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UNITED STATES
INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
Agency for International Development
Washington, D.C. 20523

GAMBIA SOIL AND WATER MANAGEMENT UNIT PROJECT
635-0202

Project Paper
Approved February 28, 1978

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28 FEB 1978

ACTION MEMORANDUM FOR THE ASSISTANT ADMINISTRATOR FOR AFRICA

FROM : AFR/DR, John L. Withers JWith

SUBJECT: Proposed Project--The Gambia, Soil and Water Management (635-0202)

Problem: To authorize a grant of $2,037,000 (FY 78 $952) to the Government of The Gambia (GOTG) to develop the institutional foundations required for a successful soil and water management program, your authorization, including approval of a waiver for vehicle procurement, is required. Additionally, your endorsement of a proposed PASA arrangement with the U.S. Soil Conservation Service for implementation of the project is also requested.

Discussion: The proposed project will assist the GOTG in addressing the problems of soil depletion, environmental damage, and loss of productivity inherent in the current agricultural practices of the country. Increasing population placed added pressures on the land and water resource bases, pressures that result in more acres cleared, more livestock grazing and more woodcutting. Traditional systems of shifting cultivation have been overburdened, and more land each year is exposed to damage by wind, water and overuse. Soil erosion, excessive and damaging water flows off the land, and other serious resource damages are occurring at an increasing rate.

The GOTG recognizes these trends as serious deterrents to its goals of improving the quality and resource base of the natural environment and of achieving stability in agricultural production. The challenge is to persuade the independent Gambian farmers to adopt new methods of farming, grazing and woodcutting that will have protective and beneficial effects on the natural resource base. To accomplish this task, AID will assist the GOTG in establishing a Soil and Water Management Unit (SWMU) within the Ministry of Agriculture and Natural Resources (MANR). The Unit will work at village levels and assist the Gambian people to become aware of local environmental problems, convince them of the need to address them, and demonstrate to them feasible methods for solving those problems which are compatible with local cultural, social and economic situations.

The project is designed to achieve three discrete but interrelated goals:

-- an improvement in the institutional capability of the GOTG to deliver educational, technical and material services to the rural population;

-- an arresting and reversal of environmental deterioration due to use of inadequate agricultural and pastoral practices; and

-- an increase and stabilization in the production of food, forage, wood and cash crops and a reduction in the susceptibility of these to drought and other weather variations.

The Unit, staffed initially by eight Gambian and three American technicians, will:

a) assist the MANR in development of national policies and programs for improving soil and water management practices;

b) provide basic soil and water management expertise and support to the programs and projects of all departments of MANR;

c) develop an effective operating procedure for providing on-the-land technical services to Gambian farmers for installing improved soil and water management systems;

d) train selected MANR employees in resource evaluation, problem identification, plan development and solution implementation;

e) train agricultural extension assistants to recognize and advise farmers on the solution of simple soil and water management problems; and

f) develop a technical guide for the proper use and management of different soils for successful soil conservation and sustained production of food, forage and other products.

AID inputs include three long term specialists (in conservation planning, plant ecology and soil science), short term consultants, commodities and equipment and training. The grant will be budgeted as follows:

-- U.S. Technicians	$1,362,000
-- Participant Training in U.S.	128,000
-- Commodities	71,000
-- Other (Housing, Services, Transport)	167,000
-- Inflation/Contingency (10%)	309,000
TOTAL	$2,037,000

A total of three phases are proposed for the project although funding is requested at this time for Phases One and Two only. Phase One covers the initial three years during which the full input of U.S. advisors will be made. Phase Two, to last years, will see leadership of the project within the SWMU passed to the Gambian specialists and the U.S. advisory team reduced to two technical advisors supporting the Gambian management. The proposed Phase Three, from years six to ten of the project, would be characterized by continued expansion of the SWMU under full Gambian leadership and staffing. Proposed U.S. inputs in Phase Three ($480,000) would be limited to the provision of short term consultants to fill specialized technical functions. Phase Three funding will be requested following review of the results of an in-depth evaluation to be performed on Phase One and Two activities.

AID's contribution to first two Phases of this project will be divided as follows:

FY 78	FY 79	FY 80
952	400	685

The GOTG will provide $292,000 or 13 percent of the life-of-project costs (calculated over all Phases), for

- -- personnel/salaries of GOTG staff of the SWMU and agricultural assistants connected with the project;
- -- certain transportation items as the purchase of one Landrover, maintenance and fuel for project vehicles, and in-country travel of SWMU staff; and
- -- land, construction supervision, maintenance and utility costs for U.S. project advisory staff.

Since this is a Sahel Development Project funded under Section 121 of the FAA, the 25 percent host country contribution required by Section 110(a) of the FAA is not applicable.

On August 19, 1977, the Africa Bureau Project Committee met to review the proposal. No unresolved issues from PRP reviews were identified. The single new issue raised concerned consensus of the Project Committee of the need for a full time AID project manager for the activity. Discussions within the Bureau following the meeting resulted in agreement on a means of addressing this staffing issue through actions to provide for assignment of a Direct-Hire agriculturalist to be the project manager in Banjul.

The proposal was included in the FY 1978 Congressional Presentation on page 405 as part of the Sahel Development Program. However, a Congressional Notification was required to justify increases in both first year and total proposed project funding from $700,000 and $1,059,000 to $952,000 and $2,037,000 respectively. The Congress was notified of these changes on February 9, 1978; the mandatory 15 day waiting period expired on February 23, 1978, without any inquires being received from the Congress.

Concerning environmental effects, a Negative Determination prepared for the PRP was approved by AID/W on December 20, 1976. That action recognized the positive and beneficial environmental aspects of this project. No further environmental analyses are required.

The project requires a proprietary procurement waiver and a source/origin waiver for Code 935 countries for the purchase of one Landrover and ten Honda 90 motorcycles amounting to a total of $20,000. Justification for the waivers is based on considerations of standardization, spare parts availability and servicing capabilities. Other vehicles operated by the MANR are Landrovers. Spare parts and servicing is available for Landrovers and for Honda motorcycles, and the GOTG itself is contributing a Landrover to the project. There are no U.S. vehicle dealerships or servicing facilities in The Gambia. There are no motorcycles comparable to those required by the project manufactured in the U.S.

Since the Gambia is a relatively less developed country, procurement for this project is also authorized from Code 941 countries in accordance with the Administrator's decision of July 14, 1977.

As a final matter, RDO/Dakar has proposed in the PP that long-term technical services for the project be procured under a PASA for approximately $1.1 million with the USDA Soil Conservation Service (SCS). SCS has been closely involved in development of this project. It has good contacts with and enjoys the confidence of the GOTG. The normal project "start-up time" will therefore be avoided to a large extent. SCS is the foremost authority in the U.S. on soil and water management practices and, therefore, is uniquely qualified to advise the GOTG concerning the creation of its own similar Soil and Water Management Unit and formulation of sound approaches to resource management. Furthermore, use of the PASA arrangement will facilitate establishing important institutional links between the SWMU and the SCS which might otherwise be difficult to achieve. Use of a private contractor, the procurement approach which is usually preferred, could not offer the same advantages. Therefore, the Project Committee concurred with the stated intention of the PP to procure long-term technical services through a PASA arrangement with USDA/SCS.

Recommendation: The Project Committee recommends that, by your signature on PAF Part II, you approve (1) a grant to the Government of the Gambia of $2,037,000 (of which $952,000 will be obligated in FY 1978) for Phases One and Two of the proposed project; and (2) waivers for proprietary and Code 935 procurement of one Landrover and ten Honda 90 motorcycles in the approximate amount of $20,000.

Drafter:AFR/DR:ELijewski:x27886 2/27/78

Clearances:

AFR/GC:STisa (draft)
AFR/DR:JKelly (draft)
AFR/DP:CWard
AFR/SFWA:JLanglois (draft)
AFR/SFWA:HFarnham (draft)
AFR/DR:LClyburn (draft)
SER/COM:CRaley (draft)
AFR/DR:DDibble (draft)
SER/ENGR:FZobrist (draft)
AFR/DR:CAnderson (draft)
SER/MO:SThornburg (draft)

AGENCY FOR INTERNATIONAL DEVELOPMENT
PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS PART I

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

PAF

2. DOCUMENT CODE: 5

3. COUNTRY/ENTITY: The Gambia

4. DOCUMENT REVISION NUMBER:

5. PROJECT NUMBER (7 digits): 635-0202

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

7. PROJECT TITLE (Maximum 40 characters): Gambia Soil and Water Management Unit

8. PROJECT APPROVAL DECISION — ACTION TAKEN: A (A = APPROVED, D = DISAPPROVED, DE = DEAUTHORIZED)

9. EST. PERIOD OF IMPLEMENTATION: YRS. 04 QTRS. 16

10. APPROVED BUDGET AID APPROPRIATED FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE C. GRANT	PRIMARY TECH. CODE D. LOAN	E. 1ST FY 78 F. GRANT	E. 1ST FY 78 G. LOAN	H. 2ND FY 79 I. GRANT	H. 2ND FY 79 J. LOAN	K. 3RD FY 80 L. GRANT	K. 3RD FY 80 M. LOAN
(1) SH	233B	066		952		400		685	
(2)									
(3)									
(4)									
TOTALS				952		400		685	

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	-0-		-0-		2,037	
(2)						
(3)						
(4)						
TOTALS	-0-		-0-		2,037	

11. PROJECT FUNDING AUTHORIZED (ENTER APPROPRIATE CODE(S)) 1 = LIFE OF PROJECT, 2 = INCREMENTAL, LIFE OF PROJECT: A. GRANT 2; B. LOAN

C. PROJECT FUNDING AUTHORIZED THRU FY 80

12. INITIAL PROJECT FUNDING ALLOTMENT REQUESTED ($000)

B. ALLOTMENT REQUEST NO. 1

A. APPROPRIATION	C. GRANT	D. LOAN
(1) SH	952	
(2)		
(3)		
(4)		
TOTALS	952	

13. FUNDS ~~RESERVED FOR ALLOTMENT~~ allotted

TYPED NAME (Chief, SER/FM/~~ESD~~ FCD): Dannie Baker

SIGNATURE: Dannie Baker for

DATE: 3/21/78

14. SOURCE/ORIGIN OF GOODS AND SERVICES: [X] 000 [X] 941 [X] LOCAL [X] OTHER 935

15. FOR AMENDMENTS, NATURE OF CHANGE PROPOSED

FOR PPC/PIAS USE ONLY	16. AUTHORIZING OFFICE SYMBOL	17. ACTION DATE (MM DD YY)	18. ACTION REFERENCE (Optional)	ACTION REFERENCE DATE (MM DD YY)

AID 1330-6 (7-76)

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PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS

PART II

COUNTRY : The Gambia

PROJECT : Soil and Water Management

PROJECT NO. : 635-0202

Pursuant to Part 1, Chapter 1, Section 121 of the Foreign Assistance Act of 1961, as amended (the "Act"), I hereby authorize a Grant to the Government of The Gambia ("Cooperating Country") of not to exceed nine hundred and fifty two thousand United States Dollars ($952,000) to assist in financing the foreign exchange and local currency costs of goods and services required for the project as described in the following paragraph.

The project shall consist of providing technical assistance, training and related goods and services for the establishment of a Soil and Water Management Unit ("SWMU") within the Ministry of Agriculture and Natural Resources ("MANR") to assist in development of national policies and programs for improving soil and water management procedures, to provide basic soil and water management expertise and support to MANR, to develop operating procedures through which on-the-land technical services are provided to farmers in installing improved soil and water management systems, to train personnel of the MANR to carry out the processes of resource evaluation, problem identification, plan development and solution implementation, to train a wide spectrum of agricultural assistants to recognize and advise farmers on the solution of simple soil and water management problems and to develop a technical guide (hereinafter referred to as the "Project").

I approve the total level of A.I.D. appropriated funding planned for the Project of not to exceed Two Million Thirty-Seven Thousand United States Dollars ($2,037,000), Grant, including the amount authorized above, during the period FY 1978 through FY 1980 subject to the availability of funds and in accordance with A.I.D. allotment procedures.

I hereby authorize the initiation of negotiations and execution of the Grant Agreement by the officer to whom such authority has been

delegated in accordance with A.I.D. regulations and Delegations of Authority, subject to the following terms, together with such other terms and conditions as A.I.D. may deem appropriate:

A. Source and Origin of Goods and Services

Except for ocean shipping, goods and services financed by A.I.D. shall have their source and origin in countries included in Code 941 of the A.I.D. Geographic Code Book and in the Cooperating Country, except as A.I.D. may otherwise agree in writing. Ocean shipping financed under the Grant shall be procured in any eligible source country except the Cooperating Country.

B. Condition Precedent

Prior to the first disbursement of funds under the Grant, or to the issuance of commitment documents with respect thereto, the Cooperating Country shall furnish to A.I.D., in form and substance satisfactory to A.I.D., a plan and schedule for the assignment of an adequate staff to the SWMU.

C. Waiver

Notwithstanding paragraph A., above, and based on the justification set forth in Section B.2 of Part IV of the Project Paper, I hereby:

1. approve a procurement source waiver from A.I.D. Geographic Code 941 and the Cooperating Country to Code 935 for the transportation requirements of the Project, including a Land Rover and motorcycles; provided that the amount of such procurement shall not exceed approximately $20,000;

2. certify that the exclusion of procurement of such transportation requirements from the requested sources in Code 935 would seriously impede attainment of U.S. foreign policy objectives and the objectives of the foreign assistance program; and

3. find that special circumstances exist to waive, and do hereby waive, the requirements of Section 636(i) of the Act.

Walter Paul Butler
Assistant Administrator
for Africa

Clearances: As Shown on
Action Memorandum

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT PAPER FACESHEET

TO BE COMPLETED BY ORIGINATING OFFICE

1. TRANSACTION CODE ("X" appropriate box)
[XX] Original [ ] Change [ ] Add [ ] Delete

PP

DOCUMENT CODE 3

2. COUNTRY/ENTITY: THE GAMBIA

3. DOCUMENT REVISION NUMBER

4. PROJECT NUMBER

5. BUREAU: a. Symbol | b. Code

6. ESTIMATED FY OF PROJECT COMPLETION: FY

7. PROJECT TITLE - SHORT (stay within brackets): Gambia Soil and Water Management

8. ESTIMATED FY OF AUTHORIZATION/OBLIGATION: a. INITIAL mo. 11 yr. 77 b. FINAL FY 82

9. ESTIMATED TOTAL COST ($000 or equivalent, $1 =)

a. FUNDING SOURCE	FIRST YEAR FY____ b. FX	c. L/C	d. Total	ALL YEARS e. FX	f. L/C	g. Total
AID APPROPRIATED TOTAL						
(Grant)	(1215)	(162)	(1377)	(2332)	(185)	(2517)
(Loan)	( )	( )	( )	( )	( )	( )
Other U.S. 1.						
Other U.S. 2.						
HOST GOVERNMENT	10	38	48	10	776	786
OTHER DONOR(S)						
TOTALS	1225	200	225	2342	951	3303

10. ESTIMATED COSTS/AID APPROPRIATED FUNDS ($000)

a. Appropriation (Alpha Code)	b. Primary Purpose Code	c. Primary Tech. Code	FY 78 d. Grant	e. Loan	FY 80 f. Grant	g. Loan	FY 82 h. Grant	i. Loan	ALL YEARS j. Grant	k. Loan
FN			1377		660		480		2517	
		TOTALS								
11. ESTIMATED EXPENDITURES			1377		660		480		2515	

12. PROJECT PURPOSE(S) (stay within brackets) [ ] Check if different from PID/PRP

1. Establish a Soil and Water Management Unit within the MANR.
2. Develop technology for improved agricultural/pastoral methods consistent with Gambian abilities and resources.
3. Train Gambian soil & water management specialists and Agricultural Assistants to apply solutions to S&W problems at national and village levels.

13. WERE CHANGES MADE IN BLOCKS 12, 13, 14, or 15 OF THE PID FACESHEET? IF YES, ATTACH CHANGED PID FACESHEET.
[ ] Yes [X] No

14. ORIGINATING OFFICE CLEARANCE

Signature: Norman Schoonover

Title: Regional Development Officer, Dakar, Senegal

Date Signed: mo. day yr. 6 20 77

15. Date Received in AID/W, or For AID/W Documents, Date of Distribution: mo. day yr.

AID 1330-4 (7-75)

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PART I - SUMMARY AND RECOMMENDATIONS

A. Face Sheet Data

As provided on cover sheet.

B. Recommendations

The following funding for this project is recommended by the PP team:

Grant

FY 1978

Funding for Phase I (years 1-3)	$1,377,000

FY 1980

Funding for Phase II (years 4-5)	$ 660,000

FY 1982

Funding for Phase III (years 6-10) (short-term consultants only)	$ 480,000
Total - - - - - - - - - - - - - - -	$2,517,000

Source/Origin Waiver to permit purchase of one landrover and 10 small motorcycles from Code 935 countries.

Construction of housing (3 units) for U.S. technicians to be by local private contractors.

C. Description of the Project

This project will assist the GOTG in addressing the problems of soil depletion, environmental damage, and loss of productivity inherent in the current agricultural system of the country. Increasing population and standards of living have placed added pressures on the land and water resource bases, pressures that result in more acres cleared, more livestock grazing and more woodcutting. Traditional systems of shifting cultivation have been overburdened, and more land each year is exposed to damage by wind, water and over-use. Soil erosion, excessive and damaging water flows off the land, and other serious resource damages are occurring at an increasing rate.

The GOTG recognizes these trends as serious deterrents to their goals of environmental quality and agricultural production stability. Methods of soil and water management to stop or reverse damaging trends have been developed in the USA and other parts of the world. Considerable research under African conditions is available.

The challenge, however, is to persuade the people who use and manage the land (independent Gambian farmers) to adopt new methods of farming, grazing, and woodcutting that will have the desired effect on the soil and water resource base. Thus the avenue for improving land management is through the people. They need to be made aware of the problem, convinced of the need to address it, and shown feasible methods with their cultural, social, and economic situation that can solve it.

To accomplish this end, AID will assist the GOTG in establishing a Soil and Water Management Unit (SWMU) within the Ministry of Agriculture and Natural Resources (MANR). The Unit, staffed initially by three Americans technicians and eight Gambian technicians will:

1. Assist MANR in development of national policies and programs for improving soil and water management practices;

2. Provide basic soil and water management expertise and support to the programs and projects of all departments of MANR;

3. Develop an operating procedure (largely based on the SCS group conservation planning process developed in the USA) that is effective in providing on-the-land technical service to Gambian farmers so that they install improved soil and water management systems on the land;

4. Train selected employees to carry out the processes of resource evaluation, problem identification, plan development, and solution implementation so that specialized expertise is gained by Gambian employees of MANR;

5. Train a wide spectrum of agricultural assistants (certificate-trained agricultural generalists providing extension services to Gambian farmers) to recognize and advise farmers on the solution of simple soil and water management problems; and

6. Develop a technical guide (or perhaps, several, by region) that documents what is known about the proper use and management of different soils for successful soil conservation and sustained production of food, forage, and other products.

Inputs by AID will include three specialists (conservation planning, plant ecology, and soil science in the first phase), short-term consultants, equipment, commodities, and training. The U.S. team leader will serve as Director of the Unit during the first phase. The GOTG will provide eight employees initially, (plus additional employees as needed to replace or supplement the Unit staff), housing and vehicle maintenance, office facilities, and training. After an initial first phase or three years, leadership within the Unit will shift from U.S. to Gambian, and the U.S. team will be reduced to two technical advisors. The second two year phase will concentrate on creation of a field-based staff of Gambian soil and water management specialists to work directly with village farmers. Training (on-the-job, in-country, and abroad) will be emphasized to develop Gambian specialist capability as rapidly as possible. A third phase from years 6-10 is also contemplated. This phase would be characterized by continued expansion of the SWMU under full Gambian leadership and staffing. The only U.S. input in this phase would be the provision of short term consultants to fulfill specialized technical functions, including training of Gambians.

D. Summary Findings

1. Timeframe of the Project

The PRP foresaw the project as a two phase 5-year activity, but limited description and analysis mainly to the first three year phase. The budgetary estimate in the PRP was also limited to Phase I.

The PP team supports the concept of at least two phases for this project. In fact, the team believes that it is very likely that the SWMU under Gambian leadership will continue to need certain technical help in specialized areas after Phase II ends in the fifth year. The PP therefore provides for the use of short-term U.S. consultants during the years 6-10 of the SWMU's existence. This concept is consistent with the new SDP guidelines permitting a project to have a ten year lifespan. The extent of the actual need for such consultants is, of course, highly speculative at this stage. For planning purposes the PP team has used a figure of 48 man/months for this five year period, and has budgeted accordingly in the Financial Plan. The addition of Phases II and III in this PP accounts for the fact that the budget of the PP is approximately double the level of that proposed in the PRP for Phase I only. It should be noted, however, that with the exception of the consultants tentatively earmarked for Phase III, the project as presented in the PP is the same in scope and purpose as that proposed in the PRP, but with the functions and operations of the SWMU defined in more depth and detail.

2. Technical Soundness

The project represents a practical application of the United States technical approach to soil and water management and is feasible under conditions in The Gambia. It will not introduce technological innovations beyond the means of Gambian farmers, but will instead seek the gradual modification of traditional methods toward practices far more in harmony with the environment. Reduced runoff, soil erosion and sedimentation are technically achievable within the cultural and economic context of Gambian farmers. Production increases should result as well from practices introduced by the project.

The MANR is institutionally ready and capable to absorb and support the SWMU. Past policies of selecting,

training, and deploying employees are a definite asset, since they closely parallel the manner in which USDA services and programs are delivered in the U.S. This will serve to make a U.S.-designed SWMU program both compatible with past and present MANR practice and acceptable as a normal situation to MANR employees.

The level of staffing (both U.S. and GOTG) coupled with the type and amount of consultants planned will provide technical and operational agency of the proper size to fit into current MANR organization and deliver needed services. If successful, the SWMU will need to grow steadily for about ten years or more. Such growth is the intent of GOTG and is represented in the financial plan for this project.

3. Economic Soundness

An economic analysis was undertaken of the impact that the SWMU should have an agricultural production in The Gambia. Based on a conservative assessment of the major cost and benefit streams, a favorable 14.8% internal rate of return was obtained. Due to the lack of precise documentation and relevant field trials in The Gambia, several tests were run to appraise the sensitivity of the basic analytic parameters to measure error. The results of these tests indicated a remarkable stability in the initial findings, even after important reductions in benefits and increases in costs. The PP team has therefore concluded that, in all but the most pessimistic conjuncture of events, the project remains economically feasible.

4. Social Soundness

A major aspect of the project and the work of the SWMU, and one which may be more difficult than finding technical solutions, is to instill at the village level the concept of land and water conservation and preservation. This will involve a thorough understanding of existing socio-cultural attitudes.

The SWMU team will be more likely to experience success in introducing improved soil and water management techniques to Gambians if they work on a village-by-village basis, for the village is the most stable unit in traditional society. They should work with and through the established power structure in the village, as well as with the established

socio-economic relationships, which are throughly reflected in the village land tenure and use patterns.

Since the SWMU's objective is to upgrade land and water use practices and does not envision large inputs of capital or machinery, it is not likely to cause any serious disruption or create any new infairness or inbalances in the system.

Indeed if the SWMU works through the right channels, the system is geared to do most of the administrative and practical work for them. The Unit need only be sensitive to certain cultural expectations when working with Gambians and be careful to make their expertise available to anyone in the village who wants and asks for it, in order to create a balanced change.

If the SWMU is sensitive to these factors, the PP team believes that the concepts and specific actions proposed in this project are sound from the socio-cultural viewpoint.

5. Financial Soundness - Degree of GOTG Commitment

The PP team was left with no doubt of the firm commitment of the GOTG to the principle of soil and water management and to this project. The GOTG has already begun some training on its own in this area. Assurances of support for both the concept and the project itself were expressed repeatedly at the highest levels of the MANR. The Permanent Secretary of the MANR was fully briefed by the PP team on all aspects of the project prior to the team's departure from Banjul, and he expressed his wholehearted support. He will ensure that the project is listed as a line item in 1977-78 annual planning supplement to the Five Year Development Budget to be published in July 1977, and that necessary budgetary provisions are made by the GOTG for 1977-78 and thereafter. The ten year horizon of the project has the effect of raising the GOTG's contribution to the project both in absolute terms and as a percentage of total project costs. GOTG costs will increase gradually to about $85,000 a year in the latter stages of the project. Even with the U.S. picking up the cost of construction of housing for the American technicians (see next section on Project Issues), the GOTG share of total project costs is still estimated at almost 25% which is in accord with standard AID practices.

6. Readiness of the Project

The project as proposed in the PP will be ready to commence in the spring of 1978 upon the arrival of the U.S. technical team. It is foreseen that under normal circumstances of project review and approval, the project could be authorized in early fall 1977 and the Project Agreement signed before the end of 1977. Time would have to be allowed to recruit and brief the U.S. technical team which will probably be under the PASA Soil Conservation Service.

In the opinion of the PP team, the project is fully responsive to the congressional mandate and SDP criterion of designing projects to benefit the rural poor directly. In the team's view the project meets all applicable statutory criteria.

E. Project Issues

Issues raised during PRP review and reported in State 014007 of 1/21/77, have been addressed by the PP team. These issues are summarized below, but most are explained more fully in the body of the PP.

1. Resolution of Housing Issue

The PP team gave the housing problem considerable study and concluded that it would be in the best interests of the project and of all parties concerned if AID financed construction of the three houses for the U.S. team, by means of contract with a local private construction firm. The houses will be three bedroom, built according to Department of Public Works standards, and suitable for expatriate occupancy and will cost approximately $60,000 each to build. Building under private contract is estimated to take 4-6 months.

The GOTG, for its part, will furnish the land on which the houses will be built and cover all maintenance and utility costs of the houses during the full period of occupancy by the U.S. technicians. This option was considered the only satisfactory solution to the housing question for several reasons:

a) It would be very difficult for the GOTG to come up with the required $180,000 in cash, even before the project has begun.

b) Even if the GOTG funding were available,

government-financed construction is often slow and delays are common, thus risking a serious delay in the commencement of the project.

c) Based on a ten year time frame of the project, the projected GOTG contribution amounts to 24% in substantive items alone and would be only slightly higher (28%) if the GOTG were to fund housing construction. It is clear that the GOTG will be making a large and genuine contribution to this project, and the PP team considered it more equitable and appropriate that the GOTG inputs relate directly to the actual activities of the SWMU, rather than to the support of the U.S. technicians. Even so, the GOTG will be providing land, maintenance and utilities for the project team's housing.

2. Inclusion of Range Management Expertise in SWMU.

The PP team has agreed that a plant ecologist (preferably with range/management/forestry experience) is needed to provide required interdisciplinary inputs. The team has been held to three people to prevent over-burdening the absorptive capacity of GOTG. A possible strain created may be the dual role of Team Leader as administrator of the Unit and chief/planner/agronomist. The PP team's judgment is, however, that in the Gambian context the arrangement is feasible with a properly selected Team Leader.

3. Other Donor Coordination

Although no other external donors are involved in this project, it is relevant to certain British ODM training activities. The PP team has assured, through discussions with GOTG officials, that all other donor and British ODM inputs into training are related agricultural information will be readily available to SWMU. Resources have been included in the PP to facilitate full utilization of such services (materials, commodities, and consultants). The ODM is planning a training seminar in The Gambia in soil and water in the fall of 1977, to be conducted by Mr. R.G.B. Jones, whose study on soil and water in The Gambia was one of the sources used by the PP team. Mr. Jones was fully briefed on the PP and wholeheartedly supports the project.

4. Relationship of SWMU to Proposed Gambia River Development Project (GRDP)

GRDP is a long-range effort involving The Gambia, Senegal, and Guinea Bissau in a project designed to supplement low-season flows of The Gambia River. The proposal is currently beset with political problems among the countries. The main effect of implementation of GRDP would be to increase the water available for irrigated rice development in The Gambia. If and when this occurs, SWMU should be able to provide soil/water/plant management guidelines to facilitate selection of irrigation project sites and aid in design of projects. (Similar inputs to current GOTG projects are considered an important part of SWMU role, as explained in the PP). The SWMU will carefully monitor progress of the GRDP and will ensure appropriate coordination with its activities.

5. Adequacy of Budget for Consultants, Participants, and Contingency

The consultant cost has been raised from $5000/mo. in PRP to $7500/mo. in PP on the basis of increased cost, amount of travel foreseen, etc. Second phase cost is raised to $8500/mo. and third phase is raised to $10,000/month. The cost of U.S. technicians has been raised from $75,000/man/year to $80,000/man/year on the basis of current estimates used by REDSO/WA for West African conditions. $90,000 is budgeted per man/year for Phase II. Housing is not covered in the amount as this is provided for separately in the budget. The contingency/inflation allowance has been left at the 14% used in the PRP since the PP team feels other cost increases included in the budget have adequately covered inflation and contingencies above this amount.

6. Maximization of Host Country Contribution

As discussed in the financial soundness statement in preceding section on Summary Findings and in the Financial Analysis, the GOTG contribution to this project will be 24% of total project costs over its 10-year life.

7. Quantification of Benefits

The PP team undertook a quantitative estimate of benefits resulting from the activities of the SWMU over a 30 year period and calculated an internal rate of return with appropriate sensitivity tests. See Part III-D Economic Analysis and Annex D for results and methodology employed.

8. Sociological Questions Relating to Land Tenure and Allocation

The question of allocation of farmers fields is not vital to maximum impact on soil and water management practices at village level. PP team is very confident that effective inroads can be made by working appropriately within the Gambian cultural and land tenure context. See Part III-C Sociological Analysis and Annex E.

9. Use of Peace Corps Volunteers

The PP team has considered the use of PCV's and discussed this with the Peace Corps Director in Banjul. The use of PCV's is not deemed to be appropriate for this project, since they are not as highly qualified as experienced professionals, yet might tend to delay training of Gambians if used in a sub-professional role. However use of PC orientation for the U.S. team has been agreed upon and should provide an important input.

10. Role of U.S. Chief of Party as Head of SWMU.

The GOTG has requested that the U.S. Team Leader be designated Head of the SWMU, in order to provide needed administrative direction during the formulative stages of the SWMU. A qualified Gambian is not currently available to serve as Unit head, but one major aim of the project is to identify, train, and place a Gambian at the head of the Unit, probably at the end of the third year of the project. (end of Phase I).

PART II - PROJECT BACKGROUND AND DETAILED DESCRIPTION

A. General Country and Project Background

1. Socio-political Background

The Gambia is a tiny country averaging less than 50 miles wide and about 250 miles long, whose chief geographic feature is The Gambia River itself. It is a Republic, with a Constitution and system of party government modeled after that of England, its former colonizer.

Administratively, the country is divided into five major divisions: Western, North Bank, Lower River, MacCarthy Island, and Upper River, each under the direction of a Commissioner. The capital city is Banjul (pop. 39,179), located at the mouth of the river. Each division is divided into several districts, administered by an elected chief and district council.

According to the 1973 census, Gambia boasts a population of 493,499, plus some 1,082 temporary residents who are mostly expatriates. Its current rate of population increase is 2 percent per annum. The greater proportion of immigration is from Senegal; the other people come from mainly Guinea, Mali, and Mauritania. The greatest single concentration of people is in the Banjul and neighboring Kombo-St. Mary areas -- mainly urban dwellers and city workers. Other urban concentrations are mainly in the divisional capitals, most of which do not exceed 4,000 population. The vast majority of the population is rural, village based and engaged in a mixture of subsistence and cash crop farming.

There are three main ethnic groups in The Gambia, with significant minorities from six other groups, each speaking a distinct language. By far the largest group are the Mandinkas, who predominate throughout the country in every division. The following table of tribal percentages indicates their relative significance to the population:

Ethnic Groups	% Population
Mandinka (including Jahankas)	42.3
Fula (including Lorobes and Tukolors)	18.2
Wolof	15.7
Jola (including Karonikas and Mansuwankas	9.5
Serahuli	8.7
Serere	2.1
Manjago	1.3
Aku	1.0
Bambara	0.4
Other	0.8

Source: Dunsmore, et. al. p.248.

The Wolofs are concentrated mainly in the Banjul, Kombo, and Saloum areas, as are the Sereres. The Akus are a small but extremely important Creole group whose residence is limited to Banjul and Kombo. The Fulas are concentrated mainly in the MacCarthy Island and Upper River Divisions. The Jolas and Manjagos can mainly be found in the Kombo and Foni areas of the Western and Lower River Divisions.

Life expectancy is not high; average life expectancy at birth is 32 years for males and 34 years for females. If a child survives his fifth year, he has a life expectancy of 50 years. 285 of every 1,000 children die before reaching the age of two. Some 47 percent of the population falls within the 15-49 year old age bracket, constituting the main labor pool, and 25 percent are between the ages of 5 and 14. Those under 4 years of age constitute 17 percent and those over 50 years make up 11 percent of the population.

There is a growing labor drain of able-bodied males in the 15-49 year old range from the villages, either to the towns in search of wage earning jobs, to schools, or as strange farmers in other areas of The Gambia. This leaves a disproportionate share of females and old and young people in the villages.

2. The Physical Environment

The relief of The Gambia can be seen as basically a flat plateau, attaining maximum altitudes of 130-160 feet above sea level and dissected down the middle by The Gambia River Valley. Of particular importance to irrigated agriculture in the country, The Gambia River is tidal throughout its length and the reduced replenishment of fresh water during the dry season (October-May) allows salt water intrusion as far as 150 miles upstream.

The country is located between 13°-14° North of the Equator in the dry Sahelo-Sudanian climate zone, characterized in the main agricultural area by an average yearly rainfall of 35-50 inches (900-1200mm.) falling almost entirely within a three month timespan (See Map 1).

Soils throughout The Gambia are considered to be low in plant nutriet levels and vary in texture from the sands, sandy loams, and clay loams found on the higher ground to the heavy clay alluviums in the river flats. Some 40 percent of all soils are estimated to be suitable for agricultural purposes, with another 14 percent suitable with qualifications and a final 46 percent unsuitable or of only marginal utility.1/ The nature of these soils makes them generally responsive to phosphate and nitrogen fertilizer applications, including animal manuring (which is undertaken on some traditional farms). The nature of the Gambian soils and of man's manipulation of the vegetative cover have faciliated an increasing amount of sheet and gulley erosion in various spots throughout the country.

One survey of land and vegetation degradation was undertaken in 1975 by the Gambian Department of Agriculture through aerial photography interpretation of twenty $10mi^2$ sample areas located throughout the country. A comparison of all twenty sample areas was undertaken with aerial photos taken in 1948 and then again in 1968. The exercise revealed some significant shifts in the country's ecology over that twenty year period.

1/ Dunsmore, et.al., p.242.

Vegetation and Land-use Designation	1946	1968
1. FOREST (Complete ground cover by trees, as viewed from above)	28.9%	3.4%
2. WOODLAND SAVANNA (Tree canopy over 50-75% of ground)	31.3%	4.6%
3. SAVANNAH (25% tree canopy)	14.0%	17.6%
4. THORN & SMALL TREE (Marginal areas, usually not suitable for annual cropping)	7.8%	31.7%
5. LOW BUSH SHRUB (Some low bush and shrubs, visible bare soil/erosion)	0.4%	19.9%
6. CROPPING W/FALLOW	17.6%	5.5%
7. CONTINUOUS CROPPING	0.0%	17.3%
	100.0%	100.0%

General trends over time appear to include, most importantly,

- rapid depletion of the national forest area (60.2% to 8.0%)
- rapid increase in marginally useful agricultural areas, including some erosion (8.2% to 51.6%)
- reduction of cropping with evident fallow (17.6% to 5.5%) and a rapid increase in continuous cropping (0.0% to 17.3%)

Up-to-date estimates of both land use patterns and the availability of suitable soils for agricultural development were recently undertaken in the context of the Land Resource Study carried out by the British Land Resources Division in 1972-75.

3. The National Economy

The importance of the natural environment

for the national economy is more than readily apparent. Agriculture constitutes virtually the entire Gambian economy, with groundnuts making up omost of the cash crop revenues and almost all foreign exchange. Its predominance in the economy is clearly reflected in the following GDP breakdown for 1973/74.

Table 1 : Gross Domestic Product (GDP) in 1973/74

	Sector	Mil Dalasis Value	% of Total
1.	Agriculture	91.5	62.2
	- Groundnuts	65.8	44.8
	- Rice	20.2	13.7
	- Millet	4.6	3.1
	- Palm Kernel	0.6	0.4
	- Cotton	0.2	0.1
2.	Livestock	3.1	2.1
3.	Fisheries	4.0	2.7
4.	Miscellaneous rural	1.1	0.7*
	SUB-TOTAL: RURAL	99.7	67.8
5.	Industry	2.7	1.8*
6.	Construction	0.4	0.3*
7.	Tourism	5.0	3.4
8.	Other Services	30.2	20.5*
9.	Public Administrations	9.0	6.1*
	GRAND TOTAL	147.0	100.0

* Wholly or in large part related to the agricultural sector. Source: IBRD, The Economy of The Gambia, December 1975.

In statistical terms, agriculture accounted in 1973/74 for

- 99% of all exports (of which 96% were in groundnuts or its by-products)
- 85% of total employment of the active population
- 90% or over of the average Gambian's monetary income

Despite agriculture's overriding importance for the national economy and the material well-being of the Gambian citizen, farms remain small (approximately 1.2 acres/person) and highly traditional, and productivity is low, as indicated in the following estimates:

Average Estimated Yields for Major Crops

- Groundnuts	700-1000 lbs./acre
- Upland rice	500-1000 lbs./acre
- Swamp rice	800-1000 lbs./acre
- Sorghum/millet	450-1000 lbs./acre

Source: Dunsmore, et. al., p.174
IBRD, Appraisal ..., p.61
Dept. of Agriculture/Banjul

The long-term outlook indicates that the Gambian economy will be highly dependent on its agricultural output for the next several decades. It is critical, therefore, that care be taken to insure the maintenance, and development, where feasible, of agricultural production and a more efficient utilization of the nation's natural resources base.

Current Agricultural Methods.

Farming has traditionally followed a pattern of shifting cultivation, where land is cleared out of bush, farmed for periods ranging up to 5-7 years, then allowed to go back to bush fallow for several (10-20) years. Increased population pressure, incentives to grow more

cash crops, and availability of oxen to work more acres with the limited labor supply have all served to increase pressure on the lands resulting in shorter and shorter bush fallow periods. In many areas of The Gambia today, farmers are practicing continuous cultivation, with rotations that include only one year of fallow in four or two years in five. During these short periods of rest, few species of plants have time to become established, and soil-building is greatly reduced as compared to the traditional bush fallow rotation.

Most cultivation is done by hand. A governmental program to introduce oxen technology has been underway since the 1950's, with the result that there are now some 10,000 pairs of oxen estimated to be working in the country. Reasons for the limited adoption of oxen technology include the natural reluctance and conservatism of traditional farmers, lack of knowledge as to how to care for and utilize oxen and, most importantly, the lack of capital or credit to purchase bulls and implements. The oxen have, however, changed Gambian agriculture significantly, since oxen farmers trade work with their neighbors and magnify the effect of the limited ox-power.

The lack of mechanization to cultivate the soil severely limits the soil management methods available to Gambian farmers. Since plant residues or green manure crops cannot be easily plowed into the soil, the maintenance of soil organic matter levels is very difficult. Soils cannot be rough-tilled to increase water intake or retard wind erosion. In short, while the soil and water problems in The Gambia are very similar to many parts of the developed world, the range of solutions available is much more limited.

4. Project Background

In accordance with a request from The Gambia Ministry of Agriculture and Natural Resources (MANR), in 1976 the AID office in Banjul submitted as one of the first PIDs for The Gambia, a proposal for a project to establish a soil and water conservation unit in the MANR which would formulate and undertake a program of systematic soil and water management. The Gambian Five Year Plan for Economic and Social Development issued in July 1975 noted that over the past decade a serious erosion problem has developed in certain parts of the country, coupled with severe deforestation. To counter

this alarming trend, the Five Year Plan stated the Government's intention to introduce soil and water management, initially envisaged as an element of the agricultural extensive service.

Upon PID approval, the PRP was undertaken in November, 1976, by a team comprising two senior officers of the USDA Soils Conservation Service and the head of the Soils Science Department of the University of North Carolina. The PRP proposed that an expatriate team of three American specialists be assigned to The Gambia for an initial three year phase to establish a Soil and Water Management Unit, develop a technical manual for soil management in The Gambia, and undertake training of both professional and sub-professional Gambians to carry out soil and water management work.

The emphasis proposed in the PRP involved working closely with village elders, compound heads, and the existing decision making structure to encourage Gambian farmers to recognize and carry out management methods that would benefit the conservation, productivity, and quality of their soils, improve water quality and quantity, and result in a more dependable higher yield of food, and forage, and wood products.

The AID/W Project Committee and ECPR reviewed the PRP and unconditionally approved it in January 1977, thus paving the way for the PP which was undertaken in May 1977.

In the PRP team's discussions with the MANR Permanent Secretary and senior staff of the Ministry of Agriculture Department, last October, improved soil and water management was identified as the top priority candidate for USAID technical assistance. This view was repeated to the PP team in May 1977 by the same GOTG officials, who pledged all necessary GOTG budget and staff support to implement the project.

Several efforts by the GOTG between the PRP and PP stages indicates the serious intent of the Government. Reuben Thomas, Director of DAO, in cooperation with Cyril Eyre, Training Advisor, has identified two senior employees and 8-9 Agricultural Assistants on the basis of their technical skills, experience with the soil programs of ODM, and proven ability to work with villagers. A specialized training session will

be held in October, 1977, for these AA's to begin exposing them to special soil and other management skills. The course will be taught by R.G.B. Jones, of the Land Resources Division of the U.K. ODM. PP team members have discussed this proposed training with Mr. Jones to assure it will be directly useful to the work of SWMU.

B. Detailed Project Description

1. Goals and Purposes of the Project

Three discrete but interrelated goals are foreseen for this project: an environmental goal, an agricultural goal and an institutional goal. As set forth in the logframe, these goals are to:

a) Halt/reverse environmental deterioration due to inadequacy of traditional agricultural/pastoral methods;

b) Increase/stabilize production of food/forage/wood/cash crops; and reduce susceptability to drought and other weather variations; and,

c) Improve institutional capability of GOTG to deliver educational, technical, and material services to rural population.

All of these goals will be served by the project, whose purpose is to establish within the GOTG by the end of the project an effective soil and water management unit operated administratively and technically by Gambians. This unit will have developed both the methodology and the staff capability to work with village elders and farmers to improve the management given to the soil, water, and vegetative resources of the nation. If such improved management can be achieved, the results will include: a higher level of productivity in terms of food, cash crops, forage, and wood; a more stable water supply for domestic, livestock, and irrigation use due to improved soil intake rates and deep percolation; reduced environmental damage due to runoff, erosion, sedimentation, and pollution of the nation's waters, as well as reduced air pollution from wind erosion; and,

an improved ability to withstand climatic variations such as the recent Sahelian drought.

A major portion of the project is training to prepare Gambians for administrative, technical, and field operational leadership in soil and water management. This will be accomplished through on-job training, specialized short courses presented by the Gambian DOA training program, generalized soil and water management courses presented to Agricultural Assistants working in the field, academic training abroad for selected employees, and technical and field seminars conducted by American soil and water conservation specialists.

The target of establishing a trained soil and water management technical assistance team in each Regional Headquarters should be achievable in 5 years. The first Gambians assigned to the Unit will, if successful, turn into candidates for academic training abroad, administrative leadership positions in the Unit, or regional specialists. As candidates are selected for academic training, new employees will be moved into the Unit to keep field working parties filled. These employees, through on-the-job training programs, will become candidates for intensive training--either at Yundum or abroad--to fill the role of regional specialist.

The target of establishing and documenting a workable village planning process is attainable within 3 years, as is the development of a basic technical manual and training materials to be used in the MANR training program. In addition, a training program can be established that will include some exposure to soil and water management principles in the refresher courses given to Agricultural Assistants at Yundum.

The goal of developing Gambian administrative capability to operate the Unit should be achievable within 3 years; depending, of course, on the individuals selected for initial Unit staffing. It will be the goal of the project to identify Gambian candidates for eventual Directorship and move them into responsible positions of leadership as rapidly as possible. This may include the establishment of a position as Deputy Director at the appropriate time,

but the Permanent Secretary, Mr. M'Boge, prefers that it not involve naming a Gambian as counterpart Director or Deputy Director. Since there is currently no suitable candidate, the Permanent Secretary and the PP Team agree that it is better to await the training of the Gambian staff members before addressing the question of Gambian leadership than to establish the position at the outset and risk having it filled with an unsuitable person, perhaps on a political basis. For these reasons the Permanent Secretary has asked that the question of Gambian leadership be pursued through talent assessment, placement, training, and evaluation by the expatriate team. He will expect periodic confidential reports from the Unit Director to guide him in determining when and how Gambian leadership will be installed. In our discussions, we agreed that a realistic goal would be for a Gambian Unit Director to take over sometime in the 3rd year of the project, with the American Team Leader moving to a position of Senior Advisor.

The suggestion of the PRP that the project be conceived in two phases still appears valid. A third phase may be needed as well. The first three year phase should be devoted to the following goals:

1) Establishment of the SWMU as a functioning, effective part of the administrative structure of MANR;

2) Development of soil and water management policy statements and program guidelines within MANR;

3) Complete integration and coordination of SWMU activities and abilities in the program and project actions of MANR;

4) Development of a village planning and action program suitable to The Gambia, and the documentation of this program as a study guide;

5) On-job training in this program to enable Gambian Unit Staff to conduct the village planning and action program;

6) Development of a technical soil and water management manual for the Gambia;

7) Training and installation of a Gambian Unit Director;

8) Solution of some basic soil and water management problems in a few (10-15) villages, to the extent that village farmers are realizing actual benefits from utilizing new management methods developed in the village planning and action process;

9) Identification of trainees for degree training abroad and placing them in appropriate curricula; and

10) Development of a more generalized training curriculum to be used at Yundum in the MANR Training Unit to give Agricultural Assistants involved in annual refresher courses some basic exposure to soil and water management principles.

The second (2-year) phase should be devoted to the following goals:

1) Conversion of SWMU from an American-directed to a Gambian-directed unit by shifting the role of expatriates from leaders to required technical advisors; (The exact technical make-up of needed expatriates in the second phase will depend on the speed of development of Gambian talent in various technical specialties. It is difficult to estimate at this time, but should be identified and projected at the project review stage.)

2) Establishment of Gambian technical specialist teams at each of the 5 Divisional headquarters so that actual field assistance to villages can begin to flow from the Divisional offices rather than headquarters;

3) Continued improvement of the technical guide, the planning and action program, and the training materials and courses used in MANR; and

4) Shifting technical leadership for various phases of the SWMU program to qualified Gambians as rapidly as training abroad can be finished and appropriate experience obtained.

It is difficult to predict with certainty at this point whether complete operation of the Unit by the Gambian staff is feasible at the end of the 5-year period represented by Phases I and II. The most likely area in which a continued U.S. input may be needed is short-term specialized consultancies. Accordingly, the PP Team proposes 4 man/years of consultancies during a third phase from years six to ten.

1) Attaining a full technical capability of National stature with Gambian staff;

2) Establishment of adequate field units so that all villages in the country have access to soil and water management specialist services through the extension services of MANR; and,

3) Continued improvement of technical and operational ability to meet emerging soil and water management problems in the Nation.

2. Operation of SWMU

Through the life of the project, the Unit will be managed to take maximum advantage of the technical talent available through the expatriate team. In addition, however, there is the need to develop an operating method that will be useful in the continuing sense.

The Unit must operate on a grand scale at times; on a very small scale at others. As principal advisor to the Ministry on matters pertaining to soil and water management, the Unit must be prepared to propose and/or advise on policy and procedural matters. Agricultural, irrigation, livestock, or forestry projects of the Ministry

require soil and water expertise, data and information, and the Unit will be expected to provide that.

At the other end of the spectrum, the Unit must develop a way to successfully plan with an individual Gambian farmer on a 1-acre field. This process, described at length elsewhere, requires a great deal of development and testing under Gambian conditions. This will place the Unit in the field much of the time, not in an attempt to solve all the problems of all 17,000 Gambian farming compounds but to develop and document a way successfully to motivate these farmers to action and teach techniques to Gambian soil and water management specialists.

Because most of the resource inventory and on-the-land planning will need to be done in the dry season, the Unit should immediately begin to develop an annual work cycle that properly balances and schedules the various types of field and office work. Such a schedule might attempt to program activities as follows:

Wet Season--

Work on policy positions for MANR;
Order and prepare aerial photos, maps, etc. for villages;
Assist villagers with growing season management practices as needed;
Field investigations of soil profiles;
Field observations of runoff and erosion conditions;
Preparation of reports for MANR projects or proposals;
Preparation of technical guide material;
Preparation of training materials;
Assist with training sessions; and
Personnel and Administration.

Dry Season--

Prepare resource inventories for villages, including soils and vegetative surveys;
Develop conservation and management plans;
Assist villagers install conservation measures such as bunds or waterways; and
Keep careful notes of field work to provide documentation for technical guide material.

The First Year

During the first year of operation, it will be important to develop some actual field experience with village conservation problems to form the basis for policy, technical guide, and training aid development. The PRP assumes that the Unit will be established in May or June, 1978. This would be excellent timing from the standpoint of the annual work cycle. Team members could spend the entire first rainy season (June-October) familiarizing themselves with the agricultural methods and conditions in The Gambia. Initial contacts with villages can provide access to fields to observe runoff and erosion problems as they occur. Development of technical information during this period will be key to any planning or technical guide preparation later. Input of the Gambian members of the Unit will be basic to the development of a complete understanding of problems and situations in the field.

During the dry season, (November-May), the Unit should concentrate on planning with villages. The PRP suggested the development of demonstration plans on the MFCs, but discussions with knowledgeable Gambians during the PP stage have somewhat discouraged this. Apparently the value of the MFC as a demonstration farm is limited, with farmers viewing it as a government farm where things are feasible that are not possible under village conditions. That being the case, most demonstration work will have to take place on individual farms, flowing out of the village conservation planning process. Assisting with the solution of conservation problems on the MFC should be undertaken mainly to provide practice and demonstration for the Gambian Unit members and the AA at the MFC involved.

Planning during the first season should be expected to result in a few (perhaps 2-5) villages arriving at the point where they have made some overall commitments to test some new methods or install some obviously needed conservation practice. Most likely, the best that can be expected is that one or more farmers in each of these villages will have agreed to test some new management method. (In the view of the PP team, this may involve incorporation of organic matter or animal manure without burning.) The extent and type of demonstration trials started in this first season must be carefully controlled, since the Unit should start only those for which it can provide careful follow-up assistance. DOA staff have

stressed the fact that Gambian farmers undergo trials fairly willingly, but if some results are not visible after the first year, these farmers, as well as their neighbors, are reluctant to repeat the trials again.

The Second Year

During the rainy season the second year, the Unit will need to concentrate on:

1. Providing needed follow-up assistance to farmers conducting trials or carrying out conservation practices to assure a high degree of success;

2. Preparation and reproduction of reports, evaluations, conservation plans for villages, and technical guide material;

3. Assessments of effectiveness of installed conservation measures (if any have been installed) in reducing runoff, retarding erosion, and enhancing production;

4. Assembly of needed photographic coverage, technical data, etc., for field work season; and

5. Preparation of training materials and aids to be used in ongoing training program of the Ministry.

During the dry season the second year, the Unit will need to concentrate on:

1. Follow-up planning with the first-year villages to convince them of the value of the conservation measures tested, get successful tests repeated and spread to other farmers, search for alternatives to practices that proved too costly, difficult, or ineffective, and initiate additional tests or new management practices as needed; and

2. Initiate planning with as many new villages as can be handled without spreading the staff too thin. The actual number here is hard to estimate, but it should be kept low enough that the Unit is not spread too thin for patient and intensive work with all cooperative villages (probably 10-15 in total).

The Third Year

During the rainy season, the Unit should be able to concentrate on:

1. Completion of the Technical Guide and related reports on the planning process;

2. Follow-up assistance to farmers conducting tests or carrying out conservation plans;

3. Continued assessment of effectiveness of installed conservation measures;

4. Assembly of needed photographic coverage, etc., for next field season; and

5. Preparation of training materials and aids to be used in the MANR training unit.

During the field season, the Unit should continue to expand services to villages, utilizing mainly Gambian members of the Unit as planning and technical assessment leaders in the planning process and involving new AAs and villages. Again, care must be taken to prevent spreading the Unit too thin for effective work.

3. The U.S. Technical Assistance Team

AID will assist the GOTG in establishing a Soil and Water Management Unit (SWMU) within the Ministry of Agriculture and Natural Resources. This Unit, headed initially by an expatriate professional conservationist, will have as its major goal the institutionalization of a soil and water management capability with GOTG. It will provide a programmatic dimension that is currently lacking in MANR and that is felt by MANR officials to be their top priority for institutional strengthening.

Initial staffing of the unit will consist of three expatriate professionals furnished by AID under the project and eight employees furnished by GOTG. Land for new housing, as well as maintenance and utilities, office space and clerical support will be provided by GOTG, with housing construction and furnishings, field equipment, special office equipment, camping equipment, and incidental supplies furnished by AID. Both AID and GOTG will furnish

one 4-wheel drive vehicle (Landrover). GOTG will provide fuel and repair services for vehicles. The office facility will be located near the Yundum Agricultural Station to facilitate communications and cooperation with the Soils Officer, Education Officer, Extension Aids Unit, and Forestry and Animal Production Departments. AID will furnish approximately $5,000. in office and laboratory equipment and $9,000. in field equipment (see Financial Plan for itemized list). Other commodities to be financed under the project include a technical library of 200 titles in two sets ($4,000.) and 10 small motorcycles for the AA's assigned to the regional centers ($10,000.).

The major mission of the expatriate staff is to provide the full range of interdisciplinary skills needed to develop a soil and water management program adapted to Gambian economic, social, cultural, physical, and environmental conditions. Professional skills required for developing and installing Soil and Water management systems are lacking in The Gambia, thus requiring a team approach to cope with the full range of technical challenges in soils, engineering, agronomy, water management, ecology, economics, forestry, grazing management, and environmental protection.

The PP team, as did the PRP team, feels the needed range of skills can be achieved by a 3-man team if carefully recruited. The following outline of requirements is somewhat altered from the PRP, on the basis that a specialist in plant ecology is now felt to be essential. The Permanent Secretary of MANR prefers that Gambian employees in SWMU not be considered "counterparts" to a particular American staffer. Instead, he prefers that the Unit Head organize both Americans and Gambians into an effective functioning unit that capitalizes on all available skills, puts Gambians into responsible positions immediately, and begins the process of "training by doing". Initially, as noted earlier, he wants the Americans to provide the managerial and professional leadership. But as the unit is organized, the Gambian who desires to become most expert in agronomy, for instance, should be placed on the staff in an appropriate place for maximum exposure to agronomic evaluations and considerations and closely evaluated for aptitude and skill. If he is successful, but needs college level training abroad to acquire the full range of technical skill to eventually become the nation's leading

agronomist, he should be considered for such training.

Qualifications of the American Team

1) The Team Leader (Unit Head)

This individual must be professionally trained in soil, plant and/or crop science, with experience in administration, personnel management, and training. He will need to function as the chief planner in working with villages, as well as the chief staff advisor to the Permanent Secretary, so he must be skilled in conservation (particularly group) planning, old enough to be regarded as a senior man in the village (40+) and in the councils of MANR, yet willing to do lengthy, hot and tedious field work as part of developing village plans. Without knowing the skills of all the staff members, it seems likely to the PP team that he will have to provide basic engineering skills until Gambians are adequately trained. It is expected that a Gambian administrative officer will be assigned to the Unit, who would relieve the team leader of routine, but time-consuming, administrative duties.

As head of the SWMU, he will be responsible for personnel appraisals, training, and administrative operation of the unit. He will be responsible for identifying and developing talent among the Gambians to move a Gambian into position as Deputy as rapidly as possible. He will provide leadership in the development of a technical manual for planning and installing soil and water management systems in The Gambia, and for the development and presentation of training segments to Gambian AA's through the MANR training unit. He must develop and document an effective group planning process with village farmers, and train Gambian planners in that art. He must be able to develop a rapid understanding of

Gambian village structures, decision making processes, and social institutions. He must be a good and patient listener, and willing to innovate and experiment to develop new methods based on Gambian technology, improved to meet a recognized need.

2) The Plant Ecologist

In the development of technical manuals and training materials, as well as the actual planning at the village level, the management of vegetation and plant residues will be critical to any improvement in the condition of Gambian soil systems. Much of this vegetation is harvested by either grazing or wood cutting. Burning is common. Particularly in the village environs, the importance of grazing management, and woodlot management is paramount.

The individual chosen for this job should probably be a range conservationist, either educated in a forestry school or having work experience involving grazed woodlands. He will need to be willing to become thoroughly familiar with West African plant species and their management characteristics, and should assemble a good set of reference materials from America and Europe prior to arrival in The Gambia.

He should be skilled in integrating the grazing, woodcutting, and cropping activities in the village into a total picture of resources use and management. He will need to develop the concepts of carrying capacity and proper use in ways that Gambian trainees and village farmers can understand, and prepare feasible, effective alternatives that can be considered as part of the management plan for the village lands being planned.

In the development of the technical guide, he will need to take the leadership in the

in the vegetative management sections as well as the forage and woodland site descriptions and condition indicators.

3) The Soil Scientist

There is a very general soil survey of The Gambia, completed in 1973 by the Land Resources Division, Ministry of Overseas Development, British Government. Reconnaissance soil surveys in limited project areas are conducted by GOTG under the direction of the Soils Officer in the Department of Agriculture. Final drafts of soil series descriptions, laboratory data, etc., are currently being completed in England, but will soon be available in The Gambia.

The Soil Scientist will be responsible for assembling this material and other soils information into a useable technical guide for conservation treatment and management. This will include determining appropriate groupings of soils that, because of their physical and morophological characteristics, can be used and treated in a similar manner; developing estimates of soil erosion hazard under different systems of management; and devising appropriate methods of improved crop and soil management that will reduce water loss, improve water utilization, minimize soil erosion and enhance crop yields.

In addition, the soil scientist will be responsible for cooperating with the GOTG Soils Officer to schedule and complete soil surveys in adequate detail to provide the basic technical information needed for developing conservation plans on selected villages. He will not only provide basic soils information and interpretations, but also be responsible for presenting this information in terms that are understandable to Gambian farmers.

The Soil Scientist will be responsible for leadership of the early development stages of national systems of soil classification and soil interpretations in The Gambia. He must collect and organize large amounts of data from soil pedon descriptions, laboratory analysis, and field notes. In addition, he must thoroughly review data from other West African countries that may contribute to a better understanding of Gambian soils and their use and management.

Short-term Consultants

Twenty-four man-months of short-term consultancy is foreseen during the first 3-year phase of the project. Consultants will be scheduled by the Unit Director in concert with needs as they are identified. The PP team has identified the following general needs:

1) In year 1, the need will be primarily for agricultural engineering assistance (assuming this is a skill lacking in the team) and perhaps a plant scientist to cover a special skill that the team does not possess.

2) In year 2, an agricultural engineer will probably be required to provide specific input into the Hydromet irrigation projects. This assumes that SWMU has undertaken some soil surveys and interpetive work on a Hydromet project and that there needs to be some detailed irrigation interpretations and design criteria developed. A soil scientist is liable to be needed to assist with development of the national classification system and a plant scientist may be helpful in getting technical guide material developed. The opportunity to prepare radio shows and movies with the Extension Aids Unit may require the use of an information specialist to help the SWMU scientists identify concepts that can be presented and help draft up outlines or scripts to facilitate the preparation of programs or movies.

3) In year 3, the major job will be development of the technical guide, and the PP team foresees a 3-man team of specialists spending two months doing little else but pulling this material together. The probability of effectively utilizing the agricultural engineer and information specialist again in year 3 seems high, as well.

In the second (2-year) phase of the project, 12 man-months of consultant time are scheduled, but little can be determined about the type of timing of consultants prior to the final stages of phase I.

If a third phase is needed to achieve full Gambian capability, it is estimated that the entire American input can be through short-term consultants. Accordingly, 48 man-months are budgeted for years 6-10.

4. The Training Element

Several training elements are involved in the project that will proceed more or less simultaneously, but will involve different people at different levels of intensity. They can perhaps be discussed most meaningfully in terms of the rationale for, and recipients of, each type of training.

a) Expatriate orientation.

Much of the first year's activities will be aimed at fully orienting the expatriate team to Gambian conditions, culture, and ethnoscience in order to be of maximum advisory value. Meeting with villagers, resource inventories, and development of the village planning and action process will all be useful in this regard. In addition, the PP team suggests that the following special efforts be undertaken as part of the project:

1) A one-week orientation session in Washington, D.C. should be conducted

for members of the project team by SCS members of the PRP and PP teams;

2) It would be very beneficial if members of the project team could be assigned to Banjul for at least one month TDY, without their families, for orientation sessions;

(It must be borne in mind that there is no USAID Mission or Embassy support services in Banjul and that the team members will not be experienced foreign service personnel accustomed to living abroad. In view of the importance of this orientation, the SCS members of the PP team believed that the SCS may be willing to make the project team available for this TDY at its own expense, if AID would cover travel and per diem costs).

3) Resident Gambian sociologists, culturists, and historians should be retained to conduct seminars for the team during the TDY period; (Some basic exposure to Mandinka greeting, language forms, and vocabulary would be useful as well)., and

4) The Peace Corps Director in Banjul has offered to make part or all of the quarterly six-week PCV orientation program available to the team members.

b) On-the-Job Training for Unit Members

Prior to being considered for a post of administrative or technical leadership or selection for degree training abroad, all staff members should undergo at least one year's training as an active member of the village planning and action team. Since the basic long-range goal of the project is to establish a service unit, all those who aspire to leadership should have first-hand experience in the provision of that service.

As people are selected to move into administrative posts or go abroad for specialized schooling, they should be replaced with new employees who have the education, experience, and capability to become soil and water management specialists. These new employees should also receive one year on-the-job training before reassignment as appropriate.

At regular intervals, the entire staff, expatriate and GOTG, should assemble to discuss and relate each member's observations, experiences, data, and conclusions. The goals of such staff meetings are to assure exchange of ideas among the staff and to plan short-term schedules and activities to achieve full staff coordination.

c) In-country Training for Specialists

Intensive one or two-week courses in conservation planning, soil survey, soils interpretations, vegetative surveys, engineering techniques, hybrid technology, etc., should be developed in cooperation with Yundum College and the Training Unit of MANR. Resource people can be either the expatriate team members or short-term consultants. Recipients of the training should be the staff of the SWMU, plus other staff within MANR that would benefit from such short courses. The goal of these courses should be to provide specialists with intensive exposure to technical background and practical field techniques.

d) General Training Courses

Soil and water management principles should become standard fare in the general training courses provided through the Training Unit of MANR. These course segments will be prepared in cooperation with the Training Unit and the Extension Aids Unit for presentation during regularly scheduled refresher courses. The students will be largely agricultural assistants. The goal of the training will be to

give students appreciation of soil and water mangement, a basic understanding of the recognition of soil and water problems, ideas on how to solve simple problems encountered in the field, and a working knowledge of the operation of the SWMU and its policies for assisting villages with problems beyond the scope of the agricultural assistant.

Instructors for these course segments should be developed among the Gambian staff of SWMU as rapidly as possible.

e) Academic Training Abroad

Achievement of a Gambian staff of technical support specialists will require several degree-holders that do not now exist in MANR in addition, perhaps, to some advanced or supplementary work for those who currently hold a Bachelor's degree. Exact specialities and training needs are difficult to identify without knowing the qualifications of the employees selected to staff the unit, but the following are tentatively foreseen:

2 - Agronomists

2 - Soil Scientists

2 - Agricultural Engineers

1 - Range Management Specialist

1 - Forester

Attempts should be made to arrange an appropriate schedule of work with a good university in the southeastern United States, where soil and management problems somewhat similar to The Gambia exist. Credit for existing college-level work should be sought wherever possible, so that schooling abroad can be reduced to the minimum.

In addition, summer internships with the Soil Conservation Service should be sought to provide Gambian students with training and field experience to supplement their college work.

PART III - PROJECT ANALYSES

A. Technical Analysis

1. The Gambian Soil and Water Conservation Problem

It is pointed out in the literature, and confirmed by observations in the field, that soil erosion, depletion of fertility, and declining soil productivity is a major problem throughout The Gambia. In the face of rising populations, the current trends can do nothing but grow worse, threatening all efforts at development in the country and eventually affecting the social and economic welfare of the population.

But the basic problem that must be solved is not simply erosion and soil depletion. Those are symptoms -- physical manifestations of a much broader and more intractable problem. That problem is that the demands on the land have exceeded the technological and managerial capacity of the Gambians to where their agricultural system is dangerously out of environmental equilibrium.[1] Returning the balance between the people and the land would reduce soil erosion and depletion as well as the many other associated environmental damages occurring. The solution, therefore, lies in the people, not in the land. A more environmentally stable society requires the people to adopt different ways of using and managing natural resources. The challenge, in short, is to alter the people's historical ways of growing crops, grazing cattle, cutting wood, and all the other things that affect vegetation and land.

The PP team is convinced, as was the PRP team, that the incorporation of marginal improvements by Gambian farmers will follow virtually the same pattern that has been experienced in America. Farmers in both societies are pragmatic, hard-working, conservative people, who must be convinced of the usefulness of every innovation. Theirs is a constantly shifting knowledge, however, and they are always seeking ways to increase production, lower costs, improve profits, or reduce risks. Once a new idea is proven to be superior, it is adopted promptly.

The major factor in adoption of new ways -- probably more important for Gambian than American farmers -- is risk. Departure from traditional ways involves the

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1 See Phil O'Keefe, "The Process of Soil Erosion", in the African Environment: Problems and Perspectives," Ed. by Paul Richards IAI London, 1975

risk of failure, and the price of failure in Gambian agriculture may be the starvation of one's family. Americans avoid risks, but often only for economic reasons. They do not like failures, but usually they can tolerate some degree of loss. Gambians, for the most part, can not. Therefore it must be assumed that a Gambian farmer will be slower to abandon traditionally proven ways, even if he is convinced that a new way stands a good chance of being more productive, so long as there is the chance that the new way increases the possibility of absolute failure under any foreseeable set of conditions.

Serious responsibility is assumed by American advisors under these conditions. Gambian farmers accept our technological skill, and can be convinced, it appears, that our recommendations are sound. But we must be careful and conservative in recommending changes. Many small tests and on-farm demonstrations are essential to ensure that innovations introduced are suitable for Gambian conditions.

One major contribution that American experience can bring to The Gambia is the development and documentation of an effective process for encouraging Gambian farmers to take the needed action to protect and improve land management. Technically, what is needed is well enough known. References available in America, Europe, and Africa thoroughly identify the need for improved management of vegetative materials in order to provide adequate cover for erosion control, organic matter maintenance, and maximum sustainable forage and wood production. Inadequate soil organic matter, excessive compaction, and depleted fertility levels are well recognized on agricultural lands. Surface runoff is excessive, and needs to be reduced by improving soil condition for intake. Some runoff is inevitable under farming conditions, however, and provision for its safe and non-erosive transport off the land is required. None of factors poses any particular mysteries to trained technicians. Employees of the Gambian Department of Agriculture recognizes them readily and understand causes, effects, and treatment needs. Village farmers can be made to understand them as well.

What is currently lacking, however, is an explanation of the process needed to induce Gambian farmers to undertake the necessary changes. What the Soil Conservation Service calls a conservation planning

process (under Gambian conditions it will necessarily be a group planning process) is neither described in the literature nor practiced by Gambian technicians. Yet without such a process, there is little hope that known technical solutions will be brought to bear on commonly perceived environmental problems.

The key to any successful planning process is the ability to communicate with people. It is often observed in the development business that you can plan with people, but you can not plan for them. The "expert" must become a joint seeker of solutions with the farmer, not an abstract advice-giver who simply brings messages and instructions. Unfortunately, much of the colonial experience has been of the latter variety. So, too, is the current practice based upon technical educations in European schools. This leads, as O'Keefe and Wisner[1/] point out, to a rejection of folk technology as well as an elitist, imperious attitude on the part of agricultural experts that results in an ineffectual transfer of needed technology into practical action and results on the land.

The SCS group planning process, well developed and described in the USA, can overcome this problem under Gambian conditions, in the opinion of the PP team. Once this has been successfully adapted in The Gambia, described in the literature, and taught to Gambian practitioners, the effect will be both positive and long-lasting. Throughout West Africa and most of the developing world, the social barriers between what is known and what is actually done are of more significance than the lack of available knowledge. It is these social barriers that the soil and water management unit -- using and adapting an American-style planning process -- must overcome.

Our conviction that this can be done is tempered by the realization that it will be both slow and difficult. The cultural and social scene in The Gambia (described in the Social Analysis) poses new problems for which techniques must be adapted. The absolute poverty of many Gambian farmers and the very limited technology available to them will slow both testing and

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1/ Phil O'Keefe and B. Wisner, "African Drought -- The State of the Game" in African Environment: Problems and Perspectives, Ed. by Paul Richards IAI, London 1975

adoption of new practices. The language and cultural barriers, while appearing to be manageable, will also slow progress.

For these reasons, as well as others cited elsewhere, the design team sees as one of the main values of this project -- at least in its initial phase -- its effectiveness in improving the ability to bridge the gap between what is known by scientists and environmental advisors and what is done by native land users. If we can develop and document a process that materially improves the ability of the GOTG to effect actual changes in the way village farmers manage their resources, the value will be of significant magnitude and importance, both in The Gambia and elsewhere in the developing world.

As a testing ground for this type of project, The Gambia is ideally suited. Its small size, egalitarian and democratic tradition, and stable political situation are rare and important assets. The quality of the current extension efforts in the MANR, and particularly the experience of the agricultural assistants, provides an excellent experience base and personnel pool upon which to build. The fact that the official language is English greatly enhances the working situation for the American advisors as well as facilitating training in the U.S. universities.

A critical factor is that the village planning process proposed is complementary and fully compatible with the ongoing extension effort of MANR. Conservation specialists, at both the PRP and PP stages, have been impressed by the obvious skills demonstrated by agricultural assistants and other Gambian DOA specialists who have this background. These people have, through both training and experience, acquired valuable and essential skills that provide an essential base upon which to build an effective soil and water management service capability.

2. <u>The Effects of Current Soil Deterioration Trends</u>

a) Decline in Soil Fertility

Where crops are totally or partially removed from any soil without return of

equivalent amounts of organic matter or fertilizer, the level of the basic plant nutrients is gradually reduced.[1] Substantial amounts of nitrogen (N), phosphorous (P), and potassium (K), and other required elements such as calcium, magnesium, iron and sulfur are a part of each crop that is removed from the land. In addition, erosion removes the finer soil particles and organic residues that contain most of the available plant nutrients.

In shifting cultivation, deep-rooted plants bring plant nutrients to the surface and, over a fallow period of several years, assemble enough available plant food to maintain productive cropping over a period of three to five years. This practice has essentially maintained soil fertility in many parts of the tropics for centuries.

Reducing the duration of, or entirely eliminating, the fallow period results in depletion of plant nutrients of the soil in the rooting zone of cultivated plants. Animal manures or fertilizers must be added to make up this loss; otherwise productivity will decline. It should be noted that animal manures can be successful in maintaining the fertility of a given field only at the expense of outlying areas where the forage containing the nutrients is grazed by the livestock. The extent of soil response to fertilizers and the kind of practices that will most effectively provide required plant nutrients are related to the kind of soil.

The burning of plant residues is practiced on most cropland in The Gambia because the farmer lacks sufficient labor and tools to incorporate plant residues into the soil. Farmers think that weed seeds are destroyed by burning, thus reducing weeding required

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1/ Webster, C.C. and P.N. Wilson. 1966. Agriculture in the Tropics. Longman Group Limited, London. p.170.

during the period of high labor demands; and recognizing the quick release of plant nutrients from the ash. Much of the nitrogen, however, is destroyed by burning. 1/ Also, burning does not create phosphorous and potassium; it merely releases them quickly from the plant residue. These nutrients are in the plant residue and would be returned to the soil, along with nitrogen, if the plant residues were incorporated into the soil.

Soil management systems that key fertility maintenance to kinds of soil, crops, and farming methods are needed.

b) Decline in Soil Organic Matter

As a result of the practice of burning, the organic matter content of cultivated soils diminishes. 2/ Yet, the maintenance of the organic matter level of soils is of basic importance to soil productivity, especially where tillage and fertilizers are scarce. Organic matter is important to both the chemical and physical quality of the soil.

Chemically, organic matter contributes to the cation exchange capacity (CEC) of soils. This is especially important in tropical soils having clay of low CEC. In such soils the depletion of organic matter reduces the capacity of the soil to hold, and prevent the leaching of, plant nutrients. In addition, without fertilization, the major source of nitrogen to growing plants is that released from the organic matter that has accumulated in the surface soil layer. 3/ Small amounts (6-8 lb/acre) are added in rainfall. Unless

1/ ibid., p.173
2/ ibid., p.172
3/ Soil Management in Tropical America. 1975. Bornemisza and Alvarado ed. Soil Science Dept., North Carolina State University, Raleigh 27607 p. 372-409

organic matter levels are maintained, the natural ability of the soil to supply nitrogen decreases.

Physically, organic matter supplies the primary binding agent that maintains a porous and friable soil structure. It imparts a sponge-like quality to the surface soil, enabling rapid infiltration of rainfall and adding materially to the soil's capacity to retain moisture and make it available for plant growth. Since greater infiltration reduces runoff, maintaining organic matter levels is one of the important methods of preventing soil erosion. An additional benefit of maintaining soil organic matter levels is that it causes the soil to resist compaction caused by livestock, human traffic or intense rainfall. By minimizing compaction, the soils are easier to till, weeds are easier to pull, and the looser soil makes harvesting groundnuts and other root crops easier.

Soil management systems that will maintain, or, if possible, increase, soil organic matter are needed.

c) Increase in Soil Erosion

The most rapid, and perhaps the most devastating, soil depleting factor on the upland soils of The Gambia is soil erosion. Runoff volumes have increased because compaction of the surface soil has reduced infiltration rates. Denuding the soil surface by burning the protective vegetative cover opens the soil to the full descructive force of wind and rain.

On bare, compact soil, the impact of raindrops dislodges individual grains of sand, silt and clay from the soil surface. The finer particles become suspended in a thin film of water running across the soil surface. Small rills develop and lead to

larger rills which in turn lead to gullies in the larger drainage ways.

Soil erosion is selective in the component of the soil that is moved. The finer soil particles and finely divided organic matter are most easily suspended and carried in run-off waters. Thus the component of the soil most vital to soil productivity is lost.

Few upland soils of The Gambia have more than 6 to 8 inches of A_1 horizon (the darkened surface layer).1/ This layer contains essentially all of the organic matter and nitrogen. Thus, the loss of the A_1 horizon would destroy the productivity of the soil for cultivated crops without fertilization, and would severely limit it even if fertilizers were used.

Sediment from eroding soils often impairs the quality of downslope soils where it is deposited. A common example is observed where water from a gully discharges onto alluvial land. At this point there is commonly a flattening of the gradient. The velocity of the water slows and sand particles are deposited. The finer silt and clay particles are carried further into the alluvial area. When sediment is carried into lakes, streams, and estuaries, water quality and the habitat of marine species are impaired.

Dry, sandy soils without vegetation cover are subject to erosion by wind. Wind also removes the most productive component of the soils, and may remove the entire A_1 horizon, destroying the natural productivity of the soil.

<u>Soil and water management systems that control soil erosion are needed.</u>

d) Other soil and water problems.

1/ Land Resources Study 22. 1976 Land Resources Division, Ministry of Overseas Development, Surrey, England KT67DY.

In The Gambia other problems include i) the erosion of stream banks where rice cultivation, cattle trampling, or tree-cutting destroys protective vegetation on the stream bank; ii) the instrusion of salt water onto irrigated rice lands causing soil salinity which reduces or prevents productive cropping; and iii) the location and proper use of irrigation water to maximize production of rice and other crops.

e) Production

Decline in production is associated with soil and water deterioration in a complex cause-effect relationship where soil deterioration reduces production, leading to greater efforts by the people to exploit the land, leading to greater damage, and on and on. Breaking this damaging cycle requires a concentrated review and evaluation of many social and economic problems. A sound soil and water management program is an essential part of this effort. To be successful it must couple concern for protection of soil and water resources with concern for production of adequate food for the people, grazing for the livestock, and wood for building and heating. Thus, the origin of broader concern for soil and water mangement as opposed to the more narrow concept of conservation.

Before discussing the management program required to solve the soil and water problems of The Gambia, we call attention to the fact that the preceding perception of the problems is that of outsiders -- and these problems must be recognized and articulated by the Gambian farmer before they can be solved. As Langley 1/ suggests, the conceptualization of the rural societies themselves should be the foundation of knowledge, providing a valid base for formulating action. Indeed, we suggest that the knowledge of the local Gambian farmer must be the base, for any other approach is not likely to lead to viable solutions.

1/ Langley, Phillip. 1975. In African Environment: Problems and Perspectives, Paul Richards ed. London

Thus the soil and water management program must be founded on an ethno-science 1/-- a hybrid technology that draws from both traditional and modern sources. Based on interviews with the farmers at Sintet village, it is evident that they are familiar with the different kinds of soil in their village, and with many aspects of the management required to obtain good yields with reasonable inputs. Much of the existing knowledge of agricultural sciences is in the minds of those who till the land. This is no less true of Gambian farmers than of farmers throughout the world, since their livelihood depends on the extent to which they understand their soils.

3. Soil and Water Data Requirements

An integrated conservation planning program requires data of many kinds. Information about adapted crops and their management requirements, adapted rotations, soil fertility and organic matter management for given crop rotations, water management, forest species and their adaptions and management, and range and pasture management are needed. To effectively apply the above data in planning, they must be assembled by kinds of soil. Adapted crops, rotations, and other management needs differ for different kinds of soil.

A major early activity, therefore, should be the collection of data by kinds of soil.

a) Soil Surveys

Considerable investigations of soils has been carried out in The Gambia. The most comprehensive is Land Resource Study 22 - The Agricultural Development of The Gambia: an Agricultural Environmental and Socio-economic Analysis. Several soil series are described and general soil maps at a scale of 1:125,000, prepared principally by photo intrepretation, are included. The

1/ O'Keefe, Phil. 1975. The Process of Soil Erosion In African Environment: Problems and Solutions, Paul Richards ed. London

nature of the soils along several transects is also reported.

Soil surveys of the detail required for operational planning have not been prepared. The following approach toward soil surveys is suggested for the SWMU, especially in the early stages. (The scale of mapping should be between 1:5,000 and 1:10,000.)

The classification and delineation of soils should be compatible with the understanding of the village farmer about differences in his soils. It is doubtful that sufficent scientific information exists, apart from that known to the farmer, to adequately judge the significance of soil differences. Some soil differences may be identified by a soil scientist that are not recognized by the village farmer. Before establishing and delineating soil mapping units, soil differences should be discussed with the farmers to assure that only soil variations of significance are mapped and to avoid delineating those of little or no importance.

It will be necessary to take numerous samples for laboratory analysis, especially during the early work. Analyses of particle size, exchangeable cations, cation exchange capacity, water holding capacity, pH, organic carbon, C:N ration, and exchangeable aluminum will be especially valuable. Soil density measurements in the upper 50cm using the saran clod method would be helpful. Results of the analyses will be useful i) to establish and verify field identification of important soil properties, and ii) to characterize soil series.

A nationwide system of soil classification will need to be developed. Use of Soil Taxonomy 1/ as the reference base is strongly encouraged to provide the most

1/ Soil Survey Staff. 1975. Soil Taxonomy: A Comprehensive System for Classifying and Interpreting Soils. Agricultural Handbook 436, Washington, D.C.

direct link to soil research and experience in other tropical areas of the world.

b) Plant Data

Data should be collected on the planting and germination, weeding and cultivation requirements, harvesting methods and yields for each crop. Plant species suited for use in stabilizing water courses should be identified.

Special attention needs to be given to documenting experiences in the management of plant residues and soil fertility for each crop, including those plant species identified for use in stabilizing water courses. Methods within the means of the village farmer of incorporating plant residues into soil must be sought. Responses to fertilizer applications on various soils should be recorded.

Collection of plant data should include the identification of native species for forage, and the amount of forage on different soils. This data indicates soil suitability for grazing of native species, the carrying capacity of each species on each soil, and the attendant management practices.

Similarly, data is needed on the production of wood crops by species and kinds of soils. Management practices required to achieve desired production levels need to be identified.

c) Water Management

Information should be collected on the drainage patterns on the village lands, and on areas where erosion has been active or sediment deposited. Water courses should be sketched, with the gradient of the water course, its approximate depth and cross-section, and evidence of active gullying noted. Attention should be given to water distribution systems that will facilitate rice production.

d) Technical Guide

The data described above provide the basis for a Technical Guide that describes soil and water management systems appropriate to each type of soil. In The Gambia, a national Technical Guide could be patterned after those developed for individual states in the USA by the SCS.

A basic element of the Technical Guide must be carefully prepared soil mapping unit descriptions. In the appendix, hastily prepared descriptions of the soil mapping units observed at Sintet village, along with an equally cursory soil survey sketch. The required soil mapping unit descriptions must be substantially expanded from these examples but certain important elements should be included, such as:

i) Surface configuration as related to run-off and erosion control. Considering the low relief and slopes, it will likely be necessary to utilize narrow slope ranges in the definition of soil phases, e.g. 0-1%, 1 to 3%, 3 to 6%, etc. However, the need for such narrow slope ranges should be carefully tested by the team. Also the shape of the slope, whether convex or concave, should be described. Different soils mapping units should be used for areas that receive runoff and deposition compared to those that do not, even though identifiable soil properties are the same.

ii) The deposition of layers of sediment, even as thin as 2 or 3 inches. Such deposition is evidence of water running onto the area, and often will result in a more productive soil.

iii) The porosity, consistence and structure of the A_1 horizon and subsurface horizons to a depth of at least 30 cm. The impact of current farming methods has led to

extreme compaction of these horizons. Ridging has resulted in a thin "varving" as erosion on the flanks of the ridges moves soil into the furrows, then carries away the organic matter, silt and clay, leaving a sandy layer, usually 1 mm. or less in thickness, in the furrow bottom. Successive storms build up a distinct layering of these materials, creating new textural and structural layers in the surface soil.

iv) Evidence of biotic activity and organic residue should be described. Other basic elements of the technical guide include crop yield data, adapted crops and tillage practices for each, soil fertility and organic matter management, and forest and range management. As these elements vary by kinds of soil, it is necessary to present each element for individual soil mapping units.

The management of plant residues is a topic of urgent importance for soil and water management in The Gambia. Proper management of these residues would solve most of the problems of soil erosion by increasing infiltration and reducing runoff. Difficulty in tillage arising from the dense, compact soil resulting from current practices would be reduced or eliminated. Depletion of the natural nitrogen content of the soil would be minimized, as would the loss of sulfur. A major effort aimed at finding practical solutions to this problem is justified, and such solutions should be included in the Technical Guide.

4. Action at the Village Level

Following is a description of the action planned at the village level. It should be kept in mind that the basic objective here is not the execution of a project wherein outside resources are directed at repairing the land,

constructing a discrete structure, or interfering with ongoing village activities. Instead, the objective is to assist Gambian farmers to understand their resource capabilities and assets, identify basic resource problems and comprehend their root causes, decide on a corrective course of action that is possible, effective, and environmentally sound, and carry out that course of action largely on their own initiative and with their own resources.

This objective may seem somewhat idealistic, but must be the basis for testing. If, in practice, it is discovered that some form of incentive is necessary to break through critical barriers, that may need to be considered. What is absolutely required, however, is that the Gambian farmer be deeply and personally involved in the planning and implementation process in order that he will be carrying out his own solution to his own problems.

The village of Sintet, in the Jarrol district, lies some 150 kilometers upriver from Banjul. It was visited by both the PRP and the PP teams. The first visit was at the end of the rainy season, just prior to harvest, and the second visit was near the end of the following dry season, just prior to the beginning of field work and planting. The resource situation described below, developed mainly during the PP team's visit, gives an indication of soil and water management problems considered to be common in Gambian villages.

The stage has been set for planning in Sintet. The villagers have, in fact, asked for assistance, assured us of their desire to improve their practices, and offered us the hospitality of the village for as long as it takes to do the job. When the SWMU is established, it should go to Sintet as one of the initial testing villages. Following is the PP team's description of the planning process that might ensue, as a typical example.

a) Identification and Understanding of the Need for Assistance

The villagers must recognize the need for assistance and request help. This has been done in Sintet. The village, through the elders (using one of the scholars, Mr. Darbo, as spokesman) has expressed the

recognition of problems and the need for assistance. This was done during the PP team visit, which simulated an initial planning contact.

b) Request for Assistance

This has been completed in Sintet, as described above. In American practice, there would be some sort of written application or request for assistance. In the Gambian tradition this should probably not be required or expected. When the Alkali, at the banta ba (see description of village structure and decision-making process in the Social Analysis), extends the village's request for help and assures their hospitality and cooperation, that is official so far as the village is concerned.

c) Resource Inventory

For the land chosen by the elders and the planning team as the planning unit[1/], the following resource inventory will need to be made. Village help in making the inventory should be requested and agreed upon, primarily as a way of involving them in the analysis so that they understand and accept the analysis as their own. All resource inventories will need to be done in the dry season to allow access to the fields, to get an accurate picture of vegetative condition at critical times, and to be in a period when the villagers can spare the time to participate.

1/ There can be some debate as to the proper size of planning unit. One could argue that all the village lands should be included. In Sintet, however, this would extend several miles in each direction and make the job so massive that it is doubtful it could be done expeditiously or within the scale of comprehension of the villagers. In Sintet, it appears that the heavily used lands for a perimeter of about a mile around the village would make an appropriate planning unit. These lands are the key to the village survival, are most heavily used and abused, and can be given the most intensive management and care.

i) Soil survey and interpretations

A soils map should be prepared by the SWMU using existing aerial photography and involving both Gambian SWMU trainees and villagers. Villagers can dig holes and discuss native knowledge of soil characteristics and management practices with team members. In Sintet, we are convinced that they both recognize and understand soil differences and can discuss the application of different management systems or practices to different soils. Soil surveys provide the opportunity for the team to learn a great deal about the native understanding and management theories on soils. Gambian SWMU trainees should be learning soil survey techniques, including aerial photo interpretation, landform development, and delineation of local soil patterns on the photos.

Appropriate interpretations, in terms of both suitabilities and limitations, should be developed as map overlays. Again, this should be thoroughly talked out with the villagers and the Gambian SWMU trainees so that the villagers understand and believe the interpretations and the trainees develop skills in helping prepare them.

The time involved in this job is liable to be in the range of 10-15 working days at Sintet, perhaps spread over several visits. Much of the time will be spent in discussions with the villagers about the soils, as well as slow, patient, and repetitive explanations of the maps so that they fully comprehend them. (This is a point of concern. It appears that the villagers, if properly oriented, can relate to good quality aerial photographs of working scale. Since they are illiterate, however, this is by no means seen to be easy or automatic, and may require much effort.)

ii) Distribution and condition of vegetation

Since the proper management of soil and water resources is virtually all based on the proper management of vegetation, it is important to form an accurate picture of the location and condition of vegetation. This includes a survey of:

-- the location, dominant species and condition of grazable vegetation;

-- the grazing values of crop residues;

-- the recent crop history of the cropland, as well as crop plans for the coming year, if known; and

-- the amount, location and condition of village woodlands.

The goal of this survey should be to help the villagers and the planning team develop a joint understanding of the vegetative regime of the planning unit. Since this is the area most heavily cropped, most heavily grazed by village sheep, goats and oxen (in addition to the grazing of the Fula cattle brought onto the fields for manuring), and most heavily exploited for cooking wood, the condition of the vegetative resources will almost certainly be depleted -- probably very seriously depleted. Our casual survey at Sintet indicates this to be the case there.

iii) Topography, runoff pattern, and water management features

Some topographic surveying (again with active involvement of SWMU trainees and villagers) will be needed to establish some of the more subtle drainage patterns. Major drainages are clearly defined and can be indicated on aerial photographs.

Active gullies are evident at Sintet and can be mapped. Valley bottoms bunded for rice production should be evaluated for engineering and water management problems. Location of irrigation wells, livestock watering holes, and similar water management features is needed.

iv) Land use and tenure

Careful discussion with the elders (and perhaps some waiting till planting has started) will be needed to map the pattern of fields and identify which are farmed by whom. This is very critical, however, because the development of most conservation treatment will depend on the action of individual farming units, under the leadership of the compound head. No real planning can begin until each alternative can be discussed in terms of who needs to do what and where.

d) Identification of Specific Resource Problems to be Addressed

Upon completion of the resource inventory, the planning team will make an analysis to identify problems that can be discussed with the villagers. The goal of this discussion is to identify problems that the villagers feel are important enough to warrant corrective action. There is always some dynamic tension in this process. The planning team will see many problems that the villagers consider unimportant. The villagers may identify something as a problem that is outside the scope of project solution (the village's lack of money, for example). A negotiating process is needed to identify realistically those soil and water management problems that are real in the eyes of both the planning team and the villagers and which are important enough to do something about. One factor: there may be problems that do not concern the village but that absolutely must be solved before a more vexing problem will

be amenable to practical solution. Where this is the case, as it often is, the planning team needs to explain carefully the reason why this seemingly insignificant problem must be solved as a precondition to further accomplishments.

Once the problems have been agreed upon, and some rough sense of priority and urgency has been established, the process of searching for solution can begin. In our example at Sintet, the list of problems should probably include:

i) Crop production:

(a) inadequate food crops for a growing population, particularly in a bad weather year;

(b) declining soil fertility and productivity;

(c) compaction of surface soils;

(d) reduced intake rate and excess runoff, and

(e) erosion, including very localized sheet erosion with its attendant soil particle redistribution, rill and gully formation, and wind erosion of sandy soils.

ii) Grazing resources:

(a) inadequate forage resources in the "hungry season";

(b) overgrazing, with attendant changes in species composition, declining plant vigor and productivity, and soil trampling; and,

(c) excessive runoff and erosion, due largely to inadequate plant cover for soil protection.

iii) Wood resources:

(a) Cooking wood is becoming more scarce and difficult to find; and

(b) Construction materials (poles, bamboo, palm fronds, etc.) are declining in availability.

One important feature of the planning process at this point is to conceptualize -- and help the villagers to conceptualize -- how these problems interact and relate to each other. This illustrates the importance of adequate interdisciplinary talent in the SWMU. Soil and water management problems are not isolated, singular problems amenable to simplistic, one-shot solutions. The land, water, and vegetation system at Sintet is out of balance, and an integrated, inter-related, and properly conceptualized set of management adjustments will be necessary to make noticeable improvements. In other words, it can not be solved in pieces. It must be solved as a system.

e) Development and Discussion of Alternatives

The SWMU team, after evaluating both the resources and the problems, develops some alternatives in preparation for working with the elders, then begins the process of searching for acceptable actions. This is a complex, time-consuming negotiation process. An alternative is proposed, discussed at length, thought about for awhile, then either accepted, modified, or rejected. If it is a key alternative, it may need to be decided in final form before some secondary or subsequent actions are planned. This is the real meat of the planning process -- where the villagers develop their solutions to their problems. If this can be successfully carried off, village people will find the resources and the ability to implement new management ideas.

Part of this process may entail the development of small testing plots where farmers can watch and test a method for a year or two before adopting it at field scale. Even though this may appear to slow the process of implementation, in reality it might actually speed it up, since no important innovations will be adopted permanently by Gambian farmers until successful demonstrations are carried out.

In Sintet, which appears typical of many other Gambian villages, the following types of alternatives seem to be worth considering:

- land use decisions, such as location of a village woodlot, on the basis of soil suitability;
- better crop rotations;
- incorporation of more crop residues into the soil with less burning;
- a better scattering and dispersion of cattle manure and incorporation into the soil rather than raking it into piles and burning it;
- seeded fallow;
- establishment of permanent vegetation in active gullies;
- delineation and vegetation of necessary waterways;
- construction of small bunds as needed;
- planned reduction of livestock numbers to carrying capacity levels, with equitable reduction between families;
- seeding of forage species;
- improved grazing management of village livestock;

- special forage or hay for work oxen; and,

- establishment and protection of trees for windbreaks or wood production.

As the plan develops, it must contain enough elements to improve soil condition, fertility, and intake rates on cropland, provide safe disposal of runoff, and balance grazing and wood cutting with carrying capacity.

f) Implementation

There is liable to be some time lag between the adoption of the general plan by the elders and the time when specific practives can be initiated. This time must be used to plan with the individual compound heads regarding actions they will take on their lands. If the village decides to seed one waterway, the chances are that will affect several landowners, so all need to be involved in agreeing to the idea and deciding how to do it so that no one bears a disproprtionate share of cost or inconvenience.

When implementation time arrives, particularly with new practices or demonstrations, SWMU technicians and trainees must regularly visit to help and encourage the farmers. The local agricultural assistant must be involved as well, but he has a full-time job as it is, so that the SWMU must be a help to him rather than a burden.

In Sintet, one or more staff members of SWMU should make a visit at least once a week during the season to see how things are going and provide or arrange for help as needed.

g) Evaluation

Following the harvest, the planning team must return for a full-scale inspection and discussion of what was done, what worked and why, what did not work and why not, and what will be done in the coming dry season and year to continue implementation of the plan. It

will again be critical to be carefully responsive to the farmer's opinions and evaluations, recognize and praise good efforts or successful tests, and to learn from mistakes or ineffective practices. Farmers must also be convinced that what they are learning is a new way of doing things that will need to be done every year to be effective.

5. A Word about Progress

Since the project is geared to the establishment of an institutional capability rather than construction of a project facility, and since the entire spectrum of man's relationship to his environment is involved rather than a discrete function, a word about progress appears in order.

Real progress will be achieved by widening the Gambian farmer's range of options and abilities in the management of his land through the establishment of a capability in the GOTG to render necessary educational, programmatic, and technical assistance, as well as policy encouragement.

To measure such progress by the number of terraces installed by 1980 or the number of farmers contacted in a given year would be to measure incorrectly. The real measure will be acceptance by the people of this new service and the changes it brings. If, in the third year of this project, there is a list of applicant villages requesting assistance that exceeds the ability of the Unit to respond, the project will have been successful. Both the need for and the effectiveness of the service will be established, and its value as a continuing function of GOTG will be demonstrable. Whether this occurs because the Unit has achieved 5 village plans instead of 10 -- or 15 demonstration trails as compared to 25 -- is of little importance.

If, on the other hand, the Unit is able to write great policies, work with 47 villages, complete 63 trials, and all kinds of other encouraging numbers, but is unable to prove its worth to the man on the farm so that he appreciates and continues to request its services, the Unit has failed. The political process will weed it out quickly after outside support is withdrawn.

There is a real danger, in the Gambian

context, of greatly increasing the risk of such absolute failure by succumbing to the normal American tendency of demanding that all inputs be rewarded by measurable numbers of identifiable results. As noted elsewhere, pressure by the team to meet high progress goals in terms of absolute on-the-land accomplishments may lead to confusion of the Gambians and rejection of the process. We will make far more real progress in this setting if we can devise methods of measuring progress in social and institutional terms, with patience that allows for the pace of human understanding and acceptance of new ideas.

6. Environmental Assessment

Based on an Initial Environmental Examination undertaken by the SCS members following the completion of the PRP, AID/W granted a Negative Determination on 12/20/76, as reported in State 049137. The decision recognizes the fact that the very essence of this project is to preserve the environment for the Gambian farmer and to avoid soil and water degradation resulting from the continuation of current practices.

In view of the Negative Determination, an Environmental Assessment is not required.

7. Technical Analysis Summary

Specific practices for solution of the soil and water management problems of The Gambia are not proposed in this document. However, the processes and institutions required for the identification and application of these practices will be developed by the project team and their GOTG counterparts. The timing of the project is propitious, as the time is soon approaching when the capability of the land to produce by current methods will be less than the required production. 1/ As indicated by the Economic Analysis of this paper, the project will result in a significant increase in agricultural production when implemented by the Gambian soil and water management unit.

The project represents a practical application of the United States technical approach to soil and water use and management in The Gambia. It will establish the institutions and processes known to be required for

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1/ Land Resources Study, p. 11 374.

successful implementation. It will not dictate the application of U.S. or European practices or methods, but instead will prepare the Gambians, and assist them in the identification and application of practices and methods appropriate and practicable under Gambian conditions.

The cost estimates of the project are judged to be reasonably firm and adequate, as the required inputs are clearly identified and it is possible to estimate requirements accurately. Detailed cost estimates are provided in the Financial Analysis. In sum, the PP team believes that the technical soundness of the project has been thoroughly documented.

B. Financial Analysis and Plan

1. Financial Impact on Participating Villages

Costs to the cooperative Gambian farmers resulting from the conservation planning activities in selected villages will be negligible. Investments of small amounts of labor will be required for establishing and maintaining permanent vegetation to stabilize gullies, and possibly short diversions or terraces. Possible practices for incorporation of organic matter into soils may require additional effort or labor. One activity of the team will include the identification of such practices that can be carried out by the farmer with little or no increase in inputs, labor or equipment. Basically, the project will result in changes in the ways in which the farmers do things, but with little or no change in the overall investment required. In addition to increases in the production and income accruing to the Gambian farmer, significant value will be gained by reducing the deterioration of both soils and productivity that will occur if farmers continue current methods. See Annex D, Economic Analysis, for a more precise explanation of these phenomena.

With respect to direct financial benefit, there can be no doubt that the rural farmers participating in the SWMU program stand to gain significantly from the standpoint of both increased crop productivity and income. Because of the fact that SWMU practices will have a cumulative beneficial effect over the long term, no

single estimate of net monetary grain to farmer revenue can be advanced in this analysis.

An order of magnitude assessment can be attempted, however, the estimation model of eventual increases in crop productivity would indicate that, depending on the ratio of traditional cereals to groundnuts cultivated (usually taken as 1:3), gains to the farmer could approximate D 40/person by year 5 and D 122/person by year 30. 1/ Taking estimated rural per capita income at the current levels of D 255 ($134), the impact of the program could result in increases of 16% to 48% in farmer revenues.

2. Recurrent Budget Analysis of the Implementing Agency of the GOTG.

The GOTG implementing agency for this project is the Ministry of Agriculture and Natural Resources (MANR). The PP team met with all ministry department heads relevant to this project and talked several times with the Permanent Secretary, Mr. M'Boge, about the project, its implementation and budget. The team carefully reviewed with the Permanent Secretary the budgetary implications of the project to the GOTG on a year-by-year basis. He expressed considerate confidence that the GOTG would be able to provide necessary support for the project as called for in the PP budget.

One budgetary item, the housing question, was identified as a potentially troublesome issue at the

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1/ The average Gambian production unit is assumed to represent an average of 1.2 acres/person, representing roughly .3 acres of cereals and .9 acres of groundnuts. Hypothetical yields are assumed to equal 800 lbs/acre for cereals and 1000 lbs/acre for groundnuts and new increases ranging from 31.8%-75% and 16.8%-60% for cereals and groundnuts respectively in year 5 and year 30. At farmgate prices of D 200/ton of cereals and D 400/ton of groundnuts, the estimated level of increased farmer income approximates D 40/person in year 5 (+ 16%) and D 122/person in year 30 (+ 48%).

time of the PRP. The PRP team proposed that the GOTG cover the cost of housing of the 3 U.S. members of the SWMU. This would involve financing the construction of new houses before the beginning of the project because of the acute housing shortage in and around Banjul. Although the PRP team had misgivings about asking the GOTG to devote a large sum at the outset of the project to direct support of the U.S. technicians instead of concentrating its resources on building up and training Gambian staff for the unit, this item was proposed for GOTG financing to maximize the GOTG share and to bring it up to 25% of the total project.

The budgetary horizon of the project has now changed. As described in the Summary Findings section in Part I of this paper, the time frame of the project has been extended to 3 phases over 10 years in accordance with new criteria governing SDP projects. Now instead of forcing the GOTG to contribute 25% of the project costs in the 3 year first phase when the U.S. share is highest, the GOTG input is spread over 10 years on an increasing basis. The PP team negotiated an arrangement whereby the U.S. would finance construction of the houses for its 3 technicians, but the GOTG would furnish the land and cover maintenance and utility costs. This was deemed to be the most equitable and practical solution for reasons expressed in the section on Project Issues in Part I.

Even without financing construction of the housing, the GOTG contribution is 24% of the project over the 10 year life of the project. (If the GOTG had retained responsibility for housing construction, its overall share would have risen only slightly, to 28%, but this would have meant a large cash payment at the very beginning, even before the commencement of the project.

The following table projects GOTG costs from years 1-10, by major category.

Personnel - salaries of GOTG staff of SWMU and AA's directly connected to the project.

Transport - initial purchase of one landrover; maintenance and fuel of project vehicles; in-country travel of SWMU staff.

Buildings - value of land, supervision of construction, maintenance and utility costs of U.S. staff houses, office space, equipment supplies nad maintenance of offices.

Training - air travel and basic salaries for participants part to U.S., administrative and travel costs of local training program.

Table 2 GOTG PROJECTS INPUTS

(in 000 Dalasis at $1 = 2.3 Dalasis)

Year	Personnel	Transport	Maint. of Bldgs.	Training	Total
1	8	23	15	0	96
2	53	11	20	38	122
3	65	12	20	38	135
4	82	16	22	27	147
5	100	20	25	27	172
6	105	22	18	30	175
7	110	24	18	30	182
8	115	26	18	30	189
9	120	28	18	30	196
10	122	30	18	30	200
	880	213	192	280	1565

The PP team has several reasons for being confident that the GOTG will be both willing and able to fulfill its financial responsibility for this project in accordance with the orders of magnitude expressed in the above budget.

a) This is the first bilateral USAID project with The Gambia, and the GOTG appears anxious to correctly abide by the terms of the agreement to establish itself as a responsible development partner.

b) The high priority nature of this project has been stressed repeatedly by the Permanent Secretary of the Implementing Agency (MANR) and other ministry department heads. When a PP team member observed that a primary

assumption of this project (see logframe) is that the GOTG will continue to treat soil and water management as a high priority area, the Permanent Secretary replied, "It is not just an assumption, it is a fact".

c) The project budget for the GOTG is established in a manageable way, now that the housing question has been settled. That is to say, expenditure will be spread fairly even throughout the project, gradually building up in the latter years. Budget categories are traditional, including personnel, transport, building maintenance and training. Personnel costs are by far the largest item, and since most personnel are already on the Ministry payroll, this will constitute more of a human resource commitment than a commitment of additional new funds by the GOTG. The GOTG is accustomed to providing this kind of support for similar foreign-assisted activities, and posed no objection to any part of the project budget as presented.

d) The GOTG annual budget process appears to be carefully planned and thoroughly well presented in an annually printed document entitled "Estimates of Recurrent Revenue and Expenditures". In addition, a capital budget of development is prepared annually. This project was provisionally listed in the 1976-77 budget prepared a year ago when possible UK funding was considered. The 1977-78 capital budget now under preparation will update the project proposal and establish a basis for recurring GOTG contributions in subsequent years.

Although along with everything else in The Gambia, the national budget is on a small scale, it should be noted that it is almost in balance. Relatively small deficits have been recorded in recent years but in decreasing amounts:

(in Millions of Dalasis)

Year	Revenue	Expenditure	Deficit	Deficit as % of Exp.
1974-75	29.7	32.7	3.0	9.1
1975-76 (est)	37.1	39.9	2.8	7.0
1976-77 (est)	42.9	44.3	1.3	3.0

As is true of many small developing countries, indirect taxes, including custom duties, account for 65% of government revenues.

The annual budget presents schedules for each Ministry, in more detail than any the design officer has seen in other Sahelian countries. There is a line item for all positions, including clerks, watchmen, etc. These cover date of establishment of position, grade, 2-year budget comparison and amount of increase/decrease.

In assessing the magnitude of the GOTG contribution, one major factor needs to be borne in mind. The overall size of the GOTG effort is far greater than the sum of money in the budget because of the huge differential between U.S. and Gambian personnel costs. Because of the high cost of maintaining U.S. experts overseas (of which salary may represent only about one-third), each position must be budgeted at $80,000 per year. Compared to this, senior Gambia staff of the SWMU will earn about $3,000. per year and the agricultural assistants earn $1,333. This means that on the average, a U.S. staff member costs 40 times as much as a Gambian staff member. Thus in terms of human resources to be devoted to the Soil and Water Management Unit, the GOTG will contribute considerable more than the U.S.: 8 vs. 3 staff per year in Phase I; 20 vs. 2 in Phase II and 30 vs. short-term consultants only for the U.S. in Phase III.

3. Summary Option

The PP team believes that the project financial plan and budget set forth in this PP represent realistic estimates of costs and inputs, both U.S. and Gambian, which will be required to implement the project. As a technical assistance activity which involves instilling changed attitudes and practices for land and water use at both the governmental and village levels, action under this project will not be completed in the 3 year period envisaged for Phase I or even in the second 2 year phase when the GOTG will take over leadership of the SWMU. This PP has therefore allowed for possible use of short-term consultants in the sixth to tenth years, after the departure of the U.S. members of the Unit. Although the range and extent of skills needed at that stage is not now known, the PP team took care to make adequate budgetary provision for this eventuality. Accordingly, the PP team believes that the project as presented is financially sound and that the financial burden falling on the GOTG is appropriate and within its budgetary capabilities.

4. Budget Tables

TABLE 3

Detailed Schedules for Consultants and Commodities

1. Short-Term Consultants

Skill	Task	Duration	Year	Cost ($)
Ag. Engineer	Advise on Water Mgmmt Practices	2 mo.	1	15,000
Plant Specialist	Supplement team w/skill lacking	2 mo.	1	15,000
Ag. Engineer (Irr)	Assist w/Hydromet Project Input	3 mo.	2	22,500
Soil Scientist	Correlation/classification	2 mo.	2	15,000
Plant Scientist	Technical Guide	2 mo.	2	15,000
Info. Specialist	Radio/Movie Presentation	2 mo.	2	15,000
Soil Scientist	Soils Interpretations for Tech Guide	2 mo.	3	15,000
Ag. Engineer	Engineering Interp. Tech Guide	2 mo.	3	15,000
Plant Specialist	Plant Mgmmt Portion/ Tech Guide	2 mo.	3	15,000
Info. Specialist	Radio/Movie Presentation	2 mo.	3	15,000
Ag. Engineer (Irr)	Assist w/Hydromet Projects	3 mo.	3	22,500
		24 mo.		180,000

TABLE 3 (continued)

2. Basic Office and Lab Equipment

Number	Item	Estimated Cost
1	Electric Typewriter	700
	Soils Laboratory Equipment	3,000
	Light/Drafting Table	300
	Drafting Set	300
	Miscellaneous	700

3. Basic Field Equipment and Supplies

Item	Estimated Cost
Soil Survey (shovels, augers, pH kits, ring infiltration)	2,000
Engineering (transit, level, rods, chains, hand levels, stereoscopes)	4,000
Plant surveys (clippers, rings, scales, borers)	1,000
Miscellaneous (camping gear, etc.)	2,000

TABLE 4

Summary of Cost Estimates
(U.S. $000)

Source	AID FY	AID LC	GOTG FY	GOTG LC	Total
Project Inputs					
Personnel					
long-term	1,080	-	-	380	1,460
consultants	762	-	-	-	762
Participant Training	128	-	-	110	238
Commodities	71	-	10	10	91
Other (housing) (services) (transport)	5	162	-	180	347
TOTAL	2,046	162	10	680	2,898
+ Contingency/ Inflation Factor (Phase I) 14%	286	23	-	96	405
TOTAL	2,332	185	10	776	3,303

Above costs are projected for Phases I, II and III. GOTG share of total cost is 23.8 percent.

COSTING OF AID-FINANCED INPUTS

	$$
1. Personnel - Long-Term	
3 - GS-13-14 equivalent	
$80,000 x 3 x 3 yrs - Phase I	720,000
90,000 x 2 x 2 yrs - Phase II	360,000
	1,080,000
2. Consultants - Short-Term	
24 man-months at 57500/mo - Phase I	180,000
12 " " at 8500/mo - Phase II	102,000
48 " " at 10000/mo - Phase III	480,000
	762,000
3. Participant Training	
8 man-years at $10,000 - Phase I	80,000
4 man-years at $12,000 - Phase II	48,000
	128,000
4. Commodities	
Basic Office + Laboratory Equip.+ Supp.	5,000
Basic Field Equip.+ Supplies	9,000
1 Land Rover	10,000
10 small motorcycles (Honda 90 or equiv.) for AA's assigned to regional centers (Phase II)	10,000
Furnishings for 3 houses	30,000
Technical Library 2 copies ea. of 200 titles at $10 average cost	4,000
Film, Processing, Printing	3,000
	71,000

5. Services

Cartographic (Abroad)	$ 5,000
Printing (In-Country)	5,000
	10,000

6. Housing Construction for U.S. Team

3 houses at 52,000	156,000
Total	2,207,000
Contingency and Inflation + 14% .	310,000
TOTAL	$ 2,517,000

The 14% inflation factor is intended to cover cost escalation and contingencies primarily for Phase I.

Phase II is limited to 2 U.S. personnel (plus short-term consultants) and 4 participants. Phase III is limited to U.S. consultants only. Cost escalation for these items is already specifically built into the budget.

C. Social Analysis

1. Socio-Cultural Feasibility

On the whole the socio-cultural feasibility of establishing new soil and water management methods with Gambian farmers seems favorable, provided the SWMU is prepared to work at the village level and provided both American and Gambian team members make an effort to work through the traditional village structure.

a) The Village

The village is a self-sufficient political and economic unit in traditional Senegambian society. The large the village, the more self-sufficient it is. Former kingdoms and empires were actually collections of villages, which interacted among themselves and with the village of the ruler, much as the members of a family interacted. When the ruling dynasty lost power, the kingdom fell apart into its component villages with relatively little distrubance to their everyday routine.

The psychological orientation of the majority of modern Gambians is still at the village level. Decision making, judicial, executive and disciplinary machinery is thoroughly established and far better understood on the village level than it is on the district, divisional or national levels - all fairly recent administrative phenomena.

Therefore, any development project like the SWMU, whose success depends on obtaining the understanding and active cooperation of the average Gambian, must be geared to communicate with people on the village level, on a village-by-village basis.

b) The Village Power Structure

Working through and with villagers actually involves working through and with the established power structure.

The social, political, and economic affairs of each village are controlled by the village head (called the Alkali) and the compound heads, along

with a select number of other key individuals, such as the Imam (prayer leader) and other people who have achieved influence for a variety of reasons. These people are referred to collectively as "the Elders". They have plenty of moral authority, but very little coercive power, and rule mainly by consensus. They cannot impose unpopular decisions and measures on the village. But they are opinion leaders who shape views as much as they are shaped by the views of the people under their leadership. They are funnels of power, and any idea voiced through them emerges clothed with authority.

In this setting there is no way that one can accomplish anything that requires the cooperation of the traditional village unless he goes through the Alkali and the village elders. They must clearly understand what the SWMU wants of them and of the villagers. Once they understand and are convinced of the soundness of any idea proposed, it is almost certain that the whole village will actively participate to the best of its ability. (See annex E-1 for a detailed description of the village socio-political structure.)

Communication with and through the village Elders is a simple procedure conducted to well-established customs, and the mechanics of it should present little difficulty. (see Annex E-6 for a detailed description of the process by which the SWMU team can communicate with the village.)

c) Village Motivation

The team will have to work out the details of arguments used to persuade the Elders to adopt any proposed schemes. The main point to keep in mind is that while nearly everybody wants to make a better and more secure living, the village farmer is most likely to be persuaded by the prospect of concrete, immediately recognizable gains. They are not likely to be impressed by abstract arguments about the benefits of long-term preservation of the land for future generations if they do not see any immediate benefits forthcoming for themselves. (see Annex E-1 for a discussion of the Gambian farmer's outlook.)

d) Village Social Structure

The village social structure will present little difficulty to the SWMU team, as long as they work with and through the Elders. It is the Elders, and not the technicians who will do any necessary manipulating of the social structure. The team needs primarily to remain alert and sensitive to what goes on about them, striving only to make sure that they do not rub against sensibilities in the areas where they will be working with the villagers.

Gambian traditional village society, particularly among the major ethnic groups, is strongly structured, both according to age and by class. Class lines are gradually becoming less rigid in urban areas where exposure to European ideas as well as increased educational and economic opportunities introduce new factors. Some ethnic groups, such as the Jolas, do not have such a strong hierarchial tradition, but in the majority of villages the traditional class system is still strongly entrenched. The existence of this traditional social structure will have little effect on the Unit's overall effectiveness except as a point of orientation for understanding the relationships and points of view of the village people. It will give clues as to who are the most effective people through whom to work.

On the other hand the hierarchy of age may have a strong bearing on the team's effectiveness in the village setting. For one thing, certain age sets are traditionally responsible for providing communal labor on all village projects. Knowing the village potential in this area can have some bearing on the methods suggested as feasible by the SWMU.

For another thing, the American team will need to determine how to fit into the protocol of the age system as they work with the villagers. An active American may want to roll up his sleeves and pitch into a small job himself rather than asking the Elders to get somebody else to do it. In this case he should check the protocol with the AA. The team members will have Elder status, and if an Elder has to do his own heavy work, it can either mean that he does not have enough authority, prestige, and public respect to motivate his juniors to help him, or it may be seen as a rebuke to his juniors, implying that they are disrespectful, disobedient or lazy. On the one hand, he may lose the respect of the Elders; on the other hand, he may antagonize or lose the

the respect of his juniors.

This does not mean that he should not work, however. He should be constantly present; moving about, encouraging, advising, doing some lighter tasks, demonstrating how to do heavy tasks if they are not being done satisfactorily. The AA's and other assistants are his juniors and should do most of the routine work after policies have been agreed upon by the Elders and the team. This is not a question of expecting others to do work that one can do oneself, probably even more efficiently. It is a question of being attuned to other peoples' ideas of what constitutes appropriate behavior. (See Annex E for a description of the age, grades and class structure.)

e) Land Ownership and Tenure

Outside of Banjul and Kobo-St. Mary, land is not owned by individuals or families in the sense familiar to Europeans. It is held in trust by the District Chief and must be distributed and used according to customary law. It cannot be sold, rented, mortaged or pledged for loans.

By custom the Alkali, as head of the founding family of the village, is ultimately responsible for determining the land needed by the village and for allocating it. When each new family comes to settle and a new compound is formed, the Alkali designates which land they may clear and use. From then on, this piece of land is "owned" by the people of that compound for as long as they care to use it. The compound head is solely responsible for its allocation to the individuals within his compound.

The average compound member does not concern himself with the problems of soil quality, fertility, fallowing, etc. He knows what is going on, but he leaves decisions to the compound head. The compound head is the one who pays Fulas to come and pasture their cattle on the fields, who decides which section of land to leave fallow, and directs crop rotation.

Therefore, the compound head is the one the SWMU team has to persuade about the practical benefits of any scheme affecting compound land. Once he is convinced, he can get necessary cooperation from the members of his

compound. The Alkali's cooperation is also essential, since he is the one ultimately responsible for the use of the land and for the welfare of the people on it.

Village fields are typically small and irregular, and compound holdings are intermixed and scattered over a wide area. This is due both to gradually increasing needs and to efforts to distribute different quality lands equally. Therefore, any attempts to improve water and soil management is likely to involve the needs of more than one compound.

Any adjustments, trade-offs, exchanges, enlargements, or diminishments which need to take place will have to be negotiated, on a field-by-field basis, with the individuals who use the affected plots, the compound heads and the Alkali. There is no easy way around this. People will be reluctant to give up any land except for land of equal or superior size and quality -- and some would even object to that on principle. No one is likely to make a sacrifice unless he can see a concrete greater benefit coming from it in the very near future. (See annex E 5 for a fuller description of the land tenure system and review annex E-1 for a discussion of the socio-geographical relationship and responsibilities on the village and compound level.)

2. Spread Effects

The SWMU team will probably find the spread effects of their projects fairly rapid within each village, whereas it may be quite a bit slower from village to village and from region to region if present methods are continued. This does not mean that ideas will not spread. But without a concentrated information campaign through the media, the SWMU team and the AA's will probably find that their program will be a slow, village-by-village process.

Gambian villagers are not ordinarily very imitative of the agricultural practices of people from other cultures, not even when they see first hand that such practices result in higher yields and benefits. They tend to assume that other people have access to knowledge or material not available to them. Also people from traditional cultures often see things as a whole, and have difficulty isolating the various

factors that might be adopted by them without disrupting their own lives and work patterns unduly.

Another main hindrance to the rapid spread of any ideas, not just those of the SWMU, is the villager's isolation due to his relative lack of mobility and his illiteracy. Ordinary Gambians, especially men, travel to a certain extent, yet it is difficult for an American to imagine the total effect on a whole village of being miles from the nearest major town, of not having a car or access to reliable or frequent public transport, and only limited access to available news. Only when their relative isolation is understood can it be realized why the village remains such a self-sufficient semi-closed system.

The success achieved by various government projects such as the ox plowing and groundnut schemes, shows that the basic secret has been intensive field work by well trained extension staff on a village-by-village basis. They explain to the vilages what benefits will accrue, and then provide the training by which the villagers or their representatives can be "walked through" a project in order to learn new techniques and to work out ways of incorporating these new elements into their old work patterns.

Villagers want to help themselves; but first they have to know what is available to them, and then they have to be shown how to use it and how to incorporate it into their own lives in a meaningful fashion.

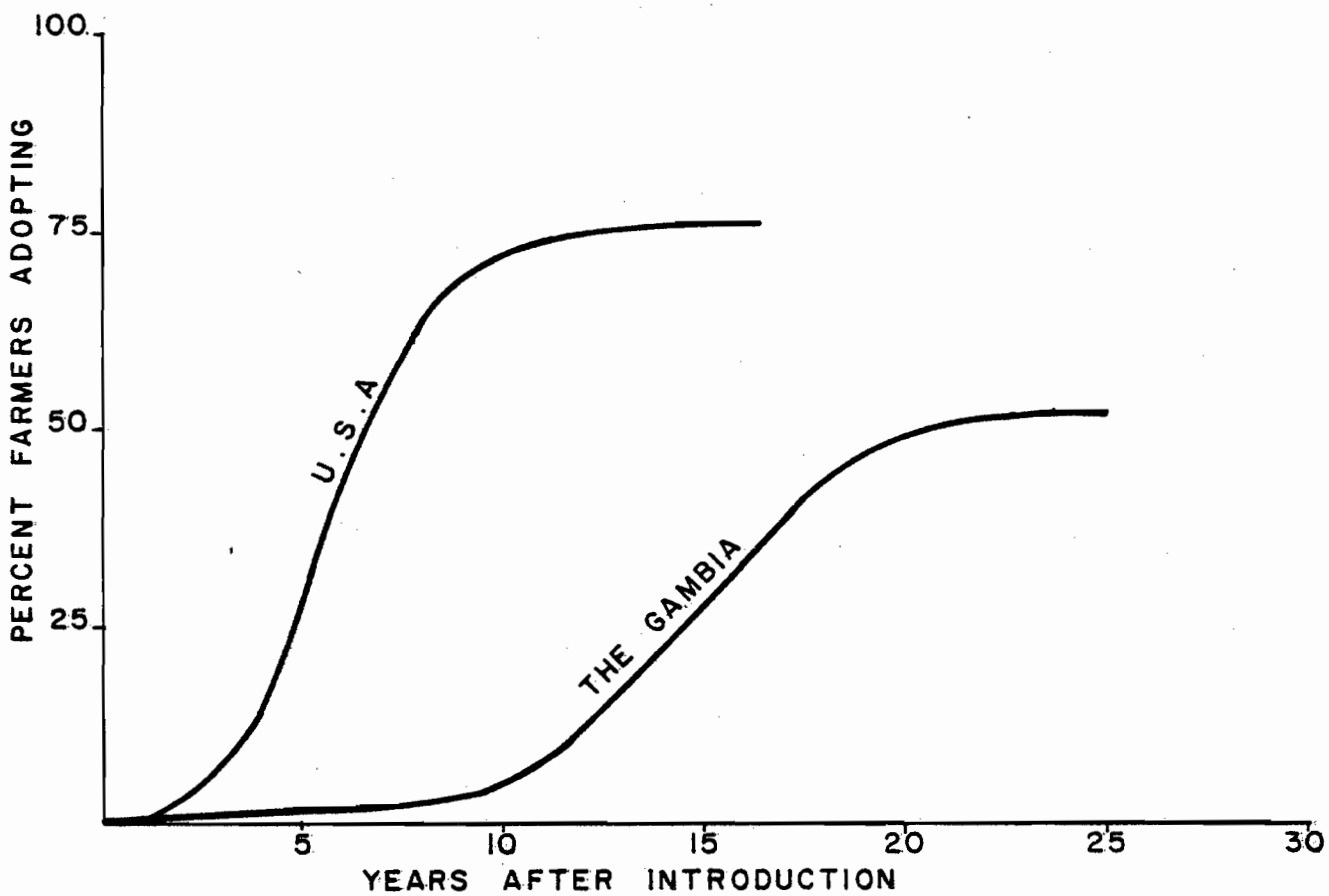
The thing which would probably help the extension service most is an extensive educational campaign through the media. Both radio and cinema are available and television will be coming soon. Rural Gambians pay a great deal of attention to their radios; and they enjoy cinema very much whenever they get a chance to see it. The Department of Agriculture has a few landrovers equipped with generators which can take educational films into any village. The Ministry of Economic Planning has its own Broadcaster and has put him in charge of putting together rural information and community development programs for broadcast over the radio. Several ministries are trying to develop a coordinated functional literacy program. Although these efforts are still in the formative stage, they can be used fruitfully by the

SWMU team to further its communication with Gambian villagers, particularly if they are willing to prepare their own materials and help work out the logistics for its dissemination.

It is very difficult to give an estimate of how long it might take the ideas of the SWMU team to spread in The Gambia, using all available sources. Based on the slender data gained from experience with the acceptance of the oxenization and groundnut programs, the following chart on the next page has been prepared to give an approximate idea of the rate of spread expected for Gambia, in comparison with the United States.

FIGURE 1

THEORIZED RATE OF ADOPTION OF NEW AGRICULTURAL METHODS : THE GAMBIA COMPARED TO THE U.S.A



3. Social Impact, Beneficiaries

Ultimately the whole village will participate in and benefit from the SWMU program. Nevertheless, certain social and historical factors may well determine the groups in the village that should be approached first, and that will receive the benefits first.

The land closest to the village is likely to be owned by the first compound to settle, while those coming later have been given lands farther and farther away. This land, particularly in areas of heavy population, suffers from the heaviest, longest use, shows the most effects of depletion and therefore should be a prime target for SWMU experiments. It is constantly visible to the whole village, and any positive improvements taking place on it will be seen by everyone. The fact that the first successful experiments have been undertaken by the most prestigious families should be added inducement for others to try the same techniques on their own fields. There is little likelihood that the Unit will benefit one family to the long-term detriment of another or creating undue long-lasting tensions or imbalances in the established social, political and economic system, if it sticks to the goal of openly providing advice and assistance to everyone in the village who wants and asks for it. If they do this, most changes for the better would be balanced. Indeed, the SWMU approach of involving the whole village in order to raise the standard of living of everybody fits in smoothly with the traditional norm; the Gambian ideal of leveling the material existence of everyone works up as well as down. This is an example of the kind of argument which should be made directly to the villagers when asking for their cooperation. The American team needs to have a fairly good grasp of the villagers' social ideals if they want to be able to appeal to them intelligently.

a) Male and Female Roles

To establish an effective soil and water conservation program in a traditional Gambian village, both men and women are going to have to be drawn into it together.

There is a definite division between the economic roles of man and woman, with each sex being

almost solely responsible for providing particular food and cash crops. Together they achieve a balanced subsistence for the village. Therefore any program aimed principally at one sex or the other is likely to skew this balance unfavorably, aggravating any existing inequalities or creating new ones, and creating family and community tensions.

The interdependent role of the sexes is well known to every villager. Therefore they will understand that the SWMU team may need to seek the cooperation of women on the lands for which women are responsible. The mechanics of enlisting the women's cooperation are no more mysterious or difficult than those for dealing with the men. The women have their own system of age sets and grades parallel to the men's. They have their own Elders; and in order to carry out their duties they hold their own meetings, organize their own work strategies and supervise themselves without male interference. The way to enlist their participation is to approach the Alkali and the Elders, as for any other group in the village.

If the SWMU team works carefully through the village structure, there is no reason why benefits from the team's technical assistance should not flow equally to men and women in rural villages.

The hybrid level of technology foreseen should not unbalance traditional male/female roles in the way that high-technology approaches such as mechanization would do. Past projects that included tractors, pumps, and similar male-oriented innovations have sometimes displaced women from their traditional crops and lands, depriving them of independent incomes. This should not be the case in the planned SWMU activities. (See Annex E 4 on the social and economic role of women in the traditional village and a description of the procedures for enlisting female cooperation.)

b) Balancing Role of the Elders

Among the many advantages to be had from working through the village power structure is the way in which the system works to level out the material existence of everyone. Glaring inequalities of material possessions are viewed as socially disruptive. This

attitude provides both the team and the Elders with the authority to make sure that any benefits accruing from SWMU schemes will be spread to as many people as are willing to participate within each village.

It will also serve as a brake against placing undue burdens and sacrifices on only a few individuals.

The Elders have their own ways of evening out the burdens of a difficult situation. Therefore, if the team works through the village Elders, gets them to help identify problems, and presents them with an array of feasible solutions, they will work out their own system of trade-offs and compensations. The team's responsibility should be to make sure they understand the extent of any problems and then to give the Elders as many alternative solutions as possible so that they can have as much negotiating room as possible. If the Elders see that any proposed scheme demands a heavy sacrifice of one individual which cannot or will not be compensated for in some way by the SWMU or by other people in the village, they will probably refuse to go along with it.

4. Areas of Possible Friction or Conflict from SWMU Team's Presence in a Village

Very few disruptions or conflicts should arise from the SWMU team's presence in a village provided that the village power structure is healthy and the people are already unified by a strong community spirit. Most potential "difficulties" are quite simple to handle, especially since there will be little or no capital assistance inputs by the Gambian Government or AID. Some of these have already been touched on.

a) Initially selected individuals will benefit most from the team's presence, simply because they are the first to volunteer fields for assistance. They will receive a lot of attention from obviously important outsiders. Since village life is not very exciting, any break in the routine is always interesting, and it is somewhat status-building socially to be the focus of the neighbor's eye while one talks with the strangers.

This is not necessarily disruptive, and may even be an asset. If the strangers are helpful, persuasive and pleasant to be around, others may be forward to share the limelight and the newly perceived benefits. As long as the strangers give equal time and attention to all, there is little likelihood of hurt feelings or jealousy arising. Most importantly, there must be equal access to any privileges or to any material means given to individuals by the team.

b) It may happen that in order to solve a problem on one farmer's field, one needs to run a ditch or an earthwork across the fields of several other people's. In this case the solution is clear but not always easy. It becomes a village matter, involving at the very minimum the heads of compounds of all the people involved and the Alkali. One has to persuade them that the experiment will be potentially useful to them all. They will then take up the task of bringing their members to agreement.

c) A cooperating farmer may say he already has too much work to do to be able to accomplish a new management practice. He may not be able to afford to hire labor and thus will ask for assistance. In that case the expert has to trust his AA's judgment as to whether the man is sincere or whether he is just trying to get extra "perks". If they decide that the man sincerely needs help, they may again approach the Alkali and Elders to ask for Kafo labor. But they first have to persuade them that helping that one man is relevant to the whole village. The team should take care not to give any assistance to one farmer that they are not willing or able to give to anybody else who asks for it.

d) The SWMU team should not try to work in a village already split by rivalries and hatred since they will probably only aggravate the unpleasantness. The principle that Gambians tend to follow is: "My enemy's friend is my enemy too". If this happens, and the Elders can do nothing, the team should withdraw immediately. They cannot hope to work effectively in a situation where the traditional controls have broken down.

D. Economic Analysis

The following is a recapitulation of the more detailed economic analysis included in Annex D.

In general, the economic feasibility analysis of an environmental project such as the one proposed in this report will utilize a cost/benefit approach analogous to that established for appraisal of other types of projects. It is perhaps true, however, that a greater number of non-quantifiable variables should be weighed during the assessment of an environmental scheme than in some other more directly production-oriented projects. This economic analysis treated only the quantifiable aspects of the program and represents, therefore, only one of several indicators of project choice. Given the somewhat tenuous and incomplete nature of much of the technical data on the subject, the PP team has attempted to weigh all quantitative aspects of the project conservatively and thus have arrived at what may be considered realistic, albeit somewhat underestimated, conclusions.

The benefit and cost sides of the equation were first treated separately prior to being reintegrated into a representative cash flow.

1. Benefits

The essence of the economic analysis is contained in the short, medium and long-term benefits which may be derived from implementation of the proposed SWMU. Basically, the most easily observable and quantifiable benefits of soil and water management are those linked to national agricultural production, for which an economic value can be established. The PP team has identified at least three major areas of improvement associated with the project and which will have a substantial impact on sustaining and improving agricultural production in The Gambia; notably

- increased plant nutrients (N,P,K.)
- improved tilth
- increased rainwater infiltration

Gambian soils can systematically be identified as deficient in each of these areas. Given that all three

factors are highly complementary and interrelated, it is difficult to isolate the effect of each factor on production. An estimation of the cumulative effect on production was therefore hypothesized and is graphically illustrated in Figure 2.

Conceptually, the SWMU's overall beneficial effect to production can be described on two separate levels: production gains and production loss foregone.

Production gains are represented by the upper half of the graph contained in Figure 2, wherein it is noted that the cumulative effect of increased plant nutrients, better root system development, easier tillage, less erosion and higher soil moisture content will lead, over time, to consistently better yields than in the reference situation. The analytic hypothesis assumes a somewhat conservative assessment of +25% yield increases for traditional cereals and +10% for groundnuts - both of which are attainable after five years and level off thereafter.

Production losses foregone are represented in the lower half of Figure 2. Topsoil is conservatively estimated to erode at a rate of 12 tons/acre/year on most Gambian croplands, resulting in eventual production losses. The order of magnitude of these losses has been taken at -50% within 30 years if permitted to continue. A second quantifiable benefit of the SWMU program will therefore be the foregoing of these losses.

2. Costs

The costs associated with the SWMU program are relatively direct and easily calculable. The contribution of both USAID and the GOTG was described extensively in the preceding "Financial Analysis".

All costs are expressed in May, 1977 dalasis and contain no tax element.

The conclusions of the statistical analysis are summarized in the following table.

Hypothesis	Reference Case	SENSITIVITY TESTS #1	#2	#3	#4	#5
I.R.R.	14.8%	10.0%	5.3%	14.0%	9.2%	4.4%

The most salient result of the cost benefit analysis described in the preceding pages was a favorable rate of return of 14.8%.

In order to test the sensitivity of the basic parameter to potential measurement error the following sensitivity tests were carried out:

- Test #1 Elimination of all benefits attributed to "production gains" requiring the program to stand on benefits from "losses foregone" alone.

- Test #2 Elimination of all "production gains" and approximately 50% of all "losses foregone".

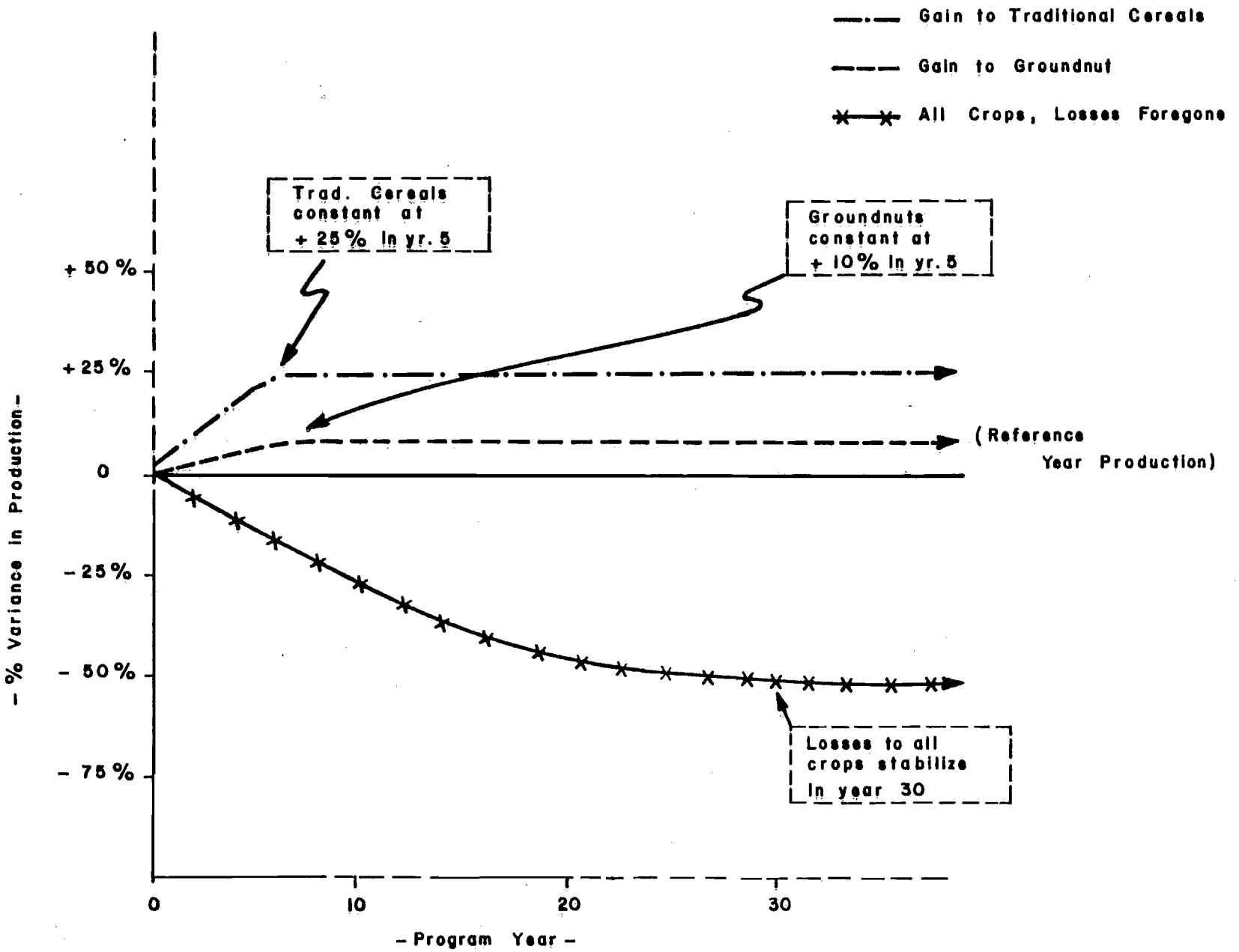
- Test #3 Costs are increased by 20% and benefits remain unchanged.

- Test #4 Costs are increased by 20% and "production gains" are entirely eliminated. (Tests 1 and 3).

- Test #5 Costs are increased by 20% and "production gains" and 50% of "losses foregone" are eliminated (Tests 2 and 3)

In all cases the sensitivity test revealed that only the most drastic reductions in benefits and increases in costs (Tests 2 and 5) substantially affect the economic viability of the project.

FIGURE 2 : ESTIMATE MODEL OF BENEFITS FLOWING FROM SWMU PROGRAM INTERVENTION OVER TIME



PART IV - IMPLEMENTATION

A. Administrative Arrangements

1. GOTG

Among the most important decisions reached by the PP team and the GOTG concerned the placement of the SWMU within the MANR (see MANR organizational chart at the end of this section). It was decided after due consideration to place the SWMU in the office of the Permanent Secretary where other special-purpose units are also located. It was deemed by the PP team and the Permanent Secretary, Mr. M'Boge, to be desirable to place the SWMU at the highest appropriate level in the Ministry to facilitate its contacts and maximize its influence with the various departments of the MANR with which it will be dealing as a technical service unit.

The work of the SWMU will be directed at two basic levels: one group of activities aimed at assisting the various departments of the MANR in the development of appropriate policy and programs in soil and water management and the second aimed at the village level to establish an advisory service on soil and water management techniques and methodology which would achieve a permanent impact on farmers' practices.

At the Ministry level, a central role will be played by the Department of Agriculture (DOA) (Reuben Thomas, Director) which will actually furnish most of the Gambian staff of the SWMU, both headquarters specialists and field agricultural assistants (AAs). The PP team was favorably impressed with the DOA staff members with whom it dealt, both at the executive and AA (field) level. Although there are presently no candidates for Gambian leadership of the SWMU, the PP team is confident that such candidates will emerge as the unit progresses and planned training of Gambia staff in-country as well as in the U.S., is completed. For a fuller discussion of this subject, see the first section of Detailed Project Description under Part II of this paper.

The PP team also met with the heads of several other departments in the MANR which will be affected by the work of the SWMU. These include:

a) Animal Health and Production Department (Wally N'Dow, Director); Mr. N'Dow supported the objectives of the SWMU as an independent unit but also expressed the hope that in the later stages, trained Gambian technical staff could be incorporated into other departments as well. He said that the Ministry's current lack of soil and water management expertise is a well-recognized shortcoming. It should be noted that Mr. N'Dow's department is expected to be the implementing agency for a large and long-term AID-financed livestock development project in The Gambia planned to begin in FY 1979.

b) Hydrometeorological Department (Malik John, Director) - This department, known locally as Hydromet, is responsible for all irrigation engineering, construction and development, in addition to providing basic hydrologic and meteorological data. Hydromet is expected to be a major user and beneficiary of the SWMU, particularly through use of short-term consultants on difficult soil/water/plant aspects of Hydromet projects, imporved capability of the soils laboratory and access to the technical library. Currently in the absence of the SWMU function, Hydromet is experiencing difficulties in completing soils surveys, obtaining technical interpretations of water intake rates, water holding capacity, slope and other factors affecting irrigation design, and in obtaining guidelines for soil/water/plant management. The Hydromet director is hopeful that the SWMU will be able to alleviate many of these problems once it becomes operational.

c) Forestry Department (Robert McKuen, Director) - Discussions with the Director of the Forestry Department indicated that clear compatibility and cooperation between SWMU and Forestry can be anticipated, although some of the activities of the Forestry Department tend to take a different approach from that foreseen for the SWMU. Recent passage of the Forest Act is an example. This Act provides MANR with the regulatory authority to outlaw forest and bush burning, control burning associated with land clearing, and declare wind erosion areas wherein farmers will be required to retain a certain number of trees (proposed regulations will require 15 per hectare).

This regulatory approach should be complementary to the village planning, action, and

education efforts of SWMU. It had been similarly proposed that soil and water management could be achieved by passage of appropriate regulations, but the PP team believed, as did the PRP team, that a more acceptable and effective conservation effort is possible through education, planning, and action programs.

McKuen believed, as did N'Dow in the Livestock Department, that SWMU inputs will be helpful to the projects in his department. He recognized the value of the ODM soil survey for general project planning and location, but also realized the need for a more detailed soil survey to serve as the basis for actual tree plantation and management. Information on soil conditions, susceptibility to erosion, and the location of critical areas will be needed as basic data in the designation of any wind erosion areas under the Forest Act.

In light of the vast reduction over the last 20 years in the area of The Gambia covered by forests, a major reforestation program is a high priority of the GOTG. To assist in this effort, the AID Officer in Banjul has submitted a Project Identification Document (PID) for a forestry development project proposed for FY 1979. This project will clearly be closely related to the work of the SWMU. Since the soil and water project will be begun first (probably a year or more earlier), the SWMU could play a useful role in the development of the forestry project. Consideration was given to combining the two projects into a single conservation project, but since planning for the Soil and Water Project was already well advanced and since the two projects had different objectives and approaches, the PP team believed that they should stand as separate projects. It is presently planned that the forestry PID will be submitted to AID/Washington by RDO/Dakar in the early summer of 1977.

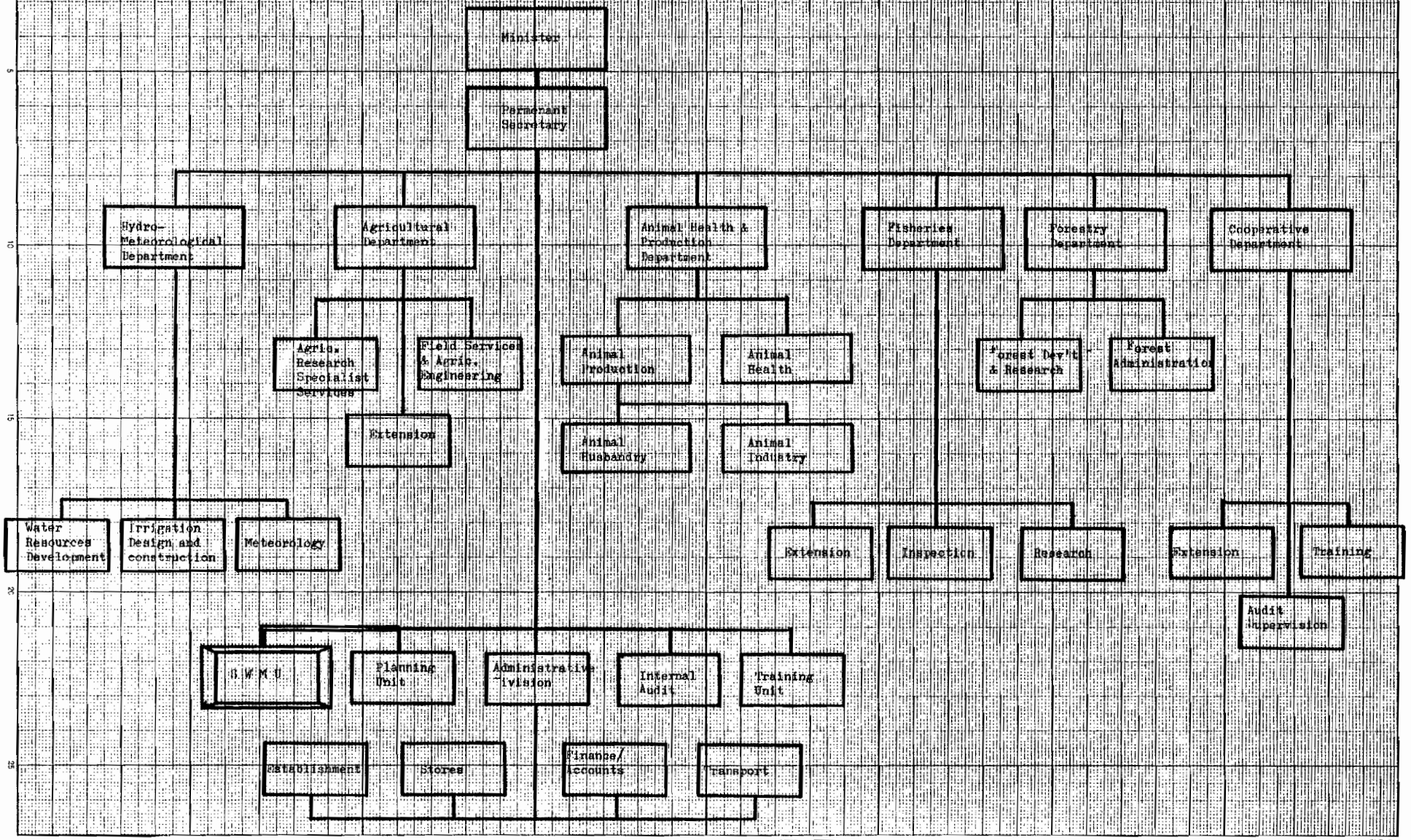
2. AID

It is expected that this project will be executed under a PASA with the USDA Soil Conservation Service (SCS), which will supply the three resident technicians, some of the consultants and will oversee the training. The role of AID in the field will be limited to project monitoring and evaluation by REDSO/WA in Abidjan and RDO in Dakar. This role is especially important since there is no AID Mission or CDO in The Gambia, only a single AID

Officer assigned to the RDO staff but resident in Banjul. At present it is foreseen that he will play only a general monitoring and very limited support role for this project and the other AID projects which are being proposed for The Gambia for subsequent years.

With respect to "Mission support" as the term is normally used, it should be noted that there is no general services (GSO) support at the Embassy in Banjul. Private arrangements must therefore be made for household repairs, but this has not presented a major problem for other resident expatriates.

Because of various problems explained in Part I, Project Issues, AID will assume responsibility for construction of housing for the three U.S. technicians, since the private housing market in Banjul is small and tight and since vacancies at the right moment cannot be counted upon. This will be done by contract with a local private construction firm (see Implementation Plan, next Section).



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B. Implementation Plan

1. Proposed Project Time Schedule

1.	Project Paper submitted to AID/W	July 1977
2.	PP reviewed by Project Committee & ECPR ..	Sept. 1977
3.	Project authorized.....	Nov. 1977
4.	Project Agreement signed	Jan. 1978
5.	PASA signed with SCS.....	Feb. 1978
6.	Contract signed with local firm for construction of 3 houses for U.S. team ...	Feb. 1978
7.	U.S. team arrives in Banjul on 30 day TDY (w/o families)	March 1978
8.	CPs met by GOTG	May 1978
9.	Housing completed	June 1978
10.	U.S. team arrives with families.....	July 1978
11.	Initial Gambian staff of SWMU selected ...	July 1978
12.	Physical establishment of SWMU and beginning of Phase I	July 1978
	(For a detailed year-by-year, west season-dry season work plan of SWMU for Phase I see Part II-B, Detailed Project Description).	
13.	Evaluation of Phase I	Summer 1981
14.	Beginning of Phase II	Summer 1981
15.	Transfer of SWMU from U.S. to Gambian leadership	Summer 1981
16.	Establishment of Gambian technical specialist teams at the 5 division Hqs.....	Fall 1981

17.	Continuation of village action program	1982 - 83 continuous
18.	Improvement of technical guide	1982 - 83
19.	Continuation of training courses in MANR .	1982 - 83 continuous
20.	Evaluation of Phase II	Summer 1983
21.	Phase III - continuation of SWMU under Gambian direction, using U.S. short-term consultants only	1983 - 1988
22.	Terminal Disbursement Date	1988
23.	Final evaluation of project	1988

2. Procurement Plan

Since commodities represent a very small portion of this project, the procurement plan is simple and informal. There are three different kinds of procurement: vehicles; household furnishings; and technical equipment and supplies for the unit including a technical library. Because of the different nature of these commodities, it is proposed that procurement be handled in the following manner:

a) Vehicles - one 4-wheel vehicle and 10 small motorcycles are to be procured, using the host government as procurement agent. For the sake of standardization, spare parts availability and servicing capacity, there is a strong case for purchasing a Land Rover as the 4-wheel vehicle (the GOTG is also contributing a Land Rover to the project) and Honda 90s as the small motorcycle. Cost estimates are $10,000 for the Land Rover and $10,000 for ten motorcycles. Accordingly, both a proprietary procurement waiver and a source/origin waiver for Code 935 countries are hereby requested for these purchases.

b) Household furnishings - This involves three complete sets of furniture for the three U.S. team members of the SWMU, budgeted at $10,000 each (total $30,000). For the sake of convenience and to ensure timely delivery, the GOTG intends to ask the RDO in Dakar to act as agent in

ordering this furniture. While it is intended that all of said furniture and appliances will be ordered from the U.S., local currency shelf item authority is requested for $30,000, to be used as needed. In this case, local procurement is deemed to include items purchased in Senegal because of the unusual geographic relationship of Gambia to Senegal.

c) Technical equipment and supplies - Since these items can most efficiently be identified and ordered by the U.S. team, the GOTG will ask the U.S. SCS under the terms of its PASA with AID to act as procurement agent for the purchase of the following items in the U.S.:

1) Technical Library

Two copies each of 200 titles to be selected by the U.S. Team 4,000

2) Basic Office and Lab Equipment

Item	Estimated Cost in $
Electric Typewriter	700
Soils Laboratory Equipment	3,000
Light/Drafting Table	300
Drafting Set	300
Miscellaneous	700
Total	$5,000

3) Basic field equipment and supplies

Item	Estimated Cost in $
Soil survey (shovels, augers, pH kits, ring infiltration)	2,000
Engineering (transit, level, rods, chains, hand levels, stereoscopes)	4,000
Plant surveys (clippers, rings, scales, borers)	1,000
Miscellaneous (camping gear,etc)	2,000
Total	$9,000

3. Construction of Housing

The construction of the three housing units will be performed by a private local contracting firm, following Handbook 11 procedures for procurement of local construction services. The contract will be with AID, not the GOTG. After a discussion with the GOTG it was decided that using this procedure construction time could likely be reduced. The project will not be advertized in the U.S. due to the relatively small cost of the contract, but U.S. contractors in the area, if any, will be encouraged to submit bids.

Plans and specifications for construction will be prepared by the Public Works Department (PWD) of Gambia, and reviewed by REDSO/WA prior to approval of the construction contract. The PWD will provide inspection of the construction, which will be monitored from time to time by a REDSO engineer.

The costs of the proposed housing units are based on cost information from similar buildings currently under construction in The Gambia plus a factor to allow for cost escalation due to normal increases in costs of labor and materials, as well as a 10% contingency factor. Inflation provisions are valid for one year and assume that the construction contract will be awarded prior to July 1978. Cost data are calculated based on drawings prepared by the PWD entitled "Senior Staff Quarters - 3 Bedroom House", and shown on PWD drawings in the 2493 series. Each unit is estimated to contain approximately 2200 square feet under roof, including a garage.

Cost estimate per unit is as follows:

2200 sq. ft. at 25 ft.^{2}	$55,000
Contingencies approx. 10%	$ 5,000
Total per Unit.....	$60,000
Total for 3 Units	$180,000

C. Evaluation Plan

1. Basis for Evaluation

Provisions for evaluation of this project will be both important and difficult. As is typical of purely technical assistance projects, the outputs will not, for the most part, be tangible products, but rather more abstract objectives such as the transfer of technology and the introduction and acceptance of new concepts and practices for soil and water management. It will be no simple matter to measure precisely, in the short run at least, the degree of acceptance by Gambian farmers of basic concepts and of the effectiveness of these practices in increasing production, preserving land and water resources, etc.

Evaluators will, however, have certain tangible benchmarks. These include: 1) an assessment of the SWMU as a functioning institution and its ability to operate effectively within its governmental setting; 2) a review of the SWMU's soil and water management technical manual; 3) an appraisal of the SWMU's action program in selected villages (resource surveys, soil, vegetative and hydrologic studies, etc., as measured in part by the number of requests for the services of the SWMU); 4) verification that the proposed training, especially in-country, has actually taken place and an appraisal of its effectiveness.

2. Types of Evaluation

It is proposed that the project be conducted in three phases covering a ten year period. Various levels of internal and external evaluation are foreseen during each phase. The most critical evaluation will come at the end of Phase II, and its results will have an important impact on the scope and magnitude of Phase III, which will provide short-term consultants only, and at present is conceived only in very broad terms.

In chronological order, the following evaluations are proposed:

a) Quarterly activities reports from the Director of the SWMU to the Permanent Secretary of the MANR describing work accomplished and planned, as

well as problems encountered.

b) An annual Project Appraisal Report (PAR) submitted by the Director of the SWMU to AID/W through the RDO in Dakar.

c) Period visits by a REDSO engineer and/or Project Officer as requested by RDO/Dakar or AID-OFF Banjul.

d) A formalized appraisal of the project at the close of Phase I (end of the third year) by an independent team, whose composition might comprise an expert from AID/W, and expert from SCS not associated with the project, and an outside consultant. A thorough and effective evaluation at this stage would influence the possible direction of Phase II.

e) A similar in-depth outside evaluation at the end of Phase II referred to above, the most critical evaluation of all, as it will determine how and even whether Phase III will be implemented.

f) A final end-of-project evaluation at the end of Phase III, up-dating the two earlier studies and appraising the last stage. The final evaluation could be an in-house AID effort by AID/W, with possible local participation by REDSO and RDO or their successor offices.

No project funds have been earmarked for evaluation. It is assumed that the studies proposed can be funded by an AID/W or REDSO Design/Evaluation allotment.

3. Baseline Data

The Project Paper contains a fair amount of information on current practices which could be used as baseline data. Fairly detailed observations and notes are offered about the village of Sintet which was visited by both the PRP and PP teams and is recommended for follow-up by the SWMU. In addition, the gathering of further baseline data will be done by the SWMU during the initial phase of its village action program early in Phase I of the project. This should provide more than ample factual

information about current soil and water practices and problems, as a basis for comparison at later stages of the project.

D. Conditions, Covenants and Negotiating Status

The PRP team, in an effort to increase the GOTG contribution to Phase I of the project, proposed that the Gambian Government assume financial and contractual responsibility for construction of the three houses needed for the U.S. members of the SWMU. In this case, a housing construction contract calling for completion of the houses prior to the arrival of the U.S. technicians would have been a condition precedent to disbursement under the grant. Now, however, this CP will not be necessary, in light of the determination by the PP team discussed elsewhere in this paper that it is impractical and unsuitable for the GOTG to bear this cost, but rather that it should be borne as part of the AID grant under a contract between AID and a private local contractor.

The only remaining CP recommended by the PP team concerns GOTG assurances that it can provide required staff support for the SWMU. A CP is proposed calling for the GOTG to submit a written plan and schedule for assigning staff to the SWMU for Phase I operation in accordance with staffing requirements set forth in the PP, as already agreed to orally by senior officials in the MANR.

The status of negotiation of this project with the GOTG is fully satisfactory for this stage of the project development. The PP team met three times with the Permanent Secretary of the MANR, to whom the Director of the SWMU will report, and discussed the planning and implementation of the project with him in some detail, as well as with other department heads in the MANR with whom the SWMU will have frequent contact. All of these officials appeared to understand fully the purposes and operation of the project and to support its concepts and approaches. The GOTG has made it clear that it wants this high priority project to go forward as soon as possible, and enthusiastically accepted the project design as set forth in this PP.

Accordingly, the PP team foresees no significant obstacles to a speedy and satisfactory negotiation of the Grant Project Agreement with the GOTG upon authorization of the project.

Bibliography

IBRD - Appraisal of Rural Development Project - The Gambia, June 2, 1976

IBRD - The Economy of The Gambia, December 12, 1975

Jones, R.G.B. Report on a Soil and Water Conservation Consultancy - Republic of The Gambia, Land Resource Report No. 12, Ministry of Overseas Development, London, Oct.-Nov. 1975

Jones, R.G.B. and Davis, K. Report on a Land Use Training Project, Bali, Indonesia Ministry of Overseas Development, London, June 9-27, 1975

Dunsmore, et.al. Land Resource Study No. 22: The Agricultural Development of The Gambia - an agricultural, environmental and socioeconomic analysis - Land Resource Division, Ministry of Overseas Development, London, 1976

Mann, R.D. The Gambia: Land and Vegetation Degradation Survey - The Need for Land Reclamation by Comprehensive Ecological Methods, Department of Agriculture, Banjul, August 1975

Webster, C.C. and Wilson, P.N. - Agriculture in The Tropics Longman, London, 1975

Bornemisza and Alvarado (ed.) Soil Management in Tropical America - Soil Service Department, University of North Carolina, 1975

Republic of The Gambia, Five Year Plan for Economic and Social Development 1975/76 - 1979/80, Ministry of Economic Planning and Industrial Development, Banjul, July 1, 1975

USAID - The Gambia Development Assistance Program (DAP) USAID/Banjul, 1977

GLOSSARY OF ABBREVIATIONS

AA	-	Agricultural Assistant
CP	-	Condition Precedent (to disbursement of AID grant)
DOA	-	Dept. of Agriculture (Gambia)
GOTG	-	Government of The Gambia
GRDP	-	Gambia River Development Project
MANR	-	Ministry of Agriculture and Natural Resources
MFC	-	Mixed Farming Center
ODM	-	Ministry of Overseas Development (UK)
PASA	-	Participating Agency Service Agreement
PP	-	Project Paper
PRP	-	Project Review Paper
SCS	-	Soil Conservation Services (US)
SDP	-	Sahel Development Program
SWMU	-	Soil and Water Management Unit
USDA	-	U.S. Department of Agriculture

Personnel References

A. Composition of Project Paper Team

Mr. R. Neil Sampson, Soil Conservationist, Soil Conservation Service, USDA

Dr. Donald McCormick, Soils Scientist, Soil Conservation Serice, USDA

Mr. James Hradsky, Economist, REDSO/WA

Dr. Winifred Galloway, Sociologist, Cultural Archives, Banjul

Mr. E. Morgan Gilbert, Design Officer, REDSO/WA

AID Office, Banjul

Douglas Broome, AID Officer, Banjul

Thomas O'Dell, Acting AID Officer, Banjul

B. Persons Contacted by PP Team

The members of the PP team interviewed all of the following officials and advisors and received much important information and valuable suggestions from them.

Francis M'Boge, Permanent Secretary, MANR

Rueben Thomas, Director DOA, MANR

Wally N'Dow, Director, Animal Health and Production Department, MANR

Robert McKuen, Director, Forestry Department, MANR

Malik John, Director of Hydromet, MANR

Bakary Sidibe, Director, Cultural Archives, GOTG

George Lowe, Director IBRD IRD Project

Cyril Eyre, Training Advisor, MANR

Sampo Ceesay, Soils Officer, DOA, Yundum Station

Seni Darbo, Project Officer, DOA

N'Donde Njai, Training Officer, Yundum Station

R.G.B. Jones, Soil Conservation Expert, ODM London

Joe Hilliard, Director, Peace Corps, Banjul

PCI 72-6 ANNEX A

LOGICAL FRAMEWORK FOR SUMMARIZING PROJECT DESIGN

Est. Project Completion Date 1988
Date of this Summary June 1977

Project Title: GAMBIA SOIL AND WATER MANAGEMENT

DEVELOPMENT HYPOTHESES — If Purpose, Then Goal; If Outputs, Then Purpose; MANAGEABLE INTEREST — If Inputs, Then Outputs

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program Goal: The broader objective to which this project contributes: a) Halt/reverse environemental deterioration due to inadequacy of traditional agricultural/pastoral methods. b) Increase/stablize production of food forage/wood/cash crops; reduce susceptability to drought, other weather variations. c) Improve institutional capability of GOTG to deliver educational, technical material services to rural population.	**Measures of Goal Achievement:** a) Reduced soil compaction, surface run-off and erosion on cultivated lands. b) Adoption of techniques to utilize animal manures, orop residues etc., to improve soil condi- / tions. c) Reduction of burning of animal manures and plant residue. d) Aggregate agricultural production increases or decreases less than previously anticipated under adverse conditions. e) Villages and farmers recognize value of the services provided and request assistance from the unit.	a) Field observations by specialists. b) Observations of field AA's c) National production estimates. d) Requests for services received from villages and farmers.	**Concerning long term value of program/project:** a) Proper soil/water management is an essential foundation of overall agricultural development program and desired environmental quality. b) Appropriate soil/water management technology can be developed in the Gambian cultural context. c) Soil/water management is and will remain a high priority of GOTG.
Project Purpose: a) Establish a soil and water management unit within Ministry of Agrioulture and National Resources. B) Develop technology for improved agriculture/pastoral methods consistent with Gambian abilities and resources. o) Train Gambian soil and water management specialists and Agricultural Assistants to functional levels of competence in developing solutions to soil and water problems.	**Conditions that will indicate purpose has been achieved: End of project status.** a) Unit under Gambian direction comprising 10-15 trained specialists. b) Soil/water technical manual printed and adopted by MANR. c) Appropriate soil/water management training courses in operation within MANR training program. d) Village planning and action process developed and documented in training aids and technical manuals.	a) MANR Budget. b) AID evaluation of unit's activities and effectiveness. c) Technical reviews of soil/water management by USDA-SCS. d) Interviews with graduates of training programs.	**Affecting purpose-to-goal link:** a) MANR and GOTG will provide adequate policy direction, budgetary support and coordination to enable unit to operate effectively. b) Soil/water management technology developed will be achievable within the financial, physical, (mechanization and cultural means of Gambian farmers. c) Appropriate techniques and concepts will be accepted by Gambian farmers as being in their own best interests.
Outputs: a) Functioning, trained soil /water management staff, both at headquarters and in field. b) Soil/water management manual to document technology and action process. c) Resource inventories, (soil, vegetative, hydrologic surveys) for selected villages as basis for soil/water management planning.	**Magnitude of Outputs necessary and sufficient to achieve purpose.** a) Manual printed and distributed in adequate quantity for users. b) 10-15 villages assisted with village planning and action process. c) 3-4 Administrative leaders trained. 8-10 technical specialists trained on the job. 8 specialists completed academic training in US. 100-125 Agricultural Assistants trained in general concepts.	a) Visit cooperating villages to evaluate extent of acceptance. b) Feedback from Agricultural Assistants on value and utility of technical manual. c) Training certificate received training records, Student's evaluations of courses	**Affecting output-to-purpose link:** a) Technical capability for development of manual will exist in unit staff as supplemented by short-term consultants. b) Village planning and action process can gradually overcome the conservatism and reluctance to adopt new techniques characteristic of Gambian villagers. c) Agricultural Assistants will find soil/water management technology a useful and valuable addition to their technical skills.
Inputs: Activities and Types of Resources a) Expatriate team of interdisciplinary specialists (conservation planner, soil scientist, plant ecologist). b) Short-term consultants. c) Long-term training abroad. d) Local training. e) Commodities and misc. supplies. f) Housing of US team.	**Level of Effort/Expenditure for each activity.** a) 3 US technical staff for 3 years (9 M/Y Phase I) = $720,000; (4 M/Y Phase II)=$360,000. b) 24 man/months of short-term consultants Phase I = $180,000; 12 m/m Phase II $102,000; 48 m/m Phase III $480,000. c) Funding for 8 Gambians to be trained abroad Phase I, 4 in Phase II = $128,000. d) On-site efforts of US team to produce local training in-pute. e) Commodities: vehicles, office and lab. equipment, household furnishings, technical library, $71,800, total. f) Construction of 3 houses - $180,000	a) AID Controller Records b) Project records and reports. c) GOTG/MANR Budgets/Reports	**Affecting input-to-output link:** a) MANR will recruit and assign qualified staff to SWMU. b) US team leader and MANR officials can select qualified candidates and arrange appropriate training program. c) Adequate supplies, commodities, and equipment can be scheduled, purchased and delivered on-site on a timely basis. d) GOTG can and will provide in-puts (including personnel, maintenance and support) as shown in project descriptio and financial plan.

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Attach PRP

ANNEX

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INFO Nelson Bone

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24 JAN. 1977
REDSO/WA

DESIGN
Gambia

Due Date 30-01

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E.O. 11652: N/A

TAGS:

SUBJECT: GAMBIA SOIL AND WATER MANAGEMENT UNIT
635-0002 PRP

1. ECPR APPROVED PRP ON DEC. 9. MAJOR POINT OF DISCUSSION, WHICH MUST BE REVIEWED BY PP TEAM IS RESOLUTION OF HOUSING AVAILABILITY QUESTION. OPTIONS ARE, GOTG CONSTRUCTION AS STATED IN PRP, RENTING, PREFAB HOMES, U.S. FINANCED CONSTRUCTION. ISSUES PAPER WITH PP GUIDANCE AND COMMENTS ON PRP BY INDIVIDUAL PROJECT COMMITTEE MEMBERS BEING POUCHED TO FIELD.

2. PP GUIDANCE AS FOLLOWS:

A. INCLUSION OF RANGE MANAGEMENT EXPERTISE FROM THE SOIL AND WATER MANAGEMENT UNIT (SWMU). SINCE SWMU UNIT IN THE DEPT. OF AGRICULTURE WOULD HAVE A SUBSTANTIAL ADVISORY AND SERVICE RELATIONSHIP WITH ALL FUNCTIONAL UNITS INCLUDING AGRICULTURE, ANIMAL HEALTH, FORESTRY AND FISHERIES IT WAS CONCLUDED THAT THE PP TEAM SHOULD CONSIDER THE INCLUSION OF A RANGE MANAGEMENT ADVISOR IN THE PROPOSED STAFFING.

B. OTHER DONOR COORDINATION. DISCUSSION REVEALED THAT

EXPERTS IN TRAINING AND AGRICULTURAL INFORMATION MAY BE PROVIDED BY EITHER THE IBRD OR THE BRITISH ODM. IT APPEARS THAT THESE SPECIALISTS WOULD NOT BE FORMAL MEMBERS OF THE SWMU, BUT IT WOULD BE NECESSARY TO USE THEIR EXPERTISE AND EFFORTS TO TRAIN AGRICULTURAL ASSISTANTS IN SOIL AND TO PROVIDE NECESSARY AGRICULTURAL INFORMATION AND EXTENSION. IT WAS NOTED THAT SINCE THE SUCCESS OF THE UNITS' EFFORTS APPEARED DEPENDENT UPON THESE FOREIGN EXPERTS, THE PP SHOULD EXPAND THIS SECTION, AND ASSURE, THROUGH DISCUSSIONS WITH THE GOG, APPROPRIATE PROVISIONS IN THE PROJECT AGREEMENT AND, IF NECESSARY COORDINATION WITH THE OTHER DONORS, THAT THESE FOREIGN SPECIALISTS WOULD BE AVAILABLE TO THE PROJECT. IF THEY ARE COMMITTED TO THIS PROJECT.

THERE SHOULD BE A STATEMENT ABOUT THE PROJECT'S RELATIONSHIP TO THE PROPOSED GAMBIA RIVER BASIN DEVELOPMENT PROGRAM.

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COST BUDGET. THE PP TEAM SHOULD REVIEW THE BUDGET TO ASSURE THE ADEQUACY OF FUNDING FOR SHORT TERM CONSULTANTS, FOR PARTICIPANTS AND FOR CONTINGENCY. THE PP TEAM SHOULD REVIEW ALL EXPECTED GOTG CONTRIBUTIONS TO ASCERTAIN WHETHER IT IS LIKELY THAT THESE FUNDS WILL BE MADE AVAILABLE DURING PROJECT IMPLEMENTATION STAGE. THE PP SHOULD ALSO OUTLINE WHAT ONGOING FINANCIAL OBLIGATIONS WILL ACCRUE TO THE GOG (AFTER AID WITHDRAWAL) AS A RESULT OF OUR INTERVENTION.

D. HOST COUNTRY CONTRIBUTION. INCLUSION OF A FOURTH MEMBER OF THE TEAM AND POSSIBLE INCLUSION OF CONSTRUCTION OF FOUR HOUSES WILL REDUCE THE GOTG CONTRIBUTION TO SUBSTANTIALLY LESS THAN 25 PERCENT OF THE PROJECT. EVEN THOUGH THIS PROJECT IS EXPECTED TO BE FUNDED FROM SDP AND AS IT IS ANTICIPATED THAT SDP PROJECTS WILL NOT REQUIRE 25 PERCENT CONTRIBUTION, THE PP TEAM SHOULD ATTEMPT TO MAXIMIZE GOTG CONTRIBUTION. (NOTE: A MULTILATERAL PROJECT WOULD ALSO EXEMPT THE PROJECT FROM THE COST SHARING REQUIREMENT OF SECTION 110(A). SEE PARA. B. ABOVE.)

E. QUANTIFICATION OF BENEFITS. ALTHOUGH IT IS REALIZED THAT SOIL AND WATER MANAGEMENT EFFORTS ARE BY THEIR NATURE NOT EASILY ISOLATED IN TERMS OF SPECIFIC IDENTIFIABLE BENEFITS, THE PP TEAM SHOULD ATTEMPT TO PRESENT SOME QUANTIFICATION OF THE BENEFITS WHICH WILL ACCRUE TO THE GAMBIA SHOULD THIS PROJECT BE UNDERTAKEN.

F. SOCIOLOGY. THE PP TEAM SHOULD PAY SPECIAL ATTENTION TO SOCIOLOGICAL QUESTIONS AS THEY PERTAIN TO THE ALLOCATION

OF FARMER'S FIELDS IN ORDER TO ASSURE THAT A FUNCTIONING SWMU WILL BE ABLE TO HAVE THE MAXIMUM IMPACT ON SOIL AND WATER MANAGEMENT PRACTICES AT THE VILLAGE LEVEL.

G. USE OF PEACE CORPS VOLUNTEERS. THE PP TEAM SHOULD CONSIDER THE USE OF PCV'S TO COMPLEMENT THE EFFORTS OF THE TECHNICAL EXPERTS.

H. ROLE OF U.S. CHIEF OF PARTY AS HEAD OF SWMU. THE PP TEAM SHOULD REVIEW THE PRESENT CONFIGURATION OF THE SWMU WHEREIN THE U.S. CHIEF OF PARTY IS HEAD OF THE UNIT. CONSIDERATION SHOULD BE GIVEN TO PHASING THE CHIEF OF PARTY AS ADVISOR TO THE GAMBIAN HEAD OF THE SWMU.

I. PP TEAM SHOULD ADHERE TO GUIDELINES AND REQUIREMENTS OF AID HANDBOOK 3, CHAPTER 6, TO ASSURE THAT PP SUBMITTED IS COMPLETE DOCUMENT.

3. TIMING/MAKEUP OF PP TEAM WILL BE SUBJECT OF JANUARY ABIDJAN DESIGN CONFERENCE.

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ANNEX C

TECHNICAL NOTES AND DRAWINGS

Soil Sketch and Map of Sintet Village

The following soil survey sketch and soil mapping unit descriptions were developed for an area adjacent to the village. They are based on a brief and cursory transect, indicated by a dashed line on the sketch, and several spade excavations to depths of 5 to 7 inches. The sketch and descriptions are included only to illustrate the general conditions, and do not approach the accuracy or integrity of the detailed soil surveys required as a part of the required resource inventories.

The soil was so dry and hard that digging with a spade was very difficult. The spade used was about 7 inches wide with a square tip. A more effective spade would be a narrow 5" sharp-shooter with a rounded tip, but dry season digging is difficult with any tool.

Prior to going on the transect, soil conditions on the village lands were discussed with the elders at the banta ba. It was clear from these discussions that the basic soil differences identified and described were known to the farmers. They selected the points where typical soils could be observed in the field, and these points did in fact represent the soil mapping units. Also, they knew most of the use and management limitations and potentials of the soils. They seemed anxious to learn of ways to prevent erosion and maximize productivity.

Description of Soil Map Units

1 B2 Slope 2-4% (uniform), extending about 400' from lower boundary to 2 A+ or 3 A1 and a ridge of soils shallow to ironstone which is not cultivated.

Ap - Dark yellowish brown sandy loam Ap 3-4 inches thick is very compact. Upper 1-2" is loose. Very dry. Lower 2" is very hard. Not tillable in dry season except with very heavy equipment.
B - Strong Brown upper B with about 30% plinthite nodules 0.5 to 2 cm in diameter. Very hard and compact. Few insect burrows. Observed to depth of 7" only.

Soil is said by villagers to be capable of groundnuts/cereal/groundnuts or cereal/fallow rotation indefinitely. Could be farmed for 20 years after clearing forest with little reduction in yield. Erosion has definitely occurred, with 3 to 4 inches estimated loss. Villagers definitely recognize erosion problem. They also say that the soil looses water because of compaction and runoff is high.

2 A+ Slope less than 1% (concave). Area extends around base of higher lying ridge flank, and receives runoff and sediment from slope above. Sediment received to date is 1 to 1½ inches (est.). (Moderately well or somewhat poorly drained).

Ap - Very dark grayish brown sandy loam Ap 5 inches thick. Very compact, hard and dry. Insect burrows and castings common. A few channels appear to be earthworms, although no castings noted. Thin light colored sand strata about 1 mm thick spaced about 0.5 cm apart, resulting from ridging probably.
A_2 - Mottled, mostly dark yellowish brown heavy sandy loam or loam. 20% dark hard concretions 0.2 to 1 cm in diameter. Very hard; dry. (A_2 observed in roadcut may be on similar soil).

This should be the most productive upland soil that we observed. Capable of various rotations and vegetable crops. Degree of compaction as it affects root penetration is uncertain. Should observe in wet season under plants.

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3 A1 Level or slightly convex, (slopes 0.5 to 3%) at roughly the same elevation as 2 A area but not on concave position. Soil is moderately well drained. It has a lighter, grayer color than 2 A, and is heavier than 2 A+ soil. Short slopes of 2 to 3% into small lateral drainage ways are less than 50 feet long, but are slightly eroded. Occurs just above 4 C1 area.

Ap - Grayish brown heavy sandy loam 4 to 5 inches thick. Very hard, dry. Few insect burrows and castings.
B - Strong brown and dark yellowish brown weakly mottled loam or sandy clay loam. Very hard, dry. 10% small hard dark colored concretions.

Villagers say this soil produces better for cereals than groundnuts. It is too heavy for good groundnuts. Infiltration here is likely very slow. Soils good for many years after clearing. Runoff collects in numerous shallow drainage ways and gullying problem is severe. Gradient of drainage-ways 1 to 3%.

4 C1 - Slopes into major drainage way; 5 to 12% slopes about 200 feet long spanning relief of 10 to 15 feet. Lateral drainage ways have severe gully hazard. No evidence of sheet erosion except narrow (20 feet) strips along lateral drainageways.

5 C1 - Ridge between major drainageways with flank slopes of 5 to 10% about 150 feet long and flatter ridgetop about 300 feet wide with slopes of 2 to 5%. All slopes convex except base slope 50 feet wide adjacent to alluvial soil below. On base slope, soil is progressively heavier and more poorly drained toward alluvial soil.

Ap - Dark grayish brown loamy sand; very dry, hard but not as hard as sandy loam soils. Few insect casts and burrows. Common plant residues, more than half of which are charred.
B - Not observed.

Good for groundnuts according to villagers, who say infiltration is good. They say the soil tires quickly. They say wind erosion does occur, but not much. No evidence of wind or water erosion.

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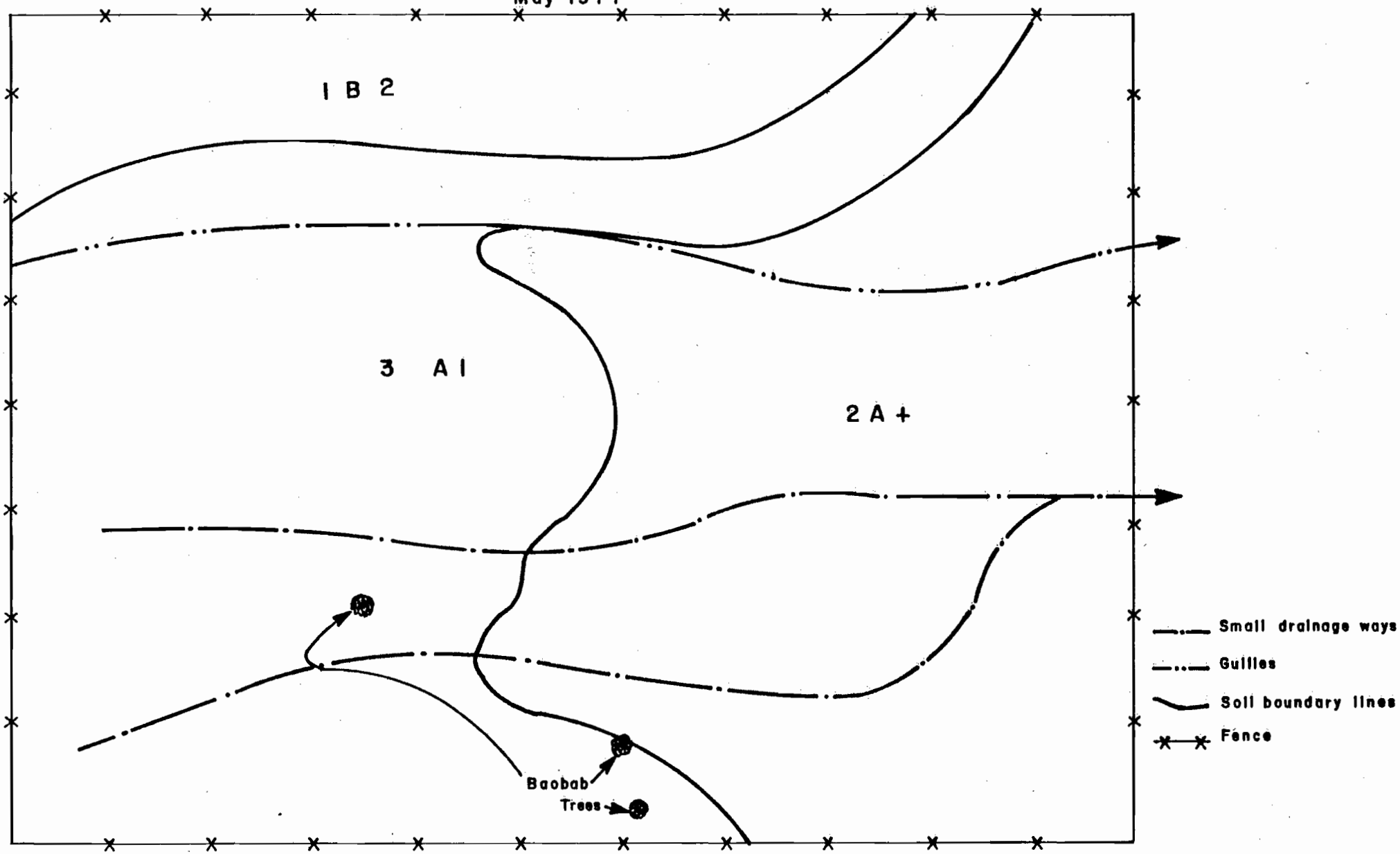
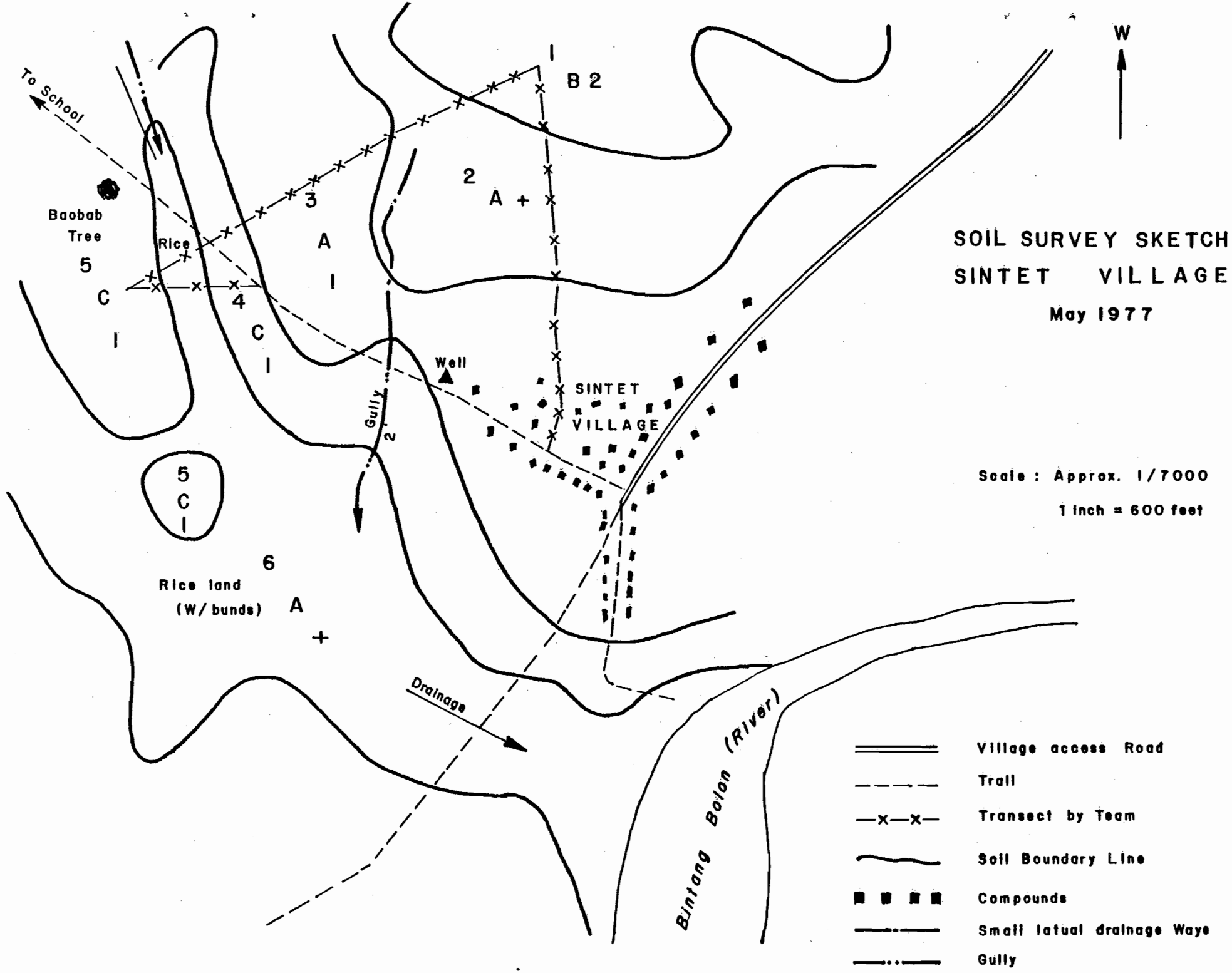
6A+ - Alluvial soil used for rice. Dark gray, poorly drained. Soil said to be silty. Middle portion comprising 1/3 to 1/2 of width is flat. Slight slopes of 0.5 to 1% are 100 to 200 feet long at margins of area. Bunds (low dams 0.5 to 2 feet high) outline fields of 0.1 to 0.5 acre.

SOIL SURVEY SKETCH

Field North of Buildings at Kanjibat Mixed farming Center
May 1977



Approx. Scale 1/1200


SOIL SURVEY SKETCH
SINTET VILLAGE
May 1977
Scale : Approx. 1/7000
1 inch = 600 feet
W
To School
Baobab Tree
Rice
5
C
I
3
A
I
4
C
I
B 2
I
2
A +
Well
SINTET VILLAGE
Gully
2
5
C
I
6
Rice land
(W/ bunds)
A
+
Drainage
Bintang Bolon (River)
Village access Road
Trail
Transect by Team
Soil Boundary Line
Compounds
Small latual drainage Waye
Gully

Kanjibat Mixed Farming Center

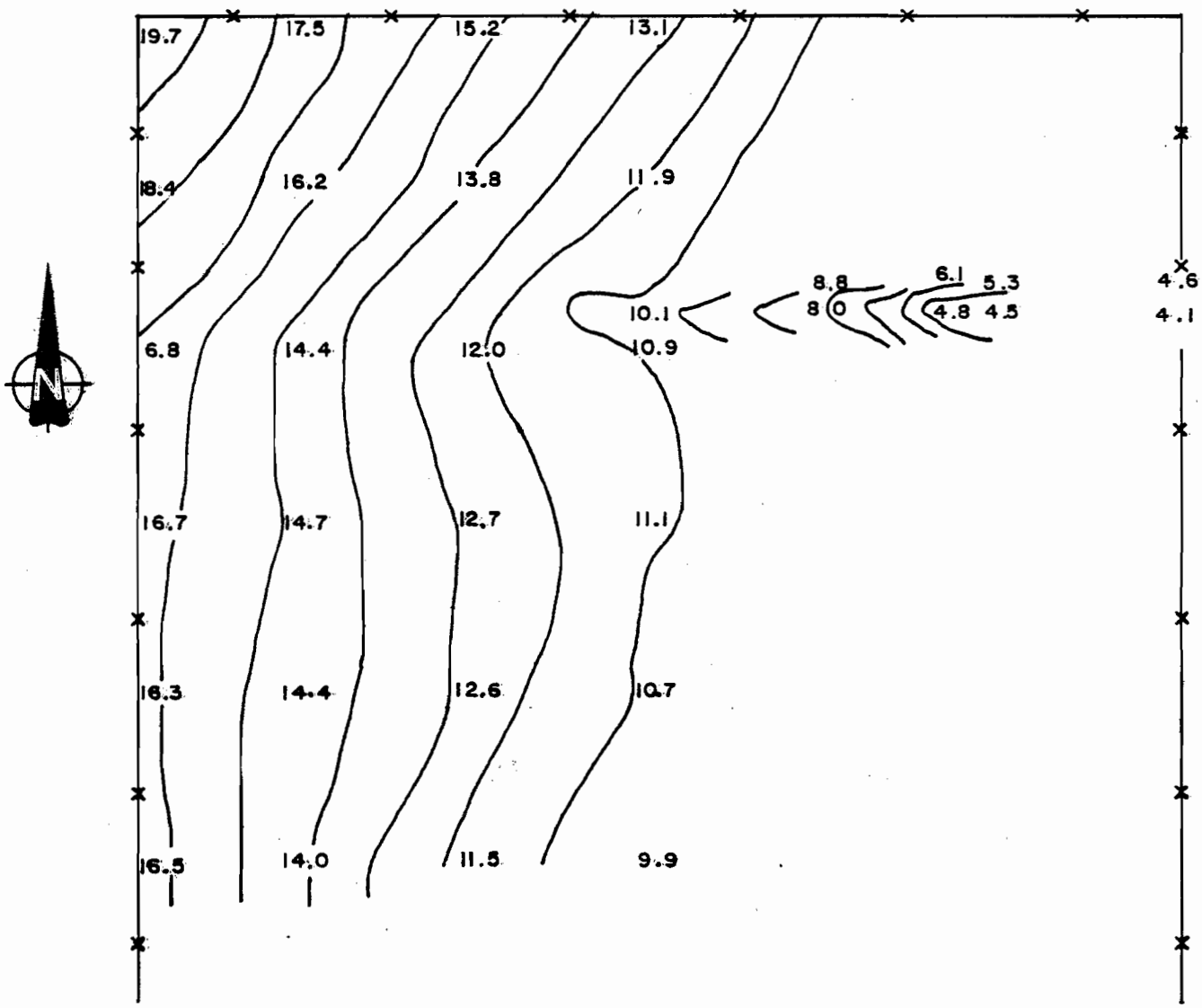
The following pages are sketches of a) the topography and drainage, and b) the soil survey of the field north of the buildings at the Kanjibat Mixed Farming Center. The contour lines were determined by a grid survey using an engineering level. Mr. Bojang, Agricultural Assistant at the Center, informed the party that runoff and erosion were problems in the fields. During the survey it was apparent that gullies have formed. At the east end of the drainageway, the dual readings represent elevations in the bottom of, and adjacent to, the gully. The gully ranges from 0.5 to 1.3 feet deep.

The soil survey sketch indicates moderate sheet erosion on soil map unit 1 B2. Significant erosion is thought to be occurring on the 3 A1 soil map unit, although less than on 1 B2. Soil map units on this sketch are considered roughly the same as those with the same number on the soil survey may of Sintet village also contained in this Annex.

This field is thought to be typical of large areas of The Gambia. The extent of the runoff and erosion problem, readily apparent on the bare land in the dry season, is much greater than indicated by the PRP Team based on observations near the end of the wet season.

Solutions to the erosion problems observed seem relatively simple, and a plan to realign the fields, grass the waterways, and divert channels could be developed. The AA at Kanjibat indicated a desire to carry out such a program, both to improve the fields and provide a learning and demonstration area.

TOPOGRAPHIC MAP - NW CORNER
KANJIBAT MFC; WESTERN DIVISION,
THE GAMBIA 5-5-77



Distances paced; elevations derived from assumed HI; Scale 1" = 100'

ANNEX D: ECONOMIC ANALYSIS

In principle, the methodologies and criteria applicable to feasibility analysis of projects with environmental goals are analogous to those established for other types of projects. In general terms, a comparison of costs and benefits resulting from the project should furnish a positive cash flow when discounted over time at the opportunity cost of capital. The measurement and quantification of cost and benefit streams in the context of environmental considerations often prove to be extremely difficult tasks, however, and depend critically on the best judgment of the technician involved in the project appraisal.

All environmental analyses will encounter both quantifiable and non-quantifiable variables. The former can be analyzed mathematically, the latter only descriptively, but any exercise involving project choice must necessarily examine both. This section is an attempt to analyze the quantifiable aspects of the SWMU project in The Gambia. The benefit and cost sides of the equation are first treated individually and then reintegrated into the concluding remarks. In all instances the PP team has attempted to weigh the quantitative aspects of the project conservatively, given the tenuous and incomplete nature of the bulk of the technical data on the topic, and thus have arrived at what we feel are realistic, albeit perhaps somewhat understated conclusions.

Benefits

Basically the easily observable impact of soil and water management interventions are those linked to national agricultural production, for which an economic value can be established. It is equally true, as has been pointed out many times earlier in this paper, that soil management practices affect a very broad and complex natural interrelationship, including forests, rangeland, animal life and the human condition, but generally in a less direct and longer term fashion than that of agricultural production. These additional benefits are very real ones, however, and although not included in this analysis, must be weighed when considering the feasibility of the project.

Annex Figure D 1 graphically indicates the anticipated effect that the SWMU should have on <u>improving</u> and <u>sustaining</u> agricultural production in the Gambia. The magnitude of agricultural production induced by the project is a function of

- increased plant nutrients
- improved tilth
- increased rainwater infiltration

Each of these actions is highly complementary to the others and their individual impacts on productivity can only be measured by an examination of their associated actions as a whole. As a precurser, however, some useful information can be presented on each of the individual parts.

Increased plant nutrients

Compost and other organic fertilizers are generally considered to be more valuable as soil conditioners than as fertilizers. Nevertheless, as fertilizers, these wastes contain from 0.2 - 1.5% N, 0.01 - 3% P and 0.2 - 2% K, plus other important elements such as calcium, magnesium, iron and sulfur. 1/ When used in tandem with chemical fertilizers they increase fertilizing efficiency by reducing fertilizer runoff or evaporation.

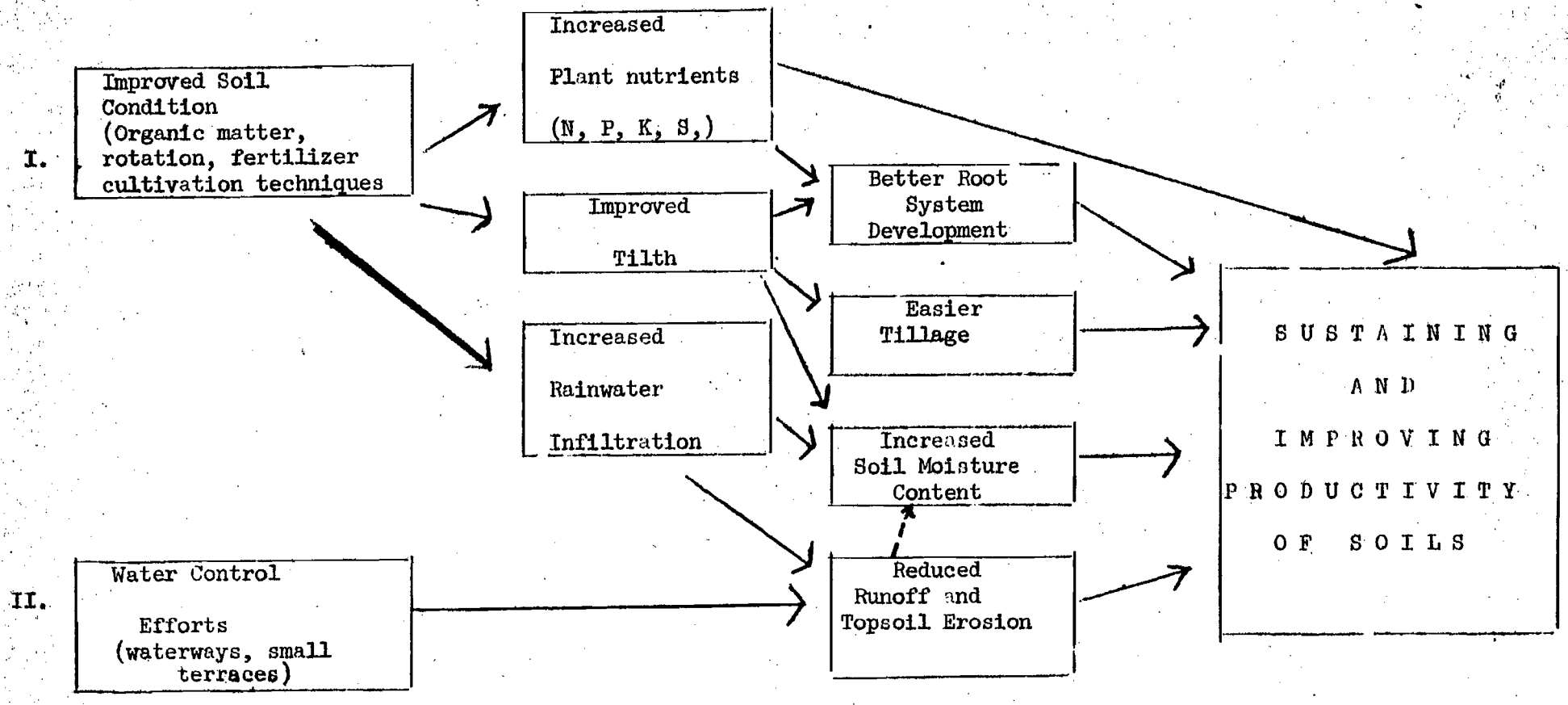
According to the recent Land Resources Survey, nutrient reserves in Gambian soils are extremely low, with N levels, for example, rarely exceeding .04% in topsoils. Current recommendations by local production specialists call for fertilization at the following levels:

(lbs/acre)	N	P	K	Other
- Groundnuts	-	8-10	-	Trace "S"
- Traditional Cereals	22-45	8-10	-	
- Rice	53-71	8-10	-	
- Cotton	22-45	8-10	-	Trace "S"

Depending upon local conditions, correct fertilization at these levels can often evoke responses ranging from 40-100% over traditional yields.

Manure and other organic matter incorporated into the soil without burning would, in conjunction with the associated effects of improved tilth and more humid top and subsoils, provide a powerful stimulus to increased productivity, most notably in cereal grains.

1/ According to the research journal Organic Manures, published by the Indian Council of Agricultural Research (Technical Bulletin No. 32) an adult cow, grazing under conditions similar to those found in the Gambia is capable of producing 54.9 lbs. N, 15.2 lbs. P and 43.6 lbs. K through normal liquid and solid excrement in one year.



DIAGRAMMATIC OUTLINE OF QUANTITATIVE BENEFITS EXPECTED TO FLOW FROM THE PROJECT

ANNEX FIGURE D 1

Improved tilth

Additions of organic matter through plant residues and animal manures improve soil structure and make the soil more porous. Such additions are thought to be the only reasonable way to reverse the trend toward increased compaction and density of the surface soil horizon. By making the soil more friable and porous, the distribution of plant root systems is facilitated, as well as a more effective use of available water and nutrients in the surrounding soils.

Improved soil structure resulting from the addition of organic matter will result in more efficient tilling practices for the Gambian farmer, whether by hand or ox-drawn methods. All tillage operations, including those required for planting, weeding and harvesting (groundnuts and rootcrops) will be made easier. Lowe 1/ has indicated that these operations account for some 84% of a traditional farmer's labor input per acre of groundnuts cultivated.

Increased rainwater infiltration

The incorporation of organic matter increases the infiltration of rainfall and consequently reduces the amount of surface runoff. The runoff of rainwater is probably more critical to the Gambia than to most other West African nations given that a part of utilizable water resources is lost to agriculture in this manner as it flows into the saline waters of the Gambia River.

Indications of the amount of runoff and infiltration as presented in the Land Resource Study are furnished in the following table for representative areas of the Gambia.

Annex Table D 1: Runoff losses from storm of 1.6.73 at the beginning of the wet season

Site	Soil Type	Rain (mm)	Observed increase in soil water (mm)	Est. Evap. (mm)	Infil-tration (mm)	Runoff Loss (%)
Giroba kunda	Lower Colluvial	91	44	7	51	44
Giroba kunda	Upper Colluvial	91	53	7	60	34
Sabi Badjara	Lower Plateau	103	35	6	41	60
Sabi Yeli	Upper Plateau	59	22	6	28	53

1/ Dunsmore, et. al. p. 324

At these runoff levels on Gambian soils it can be estimated that average annual topsoil loss is some 12 tons/acre, or approximately 1/15" annual topsoil erosion based on an estimated 180 tons/acre for one inch of topsoil. The importance of this topsoil loss due to erosion is graphically illustrated in Annex Figure D 2. Although only a generalized model, it should be noted that, under traditional cultivation, reductions in yield of up to 60% are possible within a 30-year timeframe, due to topsoil erosion.

As an estimate of the order of magnitude of correction possible we have considered that this runoff rate could be reduced by 40-50% within 10 years through the incorporation of 2-4 tons of organic matter/acre/year. It could be expected that, beyond the initial 10 year period, the reductions in rainwater runoff would become progressively less over time as the organic matter in the soil approaches a stable level and attains a self-sustaining condition by the end of the second decade.

Any reduction in the amount of surface runoff implies a higher moisture content in the arable soil--a basic prerequisite to sustained plant growth due to its direct use by plants as well as its role as the solvent that delivers nutrients to their roots.

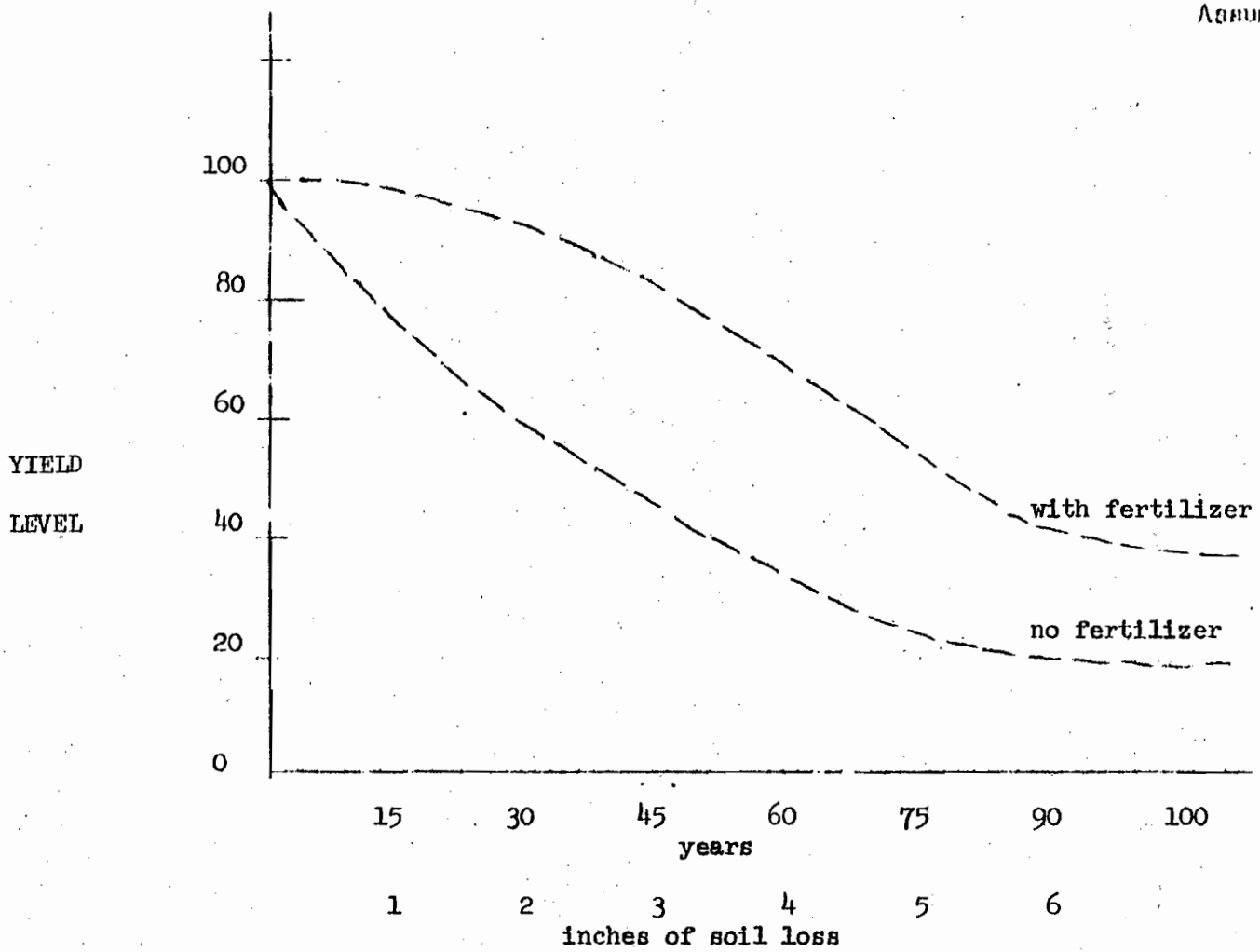
An illuminating example of the importance of soil moisture to plant development was provided in the results of cotton field trials in Northern Nigeria 1/ (an area similar in soil characteristics and rainfall patterns to those of the Gambia). With conservation measures only 31% of rainwater infiltrated into the upper layers and in a 42-inch rainfall season the soil at a 30-inch depth was not even wetted. After simple conservation practices (notably tie ridging) the infiltration depth increased to over 48 inches and tenfold increases in seed cotton production were attained, partially due to increased moisture and partially because of more effective utilization of fertilizers.

Total benefits

The cumulative effect on production of the diverse factors described to this point is extremely difficult to assess in the absence of reliable local data and field trials.

1/ See Webster and Wilson, p. 123-124.

Annex Figure D2. Generalized model of yield reduction over a 100-year period on soil with 6 inches of A_1 horizon (1080 Tons) and Annual Soil Erosion Loss of 12 Tons/acre.



Assumptions:

- yield level of 100 with fertilizer is about twice that with no fertilizer.
- without fertilization, loss of yield due to erosion is caused both by fertility loss and loss in available water. Plant vigor in using available water is reduced.
- with fertilization, plant vigor in using available water is increased

Source:
1. SCS Field Experience
2. Bornemisza & Alvarado (ed.), p. 372-408

Annex Table D-2

Agronomic Results from Three Systems of Cropping in Senegal, compared by plant and by region

Source: IRAT - Senegal, 1972

Crops	Regions	Number of experimental sites	Years of comparison	Number of annual results	Yields kg/ha			Yield indices		
					* F_0T_0	F_1T_1	F_2T_2	F_0T_0	F_1T_1	F_2T_2
Pearl Millet	Northern	2	66-70	9	578	689	948	84	100	133
	Center	3	65-70	13	366	688	999	53	100	145
	Southern	3	63-70	13	1,105	1,763	2,429	63	100	138
	Weighted mean	8	63-70	35	695	1,088	1,517			
Sorghum	Sine-Saloum	5	65-70	28	893	1,597	2,100	56	100	131
	Eastern	4	65-68	9	1,086	1,723	2,729	63	100	158
	Southern	1	67-68	2	1,617	1,905	2,190	85	100	115
	Weighted mean	10	65-68	39	975	1,642	2,166	59	100	132
Maize	Eastern	1	66-68	3	792	1,338	2,425	50	100	182
	Southern	1	67-70	4	168	1,284	2,684	13	100	209
	Weighted mean	2	66-70	7	436	1,308	2,573	33	100	197
Rainfed Rice	Southern	3	68-71	9	443	1,711	2,630	26	100	154
Cotton	Eastern	2	65-68	6	1,109	1,531	2,061	67	100	135
Groundnut	Northern	2	65-70	10	861	920	1,044	94	100	114
	Center	3	65-70	30	998	1,238	1,154	81	100	93
	Sine-Saloum	5	65-70	52	1,454	1,732	1,997	84	100	115
	Eastern	4	65-68	26	1,426	2,232	2,339	64	100	105
	Southern	3	63-70	19	1,644	1,905	2,072	86	100	109
	Weighted mean	17	63-70	137	1,311	1,669	1,821	79	100	109
Cowpea	Northern	2	65-70	9	653	727	875	90	100	120

* Mineral fertilization F_0: No fertilization F_1: Light fertilization

F_2: Heavy fertilization

Soil tillage T_0: Hand superficial tillage T_1: Superficial tillage with horse draft

T_2: Deep tillage (plowing) with oxen draft

Systems of Cropping $F_0 T_0$: Traditional shifting cultivation

$F_1 T_1$: Improved shifting cultivation

$F_2 T_2$: Semi-intensive cultivation

Some indications of the total effect of the SWMU interventions on yield can be provided, however. In the United States, for example, extensive raw data have been assembled relating soil erosion to crop yields. The data are published in more than 1000 soil surveys and were developed from interviews with farmers, soil conservationists and extension agents over the 4 to 6 year period while the soil survey was in progress. Yield reductions can range from 25% on soils with favorable subsoils to essentially 100% on soils with very unfavorable subsoils for certain crops unless the effects of erosion are compensated by increased fertilizer or other inputs. It needs to be noted that, under Gambian conditions, the effects of erosion can not be easily offset due to the lack of mechanization, fertilizer and capital. Therefore the effect of erosion in the Gambia will be more immediately and directly felt than has been the general case in the United States.

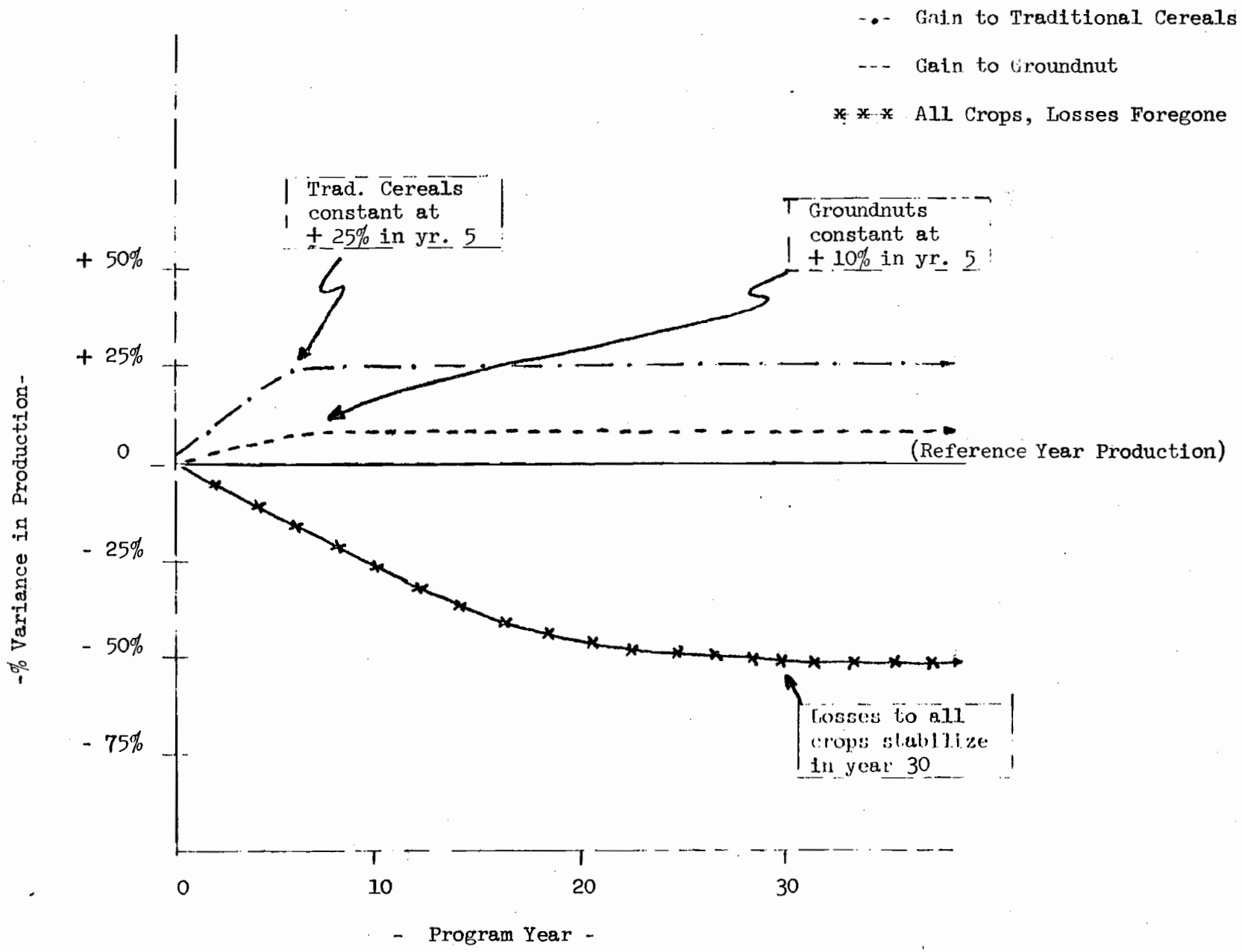
The responsiveness of Gambian soils to improved soil management can also be illustrated through field trials undertaken in Senegal (see Table D 2) where simple alterations in the level of plant nutrients ("fertilization") and better tilth ("tillage") resulted in up to threefold yield increases for sorghum and almost twofold yield increases for groundnuts in neighboring Sine-Saloum province.

Conceptually we can describe the SWMU's overall beneficial effect to production on two separate levels, both of which have been graphically presented in Annex Figure D 2.

Production gains

There is no doubt that the cumulative effect of increased plant nutrients, better root system development, easier tillage, less erosion and higher soil moisture content will lead in the short and long run to better yields than the reference situation. Based on the current lack of sound soil and water management practices and the poor growing conditions provided by most Gambian soils, rapid initial yield increases should easily be obtained in those areas where SWMU recommendations are adopted. As a prudent hypothesis we have assumed an increase in yield of +25% for traditional cereals and +10% for groundnuts, both within 5 years and both leveling off thereafter. Groundnut yields are taken at only 10% given that they do not require additional nitrogen (groundnuts are a "legume", or nitrogen-fixing) as do the cereals, but will respond, in any case, to the increase in organic matter.

ANNEX FIGURE D 3: ESTIMATE MODEL OF BENEFITS FLOWING FROM SWMU PROGRAM INTERVENTION OVER TIME



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Foregoing of production loss

Erosion of valuable topsoil will result in production loss. Although the Gambia is basically flat topographically (slopes rarely exceed 5%) Gambian soils are easily eroded and rainfall is intense (up to 0.2 in./minute) at times of year when the topsoil is the most vulnerable. In the absence of regular and widespread soil and water management practices topsoil losses could conservatively be considered at 12 tons/acre/year. This will represent a probable reduction in yield of 50% within 30 years if permitted to continue. A second benefit of the SWMU program, therefore, will be the foregoing of this production loss, conceptualized curvilinearly in Annex Figure D 3.

Both of these benefits - production gains and the foregoing of production losses - have been calculated assuming that SWMU practices are fully adopted by traditional farmers at the national rate for cereals of 10 acres in year 2, 100 acres in year 5, 1000 acres in year 10, 50,000 acres in year 20 (approximately 1/2 of total current cereal acreage) and leveling out thereafter. In establishing this hypothesis careful attention was paid to total acreage now cultivated and the projected number of extension agents available to undertake the effort. The shape of the rate of adoption curve has followed that of a normal "S-shaped" learning curve (the exact configuration of this curve is of course impossible to predict with accuracy). Calculations of total benefits derived in this way are outlined in Annex Table D 3 by year, acreage, incremental tons and incremental value added for both cereals and groundnuts, the two crops most likely to be affected by the program. All basic hypotheses are noted in the footnotes to that table.

Costs

The costs associated with the SWMU program are relatively direct and easily calculable. The contribution by both USAID and the GOTG for the first five years has already been described in some detail in Part III D, "Final Analysis". In years 6-10 USAID anticipates approximately D 188,000 assistance per year to defray supplementary consultancy costs and the GOTG will provide necessary salary and operating costs for the program over the years 6-30. It needs to be pointed out that the use of U.S. consultants in years 6-10 is highly speculative at this stage and that further, the PP Team considers the cost stream indicated in the analysis sufficient to cover most eventualities.

All costs are expressed in May 1977 dalasis and contain no tax element.

Conclusions

Building on the preceding data, a representative net cash flow was assembled over a 30-year period and is presented in Annex Table D 3. Despite the relatively important early build-up of the cost stream in contrast to the sluggish benefit stream, a favorable 14.8% internal rate of return was obtained from this analysis.

ANNEX TABLE D 3: EXPECTED IMPACT OF SWMU INTERVENTIONS ON REFERENCE YEAR CROP PRODUCTION

Program Year	CEREALS Acres(1)	CEREALS Tons(2)	CEREALS '000(3)	GROUNDNUTS Acres(4)	GROUNDNUTS Tons(5)	GROUNDNUTS '000(6)
1	0	0.0	0.0	0	0.0	0.0
2	10	0.3	0.1	20	0.4	0.1
3	40	1.6	0.3	80	1.6	0.6
4	70	3.9	0.7	140	5.1	1.8
5	100	7.1	1.3	200	9.3	3.3
6	280	24.9	4.5	560	20.7	7.5
7	460	42.8	7.7	920	24.7	8.9
8	640	60.6	10.9	1,280	28.7	10.3
9	820	78.5	14.1	1,640	32.6	11.7
10	1,000	96.3	17.3	2,000	36.6	13.2
11	5,900	574.1	103.3	11,800	40.5	15.3
12	10,800	1,051.8	189.3	21,600	779.5	280.6
13	15,700	1,529.6	275.3	31,400	1,518.5	546.7
14	20,600	2,007.3	361.3	41,200	2,257.4	812.7
15	25,500	2,485.1	447.3	51,000	3,380.7	1,217.1
16	30,400	2,962.9	533.3	60,800	4,503.9	1,621.4
17	35,300	3,440.6	619.3	70,600	5,627.2	2,025.8
18	40,200	3,918.4	705.3	80,400	6,750.5	2,430.2
19	45,100	4,396.1	791.3	90,200	7,873.7	2,834.5
20	50,000	4,873.9	877.3	100,000	8,997.0	3,238.9
21	50,000	5,394.4	971.0	100,000	9,844.9	3,544.1
22	50,000	5,914.9	1,064.7	100,000	10,692.8	3,849.4
23	50,000	6,435.3	1,158.4	100,000	11,540.7	4,154.7
24	50,000	6,955.8	1,252.0	100,000	12,388.5	4,459.9
25	50,000	7,476.3	1,345.7	100,000	13,239.1	4,766.1
26	50,000	7,996.8	1,439.4	100,000	14,144.3	5,070.3
27	50,000	8,517.3	1,533.1	100,000	14.932.2	5,375.6
28	50,000	9,037.7	1,626.8	100,000	15,780.1	5,680.8
29	50,000	9,558.2	1,720.5	100,000	16,628.0	5,986.1
30	50,000	10,078.7	1,814.2	100,000	17,475.9	6,291.3

(1) Assuming that traditional farmers fully adopt SWMU practices at the rate of 10 acres in Y_1, 100 acres in Y_5, 1000 acres in Y_{10}, 50,000 acres in Y_{20} (maximum).

(2) a) Traditional yield = 800 lbs/acre
b) Net gain taken at +6.3% in Y_2, 12.5% in Y_3, +18.8% in Y_4, and constant after Y_5 at +25%.
c) Losses foregone assumed on a linear basis for convenience Y_1= 0%, Y_{30}= 50% (representing a slightly conservative deviation from the observed situation).

(3) a) average cereal farmgate price = D 200/ton
b) Estimated 10% input cost already subtracted from total value to indicate net value added.

(4) Traditional farmers plant approximately 2 acres of groundnuts to every acre of cereal. The total number of acres of groundnut land utilizing SWMU practices was taken to be 2 times that of cereals.

(5) a) Traditional yield = 1,000 lbs/acre.
b) Net gain taken at +2.5% in Y_2, +5.0% in Y_3, +7.5% in Y_4 and constant after Y_5 at +10%.
c) Losses foregone remains as in 2(c) above.

(6) a) Estimated groundnut farmgate price = D 400/ton based on IBRD economic appraisal.
b) Net value added calculated as in 3(b).

ANNEX TABLE D 4: ANTICIPATED SWMU PROGRAM COSTS
(000 Dalasis at May 1977 prices)

Year	USAID 1/	GOTG	TOTAL
1	968.0	46.0	1,014.0
2	823.0	122.2	945.2
3	832.0	135.5	967.5
4	518.0	146.6	664.6
5	518.0	172.0	690.0
6	165.0	175.0	340.0
7	165.0	182.0	347.0
8	165.0	189.0	354.0
9	165.0	196.0	361.0
10	165.0	200.0	365.0
11	-	200.0	200.0
12	-	200.0	200.0
13	-	200.0	200.0
14	-	200.0	200.0
15	-	200.0	200.0
16	-	200.0	200.0
17	-	200.0	200.0
18	-	200.0	200.0
19	-	200.0	200.0
20	-	200.0	200.0
21	-	200.0	200.0
22	-	200.0	200.0
23	-	200.0	200.0
24	-	200.0	200.0
25	-	200.0	200.0
26	-	200.0	200.0
27	-	200.0	200.0
28	-	200.0	200.0
29	-	200.0	200.0
30	-	200.0	200.0
TOTAL	4,484.0	5,564.3	10,048.3

1/ USAID costs calculated at $1 = D 2.3

ANNEX TABLE D 5: ESTIMATED ECONOMIC CASH FLOW OVER 30-YEAR LIFE

(000 Dalasis)

Year	Benefits Cereals	Benefits Groundnuts	Total Benefits	Total Costs	Net Cash Flow
1	0.0	0.0	0.0	1,014.0	1,014.0
2	0.1	0.1	0.2	945.6	945.4
3	0.3	0.6	0.9	167.5	966.6
4	0.7	1.8	2.5	664.6	662.1
5	1.3	3.3	4.6	690.0	685.4
6	4.5	7.5	12.0	340.0	328.0
7	7.7	8.9	16.6	347.0	330.4
8	10.9	10.3	21.2	354.0	332.8
9	14.1	11.7	25.8	361.0	335.2
10	17.3	13.2	30.5	365.0	334.5
11	103.3	15.3	118.6	200.0	81.4
12	189.3	280.6	469.9	200.0	269.9
13	275.3	546.7	822.0	200.0	622.0
14	361.3	812.7	1,174.0	200.0	974.0
15	447.3	1,217.1	1,664.4	200.0	1,464.4
16	533.3	1,621.4	2,154.7	200.0	1,954.7
17	619.3	2,025.8	2,645.1	200.0	2,445.1
18	705.3	2,430.2	3,135.5	200.0	2,935.5
19	791.3	2,834.5	3,625.8	200.0	3,425.8
20	877.3	3,238.9	4,116.2	200.0	3,916.3
21	971.0	3,544.1	4,515.1	200.0	4,315.1
22	1,064.7	3,849.4	4,914.1	200.0	4,714.1
23	1,158.4	4,154.7	5,313.1	200.0	5,113.1
24	1,252.0	4,459.9	5,711.9	200.0	5,511.9
25	1,345.7	4,766.1	6,111.8	200.0	5,911.8
26	1,439.4	5,070.3	6,509.7	200.0	6,309.7
27	1,533.1	5,375.6	6,908.7	200.0	6,708.7
28	1,626.8	5,680.8	7,307.6	200.0	7,107.6
29	1,720.5	5,986.1	7,706.6	200.0	7,506.6
30	1,814.2	6,291.3	8,105.5	200.0	7,905.5

To test the sensitivity of the basic analytic parameters to potential measurement errors several sensitivity tests were undertaken. These tests include:

- Test 1 All benefits attributed to "production gains" were eliminated (both cereals and groundnuts). The program is required to stand only on the benefits derived from "losses" foregone", due basically to structural improvement of soils.

- Test 2 Both the "production gains" and approximately 50% of the "losses foregone" were eliminated. The program is required to indicate feasibility with only a minimum of soil erosion prevention.

- Test 3 Costs are increased by 20% and benefits remain unchanged.

- Test 4 Costs are increased by 20% and "production gains" are eliminated (Test 1).

- Test 5 Costs are increased by 20% and "production gains" and 50% of "losses foregone" are eliminated (Test 2).

The results of these various analyses follow and indicate a remarkable lack of sensitivity to important alterations on both the cost and benefit sides of the equation. It would appear conclusive therefore, that in all but the most pessimistic conjuncture of events, the project remains economically feasible.

Analysis	I.R.R.	Net Present Worth at 10%
Basic analysis	14.8%	5,098.0
Test 1	10.0%	- 89.9
Test 2	5.3%	-2,683.8
Test 3	14.0%	4,042.4
Test 4	9.2%	-1,145.5
Test 5	4.4%	-3,939.4

Finally, it should not be forgotten that the SWMU, as conceived in this paper, is conceived to make further significant positive contributions to the natural environment, including better utilization of irrigable areas, range management, reforestation, river bank and wind erosion. These interventions, if properly conceived and implemented, could lead to additional benefits of considerable magnitude and of very real importance to the Gambian economy.

LAND USE PATTERNS

The Land Resources Division of the British Ministry of Overseas Development (ODM) undertook a broad agricultural, environmental and socioeconomic analysis of The Gambia in the years 1972-75. One of the significant findings of that study was an estimate of the suitability of Gambian soils for agriculture, by administrative division within the country, as well as current patterns of land use by soil suitability group.

The results are indicated below:

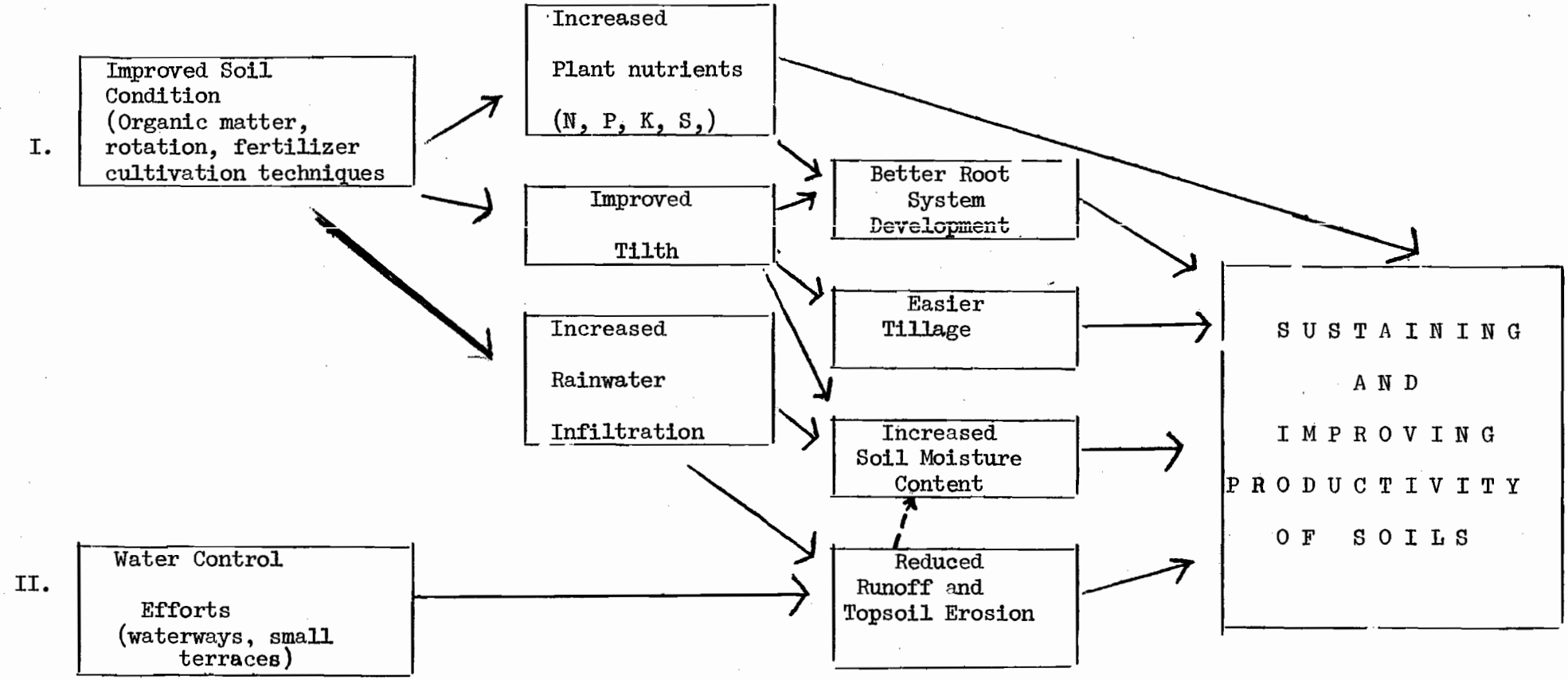
Soil Suitability to Agricultural Development by Geographical Region

(acres)

Soil Group	Western	Lower River	North Bank	MacCarthy Island N	MacCarthy Island S	Upper River N	Upper River S	TOTA
1. Unsuitable	79 025	197 175	202 155	129 690	97 330	85 690	89 440	877 49 (34%)
2. Marginal	62 635	45 035	36 545	37 705	40 305	33 890	17 890	311 66 (12%)
3. Suitable w/qualifications	96 660	53 605	75 935	21 450	58 465	27 805	30 340	366 64 (14%)
4. Suitable	193 580	84 225	231 475	100 670	83 670	38 240	76 055	806 39 (32%)
5. Suitable & Irrigable	0	0	0	37 225	71 455	36 595	50 880	200 41 (8%)

Percentage Land Use by Soil Suitability Group

Soil Group	Cultivated	Fallow	Uncultivated	Non-agricultural	TOTAL
1. Unsuitable	2%	17%	78%	3%	100%
2. Marginal	4%	31%	64%	1%	100%
3. Suitable w/ qualifications	18%	47%	33%	2%	100%
4. Suitable	22%	53%	22%	3%	100%
5. Suitable & irrigable	7%	15%	77%	1%	100%



DIAGRAMMATIC OUTLINE OF QUANTITATIVE BENEFITS EXPECTED TO FLOW FROM THE PROJECT

ANNEX FIGURE D 1

SOCIOLOGICAL BACKGROUND

ANNEX E

1. The Village

There are two discernible levels of jurisdiction in village government, lineage government and village government. The SWMU team should be familiar with the limits of each since it will determine the limits of the jurisdiction of the various elders with whom they will be dealing, especially in relation to the Alkali and with respect to questions involving land distribution.

a) Village Government

Village government has jurisdiction over all the things which we think of as public works, such as building and maintaining wells, mosques, communal grain stores, the public meeting place, public paths in the village and through the cultivated land around the village. Although compound families own the cultivated land, the heads of families in each village meet to determine when planting and harvesting should begin. Village government also undertakes a limited amount of policing of personal behavior, but only if the family to which a troublesome individual belongs cannot control him. They pass rules on the control of livestock and the location of new compounds and fences.

A village is made up of a number of compounds. Sometimes one can find a village where all the compounds have been founded by members of the same lineage, but not often. Usually villages are made up of compounds founded by different lineages. The lineage which settled in the village first is considered the founding family, and therefore the village's First Family. The eldest member of the senior branch of the founding family resident in the village is usually the village head, or Alkali. Families who come later seek permission to settle from the village head. They and their descendants are expected to respect the rights of the founding family and to keep the village head informed about what is happening in their compounds. The village head bears much the same relationship to all the compounds in his village as the compound head bears to members of his compound. Like the compound head, he is chief spokesman for his village when matters involving more than one village came up.

Affairs which come under village jurisdiction are handled by a village meeting. The right to attend the meeting and to speak depends upon the ethnic group, the area, and even local customs. Among Mandinkas, for example, only the adult male elders generally speak. If the subject of a meeting particularly concerns people who do not ordinarily attend, such as women, the elders of that group may be expcected to take part on that occasion. The main ones to speak in the meeting are the compound heads, of whom the village head is one, the first among equals. For example, if the people are thinking about building a new mosque, digging a well, or moving the village, a meeting will be called. The elders will meet, and the village head will open the discussion by stating the problem and calling for ideas and strategies. Each compound head who wishes to speak will state his opinion, and everyone is aware that he speaks on behalf of those in his own compound as well as for himself. There is no set order of speakers other than a tendency to defer to age. Others may be invited to venture their opinions, but the compound heads will have already spoken on behalf of most.

Most of the time the village elders have thoroughly discussed the matter with their families and with one another and have achieved a consensus before the village meeting is convened. The meeting is a formal presentation of all opinions, and a final stamp of approval on the agreement already reached. At other times, a village meeting might be called before a consensus has been reached to get all sides into the open. If a consensus is not achieved, the matter is dropped, either for good, or until further discussion brings general agreement. Otherwise, bitter quarrels could split the village.

Once a decision is reached, all are expected to support it, even if they opposed it earlier. Those who continue to voice opposition are condemned severly as troublemakers and face ostracism and even physical violence if they refuse to go along with the majority.

Once the elders reach a decision that involves labor, such as building a bridge, the younger men and women of the community are expected to organize themselves to do the work. The elders tell them what needs to be done, and the leaders of the age groups between 17 and 35 divide up the tasks, set days of work, and generally supervise themselves without help from the elders.

b) Lineage Government

i) Village Level

Lineage or family government has jurisdiction over everything concerned with the welfare of the Kabila: marriage, birth, death, divorce, circumcision, controlling the behavior of family members, and settling disputes. Lineages also control all cultivated land.

A large lineage cuts across several villages and even across national boundaries. However, the lineage in each village tends to operate as an independent sub-unit; only rarely do lineage matters in one village get referred to lineage elders residing elsewhere.

The eldest male member of a lineage resident in a village is referred to as the Kabila head. He generally speaks for and is consulted by other compound heads belonging to the same lineage on all matters concerning lineage government.

ii) Compound Level

The smallest unit of the village Kabila is the compound family. Generally the compound head is the eldest resident male member of the family which founded the compound. The compound is usually composed of the compound head, his wives and children, plus several other younger male relatives (often brothers) and their wives and children. Besides these there are often unattached younger men and women from other families or castes, slaves, farmers, traders, or others who have come to live and work with the family either permanently or temporarily. All members of the compound, whether they bear the same surname as the founding family or not, are treated like junior members of that lineage.

The compound head is the father of his extended compound family, the chief arbiter in any disputes within the compound, and the first to be consulted when a marriage, naming ceremony, or dispute arises within his compound, etc. He considers the opinions of other members of the compound, but his is the final word and people rarely go against him. His final decision, whether reached autocratically or after

considering people's views, is binding on the compound. If anyone goes against him publicly, it is regarded as public belittlement of his authority. At village meetings, he is the chief spokesman for the people of his compound. No one, not even the village head, has the right to interfere in the way he runs his compound unless they happen also to be senior members of his Kabila. Even elders of his lineage rarely dare to interfere unless the compound head is clearly abusing his authority or having some kind of trouble carrying out his responsibility. If a compound head is having difficulty on a family matter, he may invite the intervention of a respected elder in his lineage living in another town or area.

The land cleared by members of his compound belongs to his lineage and the compound head has sole jurisdiction over it. He parcels it out for the use of people living in the compound and lends out what the compound cannot use. No other elder of his lineage has any control over that land.

Normally all the land cleared by the people of the compound "belongs" to the compound head, who is responsible for distributing it for use of compound members. The bulk of the cultivated land is "his", i.e., used for the whole compound. Traditionally, Gambian farmers worked five days a week from morning until mid-afternoon for the compound head and two days a week in their own fields. Young men who were about to get married were granted an extra day to work for themselves, so that only four days a week are then alloted to the compound head.

When the farming season comes, the first crops planted are millet and rice for the compound. The people then move to plant the compound head's private farm, then to their own. Work on the compound food crops is done on days allotted to the compound head.

Income from the private fields and gardens normally belongs to the respective nuclear families, but most of the income from the compound head's fields goes to compound expenses. Ideally, young men not seeking wives keep only enough to buy a few clothes and other small things, turning the rest of their money or produce over to the compound head. This is added to the family food store or invested in cattle, sheep, and

goats, which can multiply and be converted into cash in time of need. When their turn comes to get married, young men expect their compound head to look for wives for them and pay the expenses connected with marriage.

The compound head has many duties in addition to finding spouses for the young people of his compound and paying their marriage expenses. All affairs relating to that compound are his responsibility. He is the head and father of his whole compound family. All the food grown on his farms and all the money made from the sale of cash crops grown on his fields goes for compound necessities as well as for the needs of his own nuclear family. When there is a shortage of food, he spends money to buy more. If any of the family gets into trouble with the administration, it is he who pays the fine. It is not uncommon for him to provide clothes for the entire compound on special feast days or buy mosquito nets for those who have none. His primary responsibility is to assure that all members of the compound family work together smoothly and peacefully as a unit. Regardless of their blood relationship to him, it is his duty to treat them all as if they were members of his own lineage.

2. Class Structure

There are three main classes or "castes" in traditional Gambian society: Freeborn (Forolu), Artisans (Nyamalolu), and Slaves (Jongolu). At the top of the Freeborn class are the Nobles, who can also be defined as a fourth and separate class. They were rulers and warriors. Also included among the Freeborn are the traders, muslim scholarly families, and ordinary free farmers.

The Artisan class among the Mandinka consists of smiths, leather workers and griots. The smith women make pottery. The Wolofs include weavers among the artisans. Artisans are of low status, and though they were not slaves, they are not thought of as being "free" either. Each artisan family is attached to a freeborn family in a patron-client relationship.

The slaves were the bottom rung of society. Slavery no longer exists in The Gambia, but people in the rural areas are very conscious of family origins. The slave families possessed status according to the

status of the family which owned them; even slaves owned slaves. At the top of the slave class were the "mansajongs" or "king's slaves", who were the corporate property of the ruling family of a traditional state, responsible only to the ruler himself. They were not domestic slaves at all, but had a combined function rather like that of a class of hereditary crown servants and an elite military cadre.

On the village level, the founding family of a town could belong to any of these classes or sub-classes, although it is most likely to be from the Freeborn class. Although they are given all due respect, having founders status does not change their class.

The population of a village is usually of mixed social origins, although one can often find villages inhabilted by people of only one class. In the mixed villages especially, the people are all very aware of one another's origins.

3. Age

Knowing the traditional Gambian's attitude towards age is an important asset in helping an outsider operate effectively in a village setting.

Each family is arranged in a smoothly ascending hierarchy according to age, from the youngest baby to the oldest elder. Advancement to positions of respect and authority is automatic and natural. Family headship goes to the eldest male member of that family. For example, the eldest member of the village founding family becomes Alkali. He is succeeded by his next youngest brother (full-, half-, or paternal cousin); when their generation is finished, the next generation takes over. Children are taught to respect and obey their older brothers and sisters as well as all grown people. Adults will listen respectfully to those older than themselves, regardless of their class. Those who are younger may be asked to do little services for those who are older.

The SWMU team will encounter this system in operation in the Village Council. The Alkali and each of the compound heads and other elders hold their posistions by right of seniority. When they speak, they

tend to speak by order of age.

There is room in the system for mature younger men of all classes who have gained a reputation for common sense, intelligence, eloquence and education. Prominent among these exceptions are men educated either in the Arabic or European tradition. Elders listen to them and give full weight to their views as long as they continue to respect those older than themselves. The SWMU team will probably be viewed by the Elders as belonging to this latter category.

Most of the jobs involved in village projects are divided up according to age and sex. Both males and females have a system of matching age grades. The old men's age grade (Mandinka: "Kebba Kafo") includes men in their late 40's and upwards, although one does not usually begin to acquire the responsibilities of an elder until his fifties. These are responsible for the policy making and rule making in the village.

The young men's age grade (Mandinka: "Kambane Kafo") includes men from about 17 to 40, and is rather like the Kebba Kafo's executive arm. They devise work strategies and do the actual physical labor to complete projects decided on by the Kebba Kafo. The women have similar arrangements of older women and younger women.

The Mandinkas have broken these grades down into smaller age sets of about 3 to 5 years spread. The key work group in a Mandinka village is the 17 to 22-year-old men and the 15 to 18-year-old women. They are the first called on to do the heavy and hard jobs. If there are not enough of them to go around, the next older sets of men and women join in. These young people also hire themselves out as a group to individual farmers for reasonable fees in order to raise money for their own social activities, for they are also the most active social set in the village. They have their own communal farms for the same reason. They and all their activities are the community's pride and joy, and they are the ones whose labor may be drawn on to accomplish village soil and water projects. Kafo labor should not be counted on exclusively, however, for rural villages are suffering a serious drain of labor as members of this group go away to school or travel to other villages to work as "strange farmers". Therefore, the Unit may find that

any labor-intensive solutions to soil and water problems may be difficult, especially in very small villages.

4. Role of Women

In the village men and women have always played separate economic, social and political roles. Since men clearly take first and senior place in this arrangement, it has been assumed by outsiders and even by many Gambians themselves that development plans will therefore involve mainly men and that the female role is minor since it is secondary.

Planners even may be somewhat reluctant to broach the subject of female participation in projects for fear of offending the elders, whose cooperation is unquestionably essential. But the elders are quite familiar with the concept that affairs affecting all must have the participation of all.

Male and female roles are not seen as overlapping or competitive. Each sex has its clearly outlined duties and spheres of influence; a member of one sex impinges on the other's territory at the peril of derision and sometimes even ostracism. No important function affecting both sexes can take place in a village or be complete unless both men and women participate in it. Each sex has to perform its separate duties in order for the whole affair to succeed. For example, in the social sphere, when a baby is named, both men and women gather to welcome it. Similarly, the formalities of a marriage contract are primarily a male affair involving only the men of the two lineages concerned, while the transfer of the bride to her husband is primarily a female affair.

This separation of roles extends into life as well. For the majority of Gambians, the traditional staple food crop is millet and its varieties. This is a man's crop. It is grown in wooded and brushy upland areas that often take a lot of labor to clear. Women grow the food crops which do not usually need a lot of clearing, i.e., rice and gardening. Rice growing, hard as it is, is done on relatively level and open fields and can be ploughed and worked without the help of men.

Only among the Jolas have both men and women always participated in rice growing. Each sex has its particular job -- men do the heavier work such as plowing

ditching, and diking while women do the lighter tasks, such as transplanting, weeding and harvesting. Women grow gardens within the compound itself and on land near the village.

With the introduction of cash cropping, millet has had to vie with groundnuts for the men's attention. As a consequence, in the rice growing areas of The Gambia, a heavier dependence has been placed on women to provide a bigger share of the family food.

5. Land Tenure and Allocation in the Village

Outside of Banjul and Combo-St. Mary, land is not registered or titled and tenure conferred. The land is held in trust by the district Chief and District Council and customary tenure rights are upheld by a 1966 law. According to customary law, land cannot be sold, rented, mortgaged or pledged for loans.

The first family to move into an unoccupied piece of land, settle, and start farming are the "owners" of the land around the village. In other words, the founding family of a village and the Alkali, who is its eldest representative, are the "owners" of an area of land that is identifiable by community custom. The boundaries are not officially marked or represented.

All other families who arrive later apply for permission from the Alkali to settle, and ask him to designate land that they may clear and farm. Therefore the Alkali is the first individual to contact on any matters relating to the use of village land as a whole. However, his authority to direct the use or cultivating practice on land is limited to the land used by the people in his own compound. The other compound heads to whom he has allocated land have sole right to redistribute it and allocate its use to anybody they please. Moreover, if there is virgin land available that has not been claimed by the village, the compound that clears this land has sole ownership of it, free of even the theoretical control by the Alkali, in order to initiate a project involving village land.

The compound head supervises the clearing of all land for the compound, and distributes plots to various members on the basis of need. He keeps back

sufficient land to grow food for the whole compound that is farmed communally on days set aside for service to him. His is the sole right over land allocation, and he may reallocate freely as the need arises. If the compound has more land than it needs, he may loan the excess to any other compounds in the village or to outsiders who ask to borrow it.

There is no "rent" charge for the ordinary borrower, only nominal exchange of kola nuts and a verbal agreement. The loan is on a year-to-year basis, and can be recalled when the compound needs it, with a year's notice being customary.

Rice land, though farmed by women, is also owned by and distributed through the compound. Most women acquire the use of rice land through their husband's right to it when they marry and come to live in his compound.

Compound heads can also turn excess land to good use and gain additional labor for the compound food crops by loaning land to "strange farmers" in return for a two or three days' labor each week on the compound fields. The strange farmer receives free food, lodging, tools and keeps the product of his own fields, although he may give a "present" to the compound head in the form of bags of groundnuts to repay seed and hospitality.

When the compound head dies, the stewardship of compound land passes intact to his successor, preventing fragmentation of the compound land.

There is no particular feeling of spiritual duty to retain the fertility of the land for the use of subsequent generations or of having received it as a "sacred trust" from their ancestors. The typical Gambian farmers' concerns for the retention of fertility and productivity do not extend much further than the immediately foreseeable future. In this aspect he is rather similar to an American farmer. The most effective appeals for his cooperation will have to be based on prospects for concrete, practical, visible and immediate benefits.

6. Communicating with the Village

a) Initial Approach

No one can expect to accomplish anything important that requires the cooperation of a traditional village unless he goes through the Alkali and the village elders. They must clearly understand what is wanted of them and of the villagers, and they must be convinced that a project is worth undertaking before they will give their full cooperation. Once they understand and are convinced of the soundness of the thing proposed, it is almost certain that the whole village will actively participate to the best of its ability.

It is also almost certain that the success or failure of any proposed project for any village will hinge on the success or failure of the first meeting. The first few minutes of this contact are the most important and can make or break the meeting. It therefore behooves any expatriate negotiator to have a sound grasp of the basic steps involved in communicating with the village elders at this crucial beginning.

The form taken by the village meeting is a simple structure for the transmission of complex ideas. If a stranger introduces an unfamiliar element into the village procedings, he runs the risk of confusing people about the real purpose of his visit by preventing them from grasping his main points fully. He may even offend them or give them the impression that he is not very serious. There are acceptable variables in any formal social or political procedure, but the stranger, like the person learning a new language, is better off making sure he knows how to operate first according to the rules; he can then start experimenting with variables. In initial contacts, the established rules should be closely observed.

The following procedures for meeting and talking to village elders for the first time are almost universally observed in Gambian villages, regardless of tribe. If visitors follow suitable basic procedures, the elders will keep the situation under control, and events should fall into place.

Before the SWMU team even starts for the village, they should decide who is leader and spokesman among themselves. He should do almost all the talking.

This is the way the Gambians do it, and it is an excellent device for introducing clarity into the discussion and for keeping things going in a straight line. They should also understand and make sure the AA understands that he is the main spokesman for the group. He should be thoroughly briefed beforehand about what the group hopes to accomplish. They should agree beforehand on what each person is going to say. It is essential that the villagers should see the visitors as coming to them through the AA, who is the man in charge of agriculture in that district. Therefore the AA should play a leading role.

When the team arrives in the village, they should go straight to the Alkali's compound and present themselves to him, or, in his absence, to his legitimate successor and spokesman. The AA should state that they have come to talk with the Alkali and the elders, and briefly explain the aim of the mission, finishing with a request for an audience. To trigger off the right chain of responses and actions, this preliminary visit to the Alkali must be made immediately. The party should not allow themselves to be diverted, even for a few minutes, from the immediate accomplishment of this mission. There will be plenty of time later to talk to people, look around, ask questions, take pictures, or do anything else that is incidental to the main goal. To do anything else will merely confuse people about what the visitors want, and may even cast doubts about their seriousness.

As soon as the visitors are seated with the Alkali, the AA may begin to outline some of the things the visitors want, for the Alkali's information only. The Alkali may listen, but he will probably ask that the visitors wait to begin the discussion until a sufficient number of elders have arrived. If he makes this request, the visitors should sit quietly during this interval, observing, talking quietly among themselves, or chatting with the elders who are already present and who may politely engage them in casual conversation through the interpreter. No business should be brought up. The atmosphere conveyed by the group should be quiet, friendly but not jovial, relaxed and unhurried. Traditional villagers set a very high value on quiet, formal behavior between responsible people who do not know one another very well.

The wait is not usually long. Almost as soon as the car arrives, the elders will automatically

begin turning up at the Alkali's place, since a car usually means official business, and official business is their business. However, some people may be in the field or further away or may have to be notified. This is a very good time for the group to orient itself, and the AA might even be able to identify certain people by name and indicate their relative position and status in the village.

As soon as sufficient people have arrived, the Alkali will say that things can begin. He will announce the arrival of the group, and state briefly what they have come for. If he has been given a preliminary outline of the purpose, he may choose to summarize that as well; but it is more likely that he will ask the AA to do so. The AA should state what the visitors plan to do, why, how the villagers are involved, and exactly what they are expected to do. Addressing the Alkali the AA can then introduce the visitors, and let them explain in more detail what their role will be. When they have finished, the AA should summarize what has been said.

At this point, the Alkali will probably choose to answer, but if he thinks someone else in the group knows more about the subject at hand than he does, he may designate that person as spokesman. He may choose to open the floor to discussion, asking the others to give their opinion. It would be well to observe the sequence of speakers, and to ask the AA as soon as is possible after the meeting who they are, for this is often a cue to the power structure and relationships within the village. Open discussion generally procedes by seniority, but prestige and a local reputation for knowledge and good sense and eloquence also count very highly.

Once all points have been clarified to everyone's satisfaction, and the situation finally summarized by the AA and the Alkali, the Alkali will close off discussion. If an excursion to the fields or elsewhere has been requested, a time will be arranged for that, usually immediately.

As soon as the visitors have accomplished the main object of their visit, the AA should give formal thanks for the elder's time and attention on behalf of his party, and state briefly what the group's schedule is, mentioning again any plans that have been made with the

elders about when they plan to be back. The Alkali or his spokesman will then respond, on behalf of the elders, repeating what the elders have agreed to do. If the party has been to the field between the first meeting and the final closing, they may wait until they get back to the village and to the original meetingplace in order to do this, unless they need to leave directly from the field for some urgent reason. After the meeting has broken up, the visitors are free to go, or they may then state any desire to look around or take pictures, etc. These sorts of requests should be made outside of and after the meeting unless they are directly related to the main purpose of the visit. But if the party plans to remain in the village for a little while, they should call back to the Alkali's compound on their way out to tell him they are going.

The procedures outlined above are not difficult. At any point, if the group spokesman is not sure about the protocol of a certain move, he can check with the AA, who will almost certainly know. The AA is a valuable resource of information for both the visitors and the villagers. An experienced AA will take charge of nearly everything. But it is essential for the visiting experts to arm themselves with as much knowledge of village social and political procedures as they can before going to the village, particularly if the AA is young or inexperienced and appears to be overawed by them. Unless the inexperienced AA is given a fairly specific directive to take the lead and even to coach the SWMU team on specific points, he may be reluctant to guide or correct people so much his senior in age and status. Therefore the visitors must know what the AA's role should be, and be ready to help an inexperienced AA learn his role, even while they are in the process of finding their own. They need to take the AA into their confidence, and make him a part of their team. They have to let him know exactly what they expect him to do and why it is so important to the success of the project. The AA must know at least as much about the plan as the people he is working with. If he knows what his inputs are to be he will feel less reluctance to speak out. But, like the village elders, he has to know exactly what is expected of him before he can be of maximum assistance.

b) Later Approaches

Once the first, most difficult, approach

has been made and the elder's cooperation has been promised, subsequent visits should be easier. The first few visits after the preliminary meeting are likely to take very much the same form and to proceed at more or less the same pace as the first one, in order to agree on exactly what must be done. Once all the agreements are made between the team and the elders, and once the specific jobs related to the project have started in the village, the formal meetings will be dispensed with. Each time the team, or any member of it, arrives in the village to do a specific job subsequently, he should call briefly by the Alkali's place to let him know that he has come and what he plans to do that day, but it is quite informal and need not take long. Any desire by any elder to accompany him on his rounds to see what is going on should be encouraged and welcomed. He should see the Alkali again upon his departure and indicate approximately when he expects to be back.

The precise point at which the need for formal meetings ceases will become clear in the process of negotiations. Both the Alkali and the AA will know, and even may say so, and the team themselves will sense it. Things evolve at their own pace. If the team members wait quietly and watchfully, learning all they can about procedures and relationships from the AA, they will find this to be a very useful time. The signals come through more clearly and their meaning is easier to decipher if one is in a relaxed, receptive frame of mind.

The SWMU team will probably feel under some pressure by the knowledge that they are scheduled to cover a set number of villages organized within a certain number of years; American planners and administrators tend to set themselves arbitrary quotas to be fulfilled within a certain timeframe. Although such goals look good in a project planning document and may be useful as a general guide, the team must bear in mind that the Gambian village structure and the farmers themselves are not goal/deadline oriented, and will not become so in the foreseeable future.

References to Annex on Sociological Background

1. Macluonidi Dissou - "Regional Planning and Integrated Development in the Rural African Environment", in: African Environment: Problems and Perspectives, Special Report 1. Ed. Paul Richards, London: IAI, 1975, pp. 73-88

2. Dunsmore, Rains, Lowe, et.al. - The Agricultural Development of The Gambia: an Agricultural, Environmental and Socioeconomic Analysis. Land Resource Study 22, Surrey, England: Land Resources Division, Ministry of Overseas Development, 1976

3. Winifred Galloway - "Traditional Social and Political Structures" in The Gambia, a Teacher's Handbook, Vol. I, Nairobi: African Social Studies Program, 1976.

4. Philip Langley - "The Ethnolinguistic Approach to the Rural Environment: Its Usefulness in Rural Planning in Africa, in African Environment: Problems and Perspectives Special Report 1, Ed. Paul Richards, London: International African Institute, 1975, pp. 89-101

5. Paul Richards - "Alternative Strategies for the African Environment", in: African Environment Problems and Perspectives, Special Report 1, Ed. Paul Richards. London IAI, 1975, pp. 102-117.

6. **Bakary**, Sidibe and Winifred Galloway - "Senegambian Traditional Families", Occasional Papers, of The Gambia Cultural Archives (Banjul) No. 1, July 1975

7. **Bakary**, Sidibe and Winifred Galloway - "Women in Traditional Senegambian Society - Past, Present and Future". Occasional Papers of The Gambia Cultural Archives (Banjul) No. 1, July 1975

8. Peter Weil - Mandinka Mansaya: The Role of the Mandinka in the Political System of The Gambia. PhD Thesis: University of Oregon, 1968

THE REPUBLIC OF THE GAMBIA

ANNEX F

Ministry of Agriculture,&
Natural Resources,
The Quadrangle,
Banjul, The Gambia.

Ref: MA/3854/(153)

30th May, 1977.

Sir,

SOIL AND WATER MANAGEMENT UNIT

Following the discussions we had in my office on the above mentioned subject, I am now formally applying for assistance from the US AID to help the Government of The Gambia in the establishment of a Soil and Water Management Unit within the Ministry of Agriculture and Natural Resources.

As you may know, the Gambia's only significant natural resource is its non-renewable agricultural land which provides work directly or indirectly for 85% of the people of this country. As such this natural resource , which is vital to the people of The Gambia, should be rationally exploited to ensure that this resource base does not deteriorate to the point where it becomes irreversably destroyed. This of course calls for programmes aimed at arresting and reversing the progressive deterioration of this resource base. The Gambia Government is determined to develop a sound and comprehensive programme in soil and water management to serve as an essential underpinning to the several interrelated programmes for improving the lot of the rural population through increased agricultural production. However, due to the Gambia's limited financial and manpower resources, long-term assistance in the establishment of this unit will be required from other sources. We have already intimated to the US AID, our desire to be assisted in this area and the USAID have responded promptly our request by conducting a review of our request for assistance in the establishment of a soil and water management unit. Now that the review is completed, the Gambian Government is anxious to establish this unit. It would, therefore, be highly appreciated if our application for assistance from the USAID could be processed as quickly as possible to enable us to establish the unit in the shortest possible time.

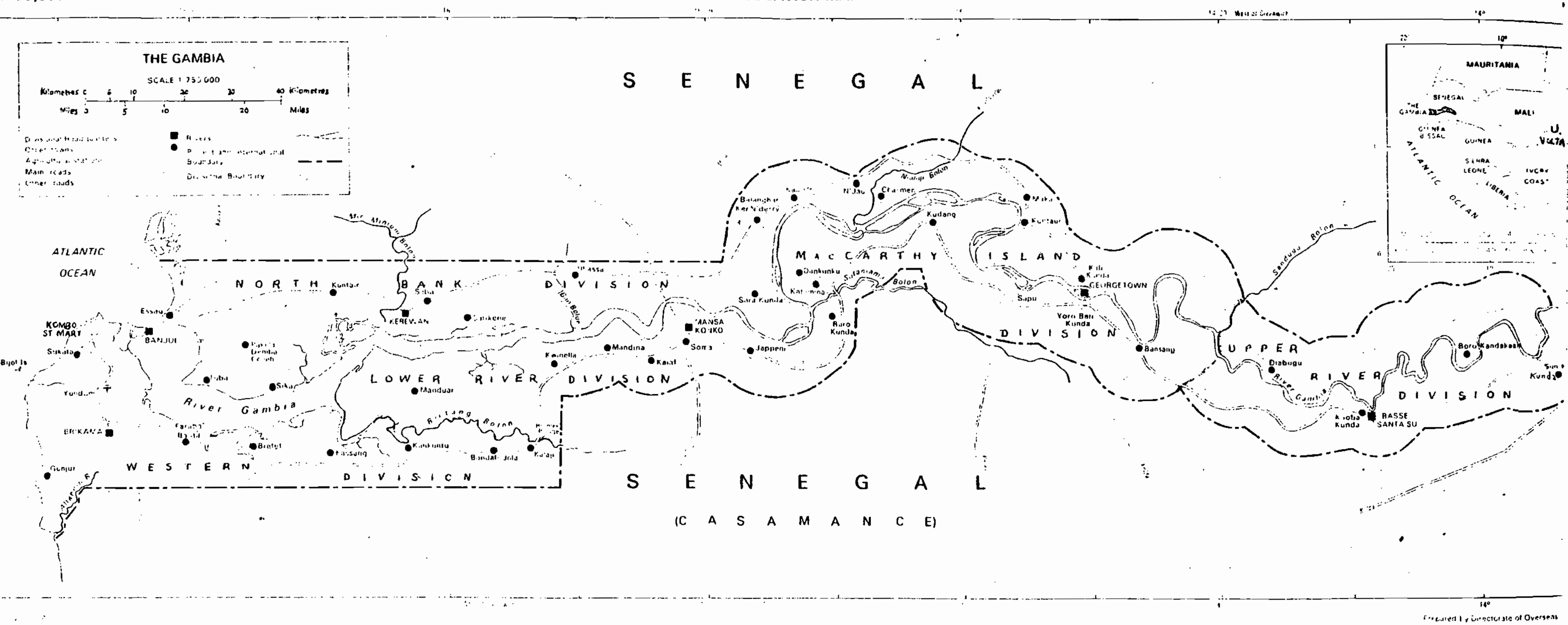
I am also forwarding under cover of this letter quite a large number of drawings for Government's Senior Staff Quarters, giving you a wide range of choice, for your study. In all, I am forwarding seven copies of drawings numbered as follows:-

Drawing No - 2724
" " - 2470/13
" " - 2507/2
" " - 2826

BEST AVAILABLE COPY

ANNEX G

:750,000 LOCATION MAP



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6C(1) - COUNTRY CHECKLIST

Listed below are, first, statutory criteria applicable generally to FAA funds, and then criteria applicable to individual fund sources: Development Assistance and Security Supporting Assistance funds.

A. GENERAL CRITERIA FOR COUNTRY

1. FAA Sec. 116. Can it be demonstrated that contemplated assistance will directly benefit the needy? If not, has the Department of State determined that this government has engaged in consistent pattern of gross violations of internationally recognized human rights?	Yes
2. FAA Sec. 481. Has it been determined that the government of recipient country has failed to take adequate steps to prevent narcotics drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. Government personnel or their dependents, or from entering the U.S. unlawfully?	No
3. FAA Sec. 620(a). Does recipient country furnish assistance to Cuba or fail to take appropriate steps to prevent ships or aircraft under its flag from carrying cargoes to or from Cuba?	No. The Gambia has no aircraft or international cargo ships under it's flag.
4. FAA Sec. 620(b). If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement?	Yes. The Gambia has a democratically elected form of government.
5. FAA Sec. 620(c). If assistance is to government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) debt is not denied or contested by such government?	No
6. FAA Sec. 620(e) (1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities?	No. Never

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7. FAA Sec. 620(f); App. Sec. 108. Is recipient country a Communist country? Will assistance be provided to the Democratic Republic of Vietnam (North Vietnam), South Vietnam, Cambodia or Laos?	No. No assistance will be provided to the countries listed.
8. FAA Sec. 620(i). Is recipient country in any way involved in (a) subversion of, or military aggression against, the United States or any country receiving U.S. assistance, or (b) the planning of such subversion or aggression?	No. The Gambia has no military forces.
9. FAA Sec. 620(j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction, by mob action, of U.S. property?	No.
10. FAA Sec. 620(l). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, inconvertibility or confiscation, has the AID Administrator within the past year considered denying assistance to such government for this reason?	No.
11. FAA Sec. 620(o); Fishermen's Protective Act, Sec. 5. If country has seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters,	
a. has any deduction required by Fishermen's Protective Act been made?	No. No seizure, sanctions or penalty has ever been imposed against U.S. fishing activities within international waters.
b. has complete denial of assistance been considered by AID Administrator?	No. ~~Never~~
12. FAA Sec. 620(q); App. Sec. 504. (a) Is the government of the recipient country in default on interest or principal of any AID loan to the country? (b) Is country in default exceeding one year on interest or principal on U.S. loan under program for which App. Act appropriates funds, unless debt was earlier disputed, or appropriate steps taken to cure default?	No. No AID loan has ever been made to The Gambia.
13. FAA Sec. 620(s). What percentage of country budget is for military expenditures? How much of foreign exchange resources spent on military equipment? How much spent for the purchase of sophisticated weapons systems? (Consideration of these points is to be coordinated with the Bureau for Program and Policy Coordination, Regional Coordinators and Military Assistance Staff (PPC/RC).)	None. The Gambia has no military forces.

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14. FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?

No. Never

15. FAA Sec. 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget?

UN obligation's are in arrears for part of 1975 and all of 1976, and 1977. Howevever Gambia advanced the UN $300,000 in 1977 to cover funding shortfalls. Arrearages will be paid from this advance.

16. FAA Sec. 620A. Has the country granted sanctuary from prosecution to any individual or group which has committed an act of international terrorism?

No. Never.

17. FAA Sec. 666. Does the country object, on basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. there to carry out economic development program under FAA?

No.

18. FAA Sec. 669. Has the country delivered or received nuclear reprocessing or enrichment equipment, materials or technology, without specified arrangements on safeguards, etc.?

No. The Gambia has no nuclear processing or enrichment capabilities.

19. FAA Sec. 901. Has the country denied its citizens the right or opportunity to emigrate?

No.

B. FUNDING CRITERIA FOR COUNTRY

1. Development Assistance Country Criteria

a. FAA Sec. 102(c), (d). Have criteria been established, and taken into account, to assess commitment and progress of country in effectively involving the poor in development, on such indexes as: (1) small-farm labor intensive agriculture, (2) reduced infant mortality, (3) population growth, (4) equality of income distribution, and (5) unemployment.

Yes. The GOTG 1975-80 Five Year Development Plan, emphasizes agricultural development, redress of the urban-rural income imbalance and rural development. Budget resources, manpower-development, credit inputs are directed towards improving incomes for 85% of the rural population. Health, infant mortality, family planning are all receiving major emphasis under these priorities.

b. FAA Sec. 201(b)(5), (7) & (8); Sec. 208; 211(a)(4), (7). Describe extent to which country is:

(1) Making appropriate efforts to increase food production and improve means for food storage and distribution.

The GOTG's national goal is to achieve food self-sufficiency by 1980. Programs for improved cereal grains, livestock production disease control, rangeland improvements are receiving major emphasis. Food distribution and storage are also an integral part.

(2) Creating a favorable climate for foreign and domestic private enterprise and investment.

The GOTG encourages both domestic and foreign private enterprise and investment through tariff concession, positive tax structures, concessionary loans and profit repatriation.

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(3) Increasing the public's role in the developmental process.

(4) (a) Allocating available budgetary resources to development.

(b) Diverting such resources for unnecessary military expenditure and intervention in affairs of other free and independent nations.

(5) Making economic, social, and political reforms such as tax collection improvements and changes in land tenure arrangements, and making progress toward respect for the rule of law, freedom of expression and of the press, and recognizing the importance of individual freedom, initiative, and private enterprise.

(6) Otherwise responding to the vital economic, political, and social concerns of its people, and demonstrating a clear determination to take effective self-help measures.

c. FAA Sec. 201(b), 211(a). Is the country among the 20 countries in which development assistance loans may be made in this fiscal year, or among the 40 in which development assistance grants (other than for self-help projects) may be made?

d. FAA Sec. 115. Will country be furnished, in same fiscal year, either security supporting assistance, or Middle East peace funds? If so, is assistance for population programs, humanitarian aid through international organizations, or regional programs?

2. Security Supporting Assistance Country Criteria

a. FAA Sec. 502B. Has the country engaged in a consistent pattern of gross violations of internationally recognized human rights? Is program in accordance with policy of this Section?

b. FAA Sec. 531. Is the Assistance to be furnished to a friendly country, organization, or body eligible to receive assistance?

c. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made?

One of the fundamental themes of the development plan is self-reliance, and involvement of the public in the development process.

4. (a) The GOTG has budgeted 35% of its resources over the next 5 years in agriculture and animal health, forestry, fisheries, mineral resources, education and health.

(b) There are no military forces in The Gambia and it has good relations with other nations.

5. The Gambia is democratic in all respects. It's land tenure system is equitable in that all persons have access to land that ask for it. The Gambia is expressly committed to redress urban-rural disparities and is directing its resources to improving the quality of life for the rural population. Politically The Gambia is a multi-party system that encourages participation in the political process. Individual freedom and freedom of the press are fundamental rights of the country's citizens.

6. The Gambia, since independence in 1967 has dedicated itself to the betterment of its citizens lives through government policies and actions that permit the fullest participation of the people in governing processes. Fullfillment of these principles ~~is~~ are predicated on self-help through rural development and budgetary resources.

c. yes.

d. No.

2. (a) N/A
(b) N/A
(c) N/A

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