrue in large part to the residents of the Banjul-Kombos-St. Mary area and environs by virtue of the fact that this region constitutes the major concentration of demand for wood products in The Gambia. Approximately 25% of the output of the plantations will be in the form of poles and sawn wood which will be out of the monetary reach of the rural and urban poor. Nearly all Gambians, however, rural or urban, poor or less poor, use wood for fuel; and 75% of the output of the proposed plantations will be fuelwood. The economic impact of the plantations, seen through the eyes of the consumer, will be a stabilized or more slowly growing price for wood products, especially fuelwood. This impact will be most keenly

felt and appreciated by the low-income consumers who must spend a greater share of their resources for fuel than do their more advantaged neighbors.

It is anticipated that all the output of the plantations will be consumed within The Gambia since Gmelina cannot compete with the tropical hardwoods exported by other West African countries.

As noted in the technical and economic analyses, the benefits of village woodlots are less assured; the mean annual increment may achieve only half the levels attained on the Gmelina plantations. To the extent that the system for distributing the products of the woodlots is equitable, so that those products are not captured by a village elite, all villagers will share in the woodlots' benefits. However, it is likely to take years for popular understanding and support of the woodlot concept to reach the level at which a scale of operation permitting satisfaction of a significant portion of the village's needs for wood could be sustained. This is one factor which argues for undertaking a pilot woodlot program as soon as possible.

Resource Access - Although the GOTG has the right to classify portions of the national territory as forest parks and has done so in 66 instances, it plans no such classifications for the foreseeable future. The Gmelina plantations which this project proposes will be located in areas which have already been designated forest parks. This project will entail no expropriation of village or other land.

According to Gambian law, all citizens may remove deadwood from forest parks for their personal use. Only entrepreneurs engaged in commercial-scale operations are required to pay licensing fees and taxes. Since these conditions will be perpetuated, the proposed project will not proscribe any resource to which the people currently have access nor alter the terms of that access.

Because of the low productivity of natural woodlands in The Gambia and the growing scarcity of wood products, the gradual incorporation of those products into the monetized sector of the economy is a process which the GOTG regards as inevitable. This project will not significantly accelerate that process.

Land allocated by a village for use as a woodlot will remain within the control of the village. However, in the case of a village whose land is barely sufficient to meet the needs of its inhabitants, it was not entirely clear from the village interviews what land or, more to the point, whose land would be allocated to the woodlot, nor how the user(s) of that land would be compensated.

Benefit Incidence - This variable is examined in terms of employment generation. The analysis notes the Forestry Department's labor-intensive production methods. In a realistic assessment of the cost and availability of factors of production in The Gambia, the Forestry Department, as a matter of policy, intends to continue in this fashion.

The Department's present system of operation generates opportunities for wage labor. In the case of woodlots, the analysis recommends use of the "kafo" system, used traditionally to organize communal labor. Wage remuneration is antithetical to the communal ethic underlying this system; instead, young men participating have usually been provided with a meal on workdays. Consequently, it is not certain whether the employment effects of plantations and woodlots are entirely comparable.

In any case, it should be noted that the "kafo" system of organizing labor is typical only of traditional Mandingo society; other forms of village mobilization will need to be sought for woodlots to be established in Jula, Fula, or Wollof villages. Approximately 42% of Gambian society is Mandingo, however.

Participation - A villager assisting with the establishment or management of a woodlot will acquire certain skills and knowledge; likewise, an employee of the Forestry Department or a contract day-laborer will acquire skills and knowledge. It is difficult to form an objective judgment as to which individual will benefit most from the skills and knowledge acquired, or most easily transfer those skills and knowledge to another field of economic endeavor to the greatest individual or national benefit. In each case, the best measure of the degree to which the individual has actually acquired the skills and knowledge is his ability to employ them usefully with a minimum of attention and supervision from the extension agent, using the villager as an example.

Socio-economic Consequences - The analysis notes the possibility that the benefits of the village woodlots may be monopolized by the local elites. The analysis then turns its attention to the Forestry Department's use of contract labor for land clearing, fencing, tree thinning, and harvest.

This contract system is commonly used by the Department of Public Works and other GOTG ministries and state corporations to accomplish certain tasks whose nature, frequency, or duration do not justify bringing on to the organization's direct-hire, full-time staff sufficient persons to meet the peak labor requirement. The Forestry Department employs the contract system in order to avoid saddling the plantations with a recurring charge for personnel which would significantly reduce, if not eliminate, their net cumulative benefit. It should be noted that the labor contracts have been negotiated under the personal supervision of the Conservator of Forests with a view toward ensuring that the contract amount provides a return per man-day comparable to the minimum wage established by the GOTG. The contracts are generally lump-sum; and in this context, the observation voiced by one villager, who had participated in the contract system, to the effect that contract laborers were more productive than direct-hire personnel, will not cause widespread astonishment.

The analysis advances the proposition that creation of users' cooperatives to manage the large-scale plantations might increase employment opportunities, security, managerial skills, and environmental awareness of the rural poor. Since there are no such users' cooperatives known in Africa at this time, the experience of the ten villages selected under this project with respect to establishment and management of their woodlots will shed valuable illumination on the merit of this proposition.

Replicability - The Gambia faces increasing land scarcity. The replicability of village woodlots will depend in large measure on the priority which villagers accord to allocating land for wood production, rather than to food, cash crop, or livestock production. In view of the anticipated greater cost effectiveness and technical efficiency of plantations with respect to wood production, the villagers may well decide that their own comparative advantage lies with food, cash crop, and livestock production. Replicability will be a key theme in evaluation of this project.

Women (and Children) - Women and children are usually responsible for securing domestic fuel. Over the long-run, this project will make fuelwood more readily available, either commercially from plantations or from woodlots close at hand and, thus, make this particular domestic chore less onerous.

Women are preferred by the Department for many tasks, including seed collection and sorting. Because of the greater patience and skill women have demonstrated at such tasks, the Conservator has indicated that he intends actively to recruit women to staff the nurseries which are to be established in connection with this project.

A similar affirmative approach will be employed with respect to recruitment of candidates for training under the project.

D. Administrative Analysis

1. GOTG and the Forestry Department

As noted above in the summary of the Technical Analysis, this project was deliberately designed to fit the Forestry Department's present and anticipated capabilities with a minimum of technical assistance inputs. Both the staff and budget of the Forestry Department have grown in recent years and are projected to continue to do so in the future. The Department has extensive experience with establishment of Gmelina plantations and has demonstrated the ability to work effectively at the scale of operations recommended in the Implementation Plan. As the scale of operations increases, additional employees of the Forestry Department are scheduled to return from training abroad to assist with their implementation. Inputs of other donors -- FAO, BADEA, and the FRG -- will provide vehicles and financing to establish forest nurseries. Two constraints on the effective implementation

of the proposed village woodlot program will, thus, be lifted. Technical advisors financed by the FRG, in connection with the forest inventory, and by AID, through the Soil and Water Management Unit Project, will work in close collaboration with the Forestry Department.

The Forestry Department has full legal authority to undertake all activities recommended for implementation under this project. The Department manages its own budget, keeps books, and receives backstopping from the Ministry of Agriculture and Natural Resource's Central Accounting Office. Books meet international standards and are available for audit.

2. AID

Following the planned increase in the size of the AID Operations Office in Banjul from one person to five persons, that office will have the capability to monitor and support the proposed project effectively in conjunction with the three other major projects which are currently approved or planned. Financial management will be handled through the Regional Controller located in USAID/Senegal, thus reducing the burden on AOO/Banjul. AOO/Banjul will also be able to draw as needed upon the legal, contracting, engineering, and other technical support services available through the Regional Economic Development Services Office for West Africa, located in Abidjan.

E. Environmental Analysis

The fragile ecology of The Gambia has been seriously disturbed by land use practices which have caused progressive destruction of vegetative cover and adverse climatic changes. Forest and woodland have diminished from an estimated 59% of the land surface of The Gambia in 1946 to only 8% in 1968. Land with thorn bush and scrub cover has increased from 7% to 50% during the same period and the area of land under virtually continuous annual cultivation has increased from zero to 17%. Resource degradation is becoming an increasingly significant determinant of poverty.

Wood, primarily for fuel, is being removed from the remaining wooded areas faster than the rate of natural regeneration. Without a reversal of present trends, knowledgable observers have estimated the wood resource of The Gambia will be exhausted within the next fifteen years. An aggressive response is required to head off the impending crisis and the actions proposed under this project constitute part of the necessary response. Under the project 1,300 ha. of plantations will be established using Gmelina, a fast-growing species introduced from Sierra Leone which can produce as much wood per hectare under plantation conditions as 10.7 ha. of natural woodland in The Gambia. Training and research will also help prepare The Gambia to make better use of its forest resource and potential.

The IEE prepared for the project identified no significant adverse impact and its recommendation for a Negative Determination received the concurrence of the AID Operations Officer, Banjul, on April 1, 1979.

The IEE is attached as Annex K.

III. Financial Plan

AID's inputs to the project total $1,575,000 of which approximately 52% will be in U.S. dollars and 48% in local currency. The principal dollar costs will be for training; and the bulk of the local currency expenditures will be in connection with establishment of the 1,300 ha. of plantations. AID's contribution will be obligated entirely during FY 1979. Tables II - IX below provide detailed breakdowns of AID inputs and a schedule of projected commitments and expenditures by project component.

The GOTG's contribution is detailed in Table I. It totals D447,975 (U.S. $233,329) over the five-year span of the project and will be entirely in local currency.

TABLE I

GOTG CONTRIBUTION

	Dalasis [1]
1. Plantation Establishment	
A. Salaries	150,000
B. Additional Fire control	22,250
C. Land	130,000
2. Village Woodlots	
A. Salaries	50,000
B. Fence Posts	40,000
C. Meals for Kafo Groups	10,000
3. Support to Mangrove Study Team	5,000 [2]
4. Contingencies at 10%	40,725
5. Total	447,975 [3]

1. D1.00 = U.S. $0.52

2. Includes office space and supplies and in-country transportation (use of boat and 40 days use of Land Rover(s))

3. Items 1-3 contain built-in inflation factor

TABLE II

SUMMARY BUDGET- AID FUNDS

		U.S. Dollars
1.	Plantation Establishment	671,495
2.	Training	362,875
3.	Commodities	138,302
4.	Construction	22,000
5.	Technical Assistance	
	A. Mangrove Feasibility Study	180,000
	B. Short-term Consultancies	60,000
6.	Subtotal	1,434,672
7.	Contigencies - 10%	140,328
8.	TOTAL	1,575,000 1/

1/ Items 1-5 contain an allowance for inflation in accordance with factors shown in detailed budgets.

TABLE III

FOREIGN EXCHANGE/LOCAL CURRENCY BREAKDOWN - AID FUNDS

(U.S. $000)

	U.S. $	LC[1/]
1. Plantation establishment	16	655
2. Training	363	-
3. Commodities	130	8
4. Construction	-	22
5. Technical assistance	240	-
6. Contingencies	74	67
7. TOTAL	823	752

1/ U.S. $1.00 =

TABLE IV

(U.S. $000)

PROJECTED SCHEDULE OF OBLIGATIONS AND EXPENDITURES - AID FUNDS

	FY 1979	FY 1980		FY 1981		FY 1982		FY 1983		FY 1984	
	Oblig.	Com.	Exp.	Com.	Exp.	Com.	Exp.	Com.	Exp.	Com.	Exp.
1. Plantation establishment	671	67	67	102	102	136	136	161	161	205	205
2. Training	363	78	13	54	58	118	98	48	83	65	111
3. Commodities	138	3	3	133	37	2	98	-	-	-	-
4. Construction	22	-	-	22	-	-	22	-	-	-	-
5. Technical assistance	240	240	-	-	200	-	20	-	20	-	-
6. Contingencies	141	38	38	31	31	25	25	20	20	27	27
7. TOTAL	1,575	426	121	342	428	281	399	229	284	297	343

Note: Funds are considered committed when a PIO document is signed or when an IFB or RFTP is issued. Commitments for training were calculated on the basis of the annual financial requirement for each student in training.

TABLE V

PLANTATION COSTS

FY	Activity	No. Ha.	Cost 1/	Mult. 2/	Total 3/
1980	Estab. 4/	175	61,250	1.1	67,375
	Weed 5/	-	-	-	-
	Total	-	61,250	1.1	67,375
1981	Estab.	225	78,750	1.2	94,500
	Weed	175	6,300	1.2	7,560
	Total	-	85,050	1.2	102,060
1982	Estab.	275	96,250	1.3	125,125
	Weed	225	8,100	1.3	10,530
	Total	-	104,350	1.3	135,655
1983	Estab.	300	105,000	1.4	147,000
	Weed	275	9,900	1.4	13,860
	Total	-	114,900	1.4	160,860
1984	Estab.	325	113,750	1.5	170,625
	Weed	300	10,800	1.5	16,200
	Total	-	124,550	1.5	186,825
1985	Estab.	-	-	-	-
	Weed	325	11,700	1.6	18,720
	Total	-	11,700	1.6	18,720
All	Estab.	1,300	455,000	-	604,625
	Weed	1,300	46,800	-	66,870
	Total	1,300	501,800	-	671,495

1/ In 1979 U.S. dollars at $1.00 = D1.92
2/ Multiplier for inflation
3/ In current U.S. dollars at $1.00 = D1.92
4/ Establishment costs equal D690 or $350 per hectare in 1979 dollars
5/ Weeding costs equal D70 or $36 per hectare in 1979 dollars

TABLE VI

TRAINING COSTS

		U.S. Dollars
1.	8 person-years academic training in U.S. to B.S. level - fields of silviculture, utilization, management, etc.	120,000
2.	2 person-years to M.S. level in U.S. fields as above	30,000
3.	7.5 person-years to diploma level in Nigeria at Forestry Institute	37,500
4.	45 person months special technical training in Southeastern U.S. - fields of harvesting, millwrighting, utilization	83,000
5.	9 person-months special academic training in U.S. - field of extension communications	19,800
6.	Compound inflation at 10% p.a.	72,575
7.	TOTAL	362,875

TABLE VII

COMMODITIES COSTS

1.	Logging and sawmill equipment per Annex D	59,500
	Inflation 10%	5,950
2.	Commodities for woodlot program	
	A. Barbed wire - Class 3, 12-guage galvanized, 4 points, 5-inch spacing; 5 strands, 10,000m each1/	5,000
	Inflation compounded 10% p.a.	1,250
	B. Polyethelene tubes - approx. 1.3 million at $15/thousand	20,000
	Inflation 10%	2,000
	C. Cross-cut saws - 50 at $30	1,500
	Sharpening guides and tools- 30 sets at $30	900
	Inflation 10%	240
3.	Extension equipment and materials	
	A. 16 mm film editing machine	500
	Inflation 10%	50
	B. 16mm and Super-8 films from SODEVA, Senegal, including inflation, shipping	2,800
	C. 16 mm and Super-8 film production	2,300
	D. Misc, shelf-item equipment and materials for production of radio and poster campaigns, including inflation	2,400
4.	Shipping (25% of above, excluding items 3B-D)	24,223

5.	Purchasing agent's fee and bank charges (8% of above, excluding 3B-D)	9,689
6.	TOTAL	138,302

1/ Barbed wire for Gmelina plantations is included in the costs itemized in table.

TABLE VIII

CONSTRUCTION COSTS

		U.S. Dollars
1.	Approximately 185 square meters (2,000 square feet) covered shed on concrete pad - $100 per square meter	18,500
2.	Inflation - 10%	1,850
3.	Additional contigency factor - 8%	1,650
4.	TOTAL	22,000

TABLE IX

TECHNICAL ASSISTANCE

	U.S. Dollars
1. Mangrove Feasibility Study	
4 person-months-utilization specialist	40,000
3 person-months-forest economist	30,000
3 person-months-production/management specialist	30,000
2 person-months-industrial engineer	20,000
2 person-months-soils scientist	20,000
2 person-months-anthropologist	20,000
1 person-month -environmentalist	10,000
1 person-month -regional/rural planner	10,000
Subtotal	180,000
2. Short-term Consultancies	
3 person-months-production/management specialist	30,000
3 person-months-utilization specialist	30,000
3. TOTAL	240,000 1/

1/ Standard average cost of 10,000 per person-month used, with inflation built in. Average cost assumes institutional overhead at 100% of salaries.

IV. IMPLEMENTATION PLAN

A. Procurement Plan

1. Source and Origin of Goods and Services

The Gambia is on the United Nation's list of relatively less-developed countries. Therefore, and in view of the fact that local currency expenditures under this project are to be authorized, the source and origin of goods and services procured under this grant shall be the United States, The Gambia, and other countries eligible under AID Geographic Code 941 (Selected Free World). Local procurement of shelf items whose origin is a country eligible under AID Geographic Code 935 (Special Free World) will also be permitted in accordance with standard AID regulations. AID/Banjul will advise the Ministry of Agriculture and Natural Resources by Implementation Letters as to the procurement regulations in effect at the time of the signature of the Grant Agreement and the changes which occur in those regulations during the life of the project.

No source/origin or other procurement waivers are anticipated at this time.

2. Principal Procurement Actions

The major procurement actions which will be required during implementation of the project are discussed below and recommendations made with respect to management of those actions.

a. Mangrove Feasibility Study

This project provides for a technical and socio-economic study of the feasibility of extracting, processing, and marketing the mangrove resources of The Gambia, particularly the Rizophora racemosa in the pool area above the proposed bridge and anti-salinity barrage at Yelitenda. It is recommended that the contract for this study be between the Ministry of Agriculture and Natural Resources and a U.S. university, firm, or other organization. Following approval of this project, an announcement should be published in the Commerce Business Daily and in the Board for International Food and Agricultural Development (BIFAD) monthly Briefs with a short description of the study and the anticipated required technical inputs, and requesting prequalification data from universities and other organizations as an expression of their interest. The draft terms of reference contained in Annex E would be part of a request for technical proposals (RFTP) mailed to prequalified universities, firms, and other organizations. The resulting technical proposals would be reviewed and a contractor selected by a committee constituted by the Forestry Department. AID/Banjul would be

represented by an observer at the meetings of this committee and would also approve or disapprove the Forestry Department's final selection as well as, with the assistance of the REDSO/WA Contracts Officer, the contract between the Forestry Department and the successful bidder.

b. Short-Term Consultancies

The following short-term technical consultancies are provided for by the project:

(1) Forest Products Harvesting and Utilization - To prepare final specifications for logging and milling equipment to be financed by the project, to assist the Forestry Department in laying out the shed which will house the bolter saw, and to make follow-up visits in order to assist personnel of the Forestry Department to apply productively the training they received under the project.

(2) Forest Management - To assist with preparation of a model plan for management of the plantations to be established under the project as well as plantations established earlier.

(3) Evaluation* - The kinds of short-term consultancies required to evaluate the project and the mechanism for obtaining those services are discussed in the Evaluation Plan, Part V below.

In order to ensure continuity of the design and implementation of this project, it is recommended that AID/Washington, acting on the authorization of the Forestry Department and AID/Banjul, undertake to obtain, through USDA, the services of the Forest Products Utilization Specialist who assisted with project design to prepare the final logging and milling equipment specifications and to help lay out the shed for the bolter saw and accessory equipment. Existing contractual relationships under a Reimbursable Services Seconding Agreement (RSSA) between AID/Washington and USDA will facilitate this. If, for some reason, the same specialist is not available for the two weeks required to perform the desired tasks, arrangements should be made for the specialist to brief the consultant who is eventually selected.

It is recommended that the universities and other organizations bidding on the contract for the Mangrove Feasibility Study also be allowed, if they so desire, to make a proposal to provide the services of the required Forest Management Specialist and the Forest Products Harvesting and Utilization Specialist who will follow up on application of training received by Gambians in those fields. If the proposals received are responsive, then provision of these services could be included in the same host country contract which covers the

*Note: Evaluation services are to be financed separately through Project 625-0929, Planning, Management and Research.

Mangrove Feasibility Study. If no proposal to provide these short-term consultancies is adequate, then it is recommended that these services be obtained through the existing RSSA between AID/Washington and USDA.

c. Training

(1) Long-Term, U.S. Academic Training will be provided in fields such as forest management, at both the administrative and applied levels; silviculture, including reforestation, thinning, and other practical application techniques; and forest economics. This training will be provided at universities such as North Carolina State, Duke (graduate programs only), and University of Washington, where appropriate degree programs are offered. AID/Banjul will assist the Forestry Department to prepare subobligating documents (Project Implementation Order/Participants) which will describe the desired objectives and fields of training and instruct AID/Washington to contract with USDA's Office of International Training to place the Gambian students in appropriate universities and to provide technical/professional supervision of the students to monitor their progress towards the training objectives. These services could be obtained from USDA under a standing RSSA which the International Training Office of the Development Services Bureau in AID/Washington has with USDA.

(2) Short-Term, Special Technical and Academic Training will be provided in the U.S. to Forestry Department personnel in the fields of rural communications and extension techniques and of forest products harvesting, millwrighting, and utilization. It is recommended that the training in rural communications at Tuskegee Institute, University of Chicago, or other appropriate location, be arranged and supervised through the same RSSA to which reference was made in the preceding paragraph.

The special technical and on-the-job training in forest products harvesting, millwrighting, and utilization will be more complex to arrange and supervise. The work done in preparation of this Project Paper has led to the conclusion that appropriate training sites exist in North Carolina and that this special program should be designed and supervised through a contract between AID/Washington and the North Carolina State Department of Natural Resources and Community Development, under whose aegis falls the Division of Forest Resources. Contacts made by the Project Design Team with the Division indicate that it has the willingness, knowledge of the training objectives, familiarity with the technologies to be supplied to The Gambia under the project, and contacts with community organizations and private forest sector enterprises necessary to design and supervise execution of the training effectively.

A Project Implementation Order/Participants (PIO/P) will be prepared by the Forestry Department with the assistance of AID/Banjul which will specify the types, fields, and duration of the short-term

technical training to be provided. The PIO/P will instruct AID/ Washington to negotiate a contract with the North Carolina State Department of Natural Resources and Community Development. The Division of Forest Resources will then proceed to make tentative arrangements with Haywood Technical Institute to design special courses for the Gambian participants in such fields as millwrighting, sawmill operation, saw filling and maintenance, lumber grading and drying, and logging. The Division will make tentative arrangements for on-the-job training in a small-scale, privately-owned logging operation and with a privately-owned enterprise which presently operates a bolter saw and planing equipment similar to that which will be provided to the Forestry Department under this project. The Division will be able to draw on the services of the Forest Products Harvesting and Utilization Specialist in the Southeastern Division of the U.S. Forest Service, headquartered in Atlanta, in making these arrangements and will also coordinate with the Southeastern Division in order to place the Gambian trainees in short-courses and workshops offered by the U.S. Forest Service which are of special interest.

Having made these tentative arrangements, the Division of Forest Resources will then prepare a training plan which will state the learning objectives to be accomplished and detail the means to achieve them. This plan will be submitted to the Gambian Forestry Department for its review and approval. Following approval, the Division will monitor and report on its implementation and the students' progress towards the training objectives.

(3) Third-Country Training - The training to be provided at the Forestry Institute in Ibadan, Nigeria, will be arranged for directly by the Gambian Forestry Department which, in the past, has sent several students there. In view of its previous experience with the Institute, the Forestry Department may wish to request, through the AID Office in Banjul, the assistance of the U.S. Embassy in Nigeria or one of its Consular Offices in order to facilitate communications and the timely enrollment of the Gambian students.

Long-term academic training provided at African rather than U.S. universities would be handled in a similar manner.

d. Commodities and materials to be procured in the U.S. include fencing material, the sawmill and logging equipment and accessories, building materials for the shed to house the bolter saw, materials for nursery operation, and some training equipment and supplies. The value of this procurement is estimated to be $138,302 CIF Banjul. In view of the GOTG's relative lack of familiarity with U.S. procurement, it is recommended that the Forestry Department contract for the services of a U.S. purchasing agent such as the Afro-American Purchasing Center (AAPC) in New York which is familiar with AID's commodity procurement and shipping regulations. The fee for the purchasing agent's services will

be approximately 7% of the value of the procurement undertaken. This fee will be reimbursable under the project.

As noted above, services of a consultant will be provided for approximately 2 weeks to assist the Forestry Department to prepare final specifications of the sawmill and logging equipment to be financed. These specifications and those of the other commodities to be procured will, with AID/Banjul's assistance, be incorporated into a Project Implementation Order/Commodities along with the appropriate instructions for marking, insurance, and shipping. The PIO/C will then be forwarded to the purchasing agent for execution.

The most expensive single piece of equipment to be procured is the bolter saw. There is only one commercial manufacturer and supplier of this saw. Nonetheless, in view of the estimated cost of this piece of equipment, $25,000 FAS, a sole source procurement waiver will not be required.

e. Shipping on U.S. flag vessels from the U.S. directly to the Port of Banjul is not likely to be obtained in view of the relatively small quantity of commodities to be procured. Direct shipment to Dakar is only slightly less difficult to come by and results in lengthy delays while the commodities are processed through Senegalese Customs, then trucked to the Sene-Gambia border and cleared through Senegalese Customs again, finally to arrive in more or less original condition and quantity in Banjul. Therefore, it is recommended that all U.S.-procured commodities be shipped on U.S. flag vessels to Antwerp for the attention of the U.S. European Logistical Support Office, American Consulate-General, Antwerp, for subsequent direct transhipment to the Port of Banjul.

f. Procurement of shelf-items and commodities of Gambian source and origin will be undertaken by the Forestry Department in accordance with the applicable GOTG and AID regulations. GOTG regulations require that procurements in excess of approximately $2,500 be put out for tender.

g. Construction services will be obtained by the Forestry Department after a competitive bidding procedure. The estimated cost of construction, including materials as well as labor, etc., is relatively slight, approximately $22,000. Therefore, the contract will most likely be awarded to one of the handful of Gambian construction firms presently in operation.

h. The labor required for plantation establishment will be obtained by the Forestry Department from a series of labor suppliers of the sort with whom the Forestry Department and other GOTG ministries, such as the Ministry of Works and Communications, have traditionally contracted in order to meet their short-term labor needs. The Forestry

Department's contracts with such suppliers are invariably small, frequently less than the equivalent of $1,000; and the labor is usually drawn from the villages surrounding the area where the plantation is to be established or other work to be carried out.

B. Disbursement Plan

1. General Information

Funds obligated for the implementation of this project will be allotted to the Controller, USAID/Senegal, who is responsible for financial management of projects in The Gambia and for submitting standard reports thereon to the Office of Financial Management in AID/Washington.

2. Foreign Exchange

a. U.S. Source/Origin Commodities - Funds to procure these commodities will be committed through PIO/Cs prepared by the Forestry Department with the assistance of AID/Banjul and containing instructions to the purchasing agent selected by the Forestry Department. Payment for these commodities will be effected through the mechanism of bank letters of commitment which is described in more detail in Annex J.

b. U.S. Participant Training - Funds to finance U.S. participant training, both long-term academic and short-term technical, will be disbursed by AID/Washington pursuant to PIO/Ps issued by AOO/Banjul and the Forestry Department. The Regional Controller in Dakar and, through that office, AOO/Banjul will be kept informed of the status of disbursements through the usual advice of charge mechanism.

c. Third-Country Training - Funds for training in Nigeria at the Forestry Institute in Ibadan or at other African universities will be committed through PIO/Ps prepared by the Forestry Department with the assistance of AID/Banjul. Disbursements for this training will be made by the Controller, USAID/Senegal against vouchers and invoices received from the training institution through the Forestry Department and AID/Banjul which will certify the vouchers administratively for payment.

d. Technical Assistance - Funds to execute the Mangrove Feasibility Study and to provide the desired short-term consultancies will be committed through PIO/Ts prepared by the Forestry Department with the assistance of AID/Banjul and through contracts signed by the Forestry Department with the institution(s) providing the technical services. Vouchers and invoices will be submitted by the supplying institution(s) to the Forestry Department which shall certify the services have been satisfactorily performed and then forward the documents through AID/Banjul to the Controller, USAID/Senegal, for payment.

If, as recommended in the Procurement Plan above, the services of the Forest Products Utilization Specialist who assisted with project design are again obtained to prepare final equipment specifications, etc., payment for these services will be made by AID/Washington against fiscal data provided in a PIO/T prepared by the Forestry Department with the assistance of AID/Banjul and following certification by the Forestry Department that the services were satisfactorily performed.

3. Local Currency

Local currency costs will be incurred primarily for construction of the shed to house the bolter saw, establishment of the Gmelina plantation, and for procurement of shelf items and goods of Gambian source and origin.

This project would appear to lend itself, at least in part, to use of the fixed amount reimbursement (FAR) method since (a) the costs of plantation establishment can be easily and accurately estimated on the basis of historical financial data and (b) it would be very simple for AID to reimburse the Forestry Department upon completion of, for example, each 100-hectare block of plantation. Use of the FAR method was considered by the project design team but rejected in view of the unreasonable financial burden it would place on the GOTG and the likelihood that it would significantly slow project implementation. Internal revenues accruing to the GOTG have, in most years during the past, with few exceptions, been sufficient to cover the GOTG's annual operating expenditures; however, there has been little surplus available for capital investments most of which, therefore, including establishment of forest plantations, have, perforce, been undertaken with foreign donor resources. Since the FAR method would require the GOTG to advance to the Forestry Department funds to establish the plantations, funds which it could obtain only at the cost of disruption of its other functions, use of this method was deemed inappropriate by the design team.

A project account will be opened in a local bank of the Forestry Department's choosing to handle local currency expenditures. This account will be opened with an advance of currency representing the anticipated cost of the first six months operation of the project, based on a budget prepared by the Forestry Department and approved by AID/Banjul. The advance will be replenished by the Controller, USAID/Senegal, in accordance with the procedure which is more fully described in Annex J. Disbursements from this account will be made by the Director of the Forestry Department subject to any oversight or approval which may be required by GOTG regulations.

C. Implementation Schedule

It is anticipated that the Grant Agreement for this project will

be signed not later than September 30, 1979, and that the general conditions precedent to disbursement will be met by October 31, 1979. The period for delivery of goods and services will be five years. Therefore, the final date for delivery of goods and services, with the possible exception of residual long-term training, will be October 31, 1984. The estimated date for AID's final contribution, with the same possible exception noted above, is April 30, 1985.

A detailed schedule of the intervening major implementation actions is found in Annex I.

V. EVALUATION PLAN

The project goal is to slow and eventually reverse the accelerating degradation of the natural resource base of The Gambia. To achieve this goal, improvements in present cropping, grazing, and wood gathering and utilization practices will be required. This project will make an important contribution to achievement of the goal by improving the efficiency of wood production and utilization in The Gambia. However, the inputs of other AID projects and the efforts of other donors are also required if this objective is to be reached. A few important examples may be cited: the Rural Development Project being carried out by the GOTG with financing from the IBRD and ODM; the forest inventory, the sites and species trials, and the development of management plans for natural woodlands which the Forestry Department will undertake with assistance from the FRG; and two AID-financed projects, the Soil and Water Management Unit Project and the Mixed Farming and Resource Management Project. Because it will be a slow and difficult process to reverse present trends towards declining soil productivity and other resource depletion, it will not be possible during the life of this project to evaluate its contribution to the achievement of the project goal.

A sub-goal pertains directly to the forest resource base of The Gambia and is to reduce the gap between consumption and production of wood and wood products (e.g. poles, sawn timber, and charcoal, as well as fire wood). Data showing that this gap is being reduced would constitute perhaps the best and most objective evidence that the purpose of this project has been achieved. A more ambitious planting program than is proposed in this paper will be required before all Gambians will be able to benefit from greater availability of wood and wood products. Nonetheless, this project will make a significant contribution to the reduction of the production/consumption gap by maximizing use of the presently available skilled manpower and existing technical data concerning plantation establishment in order to have an immediate impact on the efficiency of wood production and utilization of The Gambia.

Since such an evaluation and design effort would take place following expenditure of AID inputs for the first phase, funds have not been allocated for it in the project budget. Instead, it is recommended that a source of funds such as Project 625-0929, Planning, Management, and Research, be utilized.

In order to ascertain that the project's purpose has been achieved, the evaluation team should verify that:

1. large scale Gmelina plantations (1,300 ha.) have been established with a mean annual increment equal to or greater than 15 cubic meters per hectare and at costs equal to or less

than (in real terms) those projected in the Project Paper;

2. management plans have been established for the new plantations and are being followed;

3. the output/input ratio of the Nyambai Utilization Unit has improved, in accordance with estimated possible increases described in Annex D, that the logging and milling equipment provided under the project are being appropriately maintained and that deterioration of lumber during and storage has been reduced;

4. personnel of the Forestry Department trained under the project are utilizing the skills and knowledge to which they were exposed during their training;

5. a media campaign using film, radio, and graphics is underway, aimed primarily at rural areas and concerning the environmental and economic benefits of trees and wooded areas, the importance of controlling brush fires, the interdependence of forest, soil, and water resources, and similar themes;

6. and extension program will be actively contacting villages concerning the establishment and management of woodlots and other village-level planting;

7. woodlots have been established in at least 10 villages, are will cared for, and are producing benefits to the villagers in terms of fire wood, poles, fruits, and other tree products; and

8. utilization practices have improved as a result of use of the cross cut saws and accessories introduced in conjunction with the woodlots.

In order to evaluate these factors and the overall impact of the project, baseline data contained in this Project Paper and in the documents to which the design team referred will be drawn upon by the evaluation team. The Forestry Department has kept thorough records concerning the Gmelina plantations established to date and the operation of the Nyambai Utilization Unit; and the Department will continue to keep such records. However, additional data concerning the-following points will be required to facilitate full evaluation of the project:

- number and value of contracts for labor in connection with plantation establishment and maintenance

- number of person-days labor generated

- average wage for varying jobs

- volume of wood removed in thinnings first two years

- number of farm families cultivating crops during first year under taungya system

- number of films, radio programs, graphic presentations purchased or produced in connection with outreach component

- frequency of use of these extension materials

- estimated number of villages and persons reached

- costs associated with production and presentation of extension aids

- themes of extension presentations and audience response

- number of extension contacts between personnel of Forestry Department and villages and costs, in terms of time, per diem, etc., of those contacts

- percent of the active population of the village directly involved in establishment or maintenance of the woodlots and demographic characteristics (age, sex, etc.) of participants

- ethnic composition of villages participating, information concerning participation in previous self-help efforts, etc.

- number of person-days labor spent on various tasks of woodlot establishment and management

- technical data concerning species, survival and growth rates, etc.

- qualitative assessment of woodlot management by villages

- uses of woodlot products

It is recommended that the Forestry Department and, where appropriate, the Extension Aids Unit, collect this information as part of their normal operations. Some of the criteria will require subjective evaluation. Furthermore, the qualitative information required in connection with assessement of the success of the woodlot program will obviously be more difficult to collect than the purely technical data concerning species, survival and growth rates, etc. Since the general socio-economic characteristics of the villages participating in the woodlot program are expected to have considerable explanatory power with respect to the varying degrees of success of those woodlots, the Forestry Department may wish to assign to one of its Rangers collection of this data as a special task. Because

the Ranger who will receive the nine months training in extension communication is expected to be particularly closely involved in the woodlot program, this person appears to be a good candidate for this task.

A mid-project evaluation should be scheduled for the end of the third year of project implementation. This evaluation will focus primarily at the output level of the project and will review progress made towards reaching targets for planting and improved utilization. Personnel who have returned from training abroad will be evaluated to ensure that the training has imparted useful skills and knowledge. Plantation and sawmill management and the logging operations will be evaluated and recommendations made as required for modifications. This evaluation could be conveniently carried out during one of the consultancies by the experts in production/management and utilization for which the project budget provides funds.

Two additional studies should be mentioned: a wood and wood products consumption study and an anthropological study of woodlots and plantations. A consumption study was carried out in 1973 by Openshaw. One of his principal conclusions, that the per capita consumption level of wood products in The Gambia is 1.7 cubic meters per year, has attracted considerable attention because that level is significantly higher than those found in other Sahelian countries. The Forestry Department requested that this study be included in the project but the project design team concluded that in view of the limited funds available for the project,the study did not have the same urgency as the other activities which have been proposed and, therefore, could not be included. Nonetheless, an additional consumption study to confirm or counter the conclusions of the Openshaw report would be extremely useful to the Forestry Department's long-range planning. Accurate consumption estimates would enable the Forestry Department to pinpoint concentrations of demand outside the Banjul-Kombo- St. Mary area and locate areas where the natural resource base is particularly stressed. In addition, the study would provide more accurate information than is currently available concerning foreign exchange cost of imports of various wood products and, thus, identify economically viable opportunities for import substitution. This information would assist the Forestry Department to select new species and locations for the plantations which must be established following this project in such a way as to maximize the economic and social benefits of those investments. Therefore, the project design team endorses the Forestry Department's request for this study and recommends that AID/Washington investigate the possibilities of obtaining adequate funds, approximately $40,000, from an appropriate source.

The anthropological study of the welfare impact of plantations and woodlots and of the socio-economic factors accounting for

the variable performance of the two production models was recommended by the analyst conducting the social soundness of the project. It would be carried out over a three-year period by a graduate student in anthropology under the supervision of a university professor at a cost of approximately $60,000. Additional information and an outlined scope of work are contained in Appendix I to Annex G. To the extent that this study might provide information useful for the design of phase two, consideration should be given to finding a source of funds for it.

VI. CONDITIONS, COVENANTS, AND NEGOTIATING STATUS

No special conditions precedent or covenants are required to ensure effective implementation of this project. Standard conditions precedent and AID procedures will require that candidates are nominated and PIO/Ps signed prior to the disbursement of funds for training and, likewise, that the appropriate PIO documents and contracts are signed and approved by AID prior to disbursement of funds for construction and procurement of goods and services. The GOTG's contribution to the project will be specified in the Grant Agreement in accordance with the budgetary information provided in the Financial Plan.

The project was developed in close coordination with the staff of the Forestry Department and this document has been reviewed by them. The GOTG's request for assistance is contained in Annex A. Therefore, no difficulties in negotiating the Grant Agreement are anticipated.

VII. ANNEXES

Annexes A through P are attached.

ANNEX A

GOTG REQUEST FOR ASSISTANCE

(Forthcoming)

AID 1000-00 (1-78)

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

ANNEX B

Life of Project:
From FY 1979 to FY 1984
Total U.S. Funding $1,575,000
Date Prepared: July 2, 1979

Project Title & Number: Gambia Forestry Project 635-0205

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal: The broader objective to which this project contributes: Goal: To slow and eventually reverse the accelerating depletion of the natural resource base of The Gambia Sub-goal: To stabilize or reduce the gap between consumption and production of wood and wood products in The Gambia.	**Measures of Goal Achievement:** (a) GOTG implementing plans for management of forests and other wooded and grazing lands (b) Soil and water management objectives incorporated into agricultural development plans (c) % of land surface under forest cover stable or increasing (d) Size of GOTG plantations of fast-growing tree species increasing	(a) Documents and records of the Forestry Department and other departments of the Ministry of Agriculture and Natural Resources (b) Feasibility studies and other proposals for development projects, as well as evaluation reports	**Assumptions for achieving goal targets:** (a) AID provides assistance planned in Mixed Farming and Resource Management and Soil and Water Management Unit Projects (b) Other donors provide financial support required for adoption of sound resource management practices
Project Purpose: Purpose: To increase the efficiency of production and utilization of wood and wood products in The Gambia Sub-purpose: To lay foundation for forestry sector program of sufficient scale and scope to meet the needs of all Gambians for wood and wood products.	**Conditions that will indicate purpose has been achieved: End of project status.** (a) Plantations and woodlots established and being managed per Annex C (b) Utilization improved at Nyambai and in villages per Annex D (c) Trainees utilizing new skills and knowledge (d) Media/extension campaign underway	Post-project evaluation drawing on baseline data and data collected during life of project	**Assumptions for achieving purpose:** (a) ODM continues to finance technical assistance to Forestry Department for next five years (b) FRG carries out activities described in Part I.E. and successfully identifies new fast-growing species
Outputs: (1) 1,300 ha. Gmelina plantations (2) 50 ha. village woodlots (3) 14 employees of Forestry Department trained (4) media campaign designed using film, radio, graphics (5) Mangrove Feasibility Study carried out	**Magnitude of Outputs:**	Quarterly reports submitted by Forestry Department	**Assumptions for achieving outputs:** (a) Labor will be available for plantation establishment (b) 10 villages will be willing to participate in woodlot program (c) Forestry Department will be able to identify sufficient candidates for training
Inputs: (a) Plantation establishment - $671,695 (b) Training - $362,875 (c) Commodities - $138,302 (d) Construction - $22,000 (e) Technical assistance - $240,000 (f) Contingencies - $140,328	**Implementation Target (Type and Quantity)** See Table IV in Financial Plan, Part III	AID Controller's records	**Assumptions for providing inputs:** None

ANNEX C

PLANTATIONS AND WOODLOTS - PRODUCTION AND MANAGEMENT

Thomas E. Greathouse
Silviculturalist
U.S. Department of Agriculture
Forestry Service
On detail to Sahel Development
Program Team
AID/Washington

April 1, 1979

I. Technical Description

The Gambia Forestry Project (635-0205) is designed with five major objectives:

a. To establish 1,300 hectares (ha) of Gmelina arborea plantation to produce approximately 75% fuelwood (12m^3/ha/yr) and 25% lumber, poles and other non-fuelwood products (4m^3/ha/yr).

b. To establish 50 hectares of neem (Azadirachta indica), cashew (Anacardium), and fruit trees in 10 villages.

Details of establishing plantations and woodlots are given in Part III below.

c. Improve utilization by 25 to 50% when harvesting fuel and saw wood and processing such products as lumber and poles (See Annex D for details).

d. Improve the forest management potential by funding the training for a total of 13 persons. Three professionals would be trained in general forest management and related fields such as soil and water management. At the technician (Ranger) level, training in Nigeria for 5 persons would involve reforestation and other silvicultural techniques. In order to improve utilization, training for 5 persons in saw mill and logging operations and in maintenance of equipment is foreseen (Annex D).

e. Execute a feasibility study for extraction, processing, and marketing some 8,000 ha of tall mangroves (Rhizophora racemosa) which will be affected by the construction of a salt water intrusion barrier and bridge where the Trans Gambian Highway crosses the Gambian River near Mansa Konko. Annex E provides details.

The Gmelina plantation will be established near Finto Manereg on the Banjul-Mansa Konko highway approximately 35 miles east of Banjul. The first two village woodlots will be established in the vicinities of Illiassa, west of Farafenni and east of Pakala Forest Park, on the North side of the Gambian River; and in the Penjemu area, south of Brikama, about 25 miles from Banjul.

Another donor is funding the installation of four nurseries. Trees for the woodlots will be produced at two of these nurseries. Seed will be sown in the plantation site for establishing the Gmelina plantations, eliminating the need for a nursery there.

Species and site selections have been made by the GOTG Forest Department on the basis of trial plantings dating back as much as 20 years. Social and environmental impacts and potential for cooperation in establishing the first two village woodlots have been carefully evaluated.

Although a Phase II is not proposed at this time, it is recommended that a Phase II effort be considered as part of the mid-term project evaluation.

A. Pre-project design

1. Preliminary research

Over the past 30 years trials have been established with several species to determine which species perform best in The Gambia and what their potential yields would be.

Gmelina arborea has proven best to date in competition with two eucalyptus species, with teak (Tectona grandis), and with a local species, Khaya senegalensis. It can be expected to produce at least 15m^3/ha/yr at the proposed sites in the Western Division. Research has shown that growth of Gmelina would be significantly less in the drier areas of The Gambia. Additional sites and species trialsto be carried out over the next five years with financing from the Federal Republic of Germany are expected to yield results which will permit confident selection of fast-growing, hardy trees which will do well in the drier regions under large-scale plantation conditions.

In the drier areas where village woodlots are proposed, neem has produced the greatest yields to date (up to 20m^3/ha/yr). Cashew has demonstrated its value for its nut crop as well as several other good qualities. In addition, as an incentive to villagers to cooperate in the woodlot program, fruit trees which have demonstrated good yields in certain areas will be given to villages either for the woodlots or to plant around their homes. Research with village woodlots is in its infancy, but there is enough data or field evidence to proceed until species trials to be established by the Federal Republic of Germany indicate that other species should be considered.

The harvest and utilization of mangrove (Rhizophora racemosa) from some 8,000 hectares has no precedent. Since the sites from which the mangrove is to be harvested will be altered so that this species can no longer thrive there, no attempt will be made to regenerate it. Once the site has become stabilized behind the new dam, trials can be conducted to determine the best species to use.

2. Alternative Locations for the Project

Potential locations depend on availability of land, nearness to area of demand, possible sources of labor, access, etc. The GOTG carefully considered these and social environmental factors in selecting the proposed sites for the Gmelina plantation and the first two village woodlots. Subsequent villages will also be selected to serve as demonstration units in various divisions of the country. Success in establishing the first woodlots is believed so vital that a major selection criterion was the potential for village cooperation.

In view of the objectives and constraints associated with both the Gmelina plantations and the woodlots, the GOTG's choice leaves little room for debate. The Gmelina sites are the most advantageous available from a transportation standpoint.

3. Fencing

AID will need to fund fencing for both the plantation and woodlot programs. For plantations, fencing will be placed around the first year's planting, then some of the fencing moved to accommodate the second year's planting, etc. Approximately 5 strands of barbed wire, 19,500m in length would be needed to fence the 1,300 ha of Gmelina. An additional 10,000 meters will be needed to fence the 50 ha of village woodlots since their configuration may not be the most efficient arrangement due to conflicts with food crops or other prior uses. For cost estimates, it is believed realistic to use 30,000 meters as a minimum.

B. Nursery

Four nursery sites have been selected by the GOTG to be funded by another donor. The two woodlots to be planted in 1980 are convenient to nurseries.

C. Seed Procurement

The GOTG has established seed orchards for collecting Gmelina seed. Plantings of neem in various parts of the country offer excellent opportunities for collecting seed in the general location of the village woodlots. Seed procurement is not a problem which requires AID funding.

D. Plantation Establishment

The GOTG will contract with local timber cutters to remove trees from the area. Site preparation will be completed by local farmers who will plant farm crops between the rows of trees for the first year. Since Gmelina can be established by sowing seeds at 1m x 1m spacing, mechanical cultivation will not be needed. Instead, small ridges will be made along the rows as a place to sow the seeds. After the first growing season, spacing will be adjusted to 2m x 2m. If the seeds in any hill did not germinate, cuttings from the trees to be removed will be moved to the empty space.

Around each 25 hectare block there will be 10 meter wide fire breaks. Most of these breaks will be kept free of vegetative growth, but after the Gmelina seedlings are old enough to withstand light ground fires, fire resistant seedlings of cashew may be planted in selected breaks in a manner which will not prevent access by fire control crews.

Termites are not a problem in Gmelina or neem plantings. However, domestic grazing animals offer a severe challenge. Because of this all planted areas or trees will be fenced.

As a control against trespass by livestock or humans, a watchman will be assigned for every 500 hectares on a permanent basis once the farmer has removed his crop.

In the woodlots, villagers will be responsible for protecting their investments of time and labor.

E. Post-planting Activities

1. Weeding

During the first year, weeding will be done by the farmer as he tends his crops. In the second year, weeding will have to be done by hand (trees are only 2m x 2m apart) twice. In the third year, a single weeding will suffice. After that the tree canopy will prevent serious weed competition.

In the woodlots villagers will be responsible for necessary weeding.

2. Research

Pending increased staffing trained for research work, the GOTG will not conduct additional studies in the Gmelina plantations. It would be valuable, however, if data on height and diameter growth could be recorded from the 3rd year of growth until the 12th year, or a period which would include the first two thinnings. Previous data collections failed to include the volume removed during the first and subsequent thinnings.

Species trials are to be conducted by the FRG. Although exotic species will be stressed, it is believed that the indigenous species with the greatest potential for fast growth should be included as controls. It is possible that under plantation conditions it will be found desirable to plant some indigenous species, particularly around villages. The Forestry Department will discuss this recommendation with the FRG advisors.

Several possible studies of potential value should be considered by the Forestry Department and the German technical assistance team in addition to the study of yields. These include observations on the long term effect on soils and water table of intensively managed plantations; replacement of barbed-wire fences with living, spiney shrub or tree species grown as a fence; and research of various extension techniques to obtain maximum awareness of forest degradation problems and cooperation in solving them at village levels.

Peace Corps Volunteers might be employed effectively in collecting data and in showing villagers how reforestation works to their advantage. However, this would likely not be a full-time job and the project design team, working with the Peace Corps staff in Banjul, was unable to arrive at a satisfactory means to combine these tasks with other jobs for which the GOTG had requested Peace Corps Volunteers.

F. Integrated Resource Management

Reforestation is an important tool in conservation of natural resources. Ecological studies around the world have demonstrated that on sites where vegetation has been destroyed by fire, flood, volcanic ation or other catastrophic causes, the site is first populated by microorganisms, then with grasses and small shrubs and finally trees. Trees have the maximum

capacity for taking nutrients from the soil, converting them into forms easily usable by other plants and returning them to the soil. Herders and farmers in West Africa have known this for centuries.

The evidence was found in farmers' practice of crop rotation with bush following prior to the recent rapid increases in population and prior to the conversion of thousands of hectares from subsistance agriculture and livestock raising to intensive culture of peanuts as a cash crop. Formerly, about one-fifth of a family unit of land would be farmed for food for about ten years. Then an adjacent one-fifth would be farmed. After 40 years the first one-fifth was restocked with grass, shrubs and trees, and soil nutrients and organic matter had been relenished.

This PP proposes that man, who has been exerting undue pressue on the fragile African environment, now assist nature by re-establishing forest and woodlands. This will protect and speed up restoration of soil fertility and provide the fuel needed to cook the rural poors' millet, rice, and other foods. This project has considered soil and water, farm crop and livestock management, integrating where possible, yet realizing that integrated management is practically achieved by devoting some hectares primarily to livestock production, others primarily to fuelwood production (to cook food) and others primarily to produce the food.

G. Harvesting and Marketing of Production

Evidence from 20 years experience of growing Gmelina in plantations indicates that additional yield data are needed to account for material removed during thinnings. Data indicate that thinnings occurred between the 7th and 8th years and between the 14th and 15th years, with either a thinning between the 11th and 12th years or a breakdown in collecting data in one or both years. However, some of the variation could be due to the fact that all measurements were taken in 1977 in different age-blocks in the plantation area, rather than in the same blocks each year for the period of the trials. (See (C) and the Table F below).

TABLE I

Yields from 4 to 15 year old Gmelina arborea plantations[8]

Age (yrs)	No. of plots (N)	Av.No.[1] trees/ha (N)	Aver.basal[2] area/ha (G)	MAI[3]	CAI[4]	VS[5]	VIO[6]	dg[7]
4	20	1128	5.10	6.5	-	26	0	7.6
5	25	1430	7.68	7.20	10.0	36	0	8.2
7	8	1877	16.46	12.28	25.0	86	23	10.5
8	24	1462	15.40	?	?	84	32	11.5
9	11	1165	15.70			89	47	13.0
10	12	920	15.50			88	55	14.7
11	9	893	15.60			94	63	14.9
12	19	965	16.50			97	65	14.7
13	13	900	18.60			119	87	16.2
14	6	770	18.20			122	94	17.3
15	15	665	15.30			100	77	16.9

1. Number of trees above a set minimum diameter
2. M^2/ha, with diameter at 1.3m above ground
3. Mean annual increment in m^3/yr/ha
4. Current annual increment in m^3/yr/ha
5. V_5 = volume to 5cm diameter, under bark, at top of tree
6. V_{10} = volume to 10cm diameter, under bark, at top of tree
7. dg = diameter of tree of mean basal area ($=\frac{G}{N}$)
8. 1977 data reported in reference C.

In any event it seems reasonable to conclude that a rotation of 8 to 10 years may give a maximum yield per hectare for firewood. For lumber, leaving the best 15% of the trees until age 13-15 will probably give maximum yields.

It is recommended that one of the trainees be prepared to do exhaustive studies on this after returning to The Gambia.

It is anticipated five years after the project is implemented, all recurrent costs until the end of the useful life of the tree (about 30 years) will be paid for by the yearly cash income attributed to the GOTG through the sale of cutting permits.

The village woodlots are designed for use by the villagers who plant the trees. Unless yields exceed estimates, there will be no surplus fuelwood or other wood products for sale. The benefits in this case will accrue directly to the villagers in an improved standard of living. In addition, general benefits will accrue to all of The Gambia and to future generations as a result of the wise use of the land resources whenever woodlots are established.

1. With regard to the development of management plans for preserves of various types and plantations, the subject was discussed with the Conservator of Forests. A straight-forward plan has been developed for the approximately 1,250 acres of established Gmelina plantations. During the Forest Management Consultant's work, a model plan should be developed for the area to be planted under the project as well as a general plan for management natural forests. When the trainees in Forest Management return, the plans can be activated. As in all other facets of the project, the plans should complement soil and water management activities and objectives and will, thus, be developed in close coordination with the technical team of the Soil and Water Management Unit.

2. As noted above, the establishment of 4 forest nurseries will be funded by another donor.

3. Species and provenance trials will be funded by the FRG.

4. Until trainees return, establishment of a forest research program is impractical. This can be done at the mid-term project evaluation and serve as a training program for young forestry officers.

5. The GOTG has recently completed a reorganization plan for its forestry division. This would not be a constructive task in 1979 or 1980, but may be an appropriate topic at evaluation time.

6. The training program is to be a major portion of the project. It is discussed below in Item II.

II. Personnel Requirements

Overall personnel requirements have been established according to the attached outline, to which must be added the U.S. short term consultants. The details of the requirements are noted Below.

A. Technical Assistance

A minimum of technical assistance is required for implementing this project. Two consultancies of 3 months each by a forest management specialist and by a forest utilization expert are desirable to implement and at project mid-term, to evaluate and make recommendations for future assistance to the GOTG. A forest economist will be needed for 6 to 8 weeks to help with the evaluation. The AID Operations Officer for The Gambia would serve as the AID contact during other periods. The project manager will be the Conservator of Forests of the GOTG.

All AID-financed consultants should be professionally trained and a background in tropical forestry is desirable. The forest management and utilization experts are needed to help implement the project in cooperation with the Conservator of Forests and the rest of the Forestry Department staff.

B. Local Manpower

Over 50 full and 150 part time persons are expected to be gainfully employed in the various phases of this project in addition to workers employed in harvesting the mangrove before the dam is built at Yelitenda. The semi-skilled and non-skilled workers, many now unemployed, are expected to be recruited from villages in the vicinity of the plantation. In addition, a number of farmers will benefit from growing crops during the first year of establishment of each of the 1,300 hectares in the plantation.

Additional guards and rangers will be needed to ensure the success of the village woodlot program. Technical and administrative personnel will be selected by the Conservator of Forests of the GOTG.

C. Training

1. Academic and Technical Training Abroad

The Conservator of Forests is anxious that Gambians be trained in all contexts of this project: forest silviculture, including reforestation, thinning, and other practical application techniques; forest utilization in the forest and at the sawmill; forest management, at both the administrative and applied levels; and forest economics, in practical application techniques.

Ten person-years long-term academic training in the U.S. or at appropriate African universities will be provided for an anticipated three persons for study in the following fields: forest management (silviculture with emphasis on reforestation, tree improvement, and nurseries); forest products utilization; forest research (silviculture); and silviculture and soils.

Seven and one-half years training will be provided for five candidates for the Forestry Institute at Ibadan's diploma program covering forest management, nursery development, silviculture, extension work, and soil science.

Forty-five person-months special technical training will be provided in the U.S. for five candidates (See Annex D for details).

Nine person-months short-term academic training in the field of extension methodology and rural communications will also be provided to one candidate in order to reinforce the outreach component of the project.

2. In-Country Training

The IFB for sawmill and logging equipment procurement will stipulate that the successful bidder must furnish at least four weeks of local training for pertinent supervisory, operation and maintenance personnel at the sawmill and from the logging end of the operation.

Other in-country training should be arranged for personnel in nursery operation, reforestation, tree improvement, pest control, and utilization of forest products. This would be on-the-job training, for the most part, given by senior staff of the Forestry Department or by expatriate advisors.

III. Details of Establishing 1,300 ha of Gmelina arborea Plantations

Establish	175 ha	in first year (1980)
	225 ha	in second year
	275 ha	in third year
	300 ha	in fourth year
	325 ha	in fifth year
	1,300 ha	total

The GOTG's capacity to meet its needs for forest products will have been doubled when this project has established 1,300 hectares of Gmelina plantations.

The areas chosen for the plantations are in locations within approximately 56km south and to the east of Banjul along the Banjul-Mansa Konko road. These areas are within the existing forest parks at Salagi and Pinto Manareg and are easily accessible to the Forestry Department's headquarters near Yundum.

1. Nurseries: Since Gmelina seed is sown directly in the field in a process called "taungya," nurseries will not be needed. Seeds are sown thicker than needed so that cuttings from surplus seedlings can be moved to spots where seeds did not perminate.

The taungya system requires that interested farmers clear the site and sow the seeds in ridges in return for using the land for agricultural crops for the first year. After that time, shade from the seedlings will be too dense to permit between-row cultivation.

2. Site Selection: The sites for this 1,300 ha plantation have been selected by the GOTG Forest Department. It is known that Gmelina arborea will yield 15-20m^3 per hectare per year of forest products. While the exact percentage of each product is not known, approximately 75% will be used as fuelwood, either directly or after conversion to charcoal. The charcoal will come largely from thinnings at 5 and 10 years after planting, from small growth resulting from coppicing by the stumps of trees removed at 5 and 10 years, and from branches, small stemwood and material unsuitable for lumber and more valuable products at the 20 year harvest.

It is expected that another complete rotation can be obtained from the same root systems after this harvest.

Site selection was limited to forest reserve lands to eliminate social impacts on land needed for agricultural crop production. The soils are known to be suitable for tree growth. Environmental impact in general will be favorable (as the tree roots will hold the soil below ground level and the crowns will prevent erosive action by wind and rain and prevent negative solar action (insolation) by providing shade (See Annex K, IEE.). Evidence of the favorable impact can be observed in existing 5 to 20 year old plantations.

Economical factors such as additional employment, savings of foreign exchange by reducing imports of lumber and alternative forms of energy are discussed in the Economic Analysis (Annex F) and the IEE.

Also considered in site selection were such factors as nearness to major areas of need and availability of land, labor and usable water.

A Phase II project is not proposed at this time, but it should be considered at a mid-term evaluation Phase I will increase the GOTG's capacity for supplying fuelwood to over 15,000 persons. A Phase II effort involving an additional 1,000 ha would increase this to 22,500 persons. To harvest the same amount of fuelwood from natural stands will require harvesting the annual growth on at least 60,000 ha (versus 3,000 ha). This would be a significant contribution to the conservation of remaining forest and soil resources in the western portion of The Gambia. It would also save cost of expensive imported fuel needed to transport charcoal and fuelwood from much greater distances in eastern Gambia.

IV. Details of Establishing 50 Hectares of Village Woodlots

A second objective of this project is to establish 50 hectares of village woodlots in five years. The rate of establishment in each of ten villages has been tentatively planned as follows, but is subject to modification as circumstances warrant:

1st year:	Villages A & B, plant one hectare each	2
2nd year:	Villages A & B, plant two hectares each	4
	Villages C & D " one " "	2
3rd year:	Villages A & B, C, D, plant two hectares each	8
	Villages E & F " one " "	2
4th year:	Villages A,B,C,D,E,F plant two hectares each	12
	Villages G & H " one " "	2
5th year:	Villages A-H plant two hectares each	16
	Villages I & J " one " "	2
		50

This program is designed to meet the capacity of the small Gambian forestry and extension staffs, particularly during early years of the project when a number of staff members will be away for training.

Villages will be screened with the following in mind:

A. That village leaders recognize the need for growing their fuelwood and related wood products within easy access of their woodgatherers;

B. That 75-100% "adult male equivalents" in a village are willing to devote at least one day during the busy 5 months growing season to build fences and plant and tend trees;

C. That the villagers will expect no compensation except the materials for fencing and free trees, including a few fruit trees for food production; and

D. That they are accessible to extension workers who will use various media before, during, and after the planting to stimulate rapid completion of the work.

A Phase II project should be considered at mid-term project evaluation. Phase I will provide approximately 45% of the needs of the first two villages, approximately 35% for the next pair of villages, etc., assuming village population of about 200 persons each.

The wood production estimates are based on annual increments of $10m^3$ for neem. This will vary with site and could range between 2 to $20m^3$. Consumption estimates of $1m^3$ per person are believed suitable for villages using wood (not charcoal). An average village woodlot of 20 ha would then produce $200m^3$/year. Once established, neem reproduces by coppicing so the same root systems could be used for 20 to 30 years while producing 3 to 4 crops of fuelwood.

Other benefits to the villagers would include a better living environment due to protection of the soil in and around the woodlots and under and around the cashew and fruit trees which will be planted in single tall units,

in rows, around houses, etc. The climate in the villages will be considerably milder due to shade and protection from blowing sand and from hot winds. Livestock also will benefit. Perhaps the greatest benefit will be the reduction in hours spend in woodgathering, particularly the many hours spent transporting the wood on their heads or backs.

ANNEX D

IMPROVED UTILIZATION IN THE GAMBIA

by

William N. Darwin, Jr.
Forest Products Technologist
USDA Forest Service
State and Private Forestry
Southeastern Area

April 27, 1979

IMPROVED UTILIZATION AT NYAMBAI

The sawmill at Nyambai consists of a 60" circular headsaw with a top saw and a four knee carriage. They have a circular resaw used for ripping wide boards or removing bark from boards. They also have a cross cut saw for end trimming boards. This sawmill was originally designed to saw logs up to 20 feet in length and 36 inches in diameter. The mill is housed in a 121' by 30' covered shed. Adjacent to the mill is one additional resaw used to remanufacture lumber into ordered lumber products such as door and window frame stock. Located on the property is also a large covered shed used for lumber drying and storage. They have limited facilities for sharpening the saws located several miles down the road at Yundum. Also located on the same site as the sawmill is a hot and cold bath wood treating facility. It is primarily used to treat Gmelina arborea for fencing material.

The main species sawn in the mill is Khaya Senegalensis (dry zone mahogany). The products produced at the sawmill are consumed by low to medium income families in house construction--individuals generally building their own homes. The wood is very satisfactory for door and window framing and for roof support beams. The cost of this material is high, by American standards, for framing material, but it is one-half the cost of imported framing material. A portion of the mill production is also consumed by the Gambian government for their construction needs. The demands for the lumber far exceed the supply, particularly for that material used by individuals.

The fencing material produced consists of treated fence posts used by the Forestry Department for fencing tree plantation. They also produce a treated wooden roll fencing used by families for compound fencing. The fencing is made from 1-1/2" to 2" stem about six feet in length held parallel to one another by wire. This type of fencing is in high demand by the villagers and, when treated, gives many years of service.

The majority of the logs sawn at the mill are cut by contractors working for the Forestry Department. The logs are cut from forest preserves 35 to 40 miles from Nyambai. The native axe is currently used for felling and bucking of the logs. It is our understanding that the Forestry Department will soon be equipped with chain saws, and if they are maintained, this should aid the contractors in cutting better log and increase volume recovery by eight to ten percent. This is the volume currently being lost from felling and bucking with axes.

Many of the logs coming into the sawmill are mis-cut. Not only mis-cut to length, but mis-cut so that the logs were not as straight as they should be to get maximum lumber recovery. For example, one 20 foot log, 12 inches in diameter with ten inches of sweep will produce only one-half as much usable lumber as it would if it were cut into two ten foot sections with the resulting two inches of sweep. Therefore, a long log with a lot of sweep should be cut into two logs with a minimum of sweep to produce the maximum amount of usable lumber. Many of the logs observed contained excessive sweep to give maximum lumber recovery. Also, lumber is sawn that differs greatly in thickness and width at the ends of the boards. This produces waste as the errors in width or thickness must be corrected before the boards are used, these scraps then having only value as fuel or for making charcoal. If the boards had been sawn to proper dimension originally, there would have been more lumber produced per log. These types of problems can greatly affect the amount of lumber produced from a log. For example, during the month of February, 1979, only 4.75 board feet of lumber was produced per cubic foot of log sawn. Based on my personal experience, they should have produced 6.5 board feet of lumber per cubic foot of log sawn. I believe that the recovery of lumber per log sawn at the sawmill can be improved 30+ percent on the average. I believe these increases can be achieved without any large purchases of equipment for this mill. The improvement can be achieved through the following: (1) training of operational personnel in sawmill management techniques designed to recover the maximum amount of usable lumber from a tree rather than using a tree to fill a particular lumber order; (2) training operational personnel in the technique necessary to maintain a sawmill so that it will saw boards of uniform thickness and width; (3) rebuilding and aligning carriage and tracks of mill to allow uniform lumber to be sawn; and (4) training in log making, sawing and edging practices to maximize lumber recovery.

Following the training of personnel and rebuilding or repair of the sawmill, the amount of lumber recovered from large logs will increase. The supply of large logs in The Gambia will continue to dwindle as it has in the United States, but there will be logs of sufficient size in the foreseeable future to justify expenditures to rebuild the mill. The operational and management techniques learned will be appropriate to any other type of sawmill that could or would be built in the future.

While the present sawmill will be adequate to saw large logs produced in Eastern Gambia in the future, it is entirely unsatisfactory for sawing the small diameter lumber logs currently being grown in the Gmelina arborea plantations established around Nyambai. It is also totally inappropriate for sawing the smaller native species

growing throughout The Gambia. It is inappropriate because of the large amount of wood removed by the large saw; because of the large carriage of the present saw that contributes to difficulty of holding small logs for sawing; because of the low productivity of the present sawmill when sawing small logs. With a sawmill like the one at Nyambai, it takes nearly as long to saw a ten inch diameter, eight foot log as it does to saw a 15 inch diameter, 12 foot log, but the small log will produce less than one-half the lumber of the larger log. Since no saw exists that is a reasonable compromise for sawing the tremendous range of log diameters needing to be sawn in The Gambia, it is believed that a sawing system should be built that is designed specifically to saw small diameter short logs that are currently available and suitable for sawing in The Gambia.

A Bolter Saw system similar to that recently installed in western North Carolina and reported in "Short Log System," published by the North Carolina Forest Service, is recommended.

A system of this type would produce lumber at considerably less cost than the current sawmill and the lumber produced would be suitable for many of the same uses. The wood from Gmelina arborea is excellent for producing furniture as well as window and door frame stock. A system of this type will require less operational space than the current sawmill at Nyambai and adequate space is available within the currently fenced compound. The bolter saw will require 1500 to 2000 square feet of covered pole frame shed. It is recommended that we would supply the materials for construction. Concrete would be obtained locally and would cost 120 Dalasis per M^3.

Another advantage of the bolter saw would be the opportunity to saw into lumber many of the large limbs of Khaya senegalensis that are currently being left in the woods and lost to wild fire.

A Khaya Senegalensis whose main stem is 28 inches in diameter at the small end and 24 feet in length would contain 103 cubic feet of wood in the main stem. The cubic foot content of the top material left in the forest would be 218 cubic feet. Approximately 25 percent of this left volume would be suitable for sawing on a bolter saw from a tree of this size. This indicates that 54 cubic feet, an amount equal to over 50 percent of the currently harvested volume, of additional material could be harvested from a tree of this size if a bolter saw system were available.

The lumber production of a modern bolter mill is between seven and eight thousand board feet per eight hour shift, when bolts average 12 to 14 inches in diameter. Bolts as large as 30 inches can be sawn with a bolter saw equipped with a top saw, however, a steady diet of this size material will reduce productivity of the saw because of the time required to process the larger diameter bolts.

The outstanding attribute of the bolter saw reported is the ability to produce straight-grained, higher quality lumber from a crooked, poor quality tree. This is accomplished by cross cutting the tree into short, straight sections. For example, one article reviewed for this report showed that in sawing 100 Number 2 crooked beech logs, the recovery of furniture grade lumber was 25 percent greater from the 50 logs cut into short bolts and processed on a bolter saw than for the 50 logs sawn on a conventional carriage.

A bolter saw, when properly operated, is a relatively safe piece of equipment. One company reported the operation of three bolter saws, over a five-year period, more than a combined total of 20,000 hours with no lost time due to accidents.

With the installation of the bolter saw short log system at Nyambai, a different harvesting procedure would be required than is currently being used for the harvest of large sawlogs. Presently, two logs are loaded on wagons by Forestry Department personnel and pulled by farm tractors the 30+ miles from the forests to the sawmill. The Forestry Department will soon have two Unimog log trucks to replace the wagons and tractors. One or both of these trucks could be modified as required to haul short logs. The modification necessary to haul the short logs would be by Big-Stick Loader and wood frame commonly used in the South for the last 20+ years. A Big-Stick Loader is a simple truck loading device consisting of an upright mast with a short swinging horizontal boom fastened to the top. A wire rope is strung through the device and powered with a winch. The loader, equipped with log tongs or a sling, would be satisfactory for loading the needed wood. It is recommended that two wood racks and Big-Stick Loaders designed to fit the Unimog trucks be supplied.

Additional equipment needed for the saw shop is given on the list by Mr. Sidibeh—I also believe they need a 250 amp gasoline powered, trailer mounted portable welder. It should be of British design to ease parts replacement.

I also believe they should have about one month's help with the start-up of the Bolter Saw. If things were done right, this same individual could help Mr. Sidibeh with getting the old mill in good shape or at least locating and defining his problems.

Two other pieces of equipment that would be good to supply are a thickness planer and a three saw edger (Corley E536). Currently, there is little or no local made furniture. All of the furniture available to the low to medium income family is imported. These two pieces of equipment could be used to convert some portion of lumber to a suitability for local use by individuals in making furniture and other needed wooden household products. Also, the

single circular rip saw now used for edging and ripping will not be able to handle the lumber produced by the bolter saw system. To remove the bark from both edges of a board and rip to a desired width, each board must be passed three times through the present saw. With a three saw edger this could be done in one pass.

The improvements would greatly improve the efficiency of conversion of round wood into needed lumber and aid in maximising forest products recovery. The real effect these improvements would make in extending the wood resource base are explained in the next section.

EVALUATION OF THE EFFECT OF IMPROVED UTILIZATION IN THE GAMBIA

To evaluate the potential effect of the proposed improved utilization on the extension of the wood resource in The Gambia, the Mean Annual Area Equivalents (MAAE) for the project were determined. Mean Annual Area Equivalents are a means of comparing how many hectares of trees it would take to grow the same amount of forest products as have been generated through a utilization effort. For example, if ten trees were felled and processed in the present sawmill and produced 1000 board feet of lumber, and a way was found to improve the utilization efficiency so that 1100 board feet of lumber could be produced from the same ten trees, this has exactly the same effect as the harvest of 11 trees and processing by the old efficiencies.

These comparisons are based on the expected yield of 15 M^3 of wood grown per hectare from the Gmelina arborea plantations now growing in the Nyambai area. It is based on the fact that each 15 M^3 improvement we make in yield from the trees as we cut them, has exactly the same effect as one additional hectare of plantation available for harvest.

MAAE for the Bolter Saw Operation Sawing Gmelina arborea

There are approximately 1250 hectares of planted Gmelina growing in The Gambia. The average growth is 15 M^3 per hectare giving an annual growth for the plantation of 18,750 M^3. Approximately 25 percent of the volume is suitable for sawing and the bolter saw will give a 22 percent better yield of lumber in sawing Gmelina than will the present sawmill. The bolter saw would then have the same effect as growing an additional 69 hectares of Gmelina, all of which were suitable for sawing. This is an improvement on the plantations now growing and does not take into account those yet to be planted.

Sawing Khaya senegalensis

The annual harvest of Khaya senegalensis in The Gambia is approximately 900 M^3. The amount of wood left in the forest in the form of topwood exceeds 1800 M^3, 25 percent of which could be converted to usable production with a bolter saw. This is equal to 450 M^3 or 30 hectares of additional Gmelina plantation, all of which would produce trees suitable for sawing.

Improved Recovery from Present Sawmill

Each year, approximately 900 M^3 of Khaya senegalensis are processed in present sawmill. The lumber recovered from these logs equals approximately 62,600 board feet of lumber. The lumber recovery of

this mill can be improved 30 percent by sawmill maintenance and training in sawmilling techniques. This would have the same effect as an additional four hectares of plantation production in trees suitable for sawing.

If an internal rate of return were calculated for the cost of improved utilization versus improvement, it would be found that to exceed that anticipated for tree planting in The Gambia. It must be remembered, however, that the majority of these improvements will come from planted trees. We must have trees first, then utilize them as best we can to extend the Gambian wood base. That is what this project is designed to do.

Summary of MAAE From Utilization Program at Nyambai

Bolter sawing of plantation grown bolts	69 hectares
Bolter sawing of Khaya senegalensis topwood	30 hectares
Increased recovery from present sawmill	4 hectares
Total	103 hectares

Application of the new equipment and more efficient working methods will produce an additional 73 ha. MAAE.

IMPLEMENTATION OF UTILIZATION PROGRAM

There are two steps in the implementation of an improved utilization program for The Gambian wood resource. They are the purchase, delivery and installation of needed equipment; training of Forestry Department personnel in appropriate technology and techniques to effectively use the new equipment and what they now have. The proper order for implementation is training now, equipment later. The mean annual area equivalents described in the previous section cannot be achieved with equipment alone. Efficient utilization of a wood resource is as dependent on knowledge and skills as it is on available equipment.

The limiting factor on the amount of training that can be provided to personnel of the Forestry Department is the number of personnel available or that could be made available for training. Only three individuals would presently be available for training from the Utilization Unit. This is the number of personnel with sufficient experience in wood utilization and technical background to allow for further training in the techniques necessary to aid in the extension of the wood resource of The Gambia.

It is recommended that these individuals receive their training in the United States and that the USDA Forest Service assume responsibility for conducting the overall training program.

The training program will be divided into two phases: 4-1/2 months of technical classroom-type instruction per trainee, and 4-1/2 months of actual on-the-job experience working with the types of equipment that will be supplied following the completion of training. A total of 27 man months of training will be given to these individuals from The Gambia.

At the center of the technical classroom training for the individuals will be Haywood Technical Institute, Clyde, North Carolina. This is an industrial vocational trade school that has a Wood Utilization Department specializing in teaching the skills necessary to manage and maintain sawmill and related equipment, logging and harvesting skills, and quality log and lumber manufacturing grades and skills. A specialized and intensive training schedule will be arranged for each of the three trainees during the 4-1/2 months. In addition to the training at Haywood Tech, each individual will participate during this 4-1/2 month phase of training in specialized short courses offered by the USDA Forest Service in cooperation with individual State Forestry Commissions and universities dealing with log and lumber grading, preventing degrade and loss during drying of lumber, lumber and log storage, wood preservation and quality control of lumber thickness and width through sawmill alignment.

During the remaining 4-1/2 months of training, trainees will be working on-the-job in small, efficient sawmill and other wood using industries to gain actual experience with the types of equipment they will receive and in exercising the skills required to improve wood utilization levels in The Gambia. Work experience will include management and maintenance of small sawmills, lumber stacking and drying, lumber sawing and edging, lumber planing, charcoal kiln operations, bolter saw operation, and harvesting logs and bolts. The training will be conducted in North Carolina. Specific details of this phase of the training have not all been finalized at this time, but the USDA Forest Service has made initial contact with private industry about this phase of the training and found a general willingness on their part to cooperate in the training. A breakdown of the training cost as planned per individual for nine months is as follows:

Lodging and subsistance	$ 6,000
International travel	1,500
Domestic travel	500
Registration fees	500
On-the-job training	3,000
Classroom training	3,000
15% overhead for USFS	2,100
Total	$16,600

This is approximately $1844 per man month for this specialized, technical training.

The scheduling of training ould be one individual in the Spring of 1980 and two individuals in the Spring of 1981. Following the completion of this training, at the end of 1981, installation of equipment and supplies deliveries could begin.

A summary of the equipment, supplies and technical assistance needed for the improved utilization program in The Gambia and their costs are as follows:

Bolter Saw (complete with blower, log deck, lumber deck, power unit)	$25,000
Big Stick Loaders and wood rack	5,500
Lumber Resaw and Edger	3,500
Lumber Planer	10,000
Saw filing equipment and supplies	10,000
Materials for Bolter Saw shed	8,000
Technical Services (sawmill alignment, maintenance and bolter saw installation) 3p/mos	30,000
Supplies for sawmill alignment	5,500
Total	$97,500

IMPROVED UTILIZATION OF WOOD WITHIN VILLAGES

By far, the largest use of wood within The Gambia centers about the villages' use of wood for cooking or making charcoal for sale in the Banjul area. The majority of the 1.7 M^3 percapita consumption of wood reported by Huygen is for this purpose. By law, the only trees that can be felled for fire wood or charcoal production within the country, are dead trees. The principal tool used for felling is the native axe.

The percapita consumption of wood as reported by Huygen is considerably higher than that reported for other Sahel nations (1.0^3). Regardless of the amount actually used per capita in The Gambia, it is obvious that the effects of consumption on the forest resource far exceed actual use.

It is our opinion that the reason for the additional impact on the resource is the widespread waste that is obviously occurring between the time a tree is felled and its wood is used in a cooking fire or a dirt kiln for charcoal making. While there are probably many social and economic reasons for the waste that is occurring, from a purely forestry or utilization standpoint, the waste is being caused by the tools now being used for felling and bucking the trees and wild fire. While the villagers are quite skilled with their axes, there is eight to ten percent of the usable volume of the main stem of the felled trees which is lost in chips that are not recovered for fuel. The exclusive use of the axe and the length of time the dead tree is on the ground prior to the total harvest for fuel greatly increases the probability that the trees will be consumed by wild fire. Evident ash was observed through the countryside where felled trees had been consumed by wild fire during this dry season before they could be utilized for fuel. When the axe is the only tool available for harvesting fuel, the tendency is always to use the smaller and more easily cut portions of the tree first. This practice increases the likelihood that the majority of the tree could or will be lost to wild fire.

An obvious answer to aid in the solution of this problem would be the introduction throughout the country of one and two-man hand saws to aid in collecting of fire wood and shorten the time from felling to consumption. However, an undertaking of this type would probably meet with failure for many reasons. A saw of the types felt appropriate for use would cost much more than the rural households could afford. If an axe head cannot be forged by a family member from used truck spring, it can be purchased for seven to nine Dalasis.* The purchase of a two-man crosscut could well repre-

*U.S. $3.65-4.69

sent the major portion of the annual income of an individual. The skills necessary to keep saws sharp and set do not exist at this time within the country. Their axes are sharpened with sand on a flat hard piece of wood, however, some specialized equipment is required to sharpen hand saws and also some recurring costs, such as files would be necessary to keep their saws sharp. Since any saw is soon useless without proper maintenance and care, any widespread free distribution of saws would be useless, simply because the average villager could not at this time keep them sharp and properly set. To teach the people to use and maintain hand saws on a wide scale basis would take an extension effort beyond the present capabilities of The Gambian government. The real problem is that the average villager does not realize what the real cost of the axe is in lost resources or wasted time and energy.

This does not mean that we should not make a start, however, and our start should come with the introduction of approximate technology on the use of hand saws along with making available the tools in the same villages selected for the village wood-lot trials. The village wood-lot program cannot ultimately be a success without developing within the villages, a sense of conservation of their resource, and their conservation of the resource is dependent on their using the proper tools for harvest of their trees.

It is therefore recommended that hand saws and maintenance equipment be purchased and supplied to the villages in planting wood lots and that they be trained in the use of these tools. The cost (no more than $2500 cash) of this portion is minor in relation to the total project—but a beginning in this direction is desparately needed. This would give The Gambian government a chance to evaluate the problems associated with introducing proper hand tools for wood harvest and teaching needed skills and the acceptance of the tools by the villagers—a chance to see what value they will place on the tools in relation to time, effort and resource saved. Any widespread introduction of proper tools will simply have to wait until the extension capabilities of the country have improved.

ANNEX E

REQUEST FOR TECHNICAL PROPOSALS FOR A STUDY OF THE FEASIBILITY OF MANGROVE EXPLOITATION IN THE GAMBIA (DRAFT)

William N. Darwin, Jr.
Forest Products Technologist
U.S. Department of Agriculture
Forest Service

Todd W. Crawford
Project Design Officer
AID/Washington

July 3, 1979

Request for Technical Proposals for a Study of the Feasibility of Mangrove Exploitation in The Gambia (Draft)

I. Background

A. General

Mangrove forests extend on each bank of the Gambia River from its mouth at Banjul approximately 200 miles up river, to near Kau-Ur, and cover approximately 67,000 ha. or 7% of the total land area of The Gambia (from Land Resource Report No. 1 by M. S. Johnson). The forests are composed predominantly of Rhizophora Sp. and Avicennia Sp. Slightly more land area is occupied by Avicennia than Rhizophora. The sites occupied by the mangrove forests are flooded twice a day by the tidal rise. While tidal rise is noticeable over the entire length of the river within The Gambia, daily flooding beyond the main banks of the river does not occur sufficiently above Kau-Ur for mangrove forest development. The river banks are higher beyond this point and the daily rises in the river are generally confined to the main river bed.

Rhizophora Sp. can and does grow to large sizes along the Gambia River. Trees with main stem over 20 m. in length and ½ m. in diameter were observed along the river. Avicennia Sp. are generally much smaller than Rhizophora Sp., seldom reaching a size exceeding 7 m. main stem height or 30 cm. diameter. No total inventory of the mangrove resource has been completed for The Gambia, although an inventory is planned by the Gambian government with assistance from ODM within the next year to 18 months. However, the mangrove between Yelitenda and Kau-Ur has been inventoried and it is estimated that approximately 1,000,000 cubic meters of mangrove are standing on the 8,700 ha. of forest between Yelitenda and Kau-Ur. This is an amount of wood equal to or greater than the total annual wood consumption of The Gambia, or a BTU value equivalent to 1.5 million barrels of oil.

A salt-water intrusion barrage has been proposed for construction across the Gambia River at Yelitenda. Yelitenda is the site of the river crossing of the Trans-Gambian Highway. All traffic along the highway must cross the river by ferry and the proposed dam would serve as a bridge, as well as impounding a large pool of fresh water for irrigation. The dam will control the movement of salt water above this point during the dry season and the resultant fresh water lake would provide a source of irrigation water for approximately 24,000 ha. of land by the year 2000. The pool area of the proposed lake is greater than the present area within the river banks and would permanently flood the mangrove forests above Yelitenda. It is believed that the permanent flooding of the mangrove, along with the

removal of salt water, will result in the ultimate death of the mangrove above the dam. Considerable interest has been shown, as well it should be, in the harvest of this resource prior to dam closure and the subsequent death and possible loss of this valuable resource. The purpose of the remainder of this section is to establish the direction and type of assistance that can and should be offered to the Gambian government by AID for the harvest and use of the resource to give the maximum benefits to the people of The Gambia.

To make the best use of the mangrove resource for the Gambian people, an indepth study using the following guidelines is proposed: that the mangrove be harvested with emphasis on use of manpower rather than machine power commonly used in the U.S., Canada, and most European countries; that a water management scheme be developed for the new lake to allow for harvest following dam closure as opposed to complete harvest prior to dam closure; and that uses for the mangrove within The Gambia be developed with primary emphasis on its use as fuel.

B. Harvesting the Mangrove

Harvest of this quantity of mangrove between now and the scheduled dam closure in 1985 would be difficult even if this resource was located in Southern Mississippi, and it will be virtually impossible in The Gambia. To remove that quantity of timber in three to four years would require as highly machine-intensive and complicated a logging show as exists anywhere on earth. For example, a study conducted in Nigeria, reported in the July 1977 issue of New Africa, indicates that to harvest 200,000 cubic meters of mangrove annually would require an investment in machinery of more than five million naira (approximately $7,850,000). It would consist of numerous manually operated power saws, which for felling mangrove would require exceptional skill; six to eight yarders similar in size to a Washington 1-18, installed on barges; several floating debarkers and chippers; a water transportation system for moving logs and chips with barge capacity equivalent to possibly 50 boxcars; and unloading facilities for chips and logs. It would require 190-200 highly trained and skilled individuals to operate such a system.

The point is that operation, maintenance and management of such a system is beyond the capabilities that now exist in The Gambia. To operate such a system would require a large force of expatriates with a vast majority of salaries and benefits from the logging show not going to native Gambians. With low probability of a machine-intensive system being successful and its benefits to the Gambian people being minimal, the only alternative for harvest is a labor-intensive system.

Benefits of a labor-intensive system would be more job opportunities for native Gambians, potential lessening of adverse environmental impacts, and a probable lower per unit cost of producing wood. Use and maintenance

of handsaws and axes are certainly within current skill levels of the Gambian workforce and training would be minimal compared to that necessary for widespread use of chain saws. Hand carrying and stacking on river banks would be more environmentally satisfactory than the exclusive use of cable skidders, although some cable skidding will be required for large trees.

C. Water Management Scheme

September 1980, would probably be as early as a rational decision could be made on how to harvest and utilize the mangrove. Since considerable time would be required to order and organize manpower and machinery, it will be virtually impossible to harvest the mangrove resource completely prior to dam closure in 1985. Therefore, consideration must also be given to harvest following dam closure.

Prior to dam closure, there are only about six hours per day when the swamps are drained at low tides. The daily floodings of these soils containing high concentrations of sulfides, prevents large quantities of acid sulphates forming in the soils. Any prolonged exposure to aerobic conditions will cause acidification of soils which could, after a few weeks, have detrimental effects on aquatic life as well as definitely kill all mangrove. Some have proposed that complete harvesting must take place prior to dam closure to avoid these problems. Death of the mangrove is inconsequential since our plans are to harvest it anyway. However, long-range soil acidification could be detrimental to marine life. In this regard, discussions with University of Georgia Agronomist, Dr. Bob McCrary, and other agronomists and USDA soil scientists familiar with similar soil acidification problems along the Georgia coast, have indicated the strong possibility of a water management scheme being devised that would allow lowered water levels for reasonable intervals to facilitate timber harvest. They have also indicated that when the soil is returned to anaerobic conditions, neutralization of soils will probably occur with little or no long-term effects on marine life. Therefore, a water management scheme can be devised to facilitate harvest after dam closure. This possibility must be investigated in order to facilitate full utilization of the mangrove resource that will be inundated.

D. Possible Uses for Mangrove

Mangrove is a dense wood with 1 to 1.2 specific gravity. It has been found to be durable although subject to attack by dry land termites. It is generally unsuitable for thin boards due to its tendency to warp during drying, but it does make good timbers, house poles, railroad ties, and other large products. It is tenerally considered poor quality for manufacturing paper. Researchers have found it is suitable for making particleboard although its extremely high specific gravity would make products difficult to handle (twice the weight of pine particleboard).

Because of high specific gravity, it would probably be suitable for specialty products such as wooden agricultural bearings and shuttle blocks for textile looms. One idea proposed by other authors, which has been favorably received in The Gambia, is the possibility of construction of a particleboard plant.

Attached in Appendix A is a copy of a summary sheet of Technical Note B29 published by the Tennessee Valley Authority, October 1978. This is a proposal to construct a fiberboard plant in Tennessee of the type and size as some have proposed to build in The Gambia. The estimated cost of this plant erected in Tennessee in 1978 was $30 million. Even if a particleboard plant was reduced in size approximately one-third, the cost would still exceed $23-24 million. Such an undertaking is probably beyond financial capabilities or desires of The Gambia. It would also take about 80 high skilled employees to operate this plant. Again, these skills do not exist in The Gambia and would probably have to be imported. It is also interesting to note that a fiberboard plant of this approximate size would require two to three times more electricity than is currently consumed in The Gambia.

What is done with this wood within the country must fit the skills available and meet the needs of Gambian people. Some of the obvious needs all over The Gambia are fuel, employment, and local-use building products. The dock facilities in the Banjul harbor are probably inadequate to handle large-scale export of particleboard, cross ties, timbers, or chips.

It has also been suggested that a large, commerical enterprise could be found to harvest the mangrove for its own consumption with its own labor and machinery. This system would probably only provide The Gambia net proceeds of $1 or $2 per ton due to the high cost associated with harvest and export from the country. It seems foolish to allow a resource with a BTU value equivalent to 1.5 million barrels of oil to leave the country for a mere $1 to $2 million gain.

II. Objective and Parameters

The objective of the required services is to carry out a study of the technical, economic, environmental, and social feasibility of harvesting, processing, and marketing the mangrove resources of The Gambia. The study will identify alternative approaches, analyze their respective benefits and costs, and their social, environmental, and other effects, identify possible sources of financing for the capital investments required, and conclude with a recommendation of a particular course of action for the consideration of the Government of The Gambia.

Work done on the question to date suggests the following general parameters for the study:

A. Emphasis should be given to the exploitation of the Rhizophora Sp. in the pool area above the proposed dam at Yelitenda; however, sustained yield exploitation and management of the mangrove in the downstream reaches of the river should also be explored as one possible means to improve the benefit/cost ratio of necessary capital investments.

B. Emphasis should be placed on approaches which maximize direct benefits to The Gambia. This parameter would appear to point in the direction of approaches which maximize creation of employment for Gambians and use of local capital and entrepreneurial resources rather than machine-intensive approaches which rely more heavily on foreign capital and managerial expertise. Likewise, satisfaction of domestic consumption needs should be given priority over satisfaction of the requirements of export markets, to the extent that the former do not entail loss of significant benefits.

C. While there is no intent to pre-judge the conclusions of the desired feasibility study, use of the mangrove wood for energy appears to merit serious consideration.

D. Attention should also be given to a water management scheme which would extend the life of the mangrove in the pool area and facilitate in other ways exploitation of the resource.

III. Scope of Services

A. General

The contractor shall perform the functions described below and all others which may be required to carry out the objective described in Part II above. An estimated 18 person-months services will be required from a maximum of eight specialists:

1. Forest Products Technologist with strong background in logging;

2. Silviculturalist with strong background in forest management for sustained yields;

3. Forest Economist with strong background in marketing;

4. Industrial Engineer with strong experience in forest products utilization;

5. Anthropologist with Gambian or other closely related West African experience;

6. Soils Scientist with experience in tropical soils and problems of soil salinization and acidification;

7. Environmentalist with tropical African river basin experience; and

8. Regional/Rural Planner with experience in integrated development projects.

In performance of the desired services, the specialists shall work under the guidance of the Forestry Department of the Ministry of Agriculture and Natural Resources and shall also cooperate fully with all other government ministries and agencies. The specialists shall also take into account the data and recommendations contained in the AID Project Paper 635-0205, "Gambia Reforestation Project". Travel may be desirable to London to consult with officials of the British Overseas Development Ministry and representatives of Coode and Partners and to Malaysia and Nigeria to become familiar with techniques employed in those countries to exploit mangrove. The specialists should coordinate closely among themselves to produce one fully integrated and multi-disciplinary report.

B. Specific Services

1. The Forest Products Technologist (logging engineer) shall perform the following functions:

a. Analyze harvesting alternatives including start-up and O & M costs, types of equipment, labor requirements, etc. for both water and land-based operations;

b. Analyze transport systems such as barge or truck through the entire harvesting-processing-marketing chain;

c. Analyze storage requirements;

d. Work with the Industrial Engineer and other team members to review labor-intensive and appropriate technology approaches;

e. With the Soils Scientist, review alternatives for water management behind the dam to facilitate harvest;

f. Review processing/utilization alternatives such as charcoal production, direct energy applications, wooden agricultural bearings, cross ties, textile shuttles, etc.;

g. With respect to all of the above, the consultant shall give emphasis to the Rhizophora Sp. in the area above the dam; however to the extent that sustained yield management of the downstream resource is possible from a silvicultural point of view, he shall also analyze equipment, labor, transport, processing, and marketing requirements for that resource.

2. The Silviculturalist shall perform the following functions:

a. Work with Soils Scientist and Environmentalist to analyze alternatives for water management behind the dam to prolong the survival of the Rhizophora Sp. following dam closure;

b. Review results of ODM-financed inventory of mangroves in the downstream areas to determine volume, mean annual increment, conditions of natural regeneration, etc. of the resource;

c. Analyze alternatives for management of downstream mangroves for sustained yield exploitation consistent with needs to preserve wildlife and aquatic habitat and maintain stability of river banks.

3. The Forest Economist shall carry out the following functions:

a. Work with the Forest Products Technologist, the Industrial Engineer, and other team members to carry out macro and micro-economic and financial analyses of the alternatives identified for harvesting and processing the mangroves, both upstream and downstream of the proposed dam;

b. Use benefit/cost ratios, financial and economic internal rates of return, or other appropriate measures in connection with the above analyses;

c. Estimate the recurring costs accruing to the Government of The Gambia as a result of the alternatives;

d. Work with the Forest Products Technologist and the Industrial Engineer to determine the costs of transportation or other infrastructure improvements required by the alternatives;

e. Analyze markets for the various potential products, both domestic and foreign;

f. Analyze the foreign exchange impact of the harvesting and processing alternatives.

g. Analyze sources of financing for capital investments required by the alternatives, including domestic and foreign, commercial and concessionary;

h. Work with the Anthropologist to examine the differential employment/income effects of the alternatives proposed for harvesting and processing;

i. Examine the effect of inclusion of the downstream resource on the economic feasibility of exploiting the upstream resource.

4. The Industrial Engineer shall perform the following functions:

a. Work with Forest Products Technologist to analyze alternative uses of mangrove, such as cross ties, charcoal, fuelwood, power generation, etc.;

b. Identify foreign exchange and other capital investment costs, O & M costs, manpower requirements and costs, etc.;

c. Work with the Forest Products Technologist, the Economist, and the Silviculturalist to confirm the adequacy of the supply of mangrove (upstream and downstream) for the uses proposed;

d. Work with the Economist to determine the economic and financial feasibility of the alternatives proposed;

e. Analyze requirements for supporting infrastructure such as power systems, ports, roads, warehousing, etc. and work with the Economist to determine their costs;

f. Analyze labor requirements of various alternatives and work with the Anthropologist to determine the source and adequacy (number and skills) of labor;

g. Review labor-intensive and other appropriate technology approaches for processing;

h. Analyze options for locating the processing facilities.

5. The Anthropologist shall perform the following functions:

a. Work with the Forest Products Technologist and the Industrial Engineer to determine sources of labor for the harvesting, processing, and marketing alternatives identified;

b. Analyze adequacy of labor sources in terms of numbers and skills and in view of competing requirements for labor in connection with the construction of the proposed bridge/dam at Yelitenda and peak season agriculture;

c. Work with the Economist to determine the differential impact of alternatives proposed for harvesting, processing, and marketing on population groups such as the rural poor, the urban poor, etc.;

d. Work with the Regional/Rural Planner to analyze requirements of the various alternatives for supporting social infrastructure.

6. The Soils Scientist shall perform the following functions:

a. Work with the Silviculturalist and the Environmentalist

to determine the impact of sustained yield exploitation of the downstream resource on river bank stability;

b. Work with the Environmentalist, the Silviculturalist, and the Forest Products Technologist to explore alternatives for water management above the dam with a view toward prolonging the life of the upstream resource;

c. Analyze the impact of exploitation of the mangrove in the dam's pool area on river bank stability, soil acidity, etc.

7. The Environmentalist shall perform the following functions:

a. Work with the Silviculturalist, the Soils Scientist, and the Forest Products Technologist to determine the impact of the alternatives proposed for harvesting the mangrove both upstream and downstream of the bridge/dam;

b. In doing the above, the Environmentalist shall examine the effects of soil acidification in the pool area on the mangrove resource and on the habitat of fish, birds, and other forms of aquatic, plant, and animal life;

c. Work with the Soils Scientist and the Forest Products Technologist to determine the effects of the harvesting alternatives on river bank stability, water quality, habitat, etc.;

d. Work with the Economist and the Anthropologist to analyze the impact of disruption of the habitat of aquatic, plant, and animal life on the diets and incomes of surrounding populations;

e. Work with the Industrial Engineer to analyze the impact of effluents of the various processing alternatives;

f. Work with the Anthropologist and the Regional/Rural Planner to analyze the environmental impact of potential labor influx into the area around Yelitenda, particularly in view of labor already attracted to the area by employment opportunities created in connection with construction of the dam/bridge.

8. The Regional/Rural Planner will be responsible for the following functions:

a. Work with the Industrial Engineer and the Forest Products Technologist to determine best locations for the various processing alternatives such as tiemills, etc.;

b. In cooperation with other appropriate team members, analyze the impact of the various processing alternatives on those

locations in terms of increased demand for housing, health, and other social services;

c. Analyze in particular the impact on the Yelitenda area of the probable labor influx with respect to increased demands for housing, health, other social services, and availability of food stuffs and other essential commodities in surrounding market towns.

IV. Timing

The study shall be carried out in a six-month period beginning approximately September 1980 and ending approximately March 1981.

V. Contract

The contract shall be negotiated and signed by the Forestry Department of the Ministry of Agriculture and Natural Resources of the Government of The Gambia. The contract shall be financed by AID under the Gambia Forestry Project 635-0205. It is anticipated that the contract will be in the lump-sum form.

VI. Reports

The Contractor shall submit the following reports:

A. An Inception Report (10 copies to the GOTG and 10 copies to AID/Banjul) within 45 days following the starting date, summarizing the methodology and procedures for conducting the study including the preliminary findings and conclusions;

B. A Draft Final Report (10 copies to the GOTG and 10 copies to AID/Banjul) within four months of the starting date which shall:

1. Summarize the methodology and procedures used;

2. Describe the results of the technical, economic and financial, environmental, and social analyses carried out;

3. Make recommendations to the Government as to the optimal alternatives for harvesting, processing, and marketing the mangrove resources of The Gambia;

4. Make recommendations to the Government with respect to sources of financing which may be required and the timing for submission of the study to those sources.

C. A Final Report (50 copies to the GOTG and 50 copies to AID/Banjul) within one month of receipt of comments on the Draft Final Report from the GOTG and AID, incorporating required revisions.

VII. Data, Local Services and Facilities to be Provided by the Government

A. The Forestry Department will coordinate the Contractor's contacts with all other GOTG ministries and agencies in order to provide the Contractor with all available information that may be reasonably required for the services;

B. The Forestry Department will provide the Contractor with the following facilities, equipment, and supporting staff in The Gambia:

1. Office space, furniture, and supplies;

2. Land transportation by four-wheel drive or other suitable vehicle during approximately two months or 40 working days;

3. Secretarial support (one secretary);

4. River transportation in connection with viewing the mangrove resource.

VIII. Local Facilities, Services, and Equipment to be Provided by the Contractor

A. All transportation, office equipment, and secretarial support required in addition to the above;

B. All professional equipment, tools, reference materials, etc. which may be required;

C. Data processing services;

D. Housing and utilities;

E. Communications services.

IX. Evaluation Criteria

The following criteria will be used by the Forestry Department in reviewing the technical proposals submitted in response to this Request for Technical Proposals:

A. Understanding of the services to be performed (20%);

B. Previous experience in similar undertakings, particularly in Africa (20%);

C. Skills, qualifications, and background of personnel to be supplied (50%);

D. Support which will be provided by the corporate headquarters (10%).

The contract will be negotiated with the highest ranked offeror. Funds have been allocated by AID for the contract based on the estimated level of effort required to perform the desired services, i.e., 18 person-months. If it is not possible to negotiate a contract with the highest ranked offeror within these approximate financial limits, the Forestry Department will then proceed to negotiate with the second-highest ranked.

ANNEX F

ECONOMIC AND FINANCIAL ANALYSIS

Fred Kaiser
Economist
U.S. Forest Service
Department of Agriculture

April 4, 1979

I. Plantation Development

A survey carried out during 1973 indicated the total annual wood consumption of The Gambia was 877,900m^3. This is based on a per capita consumption of 1.72m^3 per annum estimated by Openshaw. This per capita consumption level is high based on studies of other countries in West Africa; however, it is probably realistic considering the techniques used by Gambians to harvest and utilize their forest resource.

To obtain such quantities from the existing woodland would mean that those woodlands would have to produce at least a mean annual increment of 2.2m^3 per hectare. Although no figures are at present available for the production rate of Gambian woodland, figures for comparable areas in Nigeria indicate that 1.4m^3 per hectare is likely to be the highest possible figure for natural stands.

In order to help meet Gambian wood requirements, there is a need to establish plantations of fast growing species. To date, some 1,250 ha. have been planted with Gmelina arborea, a species which grows well in western Gambia.

A. Plantation Establishment Costs

Seed of Gmelina arborea was introduced in The Gambia in 1951 from Sierra Leone and, since then, the species has played an increasingly important role in the program of reforestation. A relatively cheap technique for plantation establishment has evolved. It involves the participation of local farmers in a modified taungya system in which the farmers plant farm crops between the rows of trees during the first growing season.

Establishing Gmelina arborea plantations involves a number of steps. First, contractors are retained to clear the land about nine months before planting. Sawlogs are then removed to the Nyambai Utilization Unit, the only sawmill in The Gambia. Next, charcoal makers and fire-wood merchants are encouraged to use remaining wood. Oil palms, bamboos, immature Khaya senegalensis, and Chlorophora regia are not felled because of their future value. Finally, the area is burned over. Reported clearing and burning costs are 185 dalasis per hectare.

Roads and fire breaks are also constructed during this time period. Access is needed for management purposes. Control of wildfires in plantations has proven critical. First year costs for roads and fire protection are 35 dalasis per hectare.

Seed is then collected from previously established plantations called seed orchards. Gmelina begins to set seed in its fifth year and,

from then on, large quantities are produced annually in April-May. The seed is collected from the ground by women on a contract basis. By exerting pressure on the seed coat with two pieces of wood, the women extract the seed.

Next, the plantation area is ridged to provide suitable sowing sites. Sowing commences usually in the latter part of June or early July when the soil is moist to a depth of 12 cms. Spot sowing is carried out along the ridges with 3 seeds being sown at 1 meter intervals. Ridging, seed procurement, and sowing costs average about 90 dalasis per hectare. Surplus seedlings produced are used for the annual National Tree Planting Festival.

When clearing has been completed and about the time of ridging, meetings are held with local villagers. Individuals are allocated land within the planting area for the cultivation of farm crops or groundnuts between the ridges. Presently, no charge is made for the use of the land, but individuals sign an agreement with the Forestry Department that they will not damage the trees when tending their crops.

Tending responsibilities by the farmers normally call for two weedings, one 10 days and one 25 days after planting. The weeded material is used as a mulch to reduce water loss by evaporation.

However, it is also necessary to carry out at least one hand-weeding along the ridges during the latter part of the first year and another weeding in the second year. The third weeding in the first year costs 90 dalasis per hectare, while the second year weeding costs 70 dalasis per hectare.

Gmelina arborea is very palatable to grazing animals. Plantations must be fenced by harvest time when domestic animals, which are tied up during the growing season, are free to wander. Fencing consists of a five strands of barbed wire mounted on creosoted posts. Fencing costs 250 dalasis per hectare.

Other plantation establishment costs involve the surveying and demarcation of boundaries, additional labor costs when the taungya system was not effective, and replanting in case of seeding failure. These costs have been averaging about 40 dalasis per hectare.

B. Economic and Financial

The approach used in analyzing the economic feasibility of the project has been oriented toward the quantifiable measures of economic values. However, the quantitative analysis should not overshadow the fundamental environmental benefits behind this proposal.

The Gambian Forestry Division has been involved since 1951 in research on establishing Gmelina arborea. Although some desired research information is not available, this past work has permitted a reasonably precise economic analysis.

Implementation of this project will reforest 1,300 hectares. About 75% of the production will occur as fuelwood, 10% as charcoal and poles, and 15% as lumber. Based on current management techniques, the first fuelwood will be harvested in five years with additional production occurring throughout a 30-year period.

It is anticipated, based on Gambian forest trials, that Gmelina arborea will yield 15m^3/ha./year. Although the Gambian Forestry Department is confident that the plantations can yield this level of performance, the project design team used a more conservative estimate of 12m^3/ha./year in its sensitivity analysis.

In the basic analysis, it was assumed that a mixture of firewood, charcoal, poles and lumber will be produced as shown in Table I. A 30-year rotation was anticipated, with thinning or cutting every five years. Sawtimber would be harvested at 15 and 30 years. Where trees are removed, coppice sprouts will produce new trees. The value of production is anticipated to be 10 dalasis per m^3, shown in Table 1. Positive returns are anticipated in all years except the first five years. Table 2 provides a cash flow projection for the entire 1,300 ha. plantation and shows similarly positive returns for the same basic rotation.

Table 1

Anticipated Per Hectare Plantation Costs and Returns in Dalasis[1/]

Operation	(Year)	Cost	Return	Net Benefit
Establishment	(1)	690	85[2/]	-605
Weeding	(2)	70	-	- 70
40% Thinning	(5)	80	300	220
45% Thinning	(10)	80	540	460
Harvest	(15)	165	1,410	1,245
40% Thinning	(20)	80	300	220
45% Thinning	(25)	80	540	460
Harvest	(30)	165	1,410	1,245
TOTAL		1,410	4,585	3,175

1/ D 1.00 = U.S. $0.52

2/ Returns to government for charcoal produced during site clearing.

Table 2

Cash Flow Projection for 1,300 Hectare Plantation
(Dalasis)

	175	225	275	300	325	Add Fire Control[2]	Outlay	Return	Net Ann. Return	Net Cum. Return
1.	E -120,750 C +14,875						-120,750	+14,875	-105,875	-105,875
2.	W -12,250	E -155,250 C +19,125				-1,750	-169,250	+19,125	-150,125	-256,000
3.		W -15,750	E -188,750 C +24,200			-4,000	-208,500	+24,200	-186,300	-411,300
4.			W -19,250	E -207,000 C +22,500		-6,750	-233,000	+22,500	-210,500	-651,800
5.	T_1 -14,000 R[1] +82,500			W -21,000	E -224,250 C +27,625	-9,750	-272,000	+80,125	-191,875	-843,675
6.		T_1 -18,000 R[1] +67,500			W -22,750	-13,000	-53,750	+67,500	+13,750	-829,925
7.			T_1 -22,000 R[1] +82,500			-13,000	-35,000	+82,500	+47,500	-782,425
8.				T_1 -24,000 R[1] +90,000		-13,000	-37,000	+90,000	+53,000	-729,425
9.					T_1 -26,000 R[1] +97,500	-13,000	-39,000	+97,500	+58,500	-670,925
10.	T_2 -14,000 R[1] +246,750					-13,000	-27,000	+246,750	+219,750	-451,175
11.		T_2 -18,000 R[1] +317,250				-13,000	-31,000	+317,250	+286,250	-164,925
12.			T_2 -22,000 R[1] +387,750			-13,000	-35,000	+387,750	+352,750	+187,825
13.				T_2 -24,000 R[1] +423,000		-13,000	-37,000	+423,000	+386,000	+573,825
14.					T_2 -26,000 R[1] +458,250	-13,000	-39,000	+458,250	+419,250	+993,075
15.	H -28,875 R +246,750					-13,000	-41,875	+246,750	+204,874	+1,197,949
16.		H -37,125 R +317,250				-11,250	-48,375	+317,250	+268,875	+1,466,824
17.			H -43,375 R +387,750			-9,000	-52,375	+387,375	+335,375	+1,802,199
18.				H -49,500 R +423,000		-6,250	-56,020	+423,000	+367,000	+2,169,199
19.					H -53,625 R +458,250	-3,250	-56,875	+458,250	+401,375	+2,570,574

1. D 1.00 = U.S. $0.52
2. GOTG financed

E = Establishment (-D 690/ha.)
W = Weeding (-D 70/ha.)
T_1 = First Thinning (-D 80/ha.); Revenue (+D 300/ha.)
T_2 = Second Thinning (-D 80/ha.); Revenue (+D 1,410/ha.)
H = Harvest (-D 165/ha.); Revenue (+D 85/ha.)
C = Charcoal from clearing (+D 85/ha.)
R = Revenue

One of the features of Gmelina is that rotations can be adjusted depending upon the type of output desired. Although a combination of firewood, charcoal, poles, and lumber production was used to analyze the basic rotation cycle, a purely fuelwood rotation could be developed after the plantations were established. If only fuelwood were produced, average yields would likely be higher, but the average product values would be somewhat lower. To evaluate this alternative, the PP team has included a fuelwood evaluation of the plantations in the sensitivity analysis.

All resulting rates of return were positive. The basic rotation cycle, using constant 1979 prices, was 10.0% (Table 3). However, when the Gambian Forestry Department establishes plantations in new locations, the rate of return may be somewhat lower, 7.3%. Lower yields per hectare and a fuelwood rotation also would reduce the rate of return.

Table 3

Rate of Return Anticipated from Plantations

	Forest Units Near Current Plantations	New Forest Units
A. Basic rotation[1/]	10.0	7.3
B. Basic rotation using wood yields lower than those actually anticipated	8.1	5.9
C. Fuelwood rotation	7.9	5.8
D. Increased value from sawmill efficiency	11.1	9.4

1/ Costs and returns shown in Table 1 plus D 10 per hectare annual fire control cost.

A higher rate of return is anticipated, however, if recommended utilization improvements are made both during harvesting and in the sawmill operations. Such improvements will result in higher yields per hectare and increased quantities of higher quality products from the sawmill.

C. Other Benefits

A number of benefits will result from the plantation establishment in addition to the financial returns to the GOTG. Records of yields in 1976 revealed the following harvests by farmers and charcoal makers from a 405 ha. plantation:

Groundnuts	18 tons
Pumpkins	1,146 (units)
Calabashes	186 (units)
Charcoal	78 tons

Using 1976 prices, the value of these products was D 20,230 ($10,540) or D 500 ($260) per hectare.

Indirect values also accrue from plantations. Based on input-output analysis of timber industries elsewhere, these values should be at least three times the stumpage value. Such indirect values include employment during harvesting and processing and the support of other industries when employees purchase services, food or other tangibles.

Another major economic benefit from the project but difficult to evaluate is the benefit to the environment. First and most important, the project will spare large natural areas of forest. Research has shown that maintaining natural forest cover is one of the front-line defenses against desertification. One hectare of plantation output is estimated to equal about 10.7 ha. of natural output. Secondly, in the project area, the plantations will afford cover which will protect the soil from wind, sun, and torrential rain impacts. With proper weeding, rainfall infiltration should be improved. This will encourage optimal utilization of the local natural resource base by farm crops or trees.

ANNEX G

SOCIAL SOUNDNESS ANALYSIS

S. P. Reyna
Anthropologist
REDSO/WA
Abidjan

March 30, 1979

CONTENTS

CONTENTS (continued)

CONTENTS (continued)

INTRODUCTION

The following analysis is an assessment of the conditions for a socially sound "Reforestation in the Gambia" Project (635-0205). Certain recommendations are offered to facilitate a more socially sound project. The project has four major components:

1. large-scale plantations
2. demonstration/outreach village woodlots
3. training (local, third country, and U.S.)
4. a mangrove feasibility study

The analysis includes three sections:

1. a definition of the target population
2. an evaluation of the social soundness of plantations and woodlots in terms of:
    a. beneficiaries
    b. benefit incidence
    c. resource access
    d. participation
    e. undesired socio-economic consequences
    f. replicability and
    g. socio-cultural feasibility
3. a set of guidelines is presented for a socially sound project

SUMMARY

1. An important issue in the Gambia Reforestation Project is the social soundness of village-woodlots (hereafter "woodlots") and large-scale forestry department plantations (hereafter "Plantations").

2. Woodlots directly offer to rural poor the potential of better managing their forest resources. However, their feasibility is less certain than that of plantations.

3. It is certain that resultant, from prevailing population trends, there will be increased consumption of forest resources, and that if there is not increased forest production poverty will increase.

4. A project entirely dependent upon woodlots is on riskier feasibility grounds, while one emphasizing only plantations raises grave social soundness concerns. Therefore it is judged prudent to develope both woodlots and Plantations.

5. Suggestions are made for more socially sound plantations and woodlots.

6. An evaluation program is suggested to develope an expanded, second-phase Gambia Reforestation Project.

I. DEFINING THE TARGET POPULATION

In the Gambia the rate of population icrease exceeds the rate at which trees are removed from the land. It is this situation which must be addressed.

A. Demography

The Gambia has a population of approximately 550,000. A growth rate of 2.8% per annum (2% natural increase, .8% immigration), which is one of the highest in Africa and implies a doubling of the present population by the turn of the century. Total surface of The Gambia is 4,018 square miles, with a crude population density of 122/square mile, which appears to be the fourth highest density in sub-Saharan Africa. Approximately 85% of the population is rural. Rapid population growth at already evaluated population densities places considerable strains on The Gambia's natural resources. This is especially true with regard to the rate of loss of woodland. Between 1946 and 1968 the percentage of land surface in forest dropped from 28% to 3.4% (14).

B. Ethnic Groups

The 1973 census identified 21 ethnic groups of which five represented the vast majority, as is indicated in the following table:

Table 1: Gambia Ethnic Groups (3)	%
Mandingo (including Jahonkas)	42.3
Fula (including Lorobas and Tukulora)	18.2
Wollof	15.7
Jola (including Karoninkas & Mansuwankas)	9.5
Serahuli	8.7
Serere	2.1
Manjago	1.3
Aku	1.0
Bambara	0.4
Other Gambians	0.8

Wollofs predominate in the urban area of Banjul (41% of total). Mandingos are found in rural areas. Though Fulas predominate around Georgetown, and Serahuli in Basse (3).

Ethnic differences are not "profoundly divisive" (9), because within The Gambia "a process of tribal disintegration has been in progress since before the British...." (10). The existence of ethnic divisions is likely to be irrelevent to the success or failure of any interventions within the forestry sector.

2. Gambian Poverty

The crucial point is with the exception of a small urban elite, all Gambians are poor - however the country exhibits certain poverty differentials.

A. Cross national comparisons

Compared against other LDC's The Gambia stands out: "With a per capita income of $130 per annum (by IBRD estimates...) life expectancy of 35 years, annual public expenditures of about D 14 (US$ 5.80) per capita on health, lower rates of primary and secondary school attendance than most other coastal West African countries.... almost no industry, a school system that produces unemployed middle school leavers despite tiny absolute numbers, and a rural rate of literacy in English of less than 5%, there can be no doubt that even by LDC standards the Gambia and Gambians are among the poorest of the poor". (9)

B. Rural/Urban Poverty Differential

The rural areas with an estimated per capita income of between US$ 93 and 113 (a full 1/3 below World Bank calculations - (3), is considerably disadvantaged in comparison to the urban area (with the most disadvantaged rural areas being to the East...) As D. Aronson observes: "The concentration of wage opportunities, higher incomes amenities of all sorts, and access to the decision-making process in the Banjul area is readily demonstratable. If one adds the Western part of the Western Division as an extension of the urban area - then the list of privilages would also include receiving the lion's share of government services in primary schools, farm extension and experimentation work, and health outreach..." (9).

In the rural areas, farmers and herders produce whatever conditions of well-being they have with little government intervention except as keepers of the peace, as cash crop purchasers, and price controllers..." (9:7).

C. Resource Depletion: A New Determinant of Poverty

With the institution of colonial incursions certain political factors common to 19th century open-economies became influential determinants of the Gambia's poverty. In the near future alterations in the eco-system will become important determinants

of poverty. Depletion of forest resources will impact on well-being in two ways. First, timber is at present for the bulk of the rural population a free-good. Increasing scarcity will cause its value to rise, taking an increasing portion of this population's already extraordinarily low income. Second, loss of tree cover will exacerbate processes of soil erosion, increasing declines in agricultural productivity, with consequent further declines in rural incomes.

In summary, increased forest production can combat an increasingly significant determinant of poverty. To know how the benefits of increased production can be brought to the rural population we need to know more about rural society. It should be clear, the target population, given the "new directions" mandate must be The Gambia's rural inhabitants. It should be equally clear that in targeting this population, the project is acting in conformity to Gambian explicit development priorities for the present five year first national development plan emphasizes: "reduction in the internal disparities of income distribution" through "concentrating growth in the rural areas" (12).

3. Rural Society

This section includes background information concerning aspects of the target population's society through which the project must function to achieve its goals, and which can provide opportunities for more efficient and equitable implementation.

A. Administrative Divisions

The Gambia is divided into five divisions and 35 districts. Each division is headed by a Commissioner appointed by the Ministry of Local Government. Districts are headed by elected chiefs (Seyfo), who are the major administrative and judicial officers within their districts. The seyfo's authority is exercised through a District Council composed of village headmen (alkali) and a Court Council in which predominate trusted elders from the seyfo's village. It is the seyfo, to a large extent, on whom rests the responsibility of articulating between the national government with its programs and villagers with their needs.

B. Villages

Most rural farmers live in permanent villages strung out along the Gambia River ranging in size from 15 to 3,500 persons. Gamble says of the Mandingos' village, that it:
"can be considered the highest effective unit of social organiza-

tion, though in a few instances we do find groups of related villages with mutual obligations on important ceremonial obligations " (1)

Large villages will have a mosque (or sub-mosque), some shops, tailors, and perhaps a baker. Villages are internally sub-divided into wards and compounds.

C. Wards

Wards (kabilo) are like neighborhoods within villages. According to Lowe:
"The core of the kabilo is a patrilineal kin group but it often accomodates temporary residents...and permanent compounds not related to the patrilineage"(3:269).

Four different social strata may be distinguished within a ward: (1) compounds containing patrilineal, free-born descendents of the village's founders (langsarlu); (2) compounds that have hived off from those of the orginal langsarlu; (3) compounds of persons of slave origin; (4) compounds of immigrant settlers.

D. Compound

Wards are sub-divided into compounds (suo or korda) which in Lowe's study averaged 22 individuals (range 2 to 137) (3:270). They are distinctly fenced collections of sleeping quarters, sitting rooms, kitchens, storehouses, animal enclosures, and even small gardens. Residing amongst this collection of buildings are ifferent families. Usually the men in the families will be related by patrilineal descent - being brothers, or sons of brothers. On marriage men will stay put and their wives come from other compounds to live in that of their husbands. As men age they will take additional wives. (in one sample 72% of the men possessed one or more wives - (3:279).

Compounds include cooking-units (sinkiro) and agricultural work-units (dabada). The former are groups of women who agree to feed a group of the compound's families. A simple sinkiro would be a wife's husband and her children; a more complex one would include the rotation of cooking chores between the wives of the offspring of two brothers. Dabadas are often made up of brothers or cousins within compounds who decide to cooperate in agricultural production.

The compound head (sutio) is the oldest male member of the family. He will be succeeded by his brother who is closest to him in age, or failing a surviving brother by his eldest son. In the past compound heads enjoyed considerable authority over social, economic, and religious affairs of compound members. Presently, this authority is eroding. The presence of dabadas within compounds is reported to be a sign of rift within the compound, where "the compound head will usually retain control over land allocation, social and religious functions, house construction and compound maintenance, while

the heads of individual debadas will control the labor on their farms and to a limited extent their own financial affairs" (3:270).

E. Age-sets and grades

Each villager belongs to an age-set for life. These are groups of individuals roughly the same age. There are age-sets for men and women which are formally entered at a ceremony starting an age-set when a person undergoes circumcism. Age-sets are divided into three broad age-grades (kafo). For males there is:

a. a pre-circumcism age-grade
b. a young men's age grade (kambani kafo)
c. an elder age-grade (keba kafo)

Depending on the size of a village age-sets and grades are either village or ward based. Compound heads are automatically members of the elder age-grade. Age-sets and grades each have a leader and an assistant leader. The head of the young men's age grade acts as a coordinator and liason between the young men's and elder's age-grades.

Age-grades, especially the young men's had as "the main function...the supply of communal labor, especially as a means of overcoming 'bottlenecks' in some of the farming operations" (4:63). How to utilize the young men's age-grade is discussed in the succeeding section.

Kafo-labor is not free labor. The fees kafos charge vary with location, tasks, and the social status of the individual utilizing kafo labor. Fees may be in money or food. Lowe reports the following charges in the early 1970's:

Village 1:

age-set	payment for 1 days work (of circa 8 hours) regardless of work-group size)
10-13	D3.50
14-20	D3.00
20-27	D13.00

Village 2:

under 11	D11.00

Villagers interviewed in one village were being paid with food for kafo work by the WFP. The remuneration appeared to be one day's ration of rice, onions, and oil per worker. It should be stressed that it is not clear what is the present amount of remuneration of kafo-labor, and equally understood that its costs appear relatively small for the amounts of labor provided.

The GOTC has been quick to seize on the potential of kafo labor, employing it for a variety of development interventions. Villagers interviewed had built roads, culverts, clinics, bridges, and schools with kafo-labor.

F. Village Decision-making

Village decision-making follows a 'consensual' rather than a 'command' pattern. The headman (alkali) plays a key role in achieving consensus. The alkali is generally the oldest surviving male in the oldest langsarlu patrilineage within the village. He is assisted by his next youngest brother, or his eldest son. It is understood that he will be succeeded by this assistant.

Village policy is achieved through the elder age grade. This age-grade (keba kafo) normally consists of the alkali, his assistant, the imam (religious leader), the head of the young men's age-grade, the head of the immigrants within the village, ward heads, and compound heads. Within most villages there is an 'inner informal cabal' of about 12 males of great age and high owner/settler status. This group does not issue orders, but "tends to aggregate the interests of the whole village and uses various unofficial consensus making devices. During informal discussions with adult members of the village each member of this ruling oligarchy elicits and attempts to shape the opinions of the majority " (3:278).

G. Land tenure

Salient aspects of The Gambia land tenure system are presented below:

1. Outside of urban areas there is no individual or collective ownership of land "in the sense that land is registered and title conferred " (3:283). Rather the 1966 Land (Provinces) Act protects customary rights of land tenure which have historically evolved.

2. The following authority is vested in the village head (alkali) the right to allocate unused, unowned village-land to immigrants. Once land has been allocated, the alkali has only symbolic authority over it. The fundamental principle is: once the alkali has given land away it is out of his control. Most land in most villages is presently not under the headman's control.

3. Most land in rural Gambia is under the jurisdiction of compounds. Within compounds the head possesses the right to reallocate any of the compounds unused land to outside individuals. This land is merely loaned, and must be returned upon request.

4. Neither the alkali or the compound head has the right to sell, rent, or morgage land under their jurisdiction.

Two points are relevent:

(1) the alkali should in no way be treated as the village landowner, as there is actually very little land under his control
(2) persons most likely to be adversely impacted by transfer of lands from agriculture to forests are those individuals who have merely asked compound heads for permission to exploit compound lands. (this farmers are labelled 'strange' farmers).

II. SOCIAL SOUNDNESS: WOODLOTS AND PLANTATIONS

Project No. 635-0205 proposes two ways of increasing tree production through woodlots and plantations. These are compared in terms of the following factors germaine to their social soundness:

a. beneficiaries
b. benefit incidence
c. resource access
d. participation
e. socio-economic consequences
f. replicability
g. socio-cultural feasibility

1. Beneficiaries

Our interest is whether the beneficiaries will be the target population - rural poor

a) woodlots: should woodlots succeed, and should they by located in rural areas, then rural inhibitant would benefit by being assured of a long-term renewable resource, a diversified fuelwood and charcoal supply, and a new income opportunity

b) plantations: Openshow, author of the only significant wood consumption survey in the Gambia, concludes that "large scale forest plantations will be required to meet the demand of the urban areas and for export " (5:51). He recommends that the products of the plantations should be 60% fuelwood, 2% poles, and 38% sawnwood (5:51) - should these recommendations be followed, then:

i) the products of the plantations will be enjoyed by a relatively advantaged area (urban);

ii) as the purchase of poles and sawnwood are luxuries, for people earning less than US $100, it can be concluded that 40% of the large plantation's output will be directed at more advantaged government and private sector wage earners. It might be argued that by supplying the

urban population with wood, that the project would indirectly benefit rural poor by reducing competition between rural poor and urban areas for an increasingly scarce product. However, urban demand wood is not so great that wood is cut a great distances from Banjul. The Forestry Department reports that most fuelwood for Banjul comes from within 40 kilometers of the city. Thus, for the rural population within 40 kilometers of Banjul there would be lessened competition for a scarce commodity. But, as The Gambia DAP observes this rural populations is the most privilaged within the country, and for the rest beyond the 40 kilometer radius there are no benefits. Plantations as presently conceived stray from the target population.

2. Benefit incidence

A key factor with regard to benefit incidence is the number of employment opportunities the two forms of plantations could provide.

a) woodlots: It generally accepted that village woodlots could provide employment opportunities for a large number of villages, with an employment level per unit of land of between 3 to 5 persons/acre in West Africa. However, the key factor is the number of villages within which woodlots are successful. If woodlots do not work, they obviously will provide few employment opportunities.

b) plantations: Larger-scale plantations tend to be relatively labor unintensive. Openshaw estimates that if 93,000 acres were developed of large-scale plantations that 4300 job opportunities would be created, or .05 jobs/acre. This figure also contrasts with employment in the agricultural sector, where the adult worker cultivates 1.84 acres, which means that 93,000 acres would provide employment to 50,543 farmers. Employment opportunities per unit of land are approximately 12 times greater in agriculture than Openshaw predicts for large-scale plantations.

However, the Forestry Department, using the 'contract' system has shown a willingness to use more labor-intensive forms of utilization on its reserves. There is no reason that this labor-intensive inclination on the part of the Forestry Department cannot be encouraged and increased.

3. Resource Access

One key to a BHN's strategy is increasing access to natural resources.

a) woodlots: The woodlot keeps the land used for plantations within the possession of the village. At the very least, at the level of the village access to land resources is controlled by villagers.

b) plantations: Openshaw predicts by the year 2000 that The Gambia will require 93,000 acres of large-scale plantations (5:51) to satisfy its forest product consumption requirements. This figure may or may not be accurate, but, regardless of the exact amount of land required, it indicates that a fair amount of land might be required in a country of only 4000 square miles. The Forestry Department would use the Forestry Law to expropriate village-land to bring it under its jurisdiction for the large-scale plantations. Use of these forests for fuelwood will be restricted to parties cutting dead wood, who have paid a licensing fee currently set about 30 delasis, which is approximately 15% of the average annual income. Prior to expropriation forest resources were a free good available to all. Following this action forest resources will be largely restricted to those individuals able to satisfy the financial conditions set by the Forestry Department. Clearly, the rural poor's access to their land resource base will have been restricted.

4. Participation

An aim of the 'new directions' mandate is that people directly participate in planning for changes that crucially effect their lives, and as much as is realistic, in the management of enterprises which are basic to their welfare.

a) woodlots: The key to a village woodlot is that villagers are taught to manage themselves their forest resources. What is transfered are knowledge and skills, which are, then, employed by villages to satisfy their own needs.

b) plantations: It appears, as judged by present operations of the Forest Department on its plantations, that all decisions relevent to the management of its resources are made by members of the Forest Department. These decisions are, then, communicated to the 'contractor', who issues orders to his workers. Participation

is restricted to doing what you are told. Note: the Central Philosophy of The Gambia's present five year plan is based on "popular participation".(12:6)

5. Socio-economic Consequences

Our concern is that the operation of the two forms of forest-production might provoke unintended, undesirable consequences.

a) woodlots: Certain social analysts have commented on increasing inequities within rural villages, frequently involving wealthier, village-founders taking advantage of their neighbors (4 and 2). It is not inconceivable that the village-head and the small elite of his compatriots could manipulate woodlots to their advantage.

b) plantations: To secure labor for a number of its activities the Forestry Department utilizes what is called the 'contractor' system, where it selects a person, the contractor, and gives him a 'piece' of work, i.e., to clear some land, cut second growth, etc. The contractor then, recruits and supervises laborers. The contractor is paid by the Forestry Department who in turn pays his laborers - by the job.

Little is known concerning the 'contractor' system. No literature appears to exist concerning the topic. In all the villages where I interviewed, informants were asked about working as contract laborers. All respondents, save one, said that they did not like the system Note: one informant who spoke harshly of the system was himself an ex-contractor. Complaints consistently included:

i) that laborers felt they were not paid enough
ii) that their positions were insecure
iii) that contractors were arbitrary with respect to wages and conditions of employment

Informants' responses can be interpreted in one of two ways:

i) as the normal dissatisfaction of workers with their bosses, or
ii) as articulation of the complaints of a class of marginal workers.

This class would be distinguished by the capriciousness of all its terms of employment and lowness of its remuneration. Evidence is not available to permit selection between the two interpretations. However, it is not in AID's mandate to assist in the creation of a marginal class of seasonal workers. It is in AID's mandate to develop an equitable and efficient labor system for plantations.

6. Replicability

By replicability is meant the capacity for the activities generating benefits to increase benefit incidence. A key consideration is what benefits one is observing.

a) woodlots: There is little data on which to base empirical predictions concerning woodlot replication rates. Regardless of whether woodlots succeed or fail they take managing, i.e., the villages learn the skills and undergo the experiences of managing their forest resources. Studies suggest that managerial expertise acquired for one enterprise is readily transferable. (If I learn to manage a candy-store, it is quite likely I would do alright running a hardware store. If I become an artist, oblivious to the nuances of guiding any business, the prospects that I could manage either a candy or a hardware store are low. It is in this sense we are speaking of managerial skills being transferable.) In short, acquisition of managerial is a factor enhancing a population's ability to replicate any benefit.

   Regardless of woodlots' outcome, villagers will be exposed to very considerable information concerning the need to and ways of conserving their habitat. The possibility for diffusion of awareness of environmental problems is increased.

b) plantations: Plantations are unlikely to experience great successes diffusing either managerial skills or environmental awareness. Most workers on plantations will be seasonal, piece workers, planting, clearing, weeding or thinning. Such work, like production-line work, is inappropriate for acquiring managerial expertise. Plantations are predicted to exhibit a low capacity to generate environmental awareness. Villagers with expropriated lands and restricted access to forest products have been predicted by one social analyst to be resentful (1). Angry people are hardly likely to cherish what has been taken away from them.

7. Socio-cultural Feasibility

There is an important question remaining: are there socio-cultural factors which inhibit the fullest success of the two plantation forms.

a) woodlots: With regard to woodlots three factors need to be explored: perceived needs, changing value of wood products, and land scarcity.

   i) perceived needs: Openshaw, who sampled 35 villages and towns in all five Divisions within The Gambia reports "Many of the sample villages visited were eager

to start woodlots so they could once again have supplies near at hand". (5:53). Openshaw's findings are consistent with my own exploration of villagers' fuelwood perceptions. Interviews, conducted in nine villages between 23 March through 26 March, 1979 in the Lower River, MacCarthy Island, and North Bank Divisions, provided information which permitted construction of a "Want Hierarchy". Villagers were asked if they wanted forest trees in woodlots, and if they responded in the affirmative, latter in the interview they were asked what they wanted more or less than woodlots. Information was sufficiently clear from seven villages to permit formulation of a crude "Want Hierarchy". Two hierarchies emerged: villages south of the river had the following wants: most, assistance in agriculture, next with trees, next assistance with services such education; villages north of the river, had the same hierarchy, though (perhaps because of the lesser supplies of fuelwood) assistance to trees was a much closer second choice.

The findings, with respect to reliability and validity must be treated with extreme caution. But combined with Openshaw's data they suggest that villagers perceive a strong, though never the strongest, need for more trees.

ii) Increased value of forest products: P. Weil, one of The Gambia's senior social analysts, has stated: "Village-level woodlots controlled and owned by communities are unlikely to be successful." (1:95) (Emphasis in the original).Weil's position is: increased scarcity of forest resources raises the value of forest products, which coupled with increased need for income would mean that "few woodlots would be allowed to grow past their first period of clear growth..." (1:95).

It should be noted that The Gambia has no experience with woodlots. Nevertheless, there is evidence which disputes Weil's hypothesis. In both Chad and Upper Volta, with severer wood shortages than experienced in The Gambia, there are village woodlots which operate successfully (6 and 7). We are in the following position: there are solid theoretical reasons to suspect woodlot problems, and empirical evidence suggesting that the trees don't always get axed the instant somebody requires a little money.

iii) Land scarcity: Villages interviewed tended to feel that they did not have very much land. This feeling is supported by the observation that between 1946 and 1968 the percentage of permanently cropped land rose from nearly nothing to 17% (14:2). It is possible that villagers will simply lack the land for woodlots, or that it will be extracted from the least powerful persons in the community. Two points with regard to land scarcity should be raised: 1. there is a feeling that a present "land is not a scarce resource (9:III-15)", but that in the near future villages "may be entering upon a phase of relative land scarcity" (4:161); 2. that if villagers cannot find the land themselves the Forest Department will simply take it to satisfy The Gambia requirements for forest products.

b) plantations: To create and operate large-scale plantations rather little is required of the local population beyond provision of labor which seems adequately supplied by the contractors. The Forest Department has experience with such plantations. The technical experts on the design team believe that the existing plantations are competently run. In short, plantations seem eminently feasible.

Weil, however, believes that the same wood-hunger which will drive villagers to cut their woodlots, will drive them to illegally cut on the plantations, and he warns that plantations will "require protection and enforcement against rural people at a level unknown in The Gambia". (1:95).

8. Women's Benefits

Women and children are most frequently responsible for securing domestic fuel. Increase in wood supplies close to villages would directly benefit women by reducing the drudgery involved in cutting and carrying fire wood.

9. Summary

Diagram 1 contrasts the social soundness of woodlots and plantations (see page 16). Woodlots generally exhibit more socially sound characteristics than plantations with regard to beneficiaries, benefit incidence, resource access, and participation. The possibility exists that a consequence of both is inequitous distribution of benefits, but only plantations are likely to generate resentment against the Forest Department.

Concerning replicability, insufficient data exists to predict of woodlot wood production; however, woodlots enjoy a greater potential of diffusing environmental awareness and managerial skill. Finally, and critically, it is unclear whether woodlots will work while there is far greater confidence in the feasibility of plantations.

With regard to decisions concerning woodlots and plantations consider the following:

1. the feasibility of woodlots for increasing wood production is uncertain

2. plantations generally exhibit more socially unsound characteristics

3. it is certain that, resultant from prevailing population trends, there will be increased consumption of forest resources, and that, if this is unmatched by increased wood production, both rural and urban poverty will increase.

If the project entirely emphasizes plantations it will embark on a riskier endeavor in social soundness terms. If the project entirely emphasizes woodlots it would be implementing a more uncertain action for increasing wood production. It thus seems prudent to emphasize both woodlots and plantations.

The following section presents guidelines: for implementing woodlots utilizing local social institutions so as to enhance feasibility, and for implementating plantations in ways that have the potential of mitigating undesired social consequences.

DIAGRAM I:

Comparison of the Social Soundness of Plantations and Woodlots

	WOODLOTS	PLANTATIONS
BENEFICIARIES	are the target population	are more likely to be urban wage earners not the target popul.
BENEFIT INCIDENCE	ap.arently more employment opport.	apparently fewer employment opport.
RESOURCE ACCESS	maintains access to forest resources	reduces access to forest resources
PARTICIPATION	stimulates increased participation	prompts decreased participation
ADVERSE SOCIO-ECONOMIC CONSEQUENCES	possibility village elites enjoy disproportionate share of benefits	1. possibility that labor system is inequitous; 2. possibility that expropriation of land for plantations will generate resentment amongst rural poor
REPLICABILITY	greater capacity diffuse environmental awareness and managerial skills	lesser potential for diffusing either
SOCIO-CULTURAL FEASIBILITY	under debate	presently far easier to implement

III. GUIDELINES FOR A SOCIALLY SOUND PROJECT

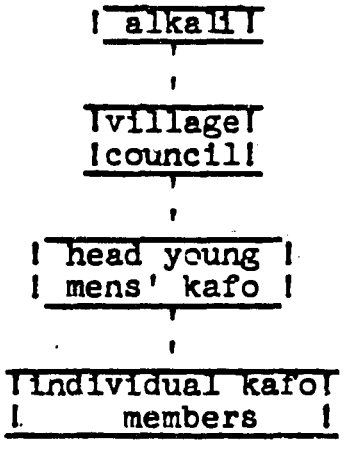
1. Village Woodlots

The following guidelines are presented for the management, size, timing, location, extension services, and incentives for the project's woodlots. An evaluation plan is recommended for the woodlots.

A. Management

The Gambia possesses a 'traditional' form of labor organization already used in development activities in the kafo-system. It is recommended that this system, or some adaptation of it such as young farmers' clubs, be utilized for the village woodlots. Should this system be utilized the organization of village cooperatives would exhibit four parts:

Diagram 2: Structure Managing Woodlots



1. The village-head (alkali) would be the main point of articulation, at least initially, between the village and the project's extension agents.

2. The village-council would be the group to inventory village opinions, and to reach consensus decisions concerning the woodlots.

3. The alkali and the village council would transmit decisions concerning woodlots through the head of the young men's age-grade, and it would be the latter's responsibility to direct actual kafo members.

4. Finally, kafo-members would perform the activities decided upon by the village.

A woodlot could be initiated in the following manner:

1. extension agents would approach the village and hold a meeting with the alkali and important elders in which they would explain the woodlot, and request the alkali and elders to discover if the village is interested in such a woodlot.

2. If the village responds in the affirmative, the extension agents and the village should arrange to survey the village's land-resources to seek the best location for the woodlot.

3. When a decision has been made concerning the technically soundest place to locate a woodlot, a village-wide meeting should be called to decide
   a) if the village wants to allocate this land
   b) if the young men's kafo is willing to provide the labor to plant, tend, and protect the new trees.

No attempt should be made to guide the villages decision. A strong indicator of commitment is the village's voluntary enthusiasm to participate.

It is critical that before this meeting the project extension personnel explicitly describe all that will be required of the young men's kafo and the village in terms of land and labor inputs, and that the village has formulated a plan of how and when to implement these inputs. It is equally critical that before this meeting the extension agents have informed the villagers concerning the amounts of outputs from the woodlots, and that the village has formulated a policy concerning the ownership of the woodlot and its outputs.

The process, thus, of initiating a woodlot involves the village making two decisions, and project personnel providing the information required for village members to make those decisions. This process has four phases:

a. project personnel provide initial information to the alkali and elders about woodlots;

b. village makes its first decision - is it, or is it not interested in woodlots;

c. project personnel provide information concerning i) village land resources, and ii) inputs and outputs of woodlots. On the basis of this the village formulates plans concerning how kafos will operate woodlots, how they will be owned, and how their products will be owned.

d. village makes second decision - to institute or reject a woodlot.

B. Size

The question of woodlot size is especially important in The Gambia because of high human population density and rapidly increasing land scarcity. Openshaw recommends " A village of 200 inhabitants will require about 15 acres of fuelwood and 3 acres of pole plantations to meet their requirements" (5:53). On the other hand experience in Upper Volta in the Eastern ORD reveals it is necessary "de rester a une petite echelle, surtout au debut. Un village de 100-200 habitants arrive difficilement a implanter et entretenir une plantation de plus de 1 hectare" (16:8). At least initially it is strongly recommended that not more than 1 hectare/year/200 inhabitants be implemented.

Keeping the size of plantations down makes excellent sense for the following reason. Wood products are now collected from amongst "wild" species. The project is asking villagers to expend additional labor to cultivate "domesticated" varieties. Such a change in wood production resembles the invention of farming in the food-production sector. A considerable literature shows that when inducing major innovations that the most successful procedure is not to attempt to introduce the innovation in its entirety at a single point in time, but to introduce it gradually, in small amounts, over time (15).

C. Timing

The preceeding point makes the question of timing of the woodlots important. It is recommended that villages plant small areas (perhaps about a 1/2 acres) each year for the period of the project. Such a timing has the following advantages:

a. it follows an "incremental" approach recommended for inducing major changes;
b. it reduces villagers' labor requirements which could be over-extended as much of the work of planting and tending trees must be performed during the agricultural season.

D. Location

The following principles are useful in guiding location of villages and woodlots:

1. Villages should be rural areas that are not advantaged in terms of government services and development interventions;

2. As much as possible, villages should be located in areas where there is little fuel-wood available (e.g., especially at certain stretches North of the river);

3. As much as possible, villages should be located in areas where there is some surplus land;

4. Villages should be located in areas where an age-grade system or some equivalent is operative.

E. Extension service

The provision of competently trained and continual extension services to "bien animer et encadrer" villagers has been found to be a necessary condition for successful woodlots (8:5). It is recommended that the project have one agent assigned to maximally two villages. Further, that an annual calendar of this agent's responsibilities be developed so that he/she can communicate the technical information and motivation when and where it is required.

F. Incentives

The question of remuneration magniture to provide villagers is delicate. On the one hand there are some who argue; one does not pay farmers to grow food, why pay them to grow trees; farmers rewards must come from the products they produce and to induce efficient production incentives should not be provided. Others, however, suggest the reverse. A number of arguments and data support this position. Among the more important are:

1. the observation that in the U.S. it was not possible to get farmers to plant trees in substantial amounts until incentive programs were developed;

2. that provision of incentives is payment for labor expended so that the nation avoids the economic and social costs attendent on the continued destruction of forest and soil resources;

3. that provision of incentives is payment for increased uncertainty incurred in shifting from pursuits with known outcomes to ones with only hazily conceived results as in tree planting;

4. that according to Weber & Dulansey "under the circumstances of severe lack of resources, an activity which will yield benefits at a (distant) future time cannot compete successfully for priority with other (more immediate) concerns. Eating comes first...." (7:41)

Given the divergence of opinion concerning the necessity of incentives, it is prudent that the project has the capacity to experiment with different incentives. Minimally this capacity should include:

1. provision of fencing, fence-poles and fruit-trees to participants
2. the preceeding rewards, plus the food or money equivalent of one days' minimum wage/day worked

G. Evaluation Plan

Because village woodlots have never been tried in The Gambia, and because there are reservations concerning their feasibility, because the ecology of The Gambia is markedly different from Sahelian areas with woodlot experience, it is important that the project evaluate the woodlots performance. The evaluation would document the socio-cultural and economic factors regulating operation and productivity of woodlots (An outline SOW for such an evaluation is included as Appendix 1).

2. Plantations

Guidelines are presented below to strengthen the social soundness of plantations

a) Emphasize fuelwood - an important benefit of plantations is their ability to combat a determinant of poverty that will become increasingly significant with depletion of forest reserves. Openshaw reports that as of the early 1970's the following annual consumption pattern occured:

27.7 million cubic ft. fuelwood
1.2 millior cubic ft. polewood
0.5 million cubic ft. sawnwood

This pattern has implications for the percentages of products produced by plantations if they are to prevent depletion of forests. Let us say that at some hypothetical time in the near future that a maximum of about 50 million cubic ft. of wood can be removed per year without overutilization of forests, that consumption requirements remained relatively constant, that plantations are producing the bulk of the country's timber, and that 50% of their output is in non-fuelwood products. This means that 25 million cubic ft. of non-fuelwood products would be produced. But that approximately 45 million cubic ft. would be demanded of fuelwood, or that there would be a tendency to cut 70 million cubic ft. which would be considerably above the maximum quantity at which resources should be removed. This implies, so long as present consumption requirements remain, that plantations should concentrate on the production of fuelwood.

This recommendation is supported for social soundness reasons. Most of The Gambia poor simply cannot afford sawnwood or polewood products, but they must have fuelwood, so that to better reach them, it is advisable for plantations to concentrate on increasing the supply of this product.

b) Location - it is recommended that as soon as it is technically feasible plantations begin in rural areas, both to increase income opportunities and the rural supply of fuelwood.

c) Plantation user-groups - Weil has recommended "...introduction of user-cooperatives for exploiting government-controlled forests..." (1:96). This is a suggestion of great interest and should be explored, but the track-record of cooperatives in both East (17) and West Africa (18) has been checkered. Nevertheless, if locally existing labor-groups that were self-managed, it might increase employment opportunities, employment security, resource access, participation, environmental awareness, managerial skills, and decrease resentment towards forest reserves.

Key to successful plantation user-groups would be: the extension of training services to the user-group as to how to produce trees on the plantations, how to produce different products; provision of an appropriate technological package for production and utilization; and provision of credit facilities to acquire this technology.

However, no plantation user-groups presently exist in Africa. Their technical, social and economic feasibility, thus, is unestablished. It is recommended that the project assess the efficiency and equity of the present labor system. The desired output of this activity would be formulation of a labor system which achieved an optimal mix of efficiency and equity. This activity could be planned and directed by the same personnel evaluating the woodlots. (An outlined SOW for such an evaluation is included in Appendix 1.)

3. Training

The Forestry Department would benefit from personnel trained to extend novel production, management, and utilization techniques to rural populations. While it is probably not possible to find forestry programs which specialize in rural outreach, it is possible to insist that individuals sent for third country and U.S. training take an undergraduate major in rural sociology or community development to complement their forestry curriculum.

4. Mangrove Feasibility

Interviews with villagers revealed that:
1. they have not utilized mangroves extensively in the past, but 2. they are turning to them as a source of building materials as rhum palms become scarcer; that they would be motivated to work them in exchange for a fair remuneration, but 4. that there are certain taboos which might inhibit their going to all areas in the swamps. The basic problem however, may be that while individuals may be motivated to work there may not be enough persons to achieve significant results.

The social soundness section of the mangrove feasibility study while conforming to the guidelines of USAID Handbook No. III should emphasize the following topics:

i. is there surficient person-power to effectively harvest the mangroves

ii. what and how local labor-groups might be used to increase employment opportunities and security, participation and managerial skills;

iii. what mangrove products should be produced and how so that the major beneficiaries are local rural peoples.

APPENDIX I

Outline SOW for Gambia Reforestation Project Evaluation Program

Goal: The evaluation program goal is to design an expanded second-phase Gambia Reforestation Project with woodlots and plantations of greater efficiency and equity. To attain this goal the program would collect and analyze data pertaining to:

1. the impact of woodlots and plantations on rural welfare;
2. discover the social, economic, and cultural factors controlling the performance of woodlots and plantations;
3. design the most realistically implementable, efficient and equitable woodlots and plantations.

Personnel:

1 econ. anthropologist/development sociologist (advanced grad. student)
1 senior rural economist with West African experience

Activities:

1. Evaluation program personnel would design a methodology for implementing the evaluation which would utilize both ethnographic and statistical techniques
2. During the first year of project implementation the graduate student would gather baseline data;
3. In the third and fourth years of implementation the graduate student would return to record alternations in baseline data for a period of one month per year.
4. In the final year of implementation both persons would analyse the collected data and issue a report making recommendations for a second Reforestry Project.

Budget:

1. Graduate student	
a. 1 year fieldwork	$20,000
b. 2 years of return visits ($5,000/year)	10,000
c. final year consultancy	2,000
2. Senior rural economist	
a. 3 years consultancy ($6,000/yr.)	18,000
Evaluation studies total.....	$60,000

REFERENCES

1. P.M. Weil: Social Analysis of Alternative Development Strategies for The Gambia River Basin: 1976-2000 For Robert Nathan Associates, Oct. 11, 1978

2. Introduction of the Oxplow in Central Gambia. In African Food Production Systems: Cases and Theory (ed.) P.F.M. McLoughlin. Baltimore: John Hopkins, 1970

3. G.D.N. Lowe: Introduction to the socio-economic studies, in The Agricultural Development of The Gambia. Land Resource Study No. 22. Land Resources Division, ODM, Surbiton, Surry, U.K., 1976

4. M.R. Haswell: The Nature of Poverty. MacMillan: NY, 1975

5. K. Openshaw: The Gambia: A Wood Consumption Survey and Timber Trend Study 1973-2000. International Forest Sc. Consultants, 21 Bigger Rd. Silverburn, Penicuik, U.K., 1973

6. Anonymous: Plantations villageoises: L'experience de 5 ans au Yatenga. Seminaire CILSS/DSE du 19 Jan. au 5 Fev. 1978

7. F. Weber and M. Dulsansey: Midpoint Evaluation Chad Reforestation Project. Consultants in Development. 2130 P. St., NW Suite 803, Washington, D.C. 20037

8. J.D. Stebler: Plantations villageoises: Experiences faites dans le cadre du project: Plantations villageoises a Kombissiri. CILSS. Ouagadougou 1978

9. D. Aronson: Analytical Description of the Poor Majority - in USAID DAP: The Gambia, 1977.

10. Lord Hailey: An African Survey. OUP: London, 1938

11. D.P. Gamble: Economic Conditions in 2 Mandinka Villages: Kerewan and Keneba. Colonial Office, London. 1955

12. Anonymous: Five Year Plan 1975/76 - 1979/80 For economic and social development. Republic of The Gambia.

13. McLelland:

14. R.D. Mann: The Gambia: Land and Vegetation Degradation Survey- The need for land reclamation by comprehensive ecological methods. Dept. of Agriculture, Yundum Experimental Station. The Gambia. 1977

15. R. Netting: et.al. The conditions of agricultural intensification in the West African Savannah. Sahel Social Development series. REDSO/WA, Abidjan, 1979

16. A. Niehoff: Introducing social change. Aldine, Chicago. 1968

17. Widestrand: African Cooperatives and Efficiency. Africana NY 1972

18. Bill Derman: Cooperatives, initiative, participation and socio-economic changes in the Sahel. Sahel Social development series. REDSO/WA, Abidjan. 1978.

ANNEX H

ADMINISTRATIVE ANALYSIS

A. The Government of The Gambia

Forestry falls under the Ministry of Agriculture and Natural Resources. Prior to 1976, Forestry was a Division, the Chief of which reported to the Director of the Department of Agriculture. In 1976, Forestry was reorganized and up-graded to become one of eight Departments within the Ministry. The head of the Forestry Department, the Conservator of Forests, reports directly to the Permanent Secretary, second in command to the Minister.

The present structure of the Forestry Department is described below. The Department Director, the Conservator of Forests, is supported by an Assistant Conservator who has been made responsible for management and research. Under the Assistant Conservator fall four sections: Utilization, Afforestation, Rural Forestry Inspectorate, and Apiculture. Under the Rural Forestry Inspectorate is one unit for each of The Gambia's five Administrative Divisions, North Bank, Upper River, Western, Lower River, and McCarthy Island.

To reflect its evolving responsibilities and programmatic emphases, the structure of the Forestry Department is to be modified beginning in the Gambian fiscal year 1979-1980 (July 1, 1979, to June 30, 1980). The titles of Conservator and Assistant Conservator of Forests will be dropped from the list of established positions and replaced by the titles Director and Assistant Director. The Apiculture Section will be absorbed into the Utilization Section; the Afforestation Section will be renamed the Production Section; the Rural Forestry Inspectorate will become the Forest Protection Section; and a new Research Section will be added.

The responsibilities of the current departmental sections are described briefly below:

A. Utilization Section - Personnel of this section are responsible for the small, government-owned sawmill and lumberyard at Nyambai. Apart from the sawmill equipment, this facility also has fence-making machinery, and a creosoting plan for treating fence posts. All machinery is relatively small-scale and requires significant labor for its operation rather than being highly automatic. The mill also produces simple beehives for public sale. When the Utilization Section incorporates the Apiculture Section, it will become responsible for the development of techniques for honey and beeswax production appropriate for village-level application.

B. The Afforestation Section has been responsible for carrying out the provisions of the Five-Year Development Plan which call for new Gmelina plantings at an average annual rate of 300 hectares. With the planned restructuring, this section will also be responsible for execution of the management plans for the existing forest parks.

C. The Rural Forestry Inspectorate is responsible for patrolling the forest reserves, organizing villagers to fight fires, licensing charcoal makers, and other wood exploiters, controlling unauthorized felling, etc.

D. The Research Section was created only in 1978 and is presently selecting locations for the site and species trials which will be supported by the FRG.

The position of Conservator of Forests is presently occupied by an expatriate professional forester with many years African experience. The incumbent's contract is financed through the British Ministry of Overseas Development, and will expire in June 1980. However, there is no reason to believe that this contract will not be renewed, or that a suitable replacement would not be found. The post of Assistant Conservator is occupied by a young Gambian professional who received an MS in Forestry from Duke University in 1978. The Assistant Conservator is presently beginning to organize site and species trials within some of the existing 66 Forest Preserves and will head the new Research Section. The Rural Forestry Inspectorate is headed by a Supervisor of Forests, a senior civil servant (Grade 13/14); the Utilization Section is headed by a Senior Forest Ranger, a mid-level civil service position (Grade 8); and the Afforestation Section, as well as each of the five units under the Rural Forestry Inspectorate, are headed by Forest Rangers in grades from 5 to 7. The position of head of the Apiculture Section is vacant.

The incumbents of most of the positions mentioned above have been with the Forestry Department for many years, but lack formalized training, with the exception of occasional short courses on specific topics. However, some younger recruits to the Department have been selected with a view to providing them with formalized training and, consequently, have already passed their "O-level" examinations at the conclusion of what corresponds to secondary education in the U.S. system. These recruits are to be provided with six months of on-the-job training in The Gambia and then sent to the Forestry Institute at the University of Ibadan for an additional 18 months training. Six employees of the Department have already completed this diploma course and another 3 are expected to do so by June/July 1979. Another Gambian is presently enrolled in a four-year course at the University of Dar es Salaam, at the conclusion of which, in June 1980, he will receive a BS in Forestry with a minor specialization in apiculture.

The personnel and budget (in real terms) of the Forestry Department have expanded steadily in recent years. In FY 1977/78, there were 99 established positions, of which 27 were Forest Guards (Grade 4) and 40 were Forest Scouts (Grade 2) working in the Rural Forestry Inspectorate. For the current fiscal year, the number of approved positions increased to 126, of which 37 were Forest Guards and 60 were Forest Scouts. During the same period, the number of Forest Rangers and Senior Forest Rangers, in grades 5 to 8, increased from 5 to 19. The corresponding budget for salaries in 1977/78 was D197,000 ($98,500) and is expected to be D262,780 ($131,400) in 1978/79. The amount requested by

the Department for FY 1979/80 is approximately D330,000 ($165,000).

Salaries paid to employees of the Forestry Department constitute a relatively small share of the Ministry of Agriculture and Natural Resources' total personnel budget. In both FY 1977/78 and FY 1978/79, the figure was only 4.3%. Other recurring costs of the Forestry Department for office supplies, POL, etc. are met out of the Ministry's general budget for that purpose. Funds to expand the Gmelina plantations in the Western Division, at an average annual rate of 300 hectares, have been included in the GOTG's capital investment budget and have been provided primarily by the United Kingdom. Funds will be available for FY 1979/80, the last fiscal year of the GOTG's current planning period.

In accordance with GOTG procedures, the Grant Agreement for this project will be negotiated and signed at the level of the Ministers of Agriculture and Finance. The Permanent Secretary of the MANR has overall managerial responsibility for all externally-financed projects in the agriculture sector, and appoints a Project Officer for each one to discharge this responsibility. In the case of this project, the Project Officer will, in all likelihood, be the Director of the Forestry Department.

The Forestry Department manages its own budget under delegation of authority from the Permanent Secretary, who also serves as the Ministry's Accounting Officer. The Department has its own accounting capability and is also backstopped by personnel in the Ministry's Central Accounting Section. Project funds can flow either through the Central Bank or through one of the two commercial banks in Banjul and may be deposited either in a general or project-specific account. Project-specific books can be maintained within the Ministry's Central Accounting Section. Accounting methods used meet international standards and government regulations allow for independent audits.

Additional information concerning project disbursement procedures is provided in Part IV, Implementation Plan.

The Implementation Plan calls for establishment of 175 hectares of plantation during FY 1980 and 225 in FY 1981. The present staff of the Forestry Department will be able to handle this scale of operation easily. Additional staff with training from the Forestry Institute in Ibadan, University of Dar es Salaam, and elsewhere, who will come on board during the life of the project, will provide the depth of personnel required to ensure adequate technical supervision of project activities as the scale and geographic dispersal of operations increase.

Legislation enacted in 1977 and regulations issued in 1978 pursuant to that legislation give the Ministry of Agriculture and Natural Resources and the Forestry Department full authority to set areas aside as forest parks; clear, reforest, or otherwise manage and protect those areas; license and control the exploitation, processing, and marketing of forest products; to charge and collect fees from private individuals engaged in those activities; and to sell products resulting from the activities of the Forestry Department in general and the Nyambai Utili-

zation Unit in particular. Therefore, all activities proposed for financing under this project fall within the authority presently accorded to the Ministry and the Department of Agriculture.

It should be noted that revenues from the activities of the Forestry Department accrue to the general account of the GOTG rather than to the Forestry Department itself. However, this procedure does not appear detrimental to the Forestry Department; although obliged to compete with other Departments within the Ministry of Agriculture and Natural Resources and with other Ministries for operational and investment funds, as was mentioned above, the budget of the Forestry Department has grown steadily in real terms within recent years indicating, in concrete terms, the increasing importance which the GOTG attachs to its activities.

B. A.I.D.

The AID Office in Banjul is presently being expanded from a one-person post to a five-person post. When the expansion is complete, AID/Banjul will have direct-hire, U.S. personnel in the following positions:

1. AID Operations Officer

2. Program Officer

3. Agricultural Projects Manager

4. Range Management Technical Officer

5. Secretary

Recruitment for these positions is expected to be completed by the end of calendar year 1979.

In FY 1980, AID/Banjul's anticipated project load will be the following:

(1) Soil and Water Management Unit Project 635-0202

(2) Mixed Farming and Resource Management Project 635-0203

(3) Forestry Project 635-0205

(4) Rural Roads Maintenance Project 635-0206

No new projects are planned for FY 1980 and, therefore, during that year, AID/W will be able to devote itself to seeing that implementation of the projects authorized in FY 79 and earlier is well launched.

Contracting for technical assistance and construction under 635-0202 has already been completed; the technical assistance team, which is to be in the field by September 1979, will be able to prepare subobligating

documents for procurement of commodities and training with a minimum of assistance from AID/Banjul. AID/Banjul will be required to allocate staff time in FY 1980 to assist the GOTG to select the technical assistance team for the Mixed Farming Project. However, once this sizable team has been recruited, only limited additional assistance from AID/Banjul will be required. Under the Rural Roads Maintenance Project, contracts will be awarded for architectural/engineering and technical services. Terms of reference have already been drafted in order to procure these services. The A and E contractor will assist the GOTG to procure construction services. Commodity procurement will be handled by a purchasing agent. Therefore, AID/Banjul involvement in implementation of this project will also be minimized.

The Implementation Plan (Part IV of the Project Paper) describes in greater detail the actions to be accomplished under the proposed Forestry Project. To summarize, however, technical assistance will be available to the Forestry Department to prepare final specifications for the limited amount of equipment and materials to be procured under this project; and it is anticipated the actual U.S. procurement will be handled by a purchasing agent. AID/Washington will assist with the negotiation of contracts to finalize plans for and manage the U.S. participant training program. A draft terms of reference already exists for procurement of technical services to carry out the Mangrove Feasibility Study. Construction under the project is uncomplicated and such assistance to the Forestry Department or to AID/Banjul which may be required to carry it out will be available from AID's Regional Economic Development Services Office in Abidjan or from engineers on the staff of GOTG's Public Works Department. Consequently, addition of this project to AID/Banjul's workload will not overtax that office's anticipated capabilities.

ANNEX I

PROPOSED IMPLEMENTATION SCHEDULE

	Event	Months from Project Start[1/]	Anticipated Actual Date
1.	Grant Agreement signed	0	9/79
2.	General conditions precedent met	1.0	
3.	Request for prequalification data for Mangrove Study and short-term consultancies mailed to CBD and BIFAD for publication	1.0	
4.	PIO/P for short-term, special technical training submitted to AID/W	1.0	
5.	Request for prequalification data published	2.0	
6.	Contract for short-term technical training signed	2.0	
7.	Final date for postmarking prequalification data	2.0	12/79
8.	Contacts with villages initiated concerning participation in village woodlot program	3.0	
9.	Contractor submits plan for short-term, special technical training to GOTG	4.0	
10.	Land clearing for first year's plantation begins	4.0	
11.	Short-list of organizations prequalified for Mangrove Study, etc. prepared	4.5	
12.	Two villages selected to participate in village woodlot program	5.0	
13.	RFTP mailed to prequalified organizations	5.0	
14.	Candidate selected for training in Nigeria	5.0	

1/ It is assumed that the Grant Agreement will be signed by September 30, 1979. The first month of project implementation will, therefore, be October 1979. Zero plus 0.5 indicates that an event is to occur not later than October 15, 1979, and zero plus 1.0 means that the event is to occur by October 31, 1979.

	Event	Months from Project Start[1/]	Anticipated Actual Date
15.	Clearing for village woodlots begins	5.5	
16.	Fencing for first year's plantation begins	6.0	
17.	Trainee departs for short-term, special technical training in U.S.	6.5	
18.	Fencing for village woodlots begins	6.5	
19.	Seeding of first year's plantation begins	7.0	
20.	Planting of village woodlots begins	7.0	
21.	Final date for postmarking technical proposals for Mangrove Study, etc.	7.5	
22.	Two candidates selected for BS training	8.0	
23.	Contract for Mangrove Study, etc. awarded	9.0	
24.	Initial PIO/P for training in Nigeria prepared	9.0	
25.	Initial PIO/P prepared for 2 BS candidates and application process begins	10.0	
26.	Contract for Mangrove Study, etc. negotiated, approved by AID, and signed	10.5	
27.	Trainee departs for Nigeria	11.0	
28.	Mangrove Study begins	12.0	9/80
29.	Contacts initiated with new villages concerning participation in woodlog program	15.0	12/80
30.	Draft final report of Mangrove Study submitted to GOTG for comment	16.0	
31.	Land clearing for second year's plantation begins	16.0	
32.	First trainee returns following special, short-term technical training in U.S.	16.0	
33.	Forest Products Utilization Specialist arrives for short-term consultancy to prepare final equipment specifications	16.0	

	Events	Months from Project Start[1/]	Anticipated Actual Date
34.	GOTG selects purchasing agent and signs contract	16.0	
35.	PIO/C for sawmill and logging equipment and accessories prepared	17.0	
36.	Two new villages selected for woodlot program	17.0	
37.	Two candidates for training in Nigeria selected	17.0	
38.	Clearing for village woodlots begins	17.5	
39.	Final report for Mangrove Study submitted to GOTG	18.0	
40.	AID/W issues letter of commitment to U.S. bank in connection with commodity procurement	18.0	
41.	Fencing for second year's plantation begins	18.0	
42.	Two trainees depart for short-term special technical training in U.S.	18.5	
43.	Fencing for village woodlots begins	18.5	
44.	Commodities ordered	19.0	
45.	Planting for second year's plantation begins	19.0	
46.	Planting begins for village woodlots	19.0	
47.	Final plans and drawings for shed to house bolter saw complete	21.0	
48.	IFB for construction of shed issued	21.5	
49.	Two candidates for BS university training depart	22.0	
50.	Bids for shed construction received	23.0	
51.	Two candidates depart for training in Nigeria	23.0	

	Events	Months from Project Start[1/]	Anticipated Actual Date
52.	Contract awarded for shed construction	24.0	9/81
53.	Contract for shed construction signed and approved by AID	25.0	
54.	Commodities shipped	25.0	
55.	Begin shed construction	26.0	
		(27.0)	12/81
56.	Contacts initiated with new villages concerning participation in village woodlot program	27.0	
57.	Construction shed completed	27.5	
58.	Second group short-term technical trainees returns	27.5	
59.	Installation equipment in shed begins	28.0	
60.	Land clearing for third year's plantation begins	28.0	
61.	Manufacturer of sawmill equipment begins training program	28.5	
62.	Two new villages selected for woodlot program	29.0	
63.	Two candidates selected for training in Nigeria	29.0	
64.	Clearing for village woodlots begins	29.5	
65.	Fencing for third year's plantation begins	30.0	
66.	Bolter saw and accessory equipment fully operational	30.0	
67.	Fencing for village woodlots begins	30.5	
68.	Two trainees depart for special short-term technical training in U.S.	30.5	
69.	Seeding for third year's plantation begins	31.0	

	Event	Months from Project Start[1/]	Anticipated Actual Date
70.	Planting for village woodlots begins	31.0	
71.	Candidate selected for MS training at U.S. or African university	32.0	
72.	PIO/P for MS candidate prepared and application process begins	34.0	
73.	Candidates depart for training in Nigeria	35.0	
		(36.0)	9/82
74.	Contacts initiated with villages concerning participation in woodlot program	39.0	12/82
75.	PIO/T for mid-project evaluation prepared	39.0	
76.	Land clearing for fourth year's plantation begins	40.0	
77.	Two new villages selected to participate in woodlot program	41.0	
78.	Clearing begins for village woodlots	41.5	
79.	Evaluation team recruited	41.5	
80.	Fencing begins for fourth year's plantations	42.0	
81.	Mid-project evaluation begins	42.0	
82.	Fencing begins for village woodlots	42.5	
83.	Seeding for fourth year's plantation begins	43.0	
84.	Planting begins for village woodlots	43.0	
85.	Draft final report on mid-project evaluation prepared	43.0	
86.	Final report on mid-project evaluation complete	44.0	
87.	Candidate for MS training departs	46.0	
		(48.0)	9/83

	Event	Months from Project Start[1/]	Anticipated Actual Date
88.	Contacts initiated with villages concerning participation in village woodlot program	51.0	12/83
89.	Land clearing begins for fifth year's plantation	52.0	
90.	Two new villages selected to participate in woodlot program	53.0	
91.	Clearing begins for village woodlots	53.5	
92.	Fencing begins for fifth year's plantation begins	54.0	
93.	Fencing begins for village woodlots	54.5	
94.	Seeding begins for fifth year's plantation	55.0	
95.	Planting begins for village woodlots	55.5	
		(60.0)	9/84
96.	Final date for provision of goods and services under project*	61.0	
		(63.0)	12/84
97.	Final date for AID disbursements under project*	67.0	

*With possible exception of residual long-term training to BS level.

ANNEX J

DISBURSEMENT PROCEDURES

I. Bank Letter of Commitment

Following signature of the Grant Agreement, the Forestry Department may request, through submission of a financing request to AID/Banjul, that AID/Washington issue a letter of commitment to a U.S. bank. The letter of commitment constitutes an agreement between AID and the U.S. bank that, under specified terms and conditions, AID will reimburse the U.S. bank for dollar payments which it makes to suppliers of commodities under letters of credit which it has opened in accordance with instructions received from the Forestry Department. The Forestry Department may designate the U.S. bank to which AID should address the letter of commitment; however, AID must concur in this choice and the bank designated must also indicate its acceptance of the letter of commitment.

The letter of commitment will be in the amount of the commodities, shipping, and insurance to be financed thereunder, plus an additional amount equivalent to the purchasing agent's estimated fee and a percentage for the cooperating bank's service charges, both of which are reimbursable under the project.

The terms and conditions in the letter of commitment will include a list of eligible commodities; eligible source and origin of the goods and services; requirements pertaining to delivery period, marking, shipping, and insurance; and a list of the documents (such as invoices, certificates of source/origin, bills of lading) which must be submitted by the supplier to the bank in order to receive payment. These terms and conditions would usually be lifted out of the PIO/C commiting funds for procurement of the commodities in question.

The Forestry Department would instruct the U.S. bank to open a letter of credit in favor of the Department's purchasing agent to pay for the agent's services. The Department could also advise the bank that further letters of credit in favor of specific suppliers of goods and services were to be opened in accordance with instructions received by the bank from the Department's purchasing agent. A sample financing request and letter of commitment will be provided to the Forestry Department by AID/Banjul.

II. Local Currency Disbursements

A. Initial Local Currency Advance

The Forestry Department will submit to AID Voucher Form SF 1034 (original) and SF 2034-A (three copies). The voucher will identify the Grant number and the amount of funds required to cover estimated project

expenditures for up to six months. The voucher shall be supported by an original and two copies of a cash flow forecast as shown below:

Cash Flow Forecast

Budget Category & Description 1/	Six Month Requirement
I. Plantation Establishment	xxxx
II. Construction	xxxx
III. Other Local Costs	xxxx
Total	xxxx

1/ These budget categories are illustrative only and should be in conformity with the budget contained in the Grant Agreement; however, sufficient breakdown of categories is necessary in order to determine that expenditures are appropriate for funding under the grant.

The Report shall include a certification by the Director of the Forestry Department as follows:

> "The undersigned hereby certifies: (1) that the above represents the best estimate of funds needed for expenditures to be incurred over the six month period, (2) that appropriate refund or credit to the Grant will be made in the event funds are not expended, and (3) that appropriate refund will be made in the event of disallowance in accordance with the terms of this Grant.
>
> By_____
>
> Title_____Date_____."

III. Replenishment of Advance

The Forestry Department may request replenishment of advance as required to meet costs of the project, provided, however, that such requests for replenishment will not be made more frequently than once monthly. The Department will submit to AID, Voucher Form SF 1034 (original) and SF 1034-A (three copies). Each voucher will identify the Grant number, and will include details of utilization of funds previously advanced, as well as an estimate of cash requirements for the following six month period. The voucher will be supported by an original and two copies of a certified expenditures report prepared as illustrated below.

REPORT OF EXPENDITURES AND REQUEST FOR REPLENISHMENT OF ADVANCE

Budget Category and Description	Budget	Current Expenditures This Period	Cumulative Expenditures To Date	Anticipated Expenditures Next 6 Months
I. Plantation Establishment	xxx	xxx	xxx	xxx
II. Construction	xxx	xxx	xxx	xxx
III. Other Local Costs	xxx	xxx	xxx	xxx
TOTAL	xxx	xxx	xxx	xxx

The undersigned hereby certifies: (1) that current expenditures detailed herein for which reimbursement is hereby requested have not previously been reimbursed to the Forestry Department; (2) that the above request for advance of funds represents the best estimates of funds required to cover project expenditures over the next six months; (3) that appropriate refund or credit to the Grant will be made in the event advance funds are not expended; (4) that appropriate refund will be made in the event of disallowance in accordance with the terms of this Grant; and (5) that such detailed supporting information for actual expenditures reported will be furnished to A.I.D. upon request.

By_____

Title_____ Date_____

EXAMPLE

ANNEX K

Gambia Reforestation Project

Initial Environmental Examination

1. Project Location	:	The Gambia, Four locations as noted in technical analysis.
Project Title	:	Gambia Reforestation Project 635-0205
Funding	:	FY 1980-1984. $1,5[illegible],000
IEE Prepared by	:	Tom Greathouse, Sylviculturalist, AID/W.
Date	:	April [illegible], 1979
Environmental Action Recommended	:	Negative Determination

Concurrence Douglas T. Bruno
AID Operations Officer, Banjul, The Gambia Date: April 1, 1979

Assistant Administrator's Decision

Approve: _____

Disapprove: _____

Date: _____

2. Examination of Nature, Scope and Magnitude of Environmental Impacts

A. Description of Project

This project proposes to plant 1,300 hectares of Gmelina arborea, a tree which has demonstrated its ability to produce 15m^3 per hectare per year of wood which is suitable for fuelwood, for conversion to charcoal, for poles and for use as timber. It also proposes to plant 50 hectares of village woodlots over the five-year life of the project. In addition, it will improve utilization of natural forests by supplying better equipment and by training persons who will conduct or supervise timber harvesting and processing operations.

The need for this project is based on data showing changes in vegetation and land use in The Gambia during the 1946-1968 period and subsequently (a,b). These data reveal that the fragile ecology of The Gambia's semi-arid region has been seriously disturbed by land use practices which have caused progressive destruction of vegetative cover and adverse climatic changes. Based on surveys in 20 10-square mile areas (a total of 200 square miles) which are depicted on a copy of a map accompanying the Mann report (b), the following changes were reported:

	1946	(Percent)	1968
Forest land	28		3.4
Woodland	31		4.6
Thornbush	7		31.0
Scrub	0		19.0
Cropping with natural fallow	17		5.5
Virtually continuous annual cropping	0		17.0

Since Mann's report, Sahelian states, including The Gambia, have experienced a severe drought cycle, with 1973 and 1977 being the driest years. It is certain that additional land has been convered from forest and woodland status to thornbush and scrub categories and that natural fallowing has been further reduced. Recent estimates indicate that less than 5% of the country now supports forest or woodland cover.

Demands on the remnant natural forest lands have increased as the human population and the numbers of livestock have increased. Estimated demand in 1975 was 2.2 m^3/ha. This exceeds the estimated annual growth rate of 1.0-1.4 m^3/ha. Unless The Gambia's ability to produce wood, which provides 90% of its fuel needs, is dramatically increased very soon by planting fast growing tree species in both large plantations and in village woodlots and by improving utilization of wood (in the forest, in processing plants, and in domestic use), the rural and urban poor in western Gambia will be paying exorbitant, to them, prices for the privilege of cooking their food. Rates and extent of tree establishment to be done by this project are shown in Annex C.

Gmelina plantations are established by sowing seeds at 1m x 1m spacing in small ridges on the planting site. Both seeds and seedlings are resistant to insects and disease. However, fencing will be required to keep goats and cattle from destroying young trees. This will have a minimum impact because the land to be planted is within already existing forest reserves.

Species to be used will be primarily Gmelina (large plantations) and neem (Azadirachta indica) in village woodlots. Other species to be planted in woodlots include cashew (Anacardium) and suitable fruit trees for respective site conditions. During the first growing season, it will be possible to grow vegetable crops between the rows of trees.

Weeding will be done by hand. Gmelina arborea and the fruit tree species to be planted are resistant to termit attack; therefore, use of herbicides, pesticides or other protective chemicals is not anticipated.

Although sowing seeds and planting and tending trees are tasks which must be done during the period when agricultural crops require many workers, Gambian officials are confident, based on actual experience, that adequate persons will be available. Over the past 20 years, they have successfully planted almost 1,250 hectares. It is reasonable to expect that with increased staffing and adequate funding, 1,300 additional hectares can be established during the project's 5-year span.

Planting of trees within village woodlots will have to proceed more slowly since the villagers will have to fence an area and plant and tend the trees with, perhaps, only the gift of the fencing and the trees as incentives. All work is to be done by hand. Since the species to be planted can reproduce by coppicing, replanting will not be necessary for up to 30 years.

Additional costs for growing the seedlings for the villagers are expected to be provided by a UNDP donor who will finance four nurseries in The Gambia.

There are several major benefits to the environment. Since about 15 times as much wood can be produced in the Gmelina plantations as in the natural forest in a given period, for each hectare of plantation, pressure will be at least reduced on 15 hectares elsewhere. Soil erosion within and adjacent to the plantations and villages will be reduced due to the windbreak, shading and interruption of rainfall effects of the trees. More suitable hand tools for felling and splitting fuelwood trees would reduce the need of villages to set fires in order to fell large trees, a practice which destroys considerable fuelwood each year.

Benfits to the villagers will be discussed in detail in the Social Soundness section of this document (Annex G). Major benefits to the rural poor will be in the form of a supply of fuelwood within easy reach of the woodgatherers. Urban poor will benefit by lower costs of charcoal because it will be available all year. Indirect benefits will come to villagers because a forested area will result in favorable climatic changes. Villagers cooperating in the woodlot program will benefit from

a more balanced diet when the fruit trees are producing crops.

The training and outreach element will be designed to promote better conservation practices by government and by all Gambians.

B. Identification and Evaluation of Environmental Impacts

Regarding impact areas, the legend is:

N - No environment impact
L - Little impact
M - Moderate impact
H - High impact
U - Unknown impact
+ = positive impact
- = negative impact

1. Land Use

a. Changing character of land through	
i. Increasing the population	N
ii. Extracting natural resources	N
iii. Land clearing	M
iv. Changing soil character (+)	L
b. Altering natural defenses	N
c. Foreclosing important uses	N
d. Jeopardizing man or his works	N

2. Water Quality

a. Physical state of water (+)	L
b. Chemical and biological states	N
c. Ecological balance (+)	L

3. Atmospheric

a. Air additives	N
b. Dust pollution (+)	L
c. Noise pollution	N

4. Natural Resources

a. Diversion, altered use of water (+)	L
b. Irreversible, inefficient commitments	N

5. Cultural

a. Altering physical symbols	N
b. Dilution of cultural traditions	N

6. Socio Economic

a. Changes in Economic Growth/Employment Patterns (+)	M
b. Changes in population	N
c. Changes in cultural patterns	N

7. Health

a. Changing a natural environment (+)	L
b. Eliminating an element in an ecosystem	N

8. General

a. International impacts	N
b. Controversial impacts	N
c. Larger program impacts (+)	L

C. Narrative Evaluation of Impacts

1. Land use and health

Land use patterns in The Gambia, as in all of the Sahel, have been changed during the last 30 years. The natural forests have been so seriously overcut that few trees of the valuable species are left. Overcutting was accompanied by overgrazing and soil-depleting agricultural practices. Conversion of the resulting thornbush and scrub to large-scale tree plantations or to village woodlots of up to 20 hectares size will be a beneficial change with regard to soil conservation, water quality, and other land use factors.

The areas to be planted with Gmelina were set aside many years ago as a forest preserve. There are no villages within their boundaries. Part time or permanent employment will be established for about 100 persons who live in surrounding villages. Beginning in the 5th year with the first thinning (40% of the trees) additional labor will be required to thin an average of 200 hectares per year. The surrounding villages and urban areas will also benefit by having an assured supply of good quality fuelwood and charcoal at reasonable prices, even during the growing season when such supplies are normally short and prices are high.

Clearing the land and sowing seeds in 3 to 4 inch high ridges will have a light to moderate impact. Indigenous thorn and other scrub bush species will be replaced with desirable trees. The new trees will have a long-term stabilizing effect on the soil as the root systems will not be disturbed for at least 30 years. Overall, development of 1,300 hectares of plantations will have its greatest impact on the natural forests which are presently supplying The Gambia's wood needs. As the plantations reach harvest age, the pressure for wood from natural forests will be reduced in a ratio of about 11-15 hectares of natural forest for each hectare of plantation.

Creation of village woodlots will make fuelwood available within a kilometer of a village. This will shorten the walk now necessary by the family woodgatherer to 1/6 or 1/10 of the present distance. This person would then be free for other productive work or self-actualizing leisure pursuits.

Introduction of more efficient utilization of trees from either natural forests or plantations will also reduce pressure on the environment, reduce a cause of bush fires and generally serve as a conservation approach.

2. Water Quality

Water quality will improve in each reforested area as the tree canopies and root systems will reduce wind, water, and solar action on the soil.

3. Atmospheric Influence

Dust pollution will be reduced somewhat.

4. Natural Resources

Establishment of tree plantations or village woodlots will mean that water formerly used by grasses, less productive weeds or shrubs or seattered trees, or which was evaporated at the soil surface, will be productively utilized by trees. No irreversible or inefficient alterations to the natural resource base are anticipated.

5. Cultural and Socio-Economic Factors

Several years ago, valuable indigenous species occupied the areas to be planted. They have been replaced by low value thornbush species. The species to be planted in both plantations and woodlots are primarily exotic species which have been well tested in The Gambia and surrounding countries. Both Gmelina and neem reproduce naturally. Both have beneficial effects on the environment. Their direct socio-economic impacts will be seen in increased quantities of forest products at reasonable prices and in dependable amounts. Benefits will accrue to low-income families who must purchase wood or charcoal or walk long distances to get it. Many such persons will be employed in preparing sites, planting, tending, harvesting or sale of the products.

Changes in economic growth/employment patterns are all seen to be positive in The Gambia.

6. Special Risk Benefit Analysis

No chemicals of any sort (pesticides, herbicides, fertilizers, etc.) are proposed for use in this project, so a special risk/benefit analysis is not required under Part I of USAID, Handbook No. 3, Appendix 4B.

If termite attacks on some of the fruit tree species become serious around the selected villages, a Special Risk/Benefit Analysis can be submitted after the problem is apparent. In such case, the chemical to be used would be dieldrin which has been registered by the U.S.E.P.A. for subsurface ground insertion for termite control and for dipping of non-food roots and tops (Reference: EPA publication of May 1978, "Suspended and Cancelled Pesticides").

7. General

No international or controversial impacts are anticipated due to this project. The project reflects objectives established by CILSS and the Club for the forestry sector.

The highly positive ecological goals promoted by this project should eventually go beyond the boundaries of the plantation and villages where project activities will take place.

Although a second phase is not proposed, at the time of the mid-project evaluation consideration should be given to a second phase program of at least equal size. By that time a number of the persons to be trained by AID will have returned to their work and will have demonstrated an ability to manage a larger scale project.

Even assuming that population levels can be held close to their present status, a large plantation in each of 2 urban areas (Banjul and Georgetown) and woodlots around each village are needed to permit natural forces to restock what were formerly forest or wooded lands. Only in this fashion can the degradation of The Gambia's natural resources be halted and reversed.

8. Recommendations for Environmental Action

It is determined that the project will not have a significant adverse effect on the environment. It will, however, be an important step in the overall strategy of the GOTG in its struggle to halt the alarmingly rapid process of desertification.

A Negative Determination, in accordance with AID Regulation 16, is recommended.

REFERENCES

A. Mann, R.D. 1977. "The Gambia: The need for a national Tree Planting Programme". (A report prepared for the President issued in August 1977). Christian Council of The Gambia, Banjul, (Mimeo).

B. Mann, R.D. 1975. "The Gambia: Land and Vegetation Degradation Survey: The need for land reclamation by comprehensive ecological methods". (A report prepared for the Ministry of Agriculture, August 1975, re-issued June 1977. (Mimeo).

C. Jacyna, Simon 1977. "Report on the Inventory of Nyambai/ Bamba and Kabafita Forest Parks". Department of Forestry, The Gambia, September 1977. (Mimeo).

ANNEX L

Equipment To Be Financed By The FRG

2 Gasoline-driven portable saws, mounted on trailers for bush use

2 Unimog logging trucks/and spare parts, fitted with winch and log carrier

6 Land Rovers for use by Rangers in regions

66 Bicycles for Scouts

12 Chain saws with spare parts and accessories

1 VW Combi Van fitted as camper

1 Aluminum-hull outboard dinghy with 20 hp engine

Miscellaneous equipment including steel tapes, logging jacks

Estimated total cost including shipping and insurance is DM 400,000 ($200,000). Funds to be available late CY 1979.

Annex M

5C(2) - PROJECT CHECKLIST

Listed below are, first, statutory criteria applicable generally to projects with FAA funds, and then project criteria applicable to individual fund sources: Development Assistance (with a sub-category for criteria applicable only to loans); and Security Supporting Assistance funds.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? IDENTIFY. HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

A. GENERAL CRITERIA FOR PROJECT.

1. App. Unnumbered; FAA Sec. 653(b) (a) Describe how Committees on Appropriations of Senate and House have been or will be notified concerning the project; (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than $1 million over that figure plus 10%)?	1. a. Project was described in the FY 1979 Congressional Presentation. b. Yes.
2. FAA Sec. 611(a)(1). Prior to obligation in excess of $100,000, will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?	2. a. Yes. b. Yes.
3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?	3. Legislative action is not required.
4. FAA Sec. 611(b); App. Sec. 101. If for water or water-related land resource construction, has project met the standards and criteria as per Memorandum of the President dated Sept. 5, 1973 (replaces Memorandum of May 15, 1962; see Fed. Register, Vol 38, No. 174, Part III, Sept. 10, 1973)?	4. N.A.
5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed $1 million, has Mission Director certified the country's capability effectively to maintain and utilize the project?	5. Yes. See Annex N to Project Paper.

A.

6. FAA Sec. 209, 619. Is project susceptible of execution as part of regional or multilateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. If assistance is for newly independent country, is it furnished through multilateral organizations or plans to the maximum extent appropriate?

6. Project is bilaterally funded. However, the British Overseas Development Ministry, FAO, the Arab Development Bank, and the Federal Republic of Germany are providing funding for parallel activities in the forestry sector in The Gambia. See Part I.E. of Project Paper.

7. FAA Sec. 601(a); (and Sec. 201(f) for development loans). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.

7. The purpose of the project is to increase the efficiency of wood production and utilization. The project will also encourage use of communal forms of organization to develop and manage village woodlots.

8. FAA Sec. 601(b). Information and conclusion on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).

8. The project will finance approximately $138,000 of U.S. commodities (out of a total project budget of $1,575,000). The project will also finance technical services in the amount of $240,000.

9. FAA Sec. 612(b); Sec. 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services.

9. The GOTG will agree in the Project Agreement to provide local currency financing in support of the technical assistance team and the production component. No U.S.-owned foreign currencies are available for this project.

10. FAA Sec. 612(d). Does the U.S. own excess foreign currency and, if so, what arrangements have been made for its release?

10. The Gambia is not an excess currency country.

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FAA Sec. 102(c); Sec. 111; Sec. 281a. Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production, spreading investment out from cities to small towns and rural areas; and (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions?

1. a. The methods of plantation establishment are highly labor-intensive and will generate employment.

b. The woodlot program will assist villagers to develop a source of wood close at hand for fuel and other domestic purposes.

B1

b. FAA Sec. 103, 103A, 104, 105, 106, 107. Is assistance being made available: [Include only applicable paragraph -- e.g., a, b, etc. -- which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source.]

(1) [103] for agriculture, rural development or nutrition; if so, extent to which activity is specifically designed to increase productivity and income of rural poor; [103A] if for agricultural research, is full account taken of needs of small farmers; — N.A.

(2) [104] for population planning or health; if so, extent to which activity extends low-cost, integrated delivery systems to provide health and family planning services, especially to rural areas and poor; — N.A.

(3) [105] for education, public administration, or human resources development; if so, extent to which activity strengthens nonformal education, makes formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in development; — N.A.

(4) [106] for technical assistance, energy, research, reconstruction, and selected development problems; if so, extent activity is: — N.A.

(a) technical cooperation and development, especially with U.S. private and voluntary, or regional and international development organizations;

(b) to help alleviate energy problem;

(c) research into, and evaluation of, economic development processes and techniques;

(d) reconstruction after natural or manmade disaster;

(e) for special development problem, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance;

(f) for programs of urban development, especially small labor-intensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development.

(5) [107] by grants for coordinated private effort to develop and disseminate intermediate technologies appropriate for developing countries.

N.A.

c. FAA Sec. 110(a); Sec. 208(e). Is the recipient country willing to contribute funds to the project, and in what manner has or will it provide assurances that it will provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)?

c. N.A. Project is funded out of Sahel appropriation (SH).

d. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing?

d. Yes. The Gambia is on the United Nations' list of the relatively least developed countries.

e. FAA Sec. 207; Sec. 113. Extent to which assistance reflects appropriate emphasis on; (1) encouraging development of democratic, economic, political, and social institutions; (2) self-help in meeting the country's food needs; (3) improving availability of trained worker-power in the country; (4) programs designed to meet the country's health needs; (5) other important areas of economic, political, and social development, including industry; free labor unions, cooperatives, and Voluntary Agencies; transportation and communication; planning and public administration; urban development, and modernization of existing laws; or (6) integrating women into the recipient country's national economy.

e. (3) The project will provide significant academic and technical training to personnel of the Forestry Department.

(5) The Gambia relies upon wood to meet nearly 90% of its energy needs. Firewood and charcoal are in short supply and their provision increasingly difficult to the poor. By increasing the efficiency of wood production and utilization, the project will be helping to solve a major economic and environmental problem.

f. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civic education and training in skills required for effective participation in governmental and political processes essential to self-government.

f. The GOTG has requested AID to focus its assistance on problems relating to natural resource management. The project was designed to make best use of existing skilled manpower in The Gambia and to increase the number of personnel with technical and managerial skills required for development of The Gambia's forestry sector.

g. FAA Sec. 201(b)(2)-(4) and -(8); Sec. 201(e); Sec. 211(a)(1)-(3) and -(8). Does the activity give reasonable promise of contributing to the development: of economic resources, or to the increase of productive capacities and self-sustaining economic growth; or of educational or other institutions directed toward socia' progress? Is it related to and consis-tent with other development activities, and will it contribute to realizable long-range objectives? And does project paper provide information and conclusion on an activity's economic and technical soundness?

g. Yes. See Annexes C-F of Project Paper for information on the project's anticipated economic impact. The plantations will produce net economic and financial benefits. Part I.E. describes the project's relation to other development activities, with which it is fully consistent. The project will contribute to the GOTG's long-term objective of improved natural resource management.

h. FAA Sec. 201(b)(6); Sec. 211(a)(5), (6). Information and conclusion on possible effects of the assistance on U.S. economy, with special reference to areas of substantial labor surplus, and extent to which U.S. commodities and assistance are furnished in a manner consistent with improving or safeguarding the U.S. balance-of-payments position.

h. Nearly 30% of the project budget will be for procurement of U.S. goods and services. No waivers have been requested for procurement.

2. Development Assistance Project Criteria (Loans only)

2. N.A. Project is grant-financed.

a. FAA Sec. 201(b)(1). Information and conclusion on availability of financing from other free-world sources, including private sources within U.S.

b. FAA Sec. 201(b)(2); 201(d). Information and conclusion on (1) capacity of the country to repay the loan, including reasonableness of repayment prospects, and (2) reasonableness and legality (under laws of country and U.S.) of lending and relending terms of the loan.

c. FAA Sec. 201(e). If loan is not made pursuant to a multilateral plan, and the amount of the loan exceeds $100,000, has country submitted to AID an application for such funds together with assurances to indicate that funds will be used in an economically and technically sound manner?

d. FAA Sec. 201(f). Does project paper describe how project will promote the country's economic development taking into account the country's human and material resources requirements and relationship between ultimate objectives of the project and overall economic development?

e. FAA Sec. 202(a). Total amount of money under loan which is going directly to private enterprise, is going to intermediate credit institutions or other borrowers for use by private enterprise, is being used to finance imports from private sources, or is otherwise being used to finance procurements from private sources?

f. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete in the U.S. with U.S. enterprise, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?

3. Project Criteria Solely for Security Supporting Assistance

FAA Sec. 531. How will this assistance support promote economic or political stability?

3. N.A.

4. Additional Criteria for Alliance for Progress

[Note: Alliance for Progress projects should add the following two items to a project checklist.]

a. FAA Sec. 251(b)(1), -(8). Does assistance take into account principles of the Act of Bogota and the Charter of Punta del Este; and to what extent will the activity contribute to the economic or political integration of Latin America?

b. FAA Sec. 251(b)(8); 251(h). For loans, has there been taken into account the effort made by recipient nation to repatriate capital invested in other countries by their own citizens? Is loan consistent with the findings and recommendations of the Inter-American Committee for the Alliance for Progress (now "CEPCIES," the Permanent Executive Committee of the OAS) in its annual review of national development activities?

4. N.A.

5. FAA Sec. 121. Additional Criteria for Sahel Development Program. How will this assistance contribute to the long-term development of the Sahel Region in accordance with a long-term multi-donor Development Plan.

5. The project is entirely consistent with the long-term strategy established by CILSS and the Club for development of the forestry sector in the Sahel. See Part I.D. of Project Paper.

Annex N

Section 611(e) Certification

Based upon my knowledge of, and experience in, the Gambia, plus that of other donors, I hereby certify that in my opinion the Government of the Gambia and its agencies will have the capability in terms of both financial and human resources to maintain and utilize effectively this project, 635-0205.

Douglas P. Broome
AID Operations Officer
AID/Banjul

ANNEX O

PID APPROVAL MESSAGES

PAGE 01 STATE 044526
ORIGIN AID-54

INFO OCT-01 AF-10 IO-14 EB-08 L-03 IGA-02 /092 R

DRAFTED BY AFR/SFWA:HGRAY:MM
APPROVED BY AFR/SFWA:DSHEAR
AFR/SFWA:MFARNHAM
AFR/SFWA:GWEVANS
AFR/SFWA:JLANGLOIS (DRAFT)
AFR/SFWA:CULINSKI (DRAFT)
AFR/SFWA:JBINGEN
AFR/SFWA:DTINSLER AFR/DP:MTATE
AFR/DR:TCRAWFORD
AFR/DR/ARD:DFERGUSON
DESIRED DISTRIBUTION
PG ACTION AFR CHRON 2 3 8 INFO IA IG GC GCAF GCFLD ENGR ES SER AGRIC
S TA/RD TAAG S4P

----------118387 2121592 /63

P 212811Z FEB 78
FM SECSTATE WASHDC
TO AMEMBASSY BANJUL PRIORITY
AMEMBASSY DAKAR PRIORITY
AMEMBASSY OUAGADOUGOU PRIORITY
AMEMBASSY ABIDJAN
AMEMBASSY BONN

UNCLAS STATE 044526

AIDAC

E.O. 11652: N/A

TAGS:

SUBJECT: GAMBIA REFORESTATION PID (635-0208)

REF: A) DAKAR 635 (NOTAL), B) BANJUL 1548 (1977) (NOTAL),
C) STATE 261969 (1977)

1. SUBJECT PID WAS ORIGINALLY REVIEWED AT JULY 8 PROJECT COMMITTEE MEETING, JULY 8 ABS ECPR, AND SEPTEMBER 8 PROJECT COMMITTEE MEETING CONVENED TO EVALUATE PID'S IN LIGHT OF ABS ECPR). IT WAS ALSO DISCUSSED AT AUGUST 17 DAP REVIEW. CONCLUSION OF THESE REVIEWS WAS THAT U.S. ASSISTANCE TO THE GAMBIA BE COMBINED IN AS FEW FUNDING VENICLES AS POSSIBLE AND THAT AID, IF POSSIBLE, SHOULD CONCENTRATE BILATERAL RESOURCE MANAGEMENT ASSISTANCE TO GAMBIA IN AN INTEGRATED LAND/WATER RESOURCE MANAGEMENT PROGRAM TO INCLUDE CONSERVATION, RANGE AND LAND USE MANAGEMENT, AND CROP PRODUCTION. IT WAS THEREFORE PROPOSED THAT THE SUBJECT PID BE CONSIDERED AS ADD-ON TO SOIL AND WATER MANAGEMENT UNIT PROJECT (635-0202) BECAUSE SUB-ACTIVITIES HAVE A CLEAR RELEVANCE TO LAND USE AND CONSERVATION.

2. FORESTRY PROJECT SHOULD BE DESIGNED AS AN ADD-ON COMPONENT, IF FEASIBLE, TO THE SOIL AND WATER MANAGEMENT UNIT PROJECT. HOWEVER, THIS SHOULD BE REVIEWED BY PROJECT DESIGN TEAM, AAO/BANJUL, AND RDO/DAKAR, AND ANY RECOMMENDATION TO AID/W.
FOR EXAMPLE, COULD THIS BE AN AMENDMENT
TO THE
PROPOSED MIXED FARMING AND RESOURCE MANAGEMENT PROJECT FOR WHICH WE ARE NOW AWAITING PID?

3. BEFORE FURTHER DESIGN OF THE REFORESTATION PROJECT, AN ADDITIONAL FACTOR WHICH HAS RECENTLY COME TO AID/W'S ATTENTION MUST BE ADDRESSED. CILSS SECRETARIAT RECENTLY INFORMED AID/W THAT FOLLOWING CONSULTATIONS WITH MR. MCEWAN, DIRECTOR OF GAMBIAN FORESTRY SERVICE, MCEWAN BELIEVED THAT REFORESTATION PID DID NOT FALL WITHIN

FORESTRY SERVICE PROGRAM AND THAT IT RAN CONTRARY TO GOTG PRIORITIES BECAUSE IT WAS BEYOND THE GOTG CAPABILITY TO MANAGE AND WOULD REQUIRE CONSIDERABLE NON-GAMBIAN TECHNICAL ASSISTANCE TO IMPLEMENT.

4. ALSO UNDERSTAND THAT APPROPOS REF C, MR. STEBLER OF CILSS ECOLOGY/ENVIRONMENT WORKING TEAM PREPARING TERMS OF REFERENCE FOR A PROPOSED JOINT US/GERMAN (FRG) DESIGN TEAM TO ASSURE COMPLEMENTARITY OF REFORESTATION PROJECTS IN THE GAMBIA. MR. STEBLER HAD PLANNED TO SEND THIS TO THE GAMBIA BY FEBRUARY 10 FOR GOTG REVIEW BEFORE SENDING TO THE US AND FRG. WE ENCOURAGE THIS INITIATIVE.

5. MEANWHILE, AS PART OF THE SENE-GAMBIA BASIN DEVELOPMENT PROGRAM, J.P. HUYGENS OF UNDP/DAKAR IS CURRENTLY IN THE GAMBIA TO DESIGN A FORESTRY PROGRAM FOR THE COMMISSION. CLEARLY THESE PROPOSED REGIONAL AND BILATERAL FORESTRY PROJECTS MUST BE COMPATIBLE.

6. IN LIGHT OF THE ABOVE, AID/W BELIEVES BEST THAT BROOME (AAO/BANJUL), IF RDO/DAKAR CONCURS, TAKE LEAD TO SOLICIT COORDINATION VARIOUS FORESTRY DESIGN ACTIVITIES WITH MCEWAN, STEBLER, AND HUYGENS. YOUR CONTACTS SHOULD CLARIFY STATUS OF THE SEVERAL PROPOSED REFORESTATION PROJECTS FOR GOTG AND STATUS OF STEBLER TOR FOR JOINT US/FRG DESIGN MISSION. ALSO REQUEST YOUR RECOMMENDATION ON WHETHER CURRENT PID IS STILL ADEQUATE. AID/W WILL THEN ADVISE RE PROJECT DESIGN REQUIREMENTS.

7. REF C BEING REPEATED BANJUL. VANCE

ACTION AID-59

INFO OCT-01 NEA-10 EB-08 EUR-12 AF-10 /100 W
------------------134586 231637Z /40

P R 231438Z MAR 78
FM AMEMBASSY BANJUL
TO SECSTATE WASHDC PRIORITY 5342
INFO AMEMBASSY ABIDJAN
AMEMBASSY BONN
AMEMBASSY DAKAR
AMEMBASSY OUAGADOUGOU

UNCLAS SECTION 1 OF 2 BANJUL 0470

AIDAC

E.O. 11652: N/A
SUBJ: GAMBIA REFORESTATION PID (635-0205)
REF: (A) STATE 044526 (B) STATE 054276

1. AID BANJUL HAS DISCUSSED REF (A) IN DETAIL WITH MCEWAN, GOTG CONSERVATOR OF FORESTS, AND HUYGENS WHO IS CURRENTLY DRAFTING FORESTRY PROGRAM IN CONJUNCTION WITH THE MULTI-DONOR MISSION TO THE COORDINATING COMMITTEE FOR THE DEVELOPMENT OF THE GAMBIA RIVER BASIN.

2. ALL PARTIES RECOGNIZE VALIDITY OF APPROACH TOWARDS INTEGRATED LAND USE MANAGEMENT AND ARE NOT LIMITING THEIR CONCEPTUALIZATION PROCESS TO NARROW, TRADITIONAL FORESTRY CONCERNS. THERE IS CLEAR RECOGNITION OF THE CLOSE RELATIONSHIP OF THE REFORESTATION/AFFORESTATION ACTIVITY (HOWEVER IT MAY IN THE END BE LINKED FORMALLY OR INFORMALLY WITH OTHER PROJECTS) TO THE PURPOSES OF THE SOIL AND WATER MANAGEMENT UNIT PROGRAM (PROJECT 635-0202) AND THE PURPOSES OF THE MIXED FARMING SYSTEMS PID NOW IN AID/W (PROJECT 635-0203).

3. WHATEVER THE OUTCOME IN TERMS OF THE AID FUNDING VEHICLE, THE OBVIOUS CONCERN EXPRESSED BY GOTG OFFICIALS WAS THAT THE EFFECTIVE CONTROL OF THE ACTIVITY BUDGET RESOURCES (FOREIGN AND GAMBIAN) SHOULD NOT BE LOST TO THE FORESTRY DEPARTMENT IN THE COURSE OF CONCEPTUALIZING INTEGRATION. THE FACTS OF GOTG ORGANIZATION WITHIN THE MINISTRY OF AGRICULTURE AND NATURAL RESOURCES MUST BE TAKEN INTO ACCOUNT.

4. WE FEEL THE CONCERNS EXPRESSED PARAS (1) AND (2) REF (A) SHOULD BEST BE RESOLVED BY JOINT AID AND FRG TEAM WHICH WE NOW UNDERSTAND IS SCHEDULED TO BE IN THE GAMBIA 2-10 MAY.

5. CONTRARY TO PARA (4) REF (A), STEBLER PASSED ASSIGNMENT TO PREPARE TOR FOR JOINT MISSION TO MCEWAN WHO HAS JUST COMPLETED THEM WITH INPUT FROM AID/BANJUL. TOR CALLS FOR EACH DONOR TO SUPPLY FOUR MEMBERS. THE EIGHT SKILLS NEEDED ARE AS FOLLOWS:

A. ENVIRONMENTALIST WITH RELEVANT EXPERIENCE IN AFRICAN SAVANNAS.
B. SILVICULTURALIST WITH RELEVANT EXPERIENCE IN SPECIES/SITE TRIALS IN THE SUDANO-GUINEAN SAVANA ZONE.
C. PROJECT DESIGN SPECIALIST.
D. FOREST MANAGEMENT EXPECT WITH RELEVANT EXPERIENCE IN AFFORESTATION IN THE SUDANO-GUINEAN SAVANNA ZONE.
D. FINANCIAL ANALYST WITH SOME FORESTRY EXPERIENCE.
F. APICULTURIST WITH RELEVANT EXPERIENCE IN MANAGEMENT OF THE AFRICAN BEE, APIS MELLIFERA ADANSONII.
G. FOREST PRODUCTS EXPERT WITH RELEVANT EXPERIENCE IN UTILIZATION OF MANGROVE SPECIES AND IN PRODUCTION OF CHARCOAL.
H. FOREST INVENTORY SPECIALIST.

6. THE TOR IDENTIFIES THE MAIN SUBJECTS OF ENQUIRY FOR THE TEAM:

A. PLANTATIONS FOR FUELWOOD PRODUCTION
B. MANAGEMENT OF NATURAL WOODLAND

C. LARGE-SCALE EXPLOITATION OF MANGROVE FOREST
D. RESEARCH INTO SUITABLE EXOTIC SPECIES FOR PLANTATION IN THE GAMBIA
E. BEE-KEEPING EXTENSION
F. NATIONAL FOREST INVENTORY
G. NATIONAL TREE PLANTING PROGRAM AT LEVEL OF RURAL POPULATION.

7. AID/BANJUL DISCUSSIONS WITH MCEWAN REVEAL THAT PARA (3) REF (A) REFLECTS A MISUNDERSTANDING ON PART OF CILSS SECRETARIAT. IN FACT, THE REFORESTATION PID WAS ORIGINALLY DEVELOPED IN CLOSE COORDINATION WITH, AND ON THE BASIS OF MUCH MATERIAL SUPPLIED BY, MCEWAN. IT IS SQUARELY WITHIN GOTG PRIORITIES PRECISELY BECAUSE IT WAS CAREFULLY THOUGHT OUT IN TERMS OF GAMBIAN CAPABILITY TO MANAGE AND THE POTENTIAL FOR GAMBIAN FORESTRY STAFF DEVELOPMENT OVER THE COMING FIVE YEARS.

ACTION TO: AFR/SFWA
DATE DUE:
DR/DF / AFR/DFI
CRM/MO (C&RSC # 2) Ext. 22000
MAR 24 1978
AM 7,8,9,10,11,12,1,2,3,4,5,6 PM

PAGE 01 BANJUL 03470 02 OF 02 231625Z 9597
ACTION AID-59

INFO OCT-01 NEA-10 EB-08 EUR-12 AF-10 /100 W
------------------104678 231636Z /40

P R 231430Z MAR 78
FM AMEMBASSY BANJUL
TO SECSTATE WASHDC PRIORITY 5343
INFO AMEMBASSY ABIDJAN
AMEMBASSY BONN
AMEMBASSY DAKAR
AMEMBASSY OUAGADOUGOU

UNCLAS FINAL SECTION OF 2 BANJUL 0470

AIDAC

8. THE CONFUSION SEEMS TO STEM FROM MCEWANS COMMENT TO THE CILSS SECRETARIAT THAT HE HAS LOOKED CLOSELY AT A WEST GERMAN FORESTATION PROJECT IN SENEGAL. ON THE BASIS OF HIS UNDERSTANDING OF THIS PROJECT'S STRUCTURE AND APPROACH, HE IS UNSURE WHETHER WEST GERMAN PROJECT STYLE AND IDEAS WOULD BE COMPATIBLE WITH GAMBIAN PLANS. HE IS, IN SHORT, NOT DESIROUS OF SEEING THIS WEST GERMAN PROJECT IN SENEGAL REPLICATED IN THE GAMBIA.

9. AID/BANJUL DISCUSSIONS WITH HUYGENS AND MCEWAN REVEAL FURTHER THE COMPATIBILITY OF THE GAMBIAN FIRST GENERATION CILSS PRIORITY PROGRAM IN FORESTRY WITH THE LONGER-HORIZONED GAMBIA RIVER BASIN FORESTRY PROGRAM. HUYGENS DOES NOT EVEN BEGIN HIS OUTPUT CONSIDERATIONS UNTIL 1983 WHILE THE IMMEDIATE GAMBIAN FORESTRY PROGRAM COVERS ROUGHLY UP TO 1985. HUYGENS IS FULLY AWARE OF GAMBIAN PROPOSALS IN THE NEARER TERM AND INDICATES CONCURRENCE WITH THEM. THEY SERVE AS A STEPPING STONE INTO HIS CONCEPTUAL FRAMEWORK.

10. IN SUMMARY, AIDW SHOULD CONSIDER TWO POINTS:

A. AT PRESENT THERE IS BUT ONE SIGNIFICANT POTENTIAL DONOR INTEREST IN GAMBIAN FORESTRY; THAT IS, THE AID AND FRG JOINT PROGRAM.

B. GOTG PRIORITIES PLACE REFORESTATION AS ONE OF THE GAMBIA'S PRIORITY PROJECTS UNDER THE CILSS FIRST GENERATION PROGRAM. THE PID STILL SERVES AS THE STARTING POINT IN THIS REGARD.
NESBERG

1
ACT
AFR
INF
1-2-4-6-5
CMGT
AAID
DSPACR
PPC
PPC
ENGR
FM
AGRIC
GC
SMC

PAGE 01 STATE 123775 0097
ORIGIN AID-30

INFO OCT-01 AF-10 CES-07 E2-08 /056 R

DRAFTED BY AFR/SFWA:HGRAY:MM
APPROVED BY AA/AFR:GTBUTCHER
AFR/SFWA SA:CLUSTIG (SUBS)
AFR/SFWA/SDP:AROLLINS (DRAFT)
AFR/SFWA:HFARNHAM (DRAFT)
AFR/SFWA:DSHEAR
AFR/DP:WTATE (SUBS)
AFR/DR:TCRAWFORD (DRAFT)
AFR/DR/ARD:DFERGUSON
A/AA/AFR:WHNORTH
DESIRED DISTRIBUTION
98 ACTION AFR 15 CHRON 1 2 8 INFO RS PPC 5 AA/DS 1 DS/AGR 2 OA 30P
----------108936 160123Z /73

R 152324Z MAY 78
FM SECSTATE WASHDC
TO AMEMBASSY BANJUL
AMEMBASSY OUAGADOUGOU
AMEMBASSY BONN
AMEMBASSY DAKAR
AMEMBASSY ABIDJAN

UNCLAS STATE 123775

AIDAC

E.O. 11652: N/A

TAGS:

SUBJECT: GAMBIA REFORESTATION PID (635-0204)

REF: A) STATE 44526, B) BANJUL 0478, C) STATE 109346

1. AS NOTED PARA 1 REF A, REVIEW OF SUBJECT PID CONCLUDED WITH PROPOSAL THAT PID BE CONSIDERED AS ADD-ON TO SOIL AND WATER MANAGEMENT UNIT PROJECT (635-0202). LATTER PROJECT WAS EXPECTED TO BECOME A COMPONENT OF A LARGE REGIONAL INTEGRATED RESOURCES MANAGEMENT PROJECT INCLUDING ACTIVITIES IN GAMBIA, SENEGAL, AND MAURITANIA. DUE PARTIALLY TO UNCERTAIN STATUS OF REGIONAL PROJECT (COMPONENTS OF WHICH WERE SUBSEQUENTLY DISAGGREGATED), PID APPROVAL CABLE WAS NOT SENT LAST FALL. OFFICIAL APPROVAL WAS FURTHER DELAYED WHEN AID/W LEARNED OF AN APPARENT GOTG RESERVATION REGARDING THE PROJECT AS NOTED PARA 3 REF A. REF B PARAS 7 AND 10B CLEARED UP THIS MISUNDERSTANDING.

2. AS NOTED REF A, AID/W IS INTERESTED IN COMBINING ITS ASSISTANCE TO THE GAMBIA IN AS FEW FUNDING VEHICLES AS POSSIBLE. AA/AFR AGREES WITH PARAS 2 AND 3, REF B, AND APPROVES THE REFORESTATION PID ON THE BASIS THAT THE DESIGN TEAM WILL REVIEW THE FEASIBILITY RE MERGER WITH OTHER PROJECTS WHEN PROJECT LINKAGES AND FUNDING ARE ANALYZED.

3. WE STILL AWAITING TOR FOR SUBJECT TEAM. PLEASE SUBMIT ASAP. VANCE

PAGE 01 PARIS 19883 01 OF 02 141840Z 6231 PARIS 19883 01 OF 02 141840Z

ACTION AID-59

INFO OCT-01 AF-10 EUR-12 INR-10 CIAE-00 SP-02 EB-08
/102 W
----------056998 141902Z /46

P R 141878Z JUN 78
FM AMEMBASSY PARIS
TO SECSTATE WASHDC PRIORITY 3253
AMEMBASSY BANJUL
INFO AMEMBASSY DAKAR .
AMEMBASSY OUAGADOUGOU
AMEMBASSY BONN

UNCLAS SECTION 01 OF 02 PARIS 19883

USDECD

AIDAC

E.O. 11652: N/A
SUBJECT: GAMBIA REFORESTATION PROJECT 635-0284

REFS: (A) PARIS 18182 NOTAL; (B) BANJUL 0759; (C) STATE 141854; (D) BANJUL 0777

1. PURSUANT TO REF. (A) CRAWFORD/FELL MET WITH OTTO VON GROTTHUSS AND GODFREY NEBO, FORESTRY SECTION GTZ RE SUBJECT PROJECT AND GERMAN FORESTRY PLANS IN GAMBIA.

OBJECTIVE WAS TO COORDINATE AID DESIGN, IDENTIFY AREAS WHERE AID COULD SUPPORT PLANNED GERMAN PROJECT AND CONTRIBUTE TO MEETING PRIORITY NEEDS OF GAMBIA AS RECOMMENDED BY AID BANJUL AND AID/W PER REFS: (B), (C). CRAWFORD/FELL WERE ENTHUSIASTICALLY RECEIVED BY GTZ REPS WHO EXPRESSED APPRECIATION FOR EXCELLENT COOPERATION AND ASSISTANCE GTZ MISSION WAS PROVIDED BY AID/BANJUL.

2. PLANNED GERMAN PROJECT INVOLVES:
A. COMPLETE FOREST INVENTORY BASED ON AERIAL PHOTOS AT 1:20,000 SCALE AND ON-GROUND VERIFICATION FROM WHICH MAPS OF FOREST AREAS WOULD BE PREPARED;
B. SPECIES/SITES TRIALS TO EXPERIMENT UNDER DIFFERENT SOIL CONDITIONS WITH TREES FOR WOOD, FORAGE, PULP, TIMBER, SOIL STABILIZATION AND REGENERATION;
C. PROTECTION OF EXISTING NATURAL FOREST LANDS, INVOLVING DEMARCATION FOREST PRESERVES AND CONSTRUCTION FIRE BREAKS;
D. TRAINING AT FORESTRY SCHOOLS IN OTHER AFRICAN COUNTRIES OR EUROPE (POSSIBLY CYPRUS).

3. PROJECT COST ROUGHLY ESTIMATED AT DM 3.2 MILLION (2 DM = $ 1, SO PROJECT WILL BE ABOUT $ 1.6 MILLION) AND COMPONENTS ARE:
A. ABOUT 9 PERSON YEARS TECHNICAL ASSISTANCE (DM 1.6) TO CONDUCT ON-GROUND SURVEYS, INTERPRET AERIAL PHOTOS AND SUPERVISE SPECIES TRIALS;
B. DM 0.9 FOR EARIAL PHOTOS BASED ON ESTIMATE GERMAN COMPANY OF DM 75-85 PER SQUARE KILOMETER;
C. DM 1.3 MILLION FOR EQUIPMENT NEEDED FOR FOREST INVENTORY AND FOREST RESERVE PROTECTION (UNIMOGS, TRACTORS, BOATS AND HOUSEBOAT FOR TECHNICIANS LODGING);
D. NO ESTIMATE OF TRAINING COST YET PREPARED.

4. GROTTHUSS SAID PROPOSAL WILL BE FINALIZED END JUNE, SENT TO MINISTRY OF COOPERATION AND SUBSEQUENTLY TRANSLATED AND SENT TO GOTG. FORESTRY IS NOT INCLUDED ON LIST OF POSSIBLE GERMAN FINANCED ACTIVITIES FOR GAMBIA IN 1978-79. EARLIEST FINANCING WOULD BE 1980, BUT GROTTHUSS SAID AID EXPRESSION OF INTEREST IN PARTICIPATING APPROPRIATE REFORESTATION-REVEGETATION PROGRAM FOLLOWING COMPLETION OF INVENTORY AND PREPARATION OF PROJECTIONS FOR SUSTAINED ANNUAL YIELD WOULD STRENGTHEN CASE FOR MOBILIZATION OF GERMAN ASSISTANCE FOR FORESTRY SECTOR.

5. CRAWFORD/FELL ASKED HOW AID COULD BEST SUPPORT GERMAN ACTIVITIES. AFTER DISCUSSION IDEAS PARA. 4 REF. (B) AND PARA. 3 REF. (D), CONCLUSION REACHED THAT AID COULD PROVIDE MOST TIMELY SUPPORT BY FINANCING AERIAL PHOTOS DESCRIBED ABOVE AND INTERIM PLANTING ACTIVITY.
A. AERIAL PHOTOS. NEBO SAID PROCESS OF SELECTION CONTRACTOR FOR AERIAL PHOTOS, DOING COMPLETE PHOTOGRAPHY AND PREPARING MOSAICS COULD EASILY TAKE A YEAR. COMPLETION OF INVENTORY WITH ON-GROUND SURVEYS AND YIELD PROJECTIONS WOULD TAKE ANOTHER YEAR. IF AID COULD FINANCE AERIAL PHOTOGRAPHY THIS WOULD CUT ONE YEAR OF TIME REQUIRED BY GERMANS TO COMPLETE INVENTORY AND WOULD ADVANCE DATE TO BEGIN LARGE SCALE REFORESTATION PROGRAM. CRAWFORD EXPLAINED THAT GAMBIA MIXED FARMING

ACTION TO: AFR/DR
DATE DUE:
SP EA RA AP AA DCH EM
CRM/MO (CSRSC # 2) Ext. 22000
AM: JUN 16 1978 PM
7 8 9 10 11 12 1 2 3 4 5 6

ACTION AID-59

SALZMAN

INFO OCT-01 AF-10 EUR-12 INR-10 CIAE-00 SP-02 EB-08
/102 W
----------057147 141983Z /41

P R 141828Z JUN 78
FM AMEMBASSY PARIS
TO SECSTATE WASHDC PRIORITY 3256
AMEMBASSY BANJUL
INFO AMEMBASSY DAKAR
AMEMBASSY OUAGADOUGOU
AMEMBASSY BONN

UNCLAS SECTION 02 OF 02 PARIS 19083

USOECD

SYSTEMS PROJECT 635-0203 HAS RESOURCE INVENTORY COMPONENT FOR WHICH AERIAL PHOTOGRAPHY ENVISIONED. THIS COMPONENT COULD EASILY BE STRUCTURED SO AS TO PROVIDE PHOTOGRAPHIC DATA REQUIRED AS BASIS FOR PREPARATION DETAILED FOREST INVENTORY BY GERMAN TECHNICIANS. USING 635-0203 AS FUNDING VEHICLE WOULD PERMIT COMPLETION OF PHOTOGRAPHY IN TIME FOR EARLY ARRIVAL GERMAN TECHNICIANS IN 1980 AND ACHIEVE ONE YEAR TIME SAVING.

B. INTERIM REFORESTATION ACTIVITY. EXACT REQUIREMENT FOR REFORESTATION CANNOT BE KNOWN UNTIL INVENTORY OF EXISTING FOREST-RESOURCES COMPLETE AND POTENTIAL OF VARIOUS SPECIES FOR SUSTAINED ANNUAL YIELD ANALYZED. HOWEVER, GTZ TECHNICIANS BELIEVE INTERIM PLANTING ACTIVITY OF 125 HA. PER ANNUM, AS SUGGESTED IN AID PID, WOULD ENABLE GOTG TO KEEP PACE TO SOME ESTENT WITH FUELWOOD REQUIREMENTS AND WOULD CERTAINLY NOT EXCEED GAMBIAN NEEDS. GOTG FAMILIAR WITH SPECIES GMELINA ARBOREA WITH PROVEN ADAPTABILITY TO GAMBIA CONDITIONS AND HIG YIELDS. REFORESTATION ACTIVITY WITH THIS SPECIES ON SCALE ABOUT 125 HA. PER ANNUM WOULDBE WITHINMANAGERIAL CAPABILITIES GOTG AND WOULD HAVE ADVANTAGE OF REQUIRING MINIMAL, IF ANY, TECHNICAL ASSISTANCE INPUT FOR IMPLEMENTATION. COST PLANTING ACTIVITY THIS SCALE COULD PROBABLY BE DONE FOR LESS THAN $ 500,000 OVER 4 YEARS PERMITTING PROCESSING OF PP ON FAST TRACK WITH AID/DAKAR APPROVAL.

6. DISCUSSION INDICATED THAT OTHER LISTED ACTIVITIES IN PARA. 4 REF. (B) AND PARA. 3 REF. (D), WHILE OF POSSIBLE INTEREST, ARE LOWER PRIORITY AND WOULD BE BEST CONSIDERED WHEN RESULTS OF FOREST INVENTORY AVAILABLE. GTZ REPS SAID TRAINING PROVIDED UNDER GERMAN PROJECT WOULD BE DESIGNED TO COVER GAMBIAN NEEDS. GTZ REPS ALSO SAID GERMAN ASSISTANCE PREPARED TO WORK WITH AID IN FURTHER DEVELOPMENT OF PROJECT IN CLOSE COOPERATION WITH CILSS.

7. IN VIEW ABOVE, CRAWFORD/FELL RECOMMEND AID ASSISTANCE TO GAMBIAN FORESTRY SECTOR CONSIST OF AERIAL PHOTOGRAPHY FINANCED THROUGH 635-0203 AND INTERIM PLANTING PROGRAM FINANCED UNDER 635-0204 OVER PERIOD OF 4 YEARS. AT END THAT PERIOD AS A RESULT OF GERMAN-FINANCED INVENTORY AND RESEARCH, SOUND EMPIRICAL BASIS WILL EXIST TO PERMIT LARGER SCALE, MULTI-DONOR INTEGRATED REFORESTATION PROGRAM.

8. REQUEST AID/BANJUL DIRECT VIEWS RE ABOVE TO AID/W. GTZ WOULD APPRECIATE EARLIEST AID RESPONSE ON RECOMMENDATION RE PHOTO COVERAGE ON TIMELY BASIS AS THIS EXPRESSION OF OTHER INTEREST WOULD ENCOURAGE FRG MINISTRY OF COOPERATION TO PROVIDE FINANCING FOR FORESTRY SECTOR IN GAMBIA.

PAGE 01 STATE 166628 8685
ORIGIN AID-37

INFO OCT-01 AF-10 EUR-12 EB-08 /068 R

DRAFTED BY AFR/DR/SFWAP:TCRAWFORD:DMB
APPROVED BY AFR/DR:JWKOEHRING
AFR/DR/SFWAP:JRMCCABE
AFR/SFWA:JJOHN (PHONE)
AFR/SFWA/SDP:CULINSKI
AFR/DR:WJOHNSON
DESIRED DISTRIBUTION
75 ACTION AFR 15 CHRON 2 3 8 INFO IA 1 PPC 8 IIA 2 AA/DS 1 DS/AGR 2
ENGR 3 37P

----------112587 301747Z /58

R 301656Z JUN 78
FM SECSTATE WASHDC
TO AMEMBASSY BANJUL
INFO AMEMBASSY DAKAR
AMEMBASSY OUAGADOUGOU
AMEMBASSY PARIS

UNCLAS STATE 166628

AIDAC BANJUL PASS ERIKSEN PARIS PASS FELL OECD

E.O. 11652: N/A

TAGS:

SUBJECT: GAMBIA REFORESTATION PROJECT 635-0204
OUAGADOUGOU PASS CILSS
REF: PARIS 19083

1. AOO BROOM MET WITH OIC LUSTIG, GAMBIA DESK OFFICER JOHN, PROJECT OFFICER CRAWFORD, AND ULINSKI (SDP) ON JUNE 21 TO DISCUSS CONTENTS REFTEL. MEETING ENDORSED RECOMMENDATIONS OF PARA. 7 REFTEL. DECISION WAS REACHED TO DEVELOP PP FOR SUBJECT PROJECT INCLUDING INTERIM PLANTING ACTIVITY OF APPROXIMATELY 125 HA. PER ANNUM; PARTICIPANT AND/OR THIRD-COUNTRY TRAINING; AND ACTIVITY TO DEVELOP STRATEGY FOR EXPLOITATION OF PORTION OF MANGROVE SWAMP WHICH WILL BE INNUNDATED BY DAM FOR WHICH UK NOW DOING FINAL DESIGN.

2. ANTICIPATE FIELDING PP DESIGN TEAM DURING AUGUST FOLLOWING COMPLETION OF FY 78 DESIGN ACTIVITIES. TEAM WILL BE RELATIVELY SMALL, CONSISTING OF 2 FORESTERS, ECONOMIST, SOCIOLOGIST, AND DESIGN OFFICER. SPECIFIC TOR FOR TEAM WILL BE DEVELOPED ASAP.

3. SEPTEL FOLLOWS ON AERIAL PHOTOGRAPHY TO BE CARRIED OUT UNDER MIXED FARMING SYSTEMS PROJECT 635-0203. VANCE

ANNEX P

BIBLIOGRAPHY

Adams, W.E. "Report on a Mission to The Gambia". Consultant to the National Rural Electrification Cooperatives Association, September-October.

BADEA/FAO. "Strengthening and Expansion of Infrastructure--Gambia National Tree Planting Festival", January 1979.

CILSS. "The Institutional Implications for Forestry Agencies through their Greater Involvement in Rehabilitation Programmes for the Sahel," working paper for CILSS/UNSO/FAO consultation on the role of forestry in the Sahel, April 1976.

CILSS. "La Situation Forestiere dans la Republique de la Gambie," working paper for CILSS/UNSO/FAO consultation on the role of forestry in the Sahel, April 1976.

Davidson, D.E. "Report on a Visit to The Gambia," January-February 1974.

Delwaulle, J.C. "Le Role de la Foresterie dans la Lutte contre la Desertification et sa Contribution au Developpement," Discussion Paper for CILSS/UNSO/FAO consultation on the role of forestry in the Sahel, April 1976.

French, David. "Discussion Paper for the Africa Bureau Firewood Workshop," AID/Washington, June 12, 1978.

GOTG. "Estimates of Recurrent Revenues and Expenditures for 1978/79."

GOTG. "The Forest Act, 1977, Regulations."

GOTG. "The Gambia: Land and Vegetation Degradation Survey--The Need for Land Reclamation by Comprehensive Ecological Methods," Forestry Department, August 1975, re-issued June 1977.

GOTG. "Ministry of Agriculture and Natural Resources, Department of Forestry--Structures, Mandates, Responsibilities, Budget," undated.

GOTG. "The Gambia--The Need for a National Tree Planting Programme," Department of Forestry, August 1977.

Huygen, Pierre. "Development of The Gambia River Basin--A Forestry Study of the Basin," January-March 1978.

Jacnya, Simon. "Report on the Inventory of Nyambai, Bamba, and Kabafita Forest Parks," Forestry Department, September 1977.

Jacyna, Simon. "Working Plan for Nyambai, Bamba, and Kabafita Forest Parks," Department of Forestry, 1977.

Johnson, M.S. "Forest Inventories in The Gambia," Land Resources Report No. 1, Overseas Development Ministry, London, undated, circa 1974.

Johnson, M.S. "Inventory of Mangroves above the Proposed Gambia River Barrage at Yelitenda, The Gambia," Land Resources Development Center, Ministry of Overseas Development, London, Report No. 54, 1978.

Land Resources Division. "Land Resource Study, Vol. 22--The Agricultural Development of The Gambia: an Agricultural, Environmental and Socio-economic Analysis," Overseas Development Ministry, London, 1976.

McEwan, R.J. "Afforestation Techniques for the Establishment of Gmelina Arborea in the Western Division of The Gambia," Forestry Department, undated.

Nebo, G. "Bericht uber eine Projektprufungsmission in Gambia," Deutsche Gesellschaft fur Technishe Zusammenarbeit (GTZ), Eschborn, May 1978.

Taal, Bye-Mass Max. "Economic Evaluation of Forest Management in The Gambia," Duke University, Durham, N.C., April 1978.

UNDP. "Development of the Gambia River Basin," Draft Final Mission Report, New York, June 1979.

Note: Additional bibliographic references are found at the end of Annex G, Social Soundness Analysis, and at the end of Annex K, Initial Environmental Examination.