UNCLASSIFIED

DEPARTMENT OF STATE

AGENCY FOR INTERNATIONAL DEVELOPMENT

WASHINGTON, D.C. 20523

635-0219

GAMBIA AGRICULTURAL RESEARCH AND DIVERSIFICATION PROJECT

PROJECT PAPER

Approved

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AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE: A (A = Add, C = Change, D = Delete) — Amendment Number: ____ — DOCUMENT CODE: 3

COUNTRY/ENTITY: THE GAMBIA

3. PROJECT NUMBER: 635-0219

4. BUREAU/OFFICE: AFRICA — 06

5. PROJECT TITLE (maximum 40 characters): GAMBIA AG. RESEARCH AND DIVERSIFICATION

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 09 DD 30 YY 92

7. ESTIMATED DATE OF OBLIGATION (Under 'B.' below, enter 1, 2, 3, or 4)
A. Initial FY 85 B. Quarter 3 C. Final FY 89

8. COSTS ($000 OR EQUIVALENT $1 =)

A. FUNDING SOURCE	FIRST FY B. FX	C. L/C	D. Total	LIFE OF PROJECT E. FX	F. L/C	G. Total
AID Appropriated Total						
(Grant)	(3,000)	(960)	(3,960)	(16,085)	(1,615)	(17,700)
(Loan)	( )	( )	( )	( )	( )	( )
Other U.S. 1.						
Other U.S. 2.						
Host Country				0	1,542	1,542
Other Donor(s)						
TOTALS	3,000	960	3,960	16,085	3,157	19,942

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	2. Loan	D. OBLIGATIONS TO DATE 1. Grant	2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	2. Loan	F. LIFE OF PROJECT 1. Grant	2. Loan
(1) SDP	101	080		0	0	17,700	–	17,700	
(2)									
(3)									
(4)									
TOTALS								17,700	

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each): 029, 012, 053, 076, 071, 073

11. SECONDARY PURPOSE CODE: 111

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code	BWS	R/AG	978	PVOU	TNG		
B. Amount	17,700	16,000	NA	200	1,500		

13. PROJECT PURPOSE (maximum 480 characters)

To test, generate, adapt, and promote the adoption of improved crop and livestock technologies that meet farmers' needs and expand and diversify Gambia's agricultural economy.

14. SCHEDULED EVALUATIONS
Interim MM 11 YY 86 | MM 08 YY 88 | Final MM 06 YY 91

15. SOURCE/ORIGIN OF GOODS AND SERVICES
☐ 000 ☒ 941 ☐ Local ☐ Other (Specify) ____

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a ____ page PP Amendment.)

Michael R. Bradley
Controller

17. APPROVED BY
Signature: Byron Bahl
Title: AID Representative
Date Signed: MM 04 DD 02 YY 85

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION
MM DD YY

ACTION MEMORANDUM FOR THE ASSISTANT ADMINISTRATOR FOR AFRICA

FROM : AFR/PD/SWAP, Norman Cohen

SUBJECT: The Gambia Agricultural Research and Diversification Project (635-0219) - Project Authorization

I. Problem: You are requested to authorize a grant of Seventeen Million, Seven Hundred Thousand Dollars (17,700,000) from the appropriation under Section 121 Sahel Development Program (SDP) of the Foreign Assistance Act of 1961, as amended, to the Republic of The Gambia for the Agricultural Research and Diversification Project (GARD). It is planned that a total of Three Million, Nine Hundred and Sixty Thousand Dollars ($3,960,000) will be obligated in FY 1985.

II. Discussion:

A. Project Description:

The goal of the Project is to achieve food self reliance in The Gambia. The Project is designed to test, generate, adapt and promote the adoption of improved crop and livestock technologies that meet farmers' needs and expand and diversify The Gambia's agricultural economy. The project will be instrumental in increasing the production of food and cash crops which is the most essential element in achieving the Project's goal. It is planned that this initial seven year project will be the first phase of a long-term commitment by A.I.D. to improve agricultural research in The Gambia.

The Project's strategy is a two-pronged effort involving: (1) the long-term institutionalization of an effective, applied agricultural research system, and (2) the development, promotion, and adoption by farmers of improved agricultural technologies as early as possible.

The project consists of five distinct but mutually supportive components as follows:

(1) Establishment of an Agricultural Research Management System (ARMS) which will set agricultural research priorities in the light of farmers needs, researchers' recommendations, and GOTG policy objectives; and will enforce these priorities through procedures by which research programs will be designed, reviewed and funded.

(2) Provision of long and short-term training for Gambians in various agricultural disciplines and improvement of research support systems including selected infrastructural improvements which will complement investments planned by

other projects, notably IBRD's Agricultural Agricultural Development Project II (ADPII)

(3) Support to on-station, component research in crops, livestock, and agroforestry.

(4) Expansion of Farming Systems Research and Extension (FSR/E) activities which have already been successfully launched in the Eastern portion of the country and linking these activities to component research and extension programs in the context of ARMS.

(5) Design of and assistance to technology promotion activities for farmers at large, including training of field workers, monitoring and feedback of results and finance for specific pilot promotional efforts.

These mutually supportive components will develop the presently uncoordinated research efforts scattered among seven organizational entities into an adaptive research system. They will provide a continuous flow of innovations to public and private change agents and help them promote the adoption of these innovations by farmers.

B. Financial Summary:

The total cost of the project is estimated at $19,242,000, of which USAID will contribute $17,700,000 and the GOTG will contribute $1,542,000 equivalent, as summarized below.

	A.I.D.	GOTG	Total
		($ In Thousands)	
Technical Assistance	4,673		4,673
Training	3,581		3,581
Construction	110		110
Commodities	1,000		1,000
Local Operating Costs	1,146	981	2,127
U.S. Campus Support	598		598
Monitoring & Evaluation	250		250
Audit	100		100
Contingency	1,146	98	1,244
Inflation	2,552	463	3,015
Indirect Costs (university overhead)	2,544		2,544
Totals	17,700	1,542	19,242

C. Socio Economic, Technical, and Environmental Description:

The Project Paper's (PP's) analyses conclude the Project to be feasible from technical economic, administrative, social and environmental perspectives. In particular, the PP's Technical Analysis determined the detailed plans for research to be supported under the Project including research on several improved technologies appropriate for The Gambia are feasible. The Administrative Analysis reviewed the current institutional context for agricultural research and the plans for the improvement of the agricultural research management system (ARMS), which will be gradually implemented over a two to three year period. The Economic Analysis, employing conservative average yield increases, estimated that the project will yield a rate of return of 28 percent over 20 years. The Social Soundness Analysis concluded Project activities will benefit a broad spectrum of the population including farm families, researchers and extension workers and strong incentives to participate exist at all levels. The Africa Bureau's environmental officer has granted a "categorical exclusion" for the Project. The IEE is included in Attachment I of the Project Paper.

D. Implementation Plan, Conditions & Covenants

The Implementation Plan provides a realistic timetable for carrying out project activities and achieving the project purpose. A Section 121(d) certification is included in Attachment E of the PP. The Financial Analysis contains a detailed analysis of the project cost as required under FAA Section 611(a).

The statutory checklists have been satisfactorily completed and are included as Attachment D of the Project Paper.

Appropriate conditions precedent and covenants for inclusion in the Grant Agreement are identified in the Project Authorization (Attachment 1).

The Executive Committee for Project Review (ECPR) chaired by _____, met on May 2, 1985 and recommended that (to be completed after the ECPR).

E. Responsible Officers

OAR/Banjul will provide a project manager for implementation of the project. AFR/PD/SWAP will be responsible for backstopping the project.

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III. Waivers:

The project will require using A.I.D. funds to purchase 2 passenger vehicles, 14 four wheel drive vehicles, 6 motorcycles, 4 trucks and 3 tractors including implements estimated to cost $442,700 from countries included in A.I.D. Geographic Code 935. To permit such procurement from Code 935 countries, appropriate waivers are requested and are embodied in the attached authorization document. Justification for such waivers is set forth in Attachment E to the authorization package.

IV. Justification to the Congress: A Congressional Notification was sent to Congress on_____ and the waiting period expired_____.

V. Recommendation: It is recommended that you sign the attached Project Authorization, and thereby approve life-of-project funding of $17,700,000 and the source origin waiver for the procurement of passenger vehicles, four-wheel drive vehicles, trucks, motorbikes, tractors including implements, and spare parts from A.I.D. Geographic Code 935 (valued at approximately $442,700).

Attachments:

(1) Project Authorization Document
(2) Project Paper
(3) Waiver Justifications

clearances

drafted by:AFR/PD/SWAP:CPippitt:edb:04/08/85 2199M

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PROJECT AUTHORIZATION

Name of Country : The Gambia

Name of Project : Agricultural Research and Diversification

Number of Project: 635-0219

1. Pursuant to Pat I, Chapter I, Section 121 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Agricultural Research and Diversification Project for The Gambia involving planned obligations of NOT to exceed seventeen million, seven hundred thousand dollars ($17,700,000) in grant funds over a seven year period from the date of authorization, subject to the availability of funds in accordance with the A.I.D./OYB allotment process, to help in financing foreign exchange and local currency costs for the project. The planned life of the project is seven years from the date of initial obligation.

2. The Project consists of testing, generating, and in collaboration with the Extension Service, PVO's and the private sector, promoting the adoption of improved crop and livestock technologies which are relevant to farmer's needs and circumstances and which will expand and diversify The Gambia's agricultural economy.

3. The Project Agreement which may be negotiated and executed by the officer(s) to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority shall be subject to the following essential terms and covenants and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

a. Source and Origin of Commodities, Nationality of Services of Services

Except as A.I.D. may otherwise agree in writing:

(1) Commodities financed by A.I.D. under the project shall have their source and origin in The Gambia, or in countries included in A.I.D. Geographic Code 941.

(2) Except for ocean shipping, the suppliers of commodities or services shall have The Gambia or countries included in A.I.D. Geographic Code 941 as their place of nationality.

(3) Ocean shipping financed by A.I.D. under the project shall be financed only on flag vessels of the United States or other countries included in A.I.D. Geographic Code 941.

b. Condition Precedent to Initial Disbursement

Prior to the first disbursement under the Grant, or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made, the Grantee shall, except as the parties may otherwise agree in writing,furnish to A.I.D. in form and substance satisfactory to A.I.D. a statement of the names of the persons holding or acting in the Office of Grantee [to be specified in the Grant Agreement], and specimen signatures of the same.

c. Conditions Precedent to Subsequent Disbursements

(1) Prior to subsequent disbursements under the Grant, except for technical assistance, or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made, the Grantee shall, except as the parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D. a detailed plan of the Grantee's interim administrative and management structure under the project which will be effective until the permanent Agricultural Research Management System is established and operational, including the name(s) of the Grantee representative(s) who will have approval authority for Project activities and expenditures and the name of the Grantee representative who will serve as a counterpart to the contractor's chief of party and will be responsible for daily liaison among the Grantee, A.I.D. and the Contractor.

(2) Prior to subsequent disbursements under the Grant on or after April 1 of each year commencing in 1986, or to the issuance by A.I.D. of documentation pursuant to which such disbursement will be made, the Grantee shall, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D. a detailed plan of research and promotional/extension activities to be carried out by the Grantee under the Project during the next twelve months, including financial, administrative and operational plans and procedures for such activities.

(3) Prior to subsequent disbursements under the Grant after December 31, 1986, or to the issuance by A.I.D. of documentation pursuant to which such disbursement will be made, the Grantee shall, except as the Parties may otherwise agree in writing, furnish to A.I.D., in form and substance satisfactory to A.I.D. a detailed plan of the permanent structure of the Grantee's Agricultural Research Management System, including financial administrative and operational plans and procedures.

(4) Prior to subsequent disbursements under the Grant after June 30, 1988, or to the issuance by A.I.D. of documentation pursuant to which disbursements will be made, the Grantee shall, except as the

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Parties may other wise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D. evidence that the permanent structure of the Grantee's Agricultural Research Management System has been established and is operational.

c. Covenants:

(1) The Grantee agrees to use its best efforts to assume on an annual basis an increasing proportion of operational costs for research under the Project, towards the goal of assuming approximately 50 percent of such costs by the beginning of the final year of the project.

(2) The Grantee agrees to ensure that all personnel trained under the Project will be appointed to established positions or otherwise integrated into government service on or before the conclusion of their training.

(3) The Grantee agrees to grant the contractor and AID the use of all equipment, vehicles, houses and office space provided under the Mixed Farming project when this project terminates or ceases to make use of such commodities and structures.

d. Waivers

Based on the justifications set forth in the project paper, (1) I hereby approve a source and origin waiver for the procurement of approximately passenger, six motorcycles, fourteen four-wheel drive vehicles, one large truck, three pick-up trucks, three tractors including implements, and spare parts from A.I.D. geographic code 935 (valued at approximately $442,700); (2) I conclude that special circumstances exist which justify waiving the requirements of Section 636(i) of the Foreign Assistance Act of 1961, and (3) I hereby certify that exclusion of procurement from Free World countries other than the Cooperating Country and countries included in Code 941 would seriously impede attainment of U.S. foreign policy objectives and objectives of the foreign assistance program.

Date: _____

_____
Mark Edelman
Assistant Administrator for Africa

Clearances: As shown on action memorandum

I. EXECUTIVE SUMMARY

A. Project Background:

The Gambia is a small (10,690 square kilometers) densely populated country whose economy is predominately agricultural. Groundnuts are the major crop and the most important source of export earnings and government revenues; but stagnant production and declining terms of trade have contributed to a progressive deterioration in the balance of payments. Domestic food production has been unable to keep pace with the growth of population and demand and currently accounts for fifty-nine percent of domestic consumption. As a consequence of adverse weather trends, rapid population growth, policy factors, and difficulties in implementing development efforts, GDP per capita continues to decline. Nutritional status appears to be deteriorating and income disparities increasing.

The Government is making a determined effort to reverse these trends by giving priority to agricultural development, with assistance from donor agencies including AID and the World Bank . Its effort is aimed at providing the hitherto unattained combination of incentives, technological improvements and inputs needed to increase productivity sufficiently to offset the above negative factors. Project support for agricultural research and promotion will strongly complement other donor and PVO assisted activities in extension and input delivery. It will also complement AID and other donor assisted activities in policy development.

B. Project Goal:

The long-term goal of The Gambia Agricultural Research and Diversification Project (GARD) is to achieve food self-reliance in The Gambia.

C. Project Purpose:

The Project's purpose is to test, generate, adapt, and promote the adoption of improved crop and livestock technologies that meet farmers' needs and expand and diversify Gambia's agricultural economy.

D. Project Elements:

The Project consists of five distinct but mutually supportive components as follows:

-Establishment of an Agricultural Research Management System (ARMS) which will set agricultural research priorities in the light of farmers' needs, researchers' recommendations, and GOTG policy objectives; it will enforce these priorities through procedures by which research programs will be designed, reviewed and funded.

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-Provision of long- and short-term training for Gambians in various agricultural disciplines and improvement of research support systems, including selected infrastructural improvements, which will complement investments planned by other projects, notably the IBRD's ADPII.

-Support to on-station component research in crops, livestock, agroforestry, socioeconomics, and water resources.

-Expansion of on-farm farming systems research/extension (FSR/E) activities which have already been successfully launched in the eastern portion of the country and linking these activities to component research and extension programs in the context of ARMS.

-Design of and assistance to technology promotion activities for farmers at large, including training of field workers, monitoring and feedback of results, and finance for specific pilot promotional efforts.

These mutually supportive components will develop the presently uncoordinated research efforts scattered among seven organizational entities into an adaptive research system. They will also work to provide a larger, more continuous flow of innovations to public and private change agents and help these agents promote the use of these innovations by farmers.

E. Project Duration and Cost:

The Project will be the first seven year phase of an estimated 15-20 year effort. The cost for the first phase is estimated to be $ 19,242,000 of which USAID will contribute $17,700,000 and the GOTG will contribute $1,542,000 equivalent.

F. Summary of Analyses:

The analyses find the project to be feasible from technical, economic, administrative, social and environmental perspectives. The Technical Analysis examines the detailed plans for research supported under the Project including research on several improved technologies appropriate for The Gambia. The Administrative Analysis reviews the current institutional context for agricultural research and the plans for the improvement of the agricultural research management system (ARMS), which will be gradually implemented over a two to three year period. The Economic Analysis estimates that the Project will yield a rate of return of 28 percent over 20 years employing conservative average yield increase estimates. The Social Soundness Analysis concludes that Project activities will result in benefits for a broad spectrum of the population including farm families, researchers and extension workers and

that strong incentives to participate exist at all levels. No adverse environmental effects are anticipated; on the contrary, research on and promotion of various cultivation practices and conservation techniques will be beneficial.

G. Involvement of Small, Disadvantaged and Women-Owned Firms:

The Prime Contractor will be encouraged to collaborate with historic black colleges and universities, as indeed was the case with the design contract and the participation of Virginia State University.

H. Waivers Required:

Two waivers are requested for (1) passenger vehicles, trucks, motorbikes and spare parts; and (2) tractors and spare parts.

I. Conditions and Covenants:

Conditions include (1) Grantee specification of interim administrative and management plans prior to first disbursement; (2) provision of detailed research and promotion plans prior to all disbursements in ensuing years beginning April 1986; (3) a detailed plan for ARMS prior to any disbursement after Dec 1986; and (4) evidence that ARMS is operational prior to any disbursement after June 1988. The Grantee will covenant to (1) use its best efforts to assume an increasing proportion of operational costs for research under the Project; (2) ensure that all personnel trained under the Project are integrated into government service; and (3) grant the Contractor the use of all commodities and structures provided under the Mixed Farming Project.

J. Project Paper Design Team:

This Project Paper was developed by the following design team composed of representatives of selected Departments in the Ministries of Agriculture and Water Resources and Environment, USAID/Banjul and consultants provided under terms of a contract with the Universities of Wisconsin, Michigan and Virgina State. Consultants in cropping systems and agricultural research management were provided by the Farming Systems Support Project (FSSP) and the International Service for National Agricultural Research (ISNAR) respectively. Additional services were provided by REDSO/WCA.

E. Gilbert Team Leader, Agricultural Economics (Michigan)

W.Bosu Animal Science/Vet Medicine (Wisconsin)

S. Bruce-Oliver Scientific Officer (Crop Protection Service)

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M. Dagg Agricultural Research Management (ISNAR)

B. Gai Socio-economics (PPMU)

G.O. Gaye Horticulture (Dept. of Agriculture)

E. Gritton Plant Science (Wisconsin)

T. Hobgood Assistant Agricultural Development Officer, & Project Design Officer (USAID/Banjul)

M. Jasseh Irrigation Engineer (Dept. of Water Resource)

D. Keene Regional Legal Advisor (REDSO/WCA)

J. Osborn Project Development Officer (REDSO/WCA)

D. Price Socio-economics (Virgina State)

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K. Shapiro Director of International Agricultural Programs/Campus Coordinator (Wisconsin)

M. Sompo-Ceesay Agricultural Research (Dept of Agriculture)

J. Sowe Dept of Animal Health & Production

R. William Cropping Systems/Horticulture (FSSP/Oregon State)

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ACRONYMS

AA	Agriculture Assistant - GOTG Extensions Service
ADPII	Agricultural Development Project II (IBRD)
ARAB	Agricultural Research Advisory Board
ARMS	Agricultural Research Management System
CILSS	Permanent Inter-State Committee on Drought Control in The Sahel.
CIMMYT	International Center for Maize and Wheat
CPS	Crop Protection Services
CUSO	Canadian University Service Overseas
DAHP	Department of Animal Health And Production
DOA	Department Of Agriculture (Ministry of Agriculture)
DWR	Department of Water Resources (Ministry of Water Resources and Environment)
DL	Dalasi $1=4.6 DL, approximately
EAU	Extension Aid Unit of The Ministry of Agriculture
FAO	Food And Agriculture Organization of The United Nations.
FRG	Federal Republic of Germany
FSR/E	Farming System Research and Extension
FFHC	Freedom From Hunger Campaign.
FSSP	Farming System Support Project
GARD	Gambia Agricultural Research and Diversification Project
GCDB	Gambia Commercial And Development Bank
GCU	Gambia Cooperative Union
GOTG	Government Of The Gambia

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GPMB	Gambia Produce Marketing Board
IARC	International Agricultural Research Center
IBRD	International Bank For Reconstruction And Development
ICCASP	Interministerial Coordination Committee on Agricultural Sector Planning
ICRAF	International Center for Research in Agroforestry
ICRISAT	International Crop Research Institute for Semi-Arid Tropics
IDA	International Development Agency
IEE	Initial Environment Examination
IFAD	International Fund for Agricultural Development
IFDC	International Fertilizer Development Center
IITA	International Institute for Tropical Agriculture
ILCA	International Livestock Center for Africa
ILO	International Labor Organization
ISNAR	International Service for National Agricultural Research
ITC	International Trypanosomiasis Center
IPC	Interim Project Committee
IPM	Integrated Pest Management Project
IMF	International Monetary Fund
LA	Livestock Assistant - GOTG Extension Service
LMB	Gambia Livestock Marketing Board
LOA	Livestock Owners Association In The Gambia
LRD/ODM	Land Resources Division of Overseas Development Ministry
LRS	Land Resources Study

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MEPID	Ministry Of Economic Planning And Industrial Development
MDI	Management Development Institute
MFP	Mixed Farming Project
MID	MacCarthy Island Division
MWRE	Ministry Of Water Resources And Environment
NARB	National Agricultural Research Advisory Board
NBD	North Bank Division Of The Gambia
NEB	Nigerian Composite
OAR/Banjul	Office of USAID Representative - Banjul
ODA	Overseas Development Administration Of The United Kingdom.
OMVG	Gambia River Basin Studies
PACD	Project Assistance Completion Date
PID	Project Identification Document
PP	Project Paper
PCV	Peace Corps Volunteer
PPMU	Program Planning And Monitoring Unit Of The Ministry of Agriculture
PRC	People's Republic of China
PS	Permanent Secretary Of A GOTG Ministry
PVO	Private Voluntary Organizations
PWD	Public Works Department Of The GOTG
RDP	Rural Development Project.
REDSO/WCA	Regional Economic Support Office/West And Central Africa - USAID
RELO	Research Extension Liaison Officer
SEFGRAD	Semi-Arid Food Grains Research and Development
SRFMP	Sahel Regional Fianancial Management Project

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SWMU	Soil and Water Management Unit of The Ministry of-Agriculture
TA	Technical Assistance
UK	The United Kingdom
UN	The United Nations
UNDP	United Nations Development Program
UNV	United Nations Volunteers
URD	Upper River Division Of The Gambia
USAID	United State Agency For International Development
VSO	Voluntary Services Overseas
VTC	Vocational Training Center in Banjul, The Gambia
WARDA	West African Rice Development Association
WD	Western Division Of The Gambia
YBK	Yoro Berri Kunda

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I. DETAILED PROJECT DESCRIPTION

A. Background:

The Gambia is a small,(10,690 square km) , densely populated (over 65 persons per square km) country located on the western coast of Africa and surrounded on three sides by Senegal. Its population is approximately 713,000 in 1984 and growing at the rate of 3.5 percent annually--one of the highest growth rates in the world. It's economy is predominately agricultural (35-40 percent of GDP and 80 percent of employment). Small farms totalling about 41,000 units are the dominant feature. Groundnuts account for nearly 50 percent of the land under cultivation, 20-30 percent of the GDP and 90 percent of export earnings. The principal food crops include sorghum, millet, rice and maize, but local production has provided a declining portion of the country's requirements in recent years and currently accounts for only 59 percent of domestic consumption.

Economic growth in The Gambia has been stagnant for nearly a decade, averaging less than two percent of GDP. Despite some upward movement in the commercial, transport, and tourism sectors, per capita real income has declined more than ten percent over the last five years primarily as a consequence of declining per capita production in the agricultural sector. It is probable, though undocumented, that food consumption and nutrition levels have also declined in rural areas. Harvested acreage has remained essentially unchanged over the past decade in the face of rapidly increasing population and the expansion of animal traction. Yields vary widely from year to year with no clear trend. With the notable exception of maize and rice, there have not been any major improvements/innovations in agricultural production and productivity for more than a decade.

Major factors responsible for the poor performance of the agricultural sector include (1) erratic and declining rainfall, (2) reduction in soil fertility and fallowing particularly in areas of high population density, (3) high rates of migration of the most economically able segments of the population into urban areas and non-farm activities, (4) inappropriate macro-economic policies especially with respect to the exchange rate, (5) lack of farmer-acceptable improved technologies needed to increase agricultural production and productivity, and (6) agricultural development policies and programs which have not provided the combination of incentives, and inputs needed to increase productivity sufficiently to offset the negative factors noted above. These factors have especially affected rural women in many instances. Low rainfall and the development of irrigated rice have had an adverse impact upon swamp rice production by women in selected areas.

In addition to the low productivity of the agricultural sector and the associated fall of groundnut production and export earnings, the Gambian economy faces the prospect of a continuing deterioration in its terms of trade. In the absence

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of improvement in agricultural production both to meet domestic needs and for export, the balance of payments will continue to deteriorate and dependence upon external aid will grow accordingly.

The Gambia's second Five-Year Development Plan (1981/2-1985/6) gives high priority to the development of agriculture, and especially: (1) increasing food production so as to raise nutritional levels and reduce imports, (2) expanding production of groundnuts in order to increase foreign exchange earnings and farmers' incomes, (3) rural development and reduction of urban-rural income disparities, and (4) diversifying food and export crop production. Equivalent importance is attached to cereals and groundnut production increases; goals are to be achieved by (1) improving farmers' support services including extension, (2) more efficient operation of the Gambia Produce Marketing Board and similar agencies, (3) direct production support in seed multiplication and crop protection, and (4) a more effective agricultural research system capable of identifying and adapting improved technologies which will improve productivity and incomes of the majority of rural residents.

The Government of The Gambia (GOTG) is making a major effort to improve agricultural production with assistance from donor agencies. Prominent among these is phase two of the Agricultural Development Project (ADPII) which is being implemented with support from the World Bank. ADPII provides major assistance to the Ministry of Agriculture to revitalize the extension program for rainfed agriculture and improve the input delivery system. The Mixed Farming Project (MFP), supported by AID, is designing and testing improvements in maize, forage crops and animal production and has achieved some success in extending the results to farmers notably in the case of an improved maize variety (Nigerian Composite). The Caisse Centrale, a French donor organization, is supporting adaptive research, extension and marketing activities in the eastern portion of the country with special emphasis upon cotton. A pilot irrigation scheme at Jahally Pacharr is concluding its first year of operation with support from IFAD. Various private voluntary organizations (PVO) including Save the Children (UK and US), Action Aide, Catholic Relief Service and the African Methodist Mission have well-established extension programs notably for horticultural crops. In addition, the government has sought to improve incentives to farmers through increases in producer prices for groundnuts and rice in particular and generally to enhance the comparative advantage of Gambian production on world markets through a major devaluation of the local currency. Such policy development is assisted by AID's Economic and Financial Policy Analyses Project. (See Annex E, Economic Policy Measures in Support of Agricultural Development.)

The range of priorities and activities which currently comprise the GOTG's agricultural development strategy necessitates consideration of the trade-offs involved. Export

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and food crops, livestock and non-farm employment all compete for the same resources; successful diversification implies that an increasing share of resources will be devoted to the production of commodities which are currently minor or non-existent in Gambian farming systems. This competition exists both at the farm level in the context of farmers decisions on cropping patterns and at the national level in the process of allocating manpower and budgets.

From the perspective of the economic planner, The Gambia should be guided by the principle of comparative advantage at both levels. Such guidance tends to lead one strongly in the direction of increasing specialization with research and extension efforts giving priority to groundnut production. As groundnuts currently account for 20-30 percent of GDP, the impact of even a modest increase in the average national yield resulting from agricultural development efforts would be major. Returns to research and development efforts for minor crops and crops that have yet to be introduced cannot promise the same impact in the short or medium term.

From a political perspective, The Gambia's efforts to increase food production and diversify reflects a desire to reduce dependence upon a single crop and upon the world market for basic food supplies. These are valid and understandable policy objectives, but ones which may have a price in terms of a somewhat slower rate of economic growth. Diversification of exports tends to reduce the fluctuations in export earnings and government revenues, but may also result in a lower average rate of growth in the short and medium term than might be achieved by a focus on those commodities where the comparative advantage is strongest. Similarly, increasing domestic food production will reduce food imports, but may adversely affect both government finances and foreign exchange balances--especially where this is achieved by means of imported inputs such as fertilizer and equipment and subsidies on both inputs and outputs. Further, with current prices and costs of production, Gambian irrigated rice cannot compete with imports in a free market situation in meeting the rice requirements of greater Banjul. However, inland markets and consumers can be most efficiently served by domestic producers.

Perhaps the most critical consideration is the importance which most farmers place on production of adequate supplies of food to meet family needs. In the past, there has been a general trend toward increasing specialization in groundnut production accompanied by growing reliance upon the market to meet food needs. Declining rainfall and soil fertility and changes in relative prices in favor of food crops may now be reversing this trend. Farmers are now at least as interested in potential improvements in food crop production as in cash crops, as is evidenced by the rapid acceptance of maize.

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C. Project Rationale:

The success of efforts to increase production will depend in large part upon the availability of productivity increasing measures which can be readily adopted by the average Gambian farm family. Measures such as animal traction which increase productivity of labor during peak labor periods will continue to be attractive to Gambian farmers as long as their acquisition is within the means of the average household. However, increasing the productivity of labor is likely at best to result in increases in production through an expansion of the area under cultivation. The scope for such expansion in acreage is limited, however, and its realization will be at the expense of the environment which continues to deteriorate. Thus, priority attention needs to be given to improvements which will increase the productivity of land and capital as well as labor.

The national agricultural research system has the responsibility for identifying and where necessary adapting improvements which can be extended to farmers. As The Gambia is not likely to be able to sustain a comprehensive research system with its own resources, there is necessarily and appropriately a heavy reliance upon basic and applied research performed in other countries. This process involves a combination of strong linkages with the sources of innovations in national, regional and international agricultural research organizations and a system to adapt innovations to meet the needs of Gambian farming systems. While some capacity to generate new technologies within the Gambian agricultural research system may be desirable and sustainable, major attention should be upon screening technologies developed outside, at least in the medium term. The comparative advantage of the Gambian agricultural research system lies in its capability to understanding the farming systems of the country, including constraints and fields of possible improvement.

The Gambian agricultural research system consists of a core of approximately 55 researchers (not all of whom devote full time to research) distributed among seven departments and two ministries. Despite a lack of collaboration and cooperation across disciplinary and departmental lines, the research service is making some progress--largely with support from externally funded projects. The Research Service has identified promising technologies on the research station which are now ready for on-farm testing. Accomplishments include the identification of NCB maize as a variety suitable for The Gambia, screening and selection of improved rice varieties, and advances in agronomic practices for groundnuts. The Mixed Farming Project (MFP) has identified and is testing and extending improved technologies for maize, forage crops, and animal production. In the case of maize, the effort currently is under the leadership of a Gambian researcher. The International Trypanosomiasis Center (ITC) is working on disease-resistant strains of cattle in The Gambia and the results promise to have a direct impact on livestock production in the country. Farming Systems Research and Extension (FSR/E) activities have already been launched with

Gambian leadership and the participation and support of ODA and ADPII.

Despite these activities and accomplishments, agricultural research in The Gambia still does not possess sufficient capacity to develop or adapt new technologies needed to improve farmer welfare and increase government revenues. There are several reasons for this problem. First, The Gambia does not possess a research management system that can make the most efficient use of this small country's necessarily limited agricultural research budget. Agricultural research is spread across two ministries and seven departments. Effective institutional arrangements to review, integrate, and rank the research programs of all these entities do not exist.

A second, and related, reason for the problem is that The Gambia lacks a comprehensive program geared to understanding the specific constraints and potential of its farming systems. Such an understanding is vital to guide component research towards activities that are needed, relevant, and promise high payoff.

The third reason for the problem is the limited training and limited numbers of research personnel. Recurrent cost constraints rule out both major increases in staff numbers and major investments in advanced degree training since both would significantly increase salary costs. While the success of the Project could increase recurrent revenues, a restrained approach to staff numbers and training is still appropriate. Tightly targeted, on-job training and some advanced degree training are indicated.

The fourth reason for the problem is The Gambia's inability to support its research staff with adequate operating and maintenance funds and with physical infrastructure. Donor assistance to applied agricultural research effectively ended in 1979 with the completion of the multilaterally financed Rural Development Project. Bridging finance from the British Overseas Development Administration (ODA) has been able only to support custodial functions; while AID's and other donor-supported projects such as MFP and the regional Integrated Pest Management Project (IPM) have concentrated on smaller, isolated interventions. Under stringent budget limitations imposed by precipitously declining government revenues, only minute funding has been available to maintain agricultural research.

The Gambia's weak revenue situation will continue to deteriorate if agriculture cannot be improved. That improvement requires a research organization that can generate useful technologies and have them adopted. However, creation of such an organization is blocked by insufficient revenues. To break this vicious circle, The Gambia Agricultural Research and Diversification Project (GARD) proposes to address each of the above aspects of the problem.

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D. Project Goal and Purpose:

The long-term goal of the Project is to achieve food self reliance in The Gambia. The Project will be instrumental in increasing the production of food and cash crops which is the most essential element in achieving this goal. This initial seven year project is the first phase of a planned fifteen to twenty year commitment by AID to improve agricultural research and production in The Gambia.

The Project's purpose is to test, generate, adapt and promote the adoption of improved crop and livestock technologies that meet farmers' needs and expand and diversify Gambia's agricultural economy. Conditions indicating that the Project purpose has been achieved would include: (1) research policies/priorities being established, research programs being reviewed, and resources being allocated accordingly; (2) on-station research being conducted which draws on innovations developed in national, regional, and international organizations and which has potential results in terms of acceptance by farmers; (3) on-farm research activities being conducted which identify farmer constraints and opportunities and test improved agricultural technologies; and (4) improved technologies from research being promoted through the Extension Service, PVO's and the private sector resulting in their adoption by the rural population.

E. Project Strategy:

Improving the effectiveness of agricultural research involves at least three major considerations. First, the system must produce results which are relevant to the needs of its clients: farmers, extension workers and policy makers. Second, these results must be extended and utilized by the clients. Third, the entire process must be institutionalized within the GOTG such that it can be sustained after the conclusion of the Project.

From a broad developmental perspective these considerations are strongly complementary. The research system must produce results which are utilized by clients in order to attract and retain the support necessary to sustain the system in the long run. The Gambian research system suffers from a lack of credibility based on the absence of a record of accomplishments. In an important sense, the spread of improved maize production under MFP has illustrated what research can do. A major task will be to assist the GOTG not only in continuing the momentum in those selected areas supported by MFP, but also to extend the effort to encompass other commodities.

The central strategic issue in designing the Project is the relative emphasis which should be placed upon the three considerations noted above in the implementation of the

Project. Agricultural research and extension projects commonly are faced with difficult choices in allocating resources, especially where both research and extension systems are in need of strengthening on nearly all counts. Limitations in resources require that some ordering of priorities be established if the Project is to have any chance of achieving a reasonable set of objectives.

Two major trade-offs must be considered. First, there is the trade-off between the production of research results in the short- and medium-term and institutionalization of an effective and sustainable research system capable of producing such results. Production of research results requires trained and experienced personnel who are often in short supply. Projects commonly fill this gap with external technical assistance which is combined with long-term training of local researchers. Long-term technical assistants commonly find themselves taking major responsibility for the implementation of research programs without significant involvement of local researchers. If production of research results is the primary objective, training and institutionalization often suffer. Conversely, requiring technical assistance staff to devote a significant share of their time to training and in general requiring substantive participation of local researchers in all research activities may inhibit the production of research results especially in the near term.

The second trade-off involves production of research results and extension of results to clients. Clearly, the second cannot take place without the first. Further, the benefits from research will not be realized unless the results are somehow made available and utilized by large numbers of farmers. Moreover, the manner and impact of the utilization of results by large numbers of farmers is essential to determining the direction of and gaining support for further research activities. However, assuming major responsibilities for extension of research results in the context of an agricultural research project, especially if this were to involve broad, sustained institutional and program support, would likely be at the expense of both the production of research results and the institutionalization of an improved agricultural research system. Therefore, achieving the proper mix of research and promotional support in project design and implementation is a major challenge.

The Project will give priority attention to the strengthening of the agricultural research system. This represents the most cost-effective means of producing research results in the medium and longer terms. There is no adequate substitute for a strong national adaptive research system capable of continuing to refine existing improved technologies and identify new prospects from the body of research results available worldwide.

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However, assigning priority to institutionalization does not mean that substantial attention will not be given either to producing research results or to ensuring that research results are extended to farmers. Within the research system, major emphasis will be given to the expansion and strengthening of Farming Systems Research and Extension (FSR/E) activities aimed at identifying, testing and extending improved technologies to farmers in collaboration with the Extension Service and Private Voluntary Organizations (PVOs). FSR/E is an approach designed to link the research system to its clients and to accelerate the process by which relevant technologies are identified and eventually utilized by agricultural producers. FSR/E in collaboration with the enhanced component research programs must produce results to gain the necessary recognition and acceptance, and ensure the longer run effectiveness and survival of the agricultural research system. The Project will retain the production of research results as a major objective and allocate resources accordingly.

The process of ensuring that research results are extended effectively to farmers is equally important. Fortunately, other donors, notably the World Bank, IFAD and the Caisse Centrale are providing major assistance to strengthen the extension services and input delivery system through rehabilitation of infrastructure, budgetary support, reorganization, and training. In the first instance, the Project's strategy is clearly to design its activities in close consultation with these projects and seek collaboration and complementarity. By so doing, it is assumed that these projects will be successful at least in providing the necessary resources for a functioning extension service and input delivery system. This will not be sufficient, however, to assure that promotional activities are planned and implemented effectively across a broad spectrum of new technologies. A streamlined and better supported Extension Service, though necessary, must still be given tools, guidance, and impetus, and the Project will produce those.

In addition to the linkages built into the FSR/E activities, the Project will organize and fund specific efforts that introduce new cultivation and husbandry techniques and varieties to farmers at large, as delivered and monitored by the Extension Service and PVOs. These institutions cannot be expected, at least in the early stages of the Project, to have the professional capacity to plan and carry out such varied and complex activities. Therefore, the Project will take promising innovations as they emerge from research efforts and design promotional campaigns for them, train extension workers in their technical details, and establish reporting and feed-back systems.

In sum, the Project's strategy is a two pronged effort involving: (1) the long-term institutionalization of an effective, applied agricultural research system, and (2) the development, promotion, and adoption by farmers of improved

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agricultural technologies as early as possible. (For a more operationally and sequentially oriented presentation of the strategy see Annex A, Technical Analysis and Annex B, Administrative Analysis.) Institutionalization is necessarily a long-term process and this initial seven year project is the first phase of a planned long-term commitment by AID to improve agricultural research in The Gambia. However, the Project's short- to medium-term objectives are to develop rapidly improved technologies and ensure their promotion and adoption by farmers. In the first year of the Project, therefore, the emphasis will be on testing improvements on groundnuts, maize, and rice where the outlook for a major impact on production in the medium-term is brightest. Simultaneously, efforts will begin towards identifying improvements in sorghum, millet, grain legumes, and small ruminant production where short-term prospects may be less promising. The Technical Analysis identifies several technologies which have shown promise on the research station and which will be used in developing on-farm trials in the early years of the Project.

F. Project Outputs:

The major outputs from the Project of an institutional nature will be (1) the establishment and effective operation of an Agricultural Research Management Systems (ARMS), (2) the expansion and integration of FSR/E activities as a recognized and valued component of research and extension in The Gambia, (3) component research programs which are adequately staffed and funded, (4) strong effective linkages between research and extension, and (5) effective promotion campaign plans and operations.

The results of these efforts and institutional developments will be in the form of a flow of research results from component, on-station programs, through FSR/E, on-farm trials, and tests with farmers and extension workers, to promotion and acceptance of promising technologies among farmers generally. Adoption of improved technologies will result in increases in production for several of the major crops both through acreage expansion, yield improvements and loss reduction. New commodities will also be identified, tested and promoted, aimed at improving incomes, nutrition and export earnings (and/or reducing imports). During the first seven years of the Project,

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it is estimated that average yields for major crops can be increased as follows:

Table 1 Yield Assumptions (kg/ha)

Commodity	1984	1992	Increase (%)	Potential*
Groundnuts	1120	1299	(16)	2000
Maize	1180	1286	(9)	2500
Sorghum	730	744	(2)	1500
Millet	600	624	(4)	1000
Swamp Rice	1000	1050	(5)	2000

*Potential yields under farm conditions. Achieved yields under research station conditions in The Gambia are generally higher by about 30 percent.

In the aggregate, the economic rate of return (IRR) for the Project is estimated at 28 percent over a twenty year period and with modest yield assumptions. A reduction in benefits by ten percent and twenty percent reduces the IRR to a still respectable 23 percent and 17 percent. (See Annex C.)

Project supported research will be the principal source of improved technologies for extension efforts. ADPII alone is targeted to deliver improved technologies to 10,500 households or approximately a quarter of the rural population of the country over its five years. The Project will collaborate with Save the Children, Action Aid and other PVOs to provide specific technologies, notably for horticultural crops, which are suitable for extension within their programs. Increases in production and income from fruits and vegetables, while not major from a GDP perspective, will have a substantial impact upon nutrition and income of producers who are primarily rural women.

G. Project Elements:

The Project consists of five distinct but mutually supportive components as follows:

-Establishment of an Agricultural Research Management System (ARMS) which will set agricultural research priorities in the light of farmers' needs, researchers' recommendations, and the GOTG policy objectives; it will enforce these priorities through procedures by which research programs will be designed, reviewed and funded.

-Provision of long- and short-term training for Gambians in various agricultural disciplines and improvement of research support systems including selected infrastructural

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improvements and renovations which will complement investments planned by other projects, notably ADPII.

-Support to component research in Crops, Livestock, Agroforestry, Socio Economics, and Water Resources.

-Expansion of FSR/E (on-farm) activities which have already been successfully launched in the eastern portion of the country and linking these activities to component research and extension programs as directed by the ARMS.

-Design of and assistance to technology promotion activities for farmers at large, including training of fieldworkers, monitoring and feedback of results and finance for specific pilot promotional efforts.

These mutually supportive components will develop the presently uncoordinated research efforts scattered among seven organizational entities into an adaptive research system. They will provide a continuous flow of innovations to public and private change agents and help them promote the adoption of these innovations by farmers.

1. Establishment of ARMS

A primary focus of effort during the first phase of the Project will be the design and establishment of the agricultural research management system (ARMS). Plans are being made for the possible structure and operations of such a system, but its precise configuration and responsibilities will be defined following the initiation of the Project scheduled for mid-1985. (See Annex B, Administrative Analysis.) The GOTG has agreed to the establishment of an Interim Project Committee (IPC) which will carry out the functions of the ARMS until the latter is formally constituted. As the main administrative body within the broader agricultural research management system, a National Agricultural Research Board (NARB) composed of representatives of clients of research, namely policy makers and producers, will be organized. The Ministries of Agriculture, Water Resources and Environment, and Planning and Economic Development, at the Permanent Secretary level, will be represented. In addition, the Gambian Produce Marketing Board (GPMB) and the Gambia Cooperative Union (GCU) will be represented. The Board will define research priorities and review research programs submitted (via a Technical Secretariat), by the various departments concerned with agricultural research. Recommendations on Project priorities and fundings will be made to the concerned ministries.

The NARB will be served by a Technical Secretariat composed of representatives of the various research services which will perform the staff work for the Board. The institutional location of the Secretariat remains to be determined, but in any event, the Technical Secretariat must not be seen as primarily representing the interests of a single department or discipline.

Proposals for specific agricultural research activities will emanate from research programs operating under the departments. Representation in the research programs will encompass different disciplines and different departments as appropriate to the concerns of the specific research program. For example, there will be a research program which will focus on irrigated agriculture and will include representatives of the Departments of Agriculture (DOA), Water Resources (DWR), the Crop Protection Service (CPS), and the

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Planning and Monitoring Unit (PPMU). Proposals will be submitted to NARB through the department responsible for the research program. Proposals will be required to indicate the relevance of the research to national priorities and to Gambian farming conditions and problems. As such the proposals will be required to reflect the results of FSR/E investigations/surveys as part of the rationale for the specific research project and to indicate the program of on-station and on-farm activities which will lead to utilization of the results by farmers.

Primary responsibility for the design and implementation of ARMS will rest with senior officials in the GOTG. To assist the process of establishing ARMS, approximately fifty percent of the time of the Contractor's Chief of Party will be devoted to this during the initial years of the Project. In addition, the Ministry of Agriculture has requested the assistance of the International Service for National Agricultural Research (ISNAR). Such assistance will be funded by the Project and will take the form of one person month of consultancy services per year for the duration of the Project, and include training of Gambians in agricultural research management, and general capacity-building in the management field.

Activities during the first year of the Project have been specified in some detail in the following sections of this PP, and the GOTG has concurred with the research program as detailed. However, as the Project moves into its second and subsequent years there is deliberately less specificity as to the precise activities to be supported under the Project. Instead, guidelines are given which reflect the thinking of key GOTG and AID officials. As ARMS becomes operational, decisions on the allocation of funds available under the Project will increasingly be made by this system.

2. Research Support Services and Training

a. Research Support Services

Agricultural research requires supporting services in several ways, including statistics, policy analysis, library resources, physical infrastructure, and research station management.

The GOTG's Program Planning and Monitoring Unit (PPMU) was established to provide some of these support services to the Ministries of Agriculture, and Water Resources and Environment. While most of PPMU's services support development activities in those Ministries, some of the services also support research. These latter include (1) the national agricultural sample survey, (2) micro and technical policy studies, and (3) a library. The first two help the ministries determine research priorities, while the third directly supports researchers.

The Project will provide limited support to all of these, primarily in the form of short-term trainers/advisors and training.

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During the latter half of the Project, long-term technical assistance in socioeconomics may increase by virtue of a possible shift in team leadership to either the crop agronomist or livestock specialist positions. The socioeconomist would then divide his or her time between FSR/E and component research activities in socioeconomics.

PPMU has received support from FAO/UNDP, MFP, and the World Bank in the form of long-term technical assistance. The FAO/UNDP Project ended in 1984 and other support will phase down rather percipitously in early 1986 without prospects for adequate staff to continue all activities at that time. A possible extension of the socioeconomics component of MFP is being explored which would complement the phasing and levels of support for socioeconomics included in the Project.

At present there is no trained biometrician or experimental statistician in The Gambia. Researchers have no one to turn to for advice on sampling design and methods of analysis. As a consequence, much prior research has been inconclusive with unexplained coefficients of variation in trial results. The Project will improve Gambian biological research by providing a short-term trainer/advisor in biometrics or experimental statistics in sample design and analytical techniques. This consultation service will assist researchers across the full range of crops and animal programs and be provided when research programs are in the design phase. The Project will support the training of a Gambian to the MS level in biometrics at the home department of the faculty member providing the in-country training. This link of training to short-term consultancies will increase the probability that the training is relevant, well targeted, and lead to long-term ties between the University department and the Gambian research system.

Some physical inventories and special studies have been carried out at Yundum and Sapu by the Ministry of Agriculture to develop a master plan for the infrastructural development of these stations. Support from ADPII will include: rehabilitation of existing infrastructure and new construction, including fourteen houses for senior-, middle-, and junior-level staff. ADPII is also considering further support for improving station management. GARD will not devote major resources to infrastructural development, but some support complementing ADPII's improvements is necessary. Specifically, the Project will support the construction of three staff houses for long-term TA staff and research associates based at Sapu.

Efficient management of research stations is critical to permit researchers to proceed with their programs. The Project will support visits by Yundum and Sapu personnel to appropriate stations in Africa and the U.S. Short-term trainer/advisor assistance will be obtained from those same sources.

b. Training

The GOTG currently has an active staff training program especially in relation to donor supported projects. The recently completed Manpower Assessment Study indicates that sufficient people will have been trained by the year 1990 for the agricultural sector including the prospective training under the Project.

(1) Short-term Training

The Project has made provision for sharing the costs of a regional Farming System Support Project (FSSP) training officer based in The Gambia, who will combine coordination of all training activities under the Project with regional training and networking duties for FSSP.

The major emphasis will be on in-service training, both local and external. Approximately one hundred short-term training programs to be conducted both in the U.S., Africa, and other countries have been budgeted for in the Project.

Both research and selected Extension staff will be trained in FSR/E concepts and methodology. The Gambia College may be used to provide some of this training. The resources of the FSSP Project will be selectively employed for this kind of training. The TA training officer will be responsible for designing and installing a special course on FSR/E for extension staff, possibly as part of the regular curriculum at the Gambia College.

The Project will support efforts to increase skills in agricultural research management and administration via a series of workshops/seminars organized by the Gambian Management Development Institute (MDI) as part of the introduction of ARMS.

Short-term external training will comprise special courses and workshops at IARC's and other institutions located in third countries, and individually designed programs of research and course work at U.S. universities lasting up to eighteen weeks (one semester). The latter will be part of a two-way flow of personnel between U.S. universities and The Gambia; thereby, staff members and advanced graduate students from participating U.S. institutions will provide consultancy support to the Project with special emphasis upon advisory assistance to Gambian researchers on research methodology across a range of disciplines.

Because institutionalization is a major objective of the Project, it is planned that all research activities supported under the Project will have Gambian leadership or at least substantial Gambian responsibility and participation. Long-term technical assistance and short-term advisors/trainers will be provided, inter alia, in crop agronomy, horticulture, forage

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agronomy, socio-economics, animal production, agroforestry, and irrigated farming systems. As a rule, technical assistance will focus upon the training, advising, and institutionalization functions rather than upon carrying out research except, rarely, where Gambian expertise does not yet exist or is insufficient.

Where a short-term trainer/advisor is provided, this will be in the context of a long-term plan. A typical pattern will involve the pairing of a Gambian researcher with an appropriate faculty member(s) from a U.S. university. The faculty member will schedule a series of short-term visits to help plan research, monitor progress, advise on problem resolution, and assist with analysis. The Gambian researchers will make one or more short-term training visits to the home department of that faculty member to work alongside researchers engaged in relevant activities and attend courses.

A long-term program of short, reciprocal visits has several advantages. First, it ensures that Gambians will have major responsibility for the research. The short-term advisor cannot take over the program, a temptation that exists for long-term technical assistance. Second, a long-term link is formed between the department providing the advisor and the particular research program. Third, this pattern is significantly less expensive than maintaining long-term technical assistance in The Gambia for the duration of the research program. Fourth, a significant training element is built into the program. (See Attachment F for schedules of short-term training programs and short-term visits of trainers/advisors.)

(2) Long-term Training

Provision has been made for a total of five BS and nine MS degree programs under the Project. Post masters course work and research experience are desirable in some fields such as agronomy and will be funded by the Project. (See Attachment F for schedule of long-term training.)

3. Support for On-Station/Component Research

Component research in The Gambia over the past decade has been largely inconclusive and not well targeted upon the needs of Gambian farmers. The research supported under the MFP particularly in maize has been a notable exception. (See Annex A.)

The Project will provide technical assistance, training, and operating cost support to component research, primarily in crops and livestock during the life of the Project. Sustainability and relevance to national priorities, policy objectives, and farm level needs as revealed through FSR/E activities will be major criteria in selecting on-station research activities. ARMS will provide the mechanism by which resources under the Project will be allocated in support of component research

currently carried out by the various departments in the two ministries.

Criteria for support will be (a) evidence that the proposed line of research has potential results in terms of acceptance by farmers, and (b) that the same line of research has been successful in other countries in the region. In general, it is not felt that the Gambian agricultural research system has a comparative advantage in carrying out path breaking research into subjects that have not experienced significant breakthroughs elsewhere under comparable ecological conditions. To an important degree this should apply to agroforestry, for example. Efforts will be made, especially during the early years of the Project, to obtain information on research and development activities which have yielded promising results elsewhere in the region. In the process, the Project will seek to expand and strengthen the links between the national research system and research activities elsewhere. These linkages will provide a continuing source of ideas and materials for adaption by the agricultural research system for use in The Gambia.

In addition to research expenses such as equipment, vehicles, and operational support (petrol, inputs, etc.), the Project will provide for 14 person years of long-term technical assistance and training in support of component research. In addition, short-term consultancies of approximately six weeks each will provide advisory assistance in component research to Gambian researchers (see Section I: B. 2.(1), Short-Term Training).

a. Cereals, Oilseeds and Grain Legumes:

Support from the Project will include various forms of assistance to on-station and on-farm research in The Gambia, such as long- and short-term training, technical assistance, commodity research, and operating costs support. Two Gambians will be trained to the MS level and additional staff to the BS level. Long-term technical assistance will include one long-term senior cropping systems agronomist at the onset of the Project and research associates in agronomy during the middle and latter phases of the Project. Efforts to improve these major commodities in Gambian farming systems are expected to provide the principal sources of benefits from the Project. As an example, existing research results strongly suggest that average groundnut yields can be easily increased by at least ten percent through the use of improved agronomic practices including treated seeds, increased plant population, and increased fertilization. Area planted to maize has spread rapidly over the past two years due to the efforts of MFP, but there remains major potential for per hectare yield improvement by improving agronomic practices under farm conditions. Research priorities for component research on crops will be strongly influenced by the results of FSR/E activities. This will be facilitated by the participation of researchers

responsible for on-station research in these commodities in FSR/E activities and utilization of the FSR/E structure for on-farm trials. A major focus will be screening of varieties using both local entries and improved varieties which have done well in similar ecological zones such as Senegal and Nigeria. Efforts will also continue on improved agronomic practices including increasing labor productivity during peak labor periods and intercropping.

b. Horticultural Crops:

Considerable scope exists for improvement in production and productivity of horticultural crops both to supply the domestic market, which remains partially dependant upon imports, and to expand exports. One need for investigation is the market conditions and requirements for specific crops. The purpose will be to identify those times of the year when "market windows" exist for the profitable production of various commodities. These investigations, which would be carried out with the collaboration of PPMU, will be combined with on-station trials on planting dates and varieties. Special attention might be given to heat-tolerant varieties of cabbage, beans, carrots and potatoes which can be successfully grown during the wet season. Work in horticulture will be closely coordinated with the FSR/E regional teams. In addition, the Project will actively collaborate with various PVOs involved in extension and adaptive research in horticultural crops, including Action Aid, Catholic Relief Services, Save the Children, Methodist Agricultural Mission, and Freedom from Hunger Campaign (FFHC). These agencies have existing extension networks in various parts of the Country which have been effectively promoting innovations for several years. Support will assist horticulture through providing operating costs for on-farm and on-station research, in-country training, long- and short-term training and technical assistance.

c. Agroforestry:

Deterioration of the environment is a source of serious concern to the citizens and government of The Gambia. Deforestation has proceeded at a rapid rate over the past few decades as a result of declining rainfall, increased fuel wood needs, and expanding population and farm lands. Thus, agricultural research efforts supported under the Project will attempt to consider systematically the agroforestry dimension. Representatives of the Department of Forestry will be included in
the reconnaisance and on-farm trials work being carried out by the FSR/E teams. The Project will identify successful agroforestry interventions and research activities in similar ecological systems, notably Sahelian, that are adaptable to Gambian conditions. Links with the International Center for Research on Agroforestry (ICRAF) will be strengthened. The Department of Forestry will be assisted with short-term advisory and training services in agroforestry. Definition of possible

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component research activities in agroforesty which might be carried out in The Gambia will await the results of these initial efforts.

d. Irrigation Systems:

The Gambian government gives high priority to the development of irrigated agriculture. As a result of the interventions of the Taiwanese, PRC, and World Bank, small-scale pump irrigated rice farming has become integrated into some farming systems of the eastern region of the country. However, these irrigated perimeters are generally not economically viable in their present state. The Project will undertake a design study to assess the feasibility of alternatives for the rehabilitation of small-scale irrigation perimeters. The primary objective will be to develop a system which is compatible with the existing farming systems, sustainable by the local economy, and supportable by available water resources.

e. Animal Traction:

The use of animal traction is becoming an increasingly common feature of farming systems in The Gambia and is an important source of increasing labor productivity during peak labor periods. International and national research activities have devoted considerable resources over the past two decades to developing and testing animal traction equipment suitable for use in the semi-arid tropics of Africa. In The Gambia, a tool bar called the sine hoe is used for tillage operations. The MFP has developed an improved cultivator for maize which needs further evaluation and promotion. The Project will make use of results from worldwide research to identify additional low cost equipment for use in The Gambia. Training and short-term technical assistance will be provided in addition to support to maintain and expand contacts with animal traction research and development projects throughout the region.

f. Soil/Crop and Water Balances:

There are currently a number of activities in progress in The Gambia on this important subject; but they are not well coordinated and lack supporting adaptive research. The Project will try to link these activities to one another and to FSR/E and component research activities. Special attention will be given to (1) the analysis of fertilizer trials conducted to date and the correlation of results with soil types, (2) improved methods of land preparation, and (3) soil/crop/water balance studies. Support to these activities will include (1) providing the soils laboratory at Yundum with the necessary equipment and materials required for soil testing and plant analysis, (2) assisting the soils survey unit in the Department of Agriculture to provide detailed soil maps of the main research stations and on-farm trial areas, (3) provision of training to the MS level

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for one Gambian in soil physics, and (4) provision of short-term trainers/advisors.

g. Crop Protection:

The Gambian Crop Protection Service (CPS) has an ongoing research program which is funded largely under the regional AID Integrated Pest Management Project (IPM). IPM also provides research direction, technical assistance, and training. Special attention under the Project will be on facilitating the involvement of CPS staff in FSR/E work. Component research will have a crops and farming systems focus rather than a disciplinary orientation, and support for training will also be provided.

h. Livestock:

Research to benefit the livestock sector will include technical assistance for research programs in crop residues, fallow land pastures, small domestic ruminants, poultry, feeding trials, overseeding legumes in rice, and living fences. This technical assistance will be a combination of short- and medium-term, as detailed in the Technical Analysis (Annex A). Some of the activities such as feeding of crop residues, fallow land pastures, and methods of harvesting and storing forages, will be a continuation of ongoing MFP work. For other activities, where the potential benefits are not yet clear, initial technical assistance team activities will be aimed at clarifying those potentials in consultation with expatriate and Gambian researchers and designing the longer-term research programs. These activities include range management, poultry, and small ruminant research. (See Annex A. Section V for detailed discussion of livestock research undertaken to date.). Training for one Gambian will be provided at the MS level in forage agronomy at a U.S. university.

4. On-Farm Research: Farming Systems Research and Extension (FSR/E):

In order to generate technologies which are relevant to farmers' needs and circumstances, the Project will undertake a series of activities which have become known as farming systems research and extension (FSR/E). (See Annex A for detailed discussion.)

FSR/E activities already exist in The Gambia. The MFP is primarily focussed on component research in maize, forage crops, socioeconomics, and range improvement, but it also supports on-farm trials in which both technical and social science disciplines are represented. During the 1984 cropping season a team based at Sapu consisting of a Gambian agronomist and a farm management economist supported by ODA carried out reconnaissance surveys in selected areas of the country, and the team plans to lay out an initial set of on-farm trials in the 1985 cropping

season. The team also carried out an assessment of the current set of demonstrations run by the Extension Service.

The second phase of ADPII was formally launched in 1984 with the implicit assumption that improved packages attractive to farmers would be available for selected crops in The Gambia. At the same time, it was recognized that a stronger agricultural research system was essential to improving and maintaining the momentum of agricultural development efforts in the country. Support for agricultural research, primarily in the form of infrastructure at the Sapu research station has been included in ADPII. Further, both the designers of ADPII and the PID for the Project envisaged close operational collaboration between the two in on-farm adaptive research aimed at identifying and testing innovations which can be readily accommodated in existing farming systems.

Since GARD funds will not be available prior to mid-1985, on-farm trials work under the Project is not possible for the 1985 cropping season. The Sapu-based FSR/E team does plan to initiate trials this season on an interim basis with support from ADPII. To assist and complement these efforts in the absence of project funding, the Farming Systems Support Project (FSSP) and AID/Banjul have agreed to fund a workshop on on-farm trials for mid-May in The Gambia just prior to the planting season. Participants will include current and prospective research staff involved in FSR/E, prospective members of the technical assistance team for the Project, and Agricultural Assistants (AA) currently serving at Sapu who will assist with the on-farm trials work during the coming season.

The Project will fund and direct a series of reconnaissance and special studies as part of the FSR/E activities during 1985 and early 1986. (See Annex A.) These studies will be carried out in collaboration with MFP and selected departments and are expected to result in the following: (a) preparation of a series of monographs on Gambian farming systems utilizing data from the Mixed Farming Project, Gambia River Basin Studies (OMVG) and the Land Resources Study (LRS); (b) zoning of farming systems in The Gambia; and (c) special surveys focussing on such issues as markets for horticultural crops, agroforestry practices, nutrition, and small irrigated systems which are required to provide guidance for future research activities.

During 1985, the Project team and the GOTG will expand the membership of the Sapu-based FSR/E team and organize a second team to operate out of the Yundum Research Station to cover the western portion of the country. The membership of these teams will be primarily Gambian from the onset. Long-term technical assistance will be provided to each regional team in the form of a Research Extension Liaison Officer (RELO) on a full-time basis for approximately three years. Approximately fifty percent of the Chief of Party's time will be devoted to participation in FSR/E activities in the western portion of the country. In

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addition to the basic two-team structure, a third group will be formed during 1985 specifically focussed upon irrigated systems with the task of developing a detailed proposal for constructing and/or rehabilitating small irrigated perimeters. This irrigation systems group will participate in the monitoring, evaluation and adaptive research activities in support of small and large irrigated schemes in the country.

FSR/E teams will be multidisciplinary and interdepartmental, although funds for support will flow through one department. Special efforts will be made to avoid dominance of FSR/E activities by a single discipline or department. The core team will consist of three or four researchers in crop agronomy, animal production/nutrition/health, extension and social science. The core team will be part of a larger FSR/E group composed of representatives of other disciplines, such as agroforestry, crop protection, and agricultural engineering. FSR/E reports will be reviewed by the Technical Secretariat of the NARB to facilitate screening of research proposals and reassessing priorities.

An additional objective of the zoning and reconnaissance work to be conducted by two FSR/E teams during the 1985/86 dry season is the identification of more sites for on-farm trials for the 1986 season. These will be added to the 1985 sites used by the Sapu team.

The FSR/E regional teams will supervise two-person village teams composed of personnel from the extension services: one agricultural assistant (AA) and one livestock assistant (LA). Each village team will be responsible for the on-farm trials in one or more villages selected as representative of individual zones. The teams will also be responsible for the collection of data required to monitor the trials.

During the 1986 cropping season each regional team will oversee the activities of at least two village teams in a total of four zones. These zones may correspond to areas under individual Mixed Farming Centers although the zoning exercise will delineate areas according to the homogeneity of farming systems. The number of village level teams will grow to a total of 16 for the entire country by the end of the Project and provide coverage for approximately half of the country.

On-station research in The Gambia has identified promising technologies which have not yet been tested in farmers' fields. Pending the development of technologies based on farm-level constraints identified in the FSR/E process, technologies currently available will be used to design on-farm trials in the initial years of the FSR/E program. Following is an illustrative list of technologies available for on-farm testing:

Groundnuts: test promising varieties identified by national program and three varieties already in use

in adjacent areas of Senegal. Test for response to potassium in sites of high land use intensity. Test for rates and timing of phosphorous application in areas of shallow or sandy soils. Test for control of Cercospera using sulphur dust. Test SE28/206 seed of high varietal purity versus farmers' own seed of the same variety not replaced since first adoption.

Maize: test Jekka (a superior local variety) against NCB (the currently recommended exotic cultivar) and farmers' own varieties at different fertilizer rates. Following two more years of on-station work and studies of farmers' practices, test maize-millet and maize-legume intercropping.

Millet/Sorghum: test use of seed dressing for control of downy mildew, smut and ergot. Test local selections on different soil types when seed with guaranteed characteristics can be produced (lack of isolation at Sapu currently prevents this)

Rainfed rice: multi-location testing of three recently identified varieties, followed by testing of crop establishment methods and fertilizer rates.

Irrigated rice: test improved cultural practices (spacing, fertilizer rates and time of application) for two recently recommended varieties IR 934-450-1 AND BG 90-2.

Linkages between research and extension will be further consolidated during the implementation of a training and visit (T and V) system under ADPII. In addition to extension officers, the proposed ADPII subject matter specialists will also participate in FSR/E activities. They will be able to use on-farm trials conducted by AA/LA teams for orientation and training of village extension workers in prospective technologies. The full range of opportunities for collaboration will be developed by the RELOs, FSSP-supported trainer and the ADPII extension specialist.

FSR/E requires strong linkages with the component/off-farm research activities on various crops and animals in different disciplines. The two activities are complementary and not substitutes for one another. A major linkage occurs through the fact that nearly all the FSR/E team members will continue to be involved in component research activities on-station. In most cases, team members will actually have major responsibilities in terms of these component research activities which will facilitate the two-way flow of information. The major impact of FSR/E activities upon component research is expected to come through this direct linkage.

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In addition, FSR/E activities are intended to give rise to a series of special socioeconomic studies under the auspices of the PPMU. Understanding and improving the socioeconomic and policy environment is as important as technology development in efforts to develop agriculture in The Gambia. Policy studies on such topics as agricultural prices and input supply will be supported with TDY technical assistance programmed in a long-term pattern as described under component research (section I.G.3.). The precise nature of those studies will be influenced by the GOTG objectives, PPMU capabilities, and Ministry of Finance maco-policy studies under the USAID-supported Economic & Financial Policy Analyses Project.

5. Promotion of Technologies:

As varieties of cereals, oilseeds, grain legumes and so forth are screened and cultural practices developed, the Project will support dissemination of the results and do further testing. This will be done initially by linkages with extension activities at the research planning stage in ARMS and by participation of farmers and extension agents in all FSR/E activities. More importantly, the Project will plan in detail and train field workers for specific promotional campaigns. It has been found that without careful, detailed promotion strategies -- as to target groups and areas, inputs and delivery, and technical focus -- and specifically trained extension workers, efforts to induce adoption of innovative practices usually fail in The Gambia as elsewhere. And the lessons of failures often are not learned due to poor monitoring.

Therefore, the Project will provide two long-term technical assistants, Research Extension Liaison Officers (RELOs), to work at the Sapu and Yundum research stations to generate promotional campaigns. They will be technical advisors to the principal agricultural officers in the western and eastern regions, and have as their major responsibilities to:

--identify innovations for promotion to farmers at large;
--assist preparation and review of yearly promotion plans;
--plan specific campaigns;
--identify financing sources and organizational structures best suited to these campaigns;
--organize the application of Project resources, as necessary, for support of pilot promotions;
--plan and lead technical training for field workers;
--plan and oversee monitoring of promotion campaigns; and
--facilitate rapid, direct feedback to the research system.

The RELOs, in other words, will ensure that promising innovations reach farmers efficiently, within the limits of the Project's, GOTG's and PVOs' organizational and financial

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capacities. Other Project resources and facilities will be brought to bear with their assistance, especially technical training by research specialists, operational funds for selected pilot promotions, and logistical and intellectual support for major campaigns as necessary.

While all of the above will complement the activities of ADPII, it is recognized at this stage that the depth and extent of need and opportunity for this project component in the middle and later years of the Project are unclear. Thus, a central issue of the Project's evaluations in years two and three will be the effectiveness, generally, of promotion of agricultural innovations in The Gambia. From this will be determined whether or not the Project's mix of research (and training and technical assistance for it) and promotion to farmers needs adjustment. See Annex F for detailed discussion on promotion activities.

H. Relationship to Existing Projects (USAID & Other Donors)

The effectiveness of the Project will depend to a large degree upon the extent to which it collaborates with other projects and institutions concerned with agricultural research, extension and training.

The Project will complement the efforts of other projects including MFP, ADPII, IPM, ODA support for research and seed multiplication, and PVO extension work. As previously noted, the Project will continue several activities currently supported by MFP. MFP itself will continue through March 1986 and the socioeconomic studies component may be extended for an additional year or so. This will facilitate an overlap with the Project which will help ensure continuity in the various research programs. Project priority attention will be given to the maize program and to the continued screening of varieties and the testing of associated agronomic practices which are capable of increasing yields for varieties currently in use by farmers. Discussions are in progress on ways to continue the MFP's socioeconomic research activities, although it is unlikely that all can be accommodated.

As noted above, ADPII seeks to increase production of upland rainfed crops through strengthening support institutions, improved input supply, infrastructural, budgetary, and management support for research and seed multiplication, and through assisting government with sectoral reform. The extension service will be reorganized so that village extension workers deal with all crops in the farming systems in their area. Over four years, an agricultural extension and training specialist will assist with the introduction of a Training and Visit (T and V) system. Both changes offer considerable opportunities for fruitful intereaction with The Project's FSR/E activities and the RELOs, in particular.

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Major emphasis is given by ADPII to the development of the Gambia Cooperative Union and its member societies. The objective is to provide timely production inputs, together with credit facilities that are closely supervised. In collabortion with the Caisse Centrale's Cotton project, ADPII intends to enhance levels of draft power and implements. A national seed production marketing and pricing policy has been submitted by the National Seed Council for approval by the World Bank, although the Seed Multiplication Unit (SMU) may need additional management support to implement it . In the evaluation of research results the Project will take note of the planned gradual elimination of fertilizer subsidies as an important sectoral reform.

A close collaborative relationship with ADPII will enhance the success of GARD as described previously. ADPII's resources are currently being used to support on-farm and on-station research and will be available for improvements in the infrastructure at Sapu. A series of discussions have been held with the ADPII coordinator and the World Bank and various opportunities for collaboration have been identified. These areas of collaboration include the involvement of ADPII subject matter specialist in GARD on-farm trial activities, the identification of promising innovations resulting from GARD which can be promoted to farmers at large by ADPII, and the involvement of GARD RELOs in the planning of these ADPII-funded extension activities. In addition, ADPII will fund infrastructural improvements which will support research operations funded by GARD. ADPII's funds will continue to be available for on-farm trials although support for on-station research will be increasingly borne by GARD. Both Projects will collaborate in efforts to improve management and administration in the Ministries of Agriculture and Water Resources and Environment. Most importantly, ADPII's financial support and technical assistance will improve the capacity of the Extension Service to promote the use of improved technologies among farmers and, as previously noted, the FSR/E and promotional activities supported by the Project will feature direct involvement by ADPII. Monitoring and evaluation activities supported by ADPII will provide information essential to measuring the impact of both Projects upon agricultural production.

Several possibilities for collaboration with PVO projects have been identified. A number of PVOs are actively involved in rural development with a focus on agriculture. These include Save the Children Fund, Action Aide, Catholic Relief Service, the Methodist African Mission, and Freedom from Hunger Campaign (FFHC). Some of these projects are already carrying out adaptive research activities on their own. Horticultural crops are a particular concentration. These projects have good extension and input delivery systems covering their target areas and in general have excellent rapport with farm families in those areas. PVO projects, however, cannot individually support the research or even the network of contacts which can identify promising technologies for testing and eventual use in their

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programs. The agricultural research system with support from the Project can provide this service. PVOs might also become participants in the network of FSR/E type activities and be included in workshops such as that planned for on-farm trials in 1985 with support from FSSP. PVO projects promise to be one of the most effective mechanisms for ensuring that research results are successfully promoted among the farming population.

ODA is currently supporting a farm management economist based at Sapu and a seed production specialist and associated assistance for the seed multiplication program. In addition, ODA has supported efforts to analyze the backlog of past research results and identify the most promising improvements for use by ADPII in their extension and trials programs. It is anticipated that ODA support for the seed program will continue at least for the next few years. The farm management economist is devoting most of his time to FSR/E activities in collaboration with Gambian researchers and will continue to function as a team member of the Sapu based FSR/E regional team. It is anticipated that support for this position will continue at least through mid-1988.

The Project also will draw on and reinforce several other AID-supported projects, especially the regional IPM project, the Soil and Water Management Project, the Economic and Financial Policy Analyses Project and the Sahel Regional Financial Management Project. IPM trials and perspectives will be selectively incorporated into the FSR/E activities, and pest management specialists will be invited to participate in the reconnaisance work. (See Crop Protection section of Technical Analysis.) The policy analysis work supported by the Project will be done in collaboration with the short-term trainers/advisors and long-term TA provided under the Economic and Financial Analyses Project. The Sahel Regional Financial Management Project will assist with the financial arrangements for the Project including the establishment and operation of an account for the Project with the GOTG.

I. Project Inputs:

The principal AID-funded inputs are technical assistance, training, evaluation, commodities, operational costs of research and promotion activities, and construction. The principal GOTG counterpart contributions will be in the form of the GOTG personnel and operating expenses, and research and government office facilities. A review of each major input category appears below.

1. Long-term Technical Assistance ($4,673,000)

A relatively small long-term technical assistance component is planned for this Project. On average, for each of the seven years there will be only three to five long-term TAs in residence, one of whom will be the Chief of Party. In total,

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29.3 years of long-term TA will be provided as follows:

GARD LONG-TERM TECHNICAL ASSISTANCE (Person 1 Years)

Project Year	1	2	3	4	5	6	7
Chief of Party/Socio-economist	1	1	1	1	1	1	1
Admin/Financial Manager	1	0.3					
Research Extension Liaison Officer (Sapu)	0.5	1	1	0.5			
Research Extension Liaison Officer (Yundum)	1	1	1				
Training Officer (FSSP)	0.5	0.5					
Crop Agronomist	1	1	1	1	1	1	1
Horticulturist			1	1			
Forage Agronomist	0.5	0.5					
Livestock Specialist				1	1	1	1
TOTAL	5.5	5.3	5	4.5	3	3	3

The Chief of Party will share his time among general project management, development of the new agricultural research management system, and participation on the FSR/E team at Yundum. During the first year he will be assisted by an administrative/financial advisor who will set up the admin/finance system for the Project which subsequently will be taken over by a local administrative assistance and gradually built into ARMS.

As discussed in the Technical Analysis, research in crop and forage agronomy will be done with the help of two long-term TAs. A research extension liaison Officer (RELO) will be provided to each of the regional FSR/E teams for a period of three years. The other two long-term TAs at the outset will work on FSR/E training. Crop work and FSR/E work will continue. A long-term TA for livestock and one for horticulture will commence work in year three, following the preliminary investigations discussed in the Technical Analysis.

Supplementing the long-term TAs described above will be approximately nine expatriate research associates (postdoctoral researchers and advanced graduate students) working with Gambian counterparts for periods of approximately twelve to eighteen months. This will allow for more intensive activity on high priority research programs at a lower cost for well-trained expatriate researchers. (See Attachment G for schedule of research associates.)

Short-term trainers/advisors will implement a series of short-term training programs, As the short-term consultants

will be used primarily to carry out training and advisory functions rather than simply serve as consultants in the traditional sense, the funds for these services are budgeted under the training line item of the budget (Short-Term Trainers/Advisors). See Attachment G for schedule of short-term trainers/advisors.

2. Training ($3,581,000)

The Project will support nine MS and five BS training programs spanning a variety of disciplines. The larger part of the Project training will be devoted to a tightly designed series of short-term programs in The Gambia, the U.S., and third countries. The Gambia/U.S. components will, for the most part, be linked together, involving on-the-job training in The Gambia, follow-up training in the U.S., and subsequent on-the-job training back in The Gambia. This involves visits by U.S. experts to The Gambia and by Gambians to the U.S. (See Attachment F for scheduling of long- and short-term training and trainers/advisors.)

The subjects to be covered in short-term training are field crop production, soil/plant/water relations, horticulture, agricultural engineering, crop protection, small ruminants, poultry, forage, biometrics, agricultural statistics, policy analysis, and management. Part of the short-term training will be done at the appropriate International Agricultural Research Centers (IARCs) as well as at specialized training institutes in Africa. Some of the training will be done at The Gambia's Management Development Institute and the Gambia College.

3. Commodities ($1,000,000):

This category is allocated to equipment items that directly support the research program. Cost for commodities were estimated by the contractor who undertook the project design using current equipment catalogs. A detailed commodity price list is found in Attachment G.

4. Construction ($110,000)

The Project was explicitly designed to complement but not duplicate ADPII which has a very large infrastructure/construction component but relatively little for technical assistance, training, and direct research support. The only construction planned is for three staff houses to accommodate the TA personnel at Sapu.

5. Local Operating Costs for Research and Promotion Activities ($1,146,000):

A major problem in The Gambia is inadequate operational support for local researchers and extension agents. In effect, The Gambia cannot derive full benefit from its skilled personnel because they lack supplies, transport, etc. The Project will

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help to alleviate this problem through specific recurrent cost financing. The GOTG will assume an increasing share of this in latter years of Phase I and Phase II of the Project, as increased agricultural productivity and policy reforms lead to an improved recurrent revenue situation.

6. Other Costs ($7,190,000)

The remaining budget items include audits ($100,000), evaluations ($250,000), campus support ($598,000), contingency ($1,146,000), inflation ($2,552,000) and indirect costs or overhead ($2,544,000).

II. FINANCIAL PLAN AND ANALYSIS

The financial plan contains the following sections: (A) budget presentation, (B) recurrent cost analysis, (C) cost effectiveness/minimization, and (D) payment verification, audits, and Section 121(d) compliance.

A. The Project Budget

The Project budget is presented in the following tables. The total cost to AID is $17,700,000. The GOTG contribution will be $1,542,000 equivalent, giving a total of $19,242,000. As the Gambia is a Sahelian country a 25 percent host country contribution is not required. Table 1 presents a summary of the total project budget by source of funding and project inputs. Table 2 provides a summary of project costs by components and input category. Table 3 presents annual project expenditures by project components and source of funding. Additional budget tables and worksheets can be found in Attachment F.

1. Technical Assistance ($4,673,000)

Technical Assistance is budgeted at $150,000 per year per person. The schedule of long-term TA is shown in the implementation plan. (See Attachment F.) In addition, five research associates (postdoctoral researchers or PhD candidates) will be scheduled for eighteen months and four for twelve months. They are budgeted at $38,900 for eighteen months per person, and $20,875 for twelve months per person.

2. International Training ($2,074,000)

Total cost for a 2-3 year MS degree program is estimated at $64,000. For a 4-year BS degree it is $72,000. (See Attachment F for for detailed budgets and schedules.) An 8-week training program in the U.S. is budgeted at $7,000, an 8-week program in Africa is budgeted at $8,000, and an 18-week program in the U.S. at $10,000.

3. In-Country Training (Short-Term Trainers/Advisors) ($1,507,000)

A six week short-term training/advisory visit to The Gambia is budgeted at $19,000.

4. Commodities and Construction ($1,110,000)

Cost estimates for commodities were obtained from current equipment catalogs. The commodity price list can be found in Attachment G. The only construction planned is for three houses at Sapu for long-term technical assistants and research associates which is budgeted at $110,000. The long-term technical assistants assigned to the Banjul area will occupy housing previously used by the MFP or rent housing. (See Conditions and Covenants.)

5. Local Support Staff and Research and Promotion Operations ($1,146,000)

Local personnel support is budgeted at going rates for hiring Gambians. This personnel consists of secretaries, drivers, and guards to support the contractor. Vehicle and equipment operation and maintenance vary according to type. Estimates are based on the experiences of the MFP and OMVG Projects.

6. Other Costs ($7,190,000)

This line item of the budget includes $598,000 for on-campus support of the university, $250,000 for two external evaluations in years three and six, $100,000 for an audit, $2,544,000 for indirect costs or overhead, $2,552,000 for inflation, and $1,146,000 for contingency. On-campus support provides 1 1/3 person years of administrative backstopping per year over the life of the Project.

A twenty-six percent university indirect costs rate is applied to all the above costs except local currency costs, individual commodities over $500, and certain training costs.

Inflation is computed at a rate of six percent for foreign exchange costs and eleven percent for all other costs. The latter is the estimate of Gambian inflation as explained in the economic analysis. The inflation rate is compounded annually.

Contingency is estimated at ten percent of all the above costs except for indirect costs. This contingency allows for very close budgeting on other items.

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Table 1
SUMMARY OF PROJECT COSTS
BY EXPENSE CATEGORY AND SOURCE OF FUNDING
($ 000)

Project Inputs	Source	AID GRANT			GOTG			TOTAL
		FX	LC	TOTAL AID	FX	LC	TOTAL GOTG	
1. Technical Assistance		4673	0	4673	0	0	0	4673
2. Training		3581	0	3581	0	0	0	3581
International		2074	0	2074	0	0	0	2074
In-Country (Trainers/Advisors)		1507	0	1507	0	0	0	1507
		1000						
3. Commodities		1000	0	1000	0	0	0	1000
Vehicles		317	0	317	0	0	0	317
Other		683	0	683	0	0	0	683
4. Construction		0	110	110	0			110
5. Local Operating Costs		160	986	1146	0	981	981	2127
Local Personnel		0	168	168	0	773	773	941
Research & Promotion Costs		160	818	978	0	208	208	1186
6. Other costs		6671	519	7191	0	561	561	7751
Campus Support (OverHead)		598	0	598	0	0	0	598
Monitoring & Evaluation		250	0	250	0	0	0	250
Audit		100	0	100	0	0	0	100
Indirect Costs		2544	0	2544	0	0	0	2544
Contingency		1036	110	1146	0	98	98	1244
Inflation		2143	410	2552	0	463	463	3015
Total		16085	1615	17700	0	1542	1542	19242

Table 2: Summary Cost of Project by Component and Input Source

I. AG RESEARCH MANAGEMENT SYSTEM	Total AID FX	Total AID LC	Total GOTG FX	Total GOTG LC	Total AID	Total GOTG	Total
Long Term TA	720	0	0	0	720	0	720
Training	184	0	0	0	184	0	184
Internat. ST Trng in Afr.	64	0	0	0	64	0	64
In-Country Trainers/Adv	120	0	0	0	120	0	120
Commodities	70	0	0	0	70	0	70
Vehicles	50	0	0	0	50	0	50
Other/Office Equipment	20	0	0	0	20	0	20
Local Operating Costs	14	399	0	14	413	14	427
Gambian Personnel	0	0	0	14	0	14	14
Local Staff	0	119	0	0	119	0	119
Office Supplies	14	21	0	0	35	0	35
Vehicle Maint/Oper	0	84	0	0	84	0	84
Rent & Utilities	0	175	0	0	175	0	175
Total	988	399	0	14	1387	14	1401

II. FSR/E & Promotion	Total AID FX	Total AID LC	Total GOTG FX	Total GOTG LC	Total AID	Total GOTG	Total
Long Term TA	1575	0	0	0	1575	0	1575
Training	188	0	0	0	188	0	188
Internat. ST Trng. IARCs	176	0	0	0	176	0	176
In-Country Trainers/Adv	12	0	0	0	12	0	12
Commodities	90	0	0	0	90	0	90
Vehicles	90	0	0	0	90	0	90
Local Operating Costs	146	324	0	401	470	401	871
Gambian Personnel	0	0	0	343	0	343	343
Local Staff	0	35	0	0	35	0	35
Supplies & Equip	26	29	0	18	55	18	73
Vehicle Maint/Oper	0	80	0	40	80	40	120
Promotion grants	120	180	0	0	300	0	300
Total	1999	324	0	401	2323	401	2724

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Table 2: Summary Cost of Project by Component and Input Source

III. COMPONENT RESEARCH	Total AID FX	Total AID LC	Total GOTG FX	Total GOTG LC	Total AID	Total GOTG	Total
Long Term TA	2378	0	0	0	2378	0	2378
Training	3209	0	0	0	3209	0	3209
Internat ST Trng US & 3rd	901	0	0	0	901	0	901
Internat Degree Trng. US	933	0	0	0	933	0	933
In-Country Trainers/Adv.	1375	0	0	0	1375	0	1375
Commodities	840	0	0	0	840	0	840
Vehicles	177	0	0	0	177	0	177
Equipment	663	0	0	0	663	0	663
Construction	0	110	0	0	110	0	110
Housing	0	110	0	0	110	0	110
Local Operating Costs	0	263	0	566	263	566	829
Gambian Personnel	0	0	0	416	0	416	416
Local Staff	0	14	0	0	14	0	14
Vehicle Maint/Oper	0	94	0	48	94	48	142
Equipment Maint/Oper	0	155	0	102	155	102	257
Total	6427	373	0	566	6800	566	7366

IV. OTHER COSTS	Total AID FX	Total AID LC	Total GOTG FX	Total GOTG LC	Total AID	Total GOTG	Total
US Campus Support	598	0	0	0	598	0	598
Monitoring & Evaluation	250	0	0	0	250	0	250
Audit	100	0	0	0	100	0	100
Total	948	0	0	0	948	0	948
Project							
Subtotal	10362	1096	0	981	11458	981	12439
Contingency (@10%)	1036	110	0	98	1146	98	1244
Inflation	2143	410	0	463	2552	463	3016
Indirect Costs (Overhead)	2544	0	0	0	2544	0	2544
Total	16085	1615	0	1542	17700	1542	19242

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Table 3: Annual Project Expenditures by Components

	Year 1 AID	Year 1 GOTG	Year 2 AID	Year 2 GOTG	Year 3 AID	Year 3 GOTG	Year 4 AID	Year 4 GOTG
I. AG RESEARCH MANAGEMENT SYSTEM								
Long Term TA	225		120		75		75	
Training	56	0	56	0	24	0	12	0
Internat. ST Trng in Afr.	32		32					
In-Country Trainers/Adv	24		24		24		12	
Commodities	35	0	0	0	0	0	35	0
Vehicles	25						25	
Other/Office Equipment	10						10	
Operating costs	59	2	59	2	59	2	59	2
Gambian Personnel	0	2		2		2		2
Local Staff	17		17		17		17	
Office Supplies	5		5		5		5	
Vehicle Maint/Oper	12		12		12		12	
Rent & Utilities	25		25		25		25	
Total	375	2	235	2	158	2	181	2
II. FSR/E & Promotion								
Long Term TA	375		450		375		150	
Training	44	0	32	0	32	0	32	0
Internat. ST Trng. IARCs	32		32		32		32	
In-Country Trainers/Adv	12							
Commodities	45	0	0	0	0	0	45	0
Vehicles	45						45	
Operating costs	78	49	72	52	69	55	67	57
Gambian Personnel		49		49		49		49
Local Staff	5		5		5		5	
Supplies & Equip	43		5		3	2	2	3
Vehicle Maint/Oper	30		12	3	11	4	10	5
Promotion grants			50		50		50	
Total	542	49	554	52	476	55	294	57

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Table 3: Annual Project Expenditures by Components

	Year 1 AID	Year 1 GOTG	Year 2 AID	Year 2 GOTG	Year 3 AID	Year 3 GOTG	Year 4 AID	Year 4 GOTG
III. COMPONENT RESEARCH								
Long Term TA	341		190		392		555	
Training	471	0	688	0	706	0	563	0
Internat ST Trng US & 3rd	76		181		186		181	
Internat Degree Trng. US	111		132		217		196	
In-Country Trainers/Adv.	284		375		303		186	
Commodities	379	0	138	0	125	0	178	0
Vehicles	65				27		85	
Equipment	314		138		98		93	
Construction	110							
Housing	110							
Local Operating Costs	28	54	35	67	53	93	51	90
Gambian Personnel		51		58		80		73
Local Staff	2		2		2		2	
Vehicle Maint/Oper	16		13	3	17	5	15	7
Equipment Maint/Oper	10	3	20	6	34	8	34	10
Total	1329	54	1051	67	1276	93	1347	90
IV. OTHER COSTS								
US Campus Support	94		84		84		84	
Monitoring & Evaluation					125			
Audit								
Total	94	0	84	0	209	0	84	0
Project								
Subtotal	2340	105	1924	121	2119	150	1906	149
Contingency (@10%)	234	11	192	12	212	15	192	15
Inflation			163	15	365	38	531	60
Indirect Costs	497	0	471	0	472	0	415	0
Total	3071	116	2750	148	3169	203	3044	224

Table 3: Annual Project Expenditures by Components

	Year 5 AID	Year 5 GOTG	Year 6 AID	Year 6 GOTG	Year 7 AID	Year 7 GOTG
I. AG RESEARCH MANAGEMENT SYSTEM						
Long Term TA	75		75		75	
			0			
Training	12	0	12	0	12	0
Internat. ST Trng in Afr.			0			
In-Country Trainers/Adv	12		12		12	
Commodities	0	0	0	0	0	0
Vehicles						
Other/Office Equipment						
Operating costs	59	2	59	2	59	2
Gambian Personnel		2		2		2
Local Staff	17		17		17	
Office Supplies	5		5		5	
Vehicle Maint/Oper	12		12		12	
Rent & Utilities	25		25		25	
Total	146	2	146	2	146	2
II. FSR/E & Promotion						
Long Term TA	75		75		75	
Training	16	0	16	0	16	0
Internat. ST Trng. IARCs	16		16		16	
In-Country Trainers/Adv						
Commodities	0	0	0	0	0	0
Vehicles						
Operating costs	64	60	62	62	58	66
Gambian Personnel		49		49		49
Local Staff	5		5		5	
Supplies & Equip	1	4	1	4		5
Vehicle Maint/Oper	8	7	6	9	3	12
Promotion grants	50		50		50	
Total	155	60	153	62	149	66

Table 3: Annual Project Expenditures by Components

	Year 5 AID	Year 5 GOTG	Year 6 AID	Year 6 GOTG	Year 7 AID	Year 7 GOTG
III. COMPONENT RESEARCH						
Long Term TA	300		300		300	
Training	405	0	254	0	122	0
Internat ST Trng US & 3rd	161		58		58	
Internat Degree Trng. US	149		64		64	
In-Country Trainers/Adv.	95		132			
Commodities	20	0	0	0	0	0
Vehicles						
Equipment	20					
Construction						
Housing						
Local Operating Costs	45	83	32	85	19	94
Gambian Personnel		60		49		45
Local Staff	2		2		2	
Vehicle Maint/Oper	14	8	11	11	8	14
Equipment Maint/Oper	29	15	19	25	9	35
Total	770	83	586	85	441	94
IV. OTHER COSTS						
US Campus Support	84		84		84	
Monitoring & Evaluation			125			
Audit					100	
Total	84	0	209	0	184	0
Project						
Subtotal	1155	145	1094	149	920	162
Contingency (@10%)	116	15	109	15	92	16
Inflation	444	83	535	112	515	155
Indirect Costs	265	0	231	0	193	0
Total	1979	242	1969	276	1720	333

B. Recurrent Costs

As discussed in the Administrative Analysis, The Gambia's agricultural research budget in 1982/83 was D1,190,000. This includes salaries for 54 researchers, supplies, operations, and maintenance. The salary bill was approximately half of the total.

By year seven of the Project, GOTG recurrent costs for supplies, operations, and maintenance are projected to increase by D303,600, a 25 percent increase over the total 1982/83 research budget and a fifty-one percent increase over the supplies, operations and maintenance budget that year.

No real incremental costs are projected for salaries. The Project does not call for the addition of any personnel to the agricultural research establishment. The Gambia's problem has been inadequate support for the personnel already in place. The Project will help alleviate that problem by initially providing funding for research support and then gradually shifting the burden of that support to the GOTG.

The projected increase in GOTG recurrent costs is relatively modest, especially when considered in light of the projected increase of agricultural output. In 1982/83, agricultural gross domestic product (AGDP) was estimated at D148,700,000. Agricultural research expenditures equalled about 0.8 percent of AGDP. By year seven of the Project, the total GOTG agricultural research budget is projected to be approximately D1,500,000 or about one percent of 1982/83 AGDP.

If ADPII expands as expected, the agricultural research budget would remain under one percent of AGDP, unless the GOTG assumes more of the cost of purchasing vehicles and building new facilities i.e., more capital costs. In its 1981 Sector Policy Paper on Agricultural Research, the Bank states that two percent of AGDP should be the target level of expenditures on research for countries where agriculture is a key economic sector.

C. Cost Effectiveness/Minimization

The Project attempts to minimize costs in several ways. First, there is no request for an increase in Gambian agricultural research personnel. The budget shows some Gambian research personnel salaries. These represent estimates of individuals who will be working with Project technical assistants and who will be involved in on-the-job training. Both the research with technical assistants and the training will be in the context of the regular duties of these Gambian researchers. In other words, the Project activities will fit

into and strengthen Gambian activities, rather than divert Gambians to different, additional activities that imply increases in personnel.

The second way the Project minimizes costs is by utilizing short-term advisors/trainers. Over the life of the Project only 29.3 years of senior long-term technical assistance is projected. Expatriates will be used intensively on short-term visits that are largely of a training nature, either formally or, more often, by working alongside Gambians in the design and analysis of research efforts.

The third way costs are minimized is by emphasizing short-term, on-the-job training. Degree training is limited to five BS and nine MS. In addition to the short-term training in The Gambia associated with TDY's (see above), there will also be short-term training in the U.S. and in Africa. The latter will be at IARC's and at special training institutes. There will also be short-term training in The Gambia in association with The Gambia's Management Development Institute and the Gambia College.

D. Payment Verification, Audit, and Section 121(d) Compliance

1. Payment Verification

Methods of financing AID/Banjul intends to use for the Project are summarized as follows:

Methods of Implementation*	Method of Financing	Approximate Amount (U.S. $1000)
TA Title XII Contractor	Letter of Credit	4,673
Training TA Contractor	Letter of Credit	3,581
Commod-TA Contractor	Letter of Credit	1,000
Construction-TA Contractor	Letter of Credit	110
Operating Expenses	Direct Payment	
Local Proc/Purchases	Purchase Order	1,146
Evaluation - Contract	Direct Payment	250
Audit - Contract	Direct Payment	100
Indirect Cost	Direct Payment	2,544
Campus Support	Letter of Credit	598
	TOTAL	14,002

*Cost for contingency ($1,146) and inflation ($2,552) are not included in table.

2. Audit

AID/Banjul has assisted the GOTG Auditor General's Office in developing their audit procedures to a point where they can audit adequately local currency disbursed by the GOTG. Auditing of the contractor's accounts will be performed by an independent auditor. Project funds have been budgeted for this purpose.

3. Section 121(d) Compliance

The GOTG's accounting operations are centralized. AID/Banjul provides advance of funds which are channelled through the Central Bank of The Gambia and controlled by the GOTG Accountant General. The Mission performs voucher payment review on a quarterly basis. Through the Sahel Regional Financial Management Project, USAID is assisting the Gambian Government to strengthen their accounting system. A 121(d) certification for the Project can be found in Attachment E of this PP.

III. IMPLEMENTATION AND PROCUREMENT PLAN

A. Implementation Arrangements and Schedule:

The detailed schedule for implementation of Project activities is shown in the implementation chart (Attachment F). Major implementation arrangements are described below.

1. Grantee Implementing Agency

The primary grantee implementing agency will be the Ministry of Agriculture. The Ministry of Water Resources and Environment will also be a recipient of Project support.

2. Grantee Personnel

The various GOTG ministries and departments involved in the Project have agreed to make personnel available for the Project activities and training as indicated in this PP. The GOTG will be responsible for all allowances. The GOTG will guarantee a position in the sponsoring ministry for personnel undertaking degree training under the Project. (See Conditions and Covenants Section.)

3. Project Management

The Project Description and Administrative Analysis contain detailed projections on the configuration of an agricultural research management system for The Gambia which would be an integral part of the GOTG structure and responsible for the management of research activities supported by the Project. It is anticipated that these will undergo considerable refinement

in the months preceding and following the formal initiation of the Project.

The Project will be managed initially by an Interim Project Committee (IPC) consisting of the Permanent Secretaries of the Ministries of Agriculture, Water Resources and Environment, and Economic Planning and Industrial Development, the Assistant Director for Research (DOA), and Chief of Party (COP) of the TA team. The concurrence of the IPC will be required to expend funds in support of Project activities. The Assistant Director of Research (DOA) will serve as secretary to the IPC and the GOTG counterpart to the COP until ARMS has been formally established and permanent arrangements installed. The Assistant Director in consultation with the COP will act on behalf of the IPC in all routine matters affecting the Project that require GOTG authorization, such as financial arrangements, designation of trainees, and staffing schedules for short- and long-term TAs. The COP will be responsible for submitting activity/work programs every six months for review by the Committee and AID/Banjul.

AID/Banjul will assign a project officer to backstop the Project. He or she will be responsible for budgeting, implementation actions, monitoring, reporting, and obtaining necessary clearances and timely decisions from USAID. He or she will serve as liaison among USAID, GOTG, and the contractor.

4. Financial Management

A long-term U.S. administrator/financial manager will be employed by the contractor to (a) ensure that proper Project financial management and control systems are established; (b) be responsible for strengthening financial management in the Ministry of Agriculture in collaboration with the Sahel Regional Financial Management Project; (c) provide administrative liaison among USAID, GOTG, and the contractor; (d) be responsible for local procurement of commodities and arrange for construction; and (e) select and train local administrative staff employed by the Project. Separate accounts for Project funds will be established and a system of cosignatures will be required. Funds for local currency will be channeled through the GOTG's accounting system. AID/Banjul will disburse funds for local operating costs on the basis of procedures to be defined in the Project Agreement. Payment to the TA contractor, will be made directly by AID through a Letter of Credit. The contractor will provide sufficient detail to AID/Banjul in order for the project officer to monitor the contractor's expenditures. Specific financial procedures following the signing of the Project Agreement will be spelled out in Project Implementation Letters.

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B. Procurement Arrangements and Responsibilities

Technical assistance, commodities, construction services, and training will be the responsibility of the contractor.

1. Technical Assistance

The technical assistance will be procured via a direct contract with AID. A total of 29.3 person years of long-term TA and ten years of short-term trainers/advisors will be provided (included in the training line item of the budget as discussed in Section I, Project Inputs).

2. Construction

Three staff houses will be constructed for the technical assistance personnel based at Sapu. The contractor will contract with local A&E and construction firms to undertake the construction. The REDSO/WCA engineer will approve construction plans and make periodic site visits until the construction has been completed.

3. Commodities

a. Responsible Agency

All commodity procurements for the Project will be undertaken by the contractor. AID advice in procurement matters will be furnished by AID/Banjul in collaboration with REDSO/WCA or by AID/Washington as needed.

b. Source/Origin of Procurements

The authorized source/origin of commodities for the Project is AID Geographic Code 941 except that indigenous goods and free world shelf items may be purchased locally in accordance with Handbook 1, Supplement B, Chapter 18.

c. Waivers

Two waivers are requested and can be found in Attachment E of this Project Paper. The first waiver is a source/origin waiver from AID Code 000 to Code 935, and a waiver of the requirement of Section 636(i) of the Foreign Assistance Act of 1961, as amended, for the procurement of seven passenger vehicles, one five-ton truck, six motorbikes, four pick-up trucks, and spare parts. The second waiver is a source origin waiver from AID Geographic Code 941 to Geographic Code 935 to permit the purchase of three tractors and spare parts.

d. Delivery, Receipt and Utilization

All Project commodities imported into The Gambia will be shipped CIF Banjul. Suppliers will provide all-risk marine insurance in the amount of 120 percent of the CIF cost of the commodities and similar insurance for inland freight. AID's

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marking requirements for overseas shipments will be observed by suppliers of commodities.

The GOTG is responsible for the proper reception and clearances of incoming Project commodities. Inspections of incoming shipments will be made, and receiving documents shall be annotated with comments on evident damages/losses. The GOTG will file claims when necessary. The contractor and the GOTG will follow AID marking requirements on all Project financed commodities.

4. Local Logistics

While the definite arrangements for local logistics will not be finalized until both the Grant Agreement and TA contract are signed, the following arrangements for local logistics are expected.

It is recommended that all the facilities, vehicles, and equipment financed by AID under the MFP be made available to the contractor to support GARD activities. (See Conditions and Covenants Section.) All vehicles will be under the direct control of the contractor's Chief of Party. All vehicle fuel will be tax free and will be purchased directly by the contractor from the U.S. Embassy and other sources. All vehicle maintenance and repairs will be the direct responsibility of the contractor and will be arranged in the most efficient manner as determined by the contractor.

The contractor will have the use of all housing (including furnishings) now occupied by the MFP, including residences and guest houses. (See Conditions and Covenants.) The Project will be given control of the Abuko facilities now occupied by MFP. These will be used until suitable facilities being built by ADPII are available at Yundum. The MFP Abuko facilities include two office blocks and a warehouse. These will be used by the Chief of Party, the crop agronomist, the forage agronomist, the livestock researcher, the FSR/E team, short-term personnel, counterparts, and the support staff. The Project also will occupy facilities at Sapu. The Project will be given control of the current MFP guest house. Office space and research space will be allocated by THE GOTG.

The Chief of Party will be allocated office space by the THE GOTG convenient for his interaction with his designated counterpart, the Assistant Director of Research. He will occupy this for the time devoted to the research management system.

IV. MONITORING AND EVALUATION PLAN

A. Monitoring Activities

There will be careful monitoring of Project implementation throughout the life of the Project. The monitoring process will collect information to enable both USAID and GOTG project managers to compare reported progress against planned inputs, outputs and objectives; it will alert project management and policy makers to implementation problems requiring corrective action; and it will provide the necessary information for the preparation of Project evaluations including information on conditions and assumptions which are critical to the success of the Project.

1. AID:

In order to provide continuity and coordination within AID/Banjul, a Project Committee will be established. The Project Committee will serve as a management tool and will meet as required to review progress and assist in the resolution of implementation issues.

2. GOTG:

The PPMU, because of its experience in monitoring Ministry of Agriculture programs, will take the lead in establishing and institutionalizing a monitoring system within the GOTG agencies responsible for Project implementation. Such a system will include an annual review of research undertaken by the Project.

3. TA Contractor:

The Chief of Party (COP) will provide AID/Banjul with quarterly progress reports on Project activities detailing Project progress and implementation problems which need to be resolved. The COP will also submit an annual report which will analyze the progress and problems for each of the main components of the Project: Agricultural Research Management System, on-farm research, on-station research, training, research support, and promotion activities.

4. Periodic Reviews:

Project implementation reviews will be conducted semi-annually by AID/Banjul during their review of agricultural projects. The PPMU will undertake quarterly reviews to identify implementation problems and recommend corrective action. After these reviews, the AID Agricultural Development Officer and/or the AID Project Officer will meet with the COP, and the Chairman of the Interim Project Management Committee (IPC) or, once established, the Agricultural Research Board, to review Project progress.

B. Evaluation Plan

1. Joint AID/GOTG Review:

Early in year two or sooner, if appropriate, a joint review will be conducted by the GOTG, AID/Banjul, and the contractor. The review will assess in detail the plan for the establishment of the Agricultural Research Management System. It will also detail the degree to which inputs have been provided efficiently and identify corrective actions as necessary. Finally, it will assess briefly the development, dissemination , and impact of new innovations since project design. Key issues to be examined are the adequacy of the levels of technical assistance and the effectiveness of promotional/extension activities.

2. External Evaluations

Two external evaluations will take place during the life of the Project in years three and six. These will be independent evaluations, carried out by multidisciplinary teams contracted by AID/Banjul, and with the assistance of REDSO/WCA.

A key purpose of the first independent evaluation will be to assess ARMS in order to determine if it is carrying out the key functions of establishing research priorities, reviewing ongoing and proposed research activities in light of these priorities, and allocating resources for research accordingly. If the ARMS is in place, project management will move from the interim arrangement to that which has been developed as part of the ARMS.

The first independent evaluation will assess (a) the degree to which Project outputs have or can likely be achieved, including the degree to which the Project has been able to generate technologies which are being adopted by farmers, (b) whether or not sufficient quality and quantity of information is being collected to enable measurement of the Project's progress, and (c) the need for making changes in GOTG and contractor staffing, level of resources, and management arrangement for the various components of the Project. The effectiveness of promotional/extension activities being conducted by the Project and other projects also will be given special attention.

The second evaluation will be conducted approximately mid-year of year six of implementation. This final evaluation will review Project accomplishments against planned outputs and EOPS (end of project status) and identify activities which will be undertaken during a Phase II project. If a Phase II project is recommended by the evaluation team, sufficient time will be available to design it and make the necessary arrangements for a smooth transition to Phase II.

The two external evaluations will require three to four external evaluators. The evaluations will be organized by AID/Banjul in collaboration with REDSO/WCA and/or AID/Washington and GOTG personnel. Each evaluation has been budgeted at

$125,000. These funds will be controlled by AID/Banjul and outside of the technical assistance contract. Detailed scopes of work for each evaluation will be developed by AID/Banjul, REDSO/WCA, and the GOTG.

V. SUMMARIES OF ANALYSES

A. Technical Analysis:

Current farming practices in The Gambia are largely those that evolved over generations and are characterized by shifting cultivation with low levels of purchased inputs. Hand labor is the dominant power source although use of animal traction has been increasing steadily in recent years. In addition, the irrigated rice perimeters make regular use of tractors for land preparation, provided on a subsidized cost basis by the Ministry of Agriculture. In most areas labor, particularly during the peak periods of planting and weeding, is the constraint most binding upon production. Virtually all farming systems in the country contain both crop and livestock components in addition to off-farm employment.

Rapid population growth and declining rainfall are forcing changes in farming systems, including the reduction of fallow periods and a shift to crops which are more drought tolerant or have shorter growing seasons. Land and fodder available for livestock are reduced accordingly, as is the tree cover.

Despite these adverse trends there remains major scope for improvement in agricultural production in The Gambia, largely through the systematic identification, adaptation and promotion of innovations which will increase productivity. Yields for groundnuts and cotton are generally higher in neighboring portions of Senegal which have virtually identical climatic conditions. The Gambian agricultural research system has not been notably effective in performing this task to date outside the context of a relatively few externally funded projects such as MFP. The rapid expansion of the use of an improved maize variety, Nigerian Composite, is illustrative of what can take place for other commodities.

The Gambian agricultural research system is small and likely to remain so. The major focus of activity, therefore, must be upon adaptive research aimed at identifying improved technologies which can be readily integrated into existing farming systems drawing extensively upon research results from external institutions. The Gambia already possesses a number of agricultural researchers who, with additional training, are capable of performing this function. However, the level of support for non-salary research expenses per scientist is one of the lowest in Africa.

In addition, there is no effective system of defining and enforcing research priorities and monitoring/evaluating results. The Agricultural Research Advisory Board (ARAB) has

been in operation since 1977, is limited to the Department of Agriculture, and lacks power and expertise in research planning and administration. As a consequence, research projects commonly reflect the priorities and interests of individual scientists and/or those of external agencies who provide the bulk of the funding. Outside of special projects such as MFP, there has been little effective transfer of research results to farmers via promotion programs.

ARMS, the feasibility of which is discussed in Annex B, will be broader based and will enhance significantly the GOTG's capacity to define and enforce research priorities as well as monitor and evaluate on-going research projects. The details of the FSR/E and component research activities proposed for support under the Project are presented in Annex A. FSR/E activities have already been initiated in The Gambia and there is a growing understanding and appreciation of the value of the approach. Considerable information on Gambian farming systems already exists from surveys carried out with support from other projects which will be analyzed selectively in support of the FSR/E program.

Another limiting factor in The Gambia is the availability of suitable technologies for use in Gambian farming systems. For groundnuts, cotton, maize, horticultural crops and rice the situation appears promising. Technologies are available which appear suitable for adaptation to Gambian conditions. The Project will strengthen contacts with the sources of technological improvements including the IARCs, and neighboring national agricultural research systems, notably Senegal. It may be possible to utilize some of these technologies such as improved varieties of groundnuts and maize with little or no modification.

The situation is less promising with animal production, agroforestry, sorghums and millets. The Gambian research system does not have a comparative advantage in conducting path-breaking research there has been little success to date elsewhere in the Sahel. At the same time, researchers concerned with these commodities will be represented on the FSR/E teams and the Project will support contacts with external agencies and projects doing research in these areas. As promising approaches are identified which have achieved some results elsewhere under similar ecological conditions, research activities will be mounted in-country with support from the Project.

B. Administrative Analysis:

At the present time, there is no coherent system by which research priorities are established and decisions made in the allocation of resources which reflect these priorities. The research activities are distributed across seven departments and two ministries without functioning mechanisms to encourage researchers to work together on problems which transcend

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disciplinary and organizational boundaries. Further, researchers have little incentive and fewer resources to ensure that their research is relevant to the needs of their clients, especially include farm families and extension workers.

Agricultural research was entirely the responsibility of the the Department of Agriculture until 1973 when responsibility for livestock research was transferred to the Department of Animal Health and Production. Forestry and Fisheries Departments in the Ministry of Water Resources and Environment are responsible for research on those subjects. With the creation of the Crop Protection Service in 1978, responsibility for research on crop protection and storage was transferred to that department. The Water Resources Department has responsibility for research on the technical aspects of irrigation systems.

Research across departmental and disciplinary lines is almost non-existent at the present time and most of the research is sustained by support from externally funded projects such as MFP, IPM, and ITC. Within the Department of Agriculture, research activities are organized largely along commodity lines with programs in upland crops, rice and horticultural crops. Recently FSR/E activities were initiated under the cultural agronomy program, but participation of researchers from other research programs has been very limited to date.

Crop research comes under the Assistant Director for Research in the Department of Agriculture who is the convenor of the Agricultural Research Advisory Board (ARAB) which is responsible for coordinating and monitoring research in the Department Agriculture. Extension Services are represented on this board. The Board meets infrequently and generally does not undertake a systematic review of research programs.

Current levels of support for agricultural research in The Gambia are difficult to determine, as resources are diffused in the budgets of different departments and special projects. Approximately DL2 million are currently expended annually in support of agricultural research representing approximately 0.8% of the agricultural GDP. This figure compares favorably with the average for twenty-three African countries, but is somewhat below the World Bank current target figure of one percent. Further, the level of support per scientist is well below the average for African countries indicating that the funding for non-salary components of research is negligible.

A central component of the Project is the creation of the agricultural research management system (ARMS). The present organizational structure can provide a foundation for the development of ARMS. GARD will support existing institutions to build new capacities and approaches in managing and carrying out agricultural research. A model for ARMS is presented which includes the creation of a National Agricultural Research Board

(NARB) which will be served by a Technical Secretariat. Membership in NARB should include representation from the Ministries of Agriculture, Water Resources and Environment, and Economic Planning and Industrial Development, GPMB, and GCU.

The duties of the Board will include: (1) establishment of guidelines for research in each Ministry, (2) recommendations on resource allocations (funds and manpower) among divisions and departments, (3) recommendations on interdepartmental collaborative research, and (4) recommendations on staff training, development and deployment.

Actual research programs will continue to be formulated at the research program level. Research programs will include researchers of different disciplines and from different departments. Research proposals will be required to explain the relevance of the research to existing farming conditions and research priorities and present plans for testing of results under farm conditions in the context of FSR/E activities.

ARMS also will include a monitoring and evaluation capability. Special efforts will be made to facilitate continuing communication and linkages: (1) between the research system and farmers, (2) between research and extension, (3) among various components of the research system, (4) with external research organizations, and (5) between researchers and policy makers.

The successful installation and operation of ARMS requires not only agreement on institutional structure, powers and procedures, but more importantly, changes in the modus operandi which currently characterizes management and administration in government agencies. There are many problems of a general nature, such as difficulties in delegation of authority and limited organizational capacity, which will impede both the effectiveness of the Project and ADPII. In consultation with ministry officials and representatives of other projects, GARD will support efforts to deal with these more general managerial and administrative problems via a series of workshops/seminars organized by the Management Development Institute.

C. Economic Analysis:

1. Policy Environment:

The Gambian Government began to take an active approach to economic development in the early 1970's. Development banking institutions were created to provide financing and the Ministry of Economic Planning and Industrial Development was established to develop and coordinate large-scale investment programs. These efforts fostered economic activity which led to sharp increases in imports and government expenditures but they were not successful in expanding exports and revenues to cover the increases. To address the resulting financial difficulties, the

government entered into three programs with the IMF: in 1979, 1981/82, and 1984/85. While government fully implemented the programs, they had limited effect. The country continues to face financial crisis and structural imbalances. Poor rainfall and low, fluctuating agricultural production have aggravated the situation.

The key factor in the government's agriculture policy making and market interventions has been how to deal with the fluctuations in agricultural production. During the 1960's and most of the 1970's, the government minimized the effects of fluctuations in agricultural output by (a) maintaining adequate levels of foreign exchange which it used to increase food imports, and (b) allowing the Gambia Produce Marketing Board (GPMB) to accumulate large reserves which it used to maintain the farm gate price of groundnuts. The financial difficulties caused by disappointing returns to investments in development, unfavorable weather, declining terms of trade, declining real assistance levels, and policy factors such as consumption subsidies and an overvalued exchange rate make it impossible for the government to maintain this strategy. Thus, in addition to the strong policy reform measures taken in conjunction with the IMF programs, the government, with the assistance of AID and other donors, is working on further economic reform measures. These will complement the investments represented by this Project, ADPII, and others. (See Annex E for detailed review of policy considerations.)

2. Economic Rate of Return

Macro policy changes now in progress are creating conditions favorable to the expansion of agricultural production. The Technical and Administrative Analyses have detailed the feasibility of the Project from those two perspectives. The Economic Analysis (Annex C) finds that with even modest increases in average yields for the major crops, notably groundnuts and selected cereals, and given existing expenditures on extension, the Project will have a favorable rate of return (27.3percent). Reduction in expected benefits by 10percent and 20percent reduces the IRR to 23.0percent and 19.0percent respectively.

The output and yield assumptions are drawn from the Technical Analysis. Additional input costs associated with the use of improved technologies have been taken into consideration as have differential inflation rates between domestic and international prices. The Economic Analysis also examines the effect of including the costs of this Project as the research component of ADP II which includes a major increase in extension costs. The resulting rate of return is still attractive a 17.2percent.

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3. Relation to World Vegetable Oil Markets and U.S. Producers (PD-71)

The Project will assist the GOTG to increase yields per hectare and total production of groundnuts. The Gambia's share of the world market for vegetable oil resulting from groundnut exports is very small. Over the past eleven years groundnut exports have averaged only 105 thousand metric tons per year. The Project expects to increase per hectare yield of groundnuts by sixteen percent over a seven year period. This will not result in The Gambia significantly increasing its small share of the world vegetable oil market and thereby adversely affecting U.S. producers. On the other hand, as discussed in the technical and economic analyses, there is a strong development rationale for the U.S. to support increased groundnut production in The Gambia.

D. Social Soundness Analysis

The Social Soundness Analysis (Annex D) examines the sociocultural feasibility of efforts to improve agricultural production and productivity. The relevant perspectives include those of farm families, extension workers and researchers, who constitute the principal beneficiary groups under the Project. Additional details on the organizational structures and operations of these agencies are included in Annexes A and B. The Social Soundness Analysis provides a discussion of the project impacts and spread effects and concludes with an examination of the implications of the analysis for the Project implementation.

The analysis of village-level social organization, farming systems and practices shows ample evidence of a willingness to accept innovations which are profitable and can be easily integrated into existing farming systems. Farming systems are undergoing continuous change in response to such factors as market conditions, weather changes and the availability of improved practices and inputs.

Gambian farmers face constraints which must be considered in the design of improved practices. Communal land tenure arrangements complicate investments in land, particularly in the case of improvements in range land for livestock. Availability of labor during the planting/weeding period is a key constraint influencing farmer decisions on the allocation of resources to various crops and the acceptability of innovations. Labor constraints can be addressed through the use of animal traction, reduction of weeding requirements via intercropping and hiring of labor. FSR/E is specifically designed to identify such

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constraints and take them into consideration in the design of on-farm trials.

Both men and women are actively involved in agricultural production. The traditional division of labor between men and women is fading with the introduction of irrigated rice schemes and the decline in swamp rice production. There do not appear to be any serious barriers to having both men and women share in the benefits of improved technologies. Increases in productivity in a particular crop are likely to attract more participation by both groups. Nevertheless, to ensure that the FSR/E activities achieve a balanced perspective vis a vis rural women, interviews with women will be conducted at all stages of survey work and all survey data disaggregated by gender. Women will also be recruited as farmer cooperators for on-farm trials.

Extension workers and researchers will continue to bear responsibility for the development and dissemination of improved practices. The Project will provide the support needed to improve the efficiency of the research system and, in the process, positively impact upon the morale and image of the research service. Extension programs will be provided with more research results which have been farm tested and thus likely to be easily and rapidly disseminated among the farm population at large. In addition, extension workers will participate in the research process through their involvement in FSR/E and thus have a better appreciation of the research process and influence upon it. Communication between researchers and extension workers will improve and with it the effectiveness of both.

Farm families will be the principal beneficiaries from the activities supported under the Project. Production and incomes will increase as a result of the adoption of various innovations, especially in maize, groundnuts, rice and horticultural crops. The economy as a whole will benefit from increased availability of food at reasonable prices and improvements in the balance of payments through increases in exports and reduction in agricultural imports.

Increases in rural incomes and higher production of nutritious commodities such as fruits and vegetables are expected to result in measurable improvements in nutritional status. The analysis makes specific suggestions regarding the process of achieving this goal.

E. Environmental Concerns

Many observations and studies have been made of the arable land, water, forest and rangeland resources of The Gambia and the traditional manner in which these resources are employed and managed by farmers. While the resource basis is extremely

limited and the environment is often harsh, rational use is made of these resources in small farmer crop and livestock endeavors. Land-use generally corresponds to land capability characteristics.

The principal thrust of the Project will be to provide technical assistance in controlled research, special studies, pilot investigations, training, and some promotional activities. A negative determination on the Initial Environmental Environmental Explanation has been made based on the categorical exclusions set forth in Regulation 16. The activities proposed in the Project will have little or no negative effect on the environment. On the contrary, the activities proposed are aimed towards development of environmentally sustainable resource management systems. The IEE and State Cable 089626 which give "a categorical exclusion" are included in Attachment I.

VI. CONDITIONS AND COVENANTS

A. Condition Precedent to Initial Disbursement

Prior to the first disbursement under the Grant, or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made, the Grantee shall, except as the parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D. a Statement of names of the persons holding or acting in the Office of Grantee (to be specified in the Grant Agreement), and a specimen signature of such statement.

B. Conditions Precedent to Subsequent Disbursements

1. Prior to subsequent disbursements under the grant, except for technical assistance, or the the issuance by A.I.D. of documentation pursuant to which disbursement will be made, the Grantee shall, except as the parties may otherwise in writing, furnish to A.I.D. inform and substance satisfactory to A.I.D. a detailed plan of the grantee's interim administrative and management structure under the Project which will be effective until the permanent Agricultural Research Management System is established and operational, includiing the Name(s) of the Grantee representative who will serve as a Counterpart to the contractor's chief of party and will be responsible for daily liaison among the Grantee, A.I.D. and the Contractor.

2. Prior to subsequent disbursements under the Grant on or after April 1 of each year of the Project commencing in 1986, or to the issuance by A.I.D. of documentation pursuant to which such disbursements will be made, the Grante shall, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D. a detailed plan of research and promotional/extension activities to be carried out by the Grantee under the Project during the next twelve months, including financial, administrative and operational plans and procedures for such activities.

3. Prior to subsequent disbursements under the Grant after December 1986, or to the issuance by A.I.D. of documentation pursuant to which such disbursement will be made, the Grantee shall,

except as the Parties may otherwise agree in writing, furnish to A.I.D., in form and substance satisfactory to A.I.D. a detailed plan of the permanent structure of the Grantee's Agricultural Research Management System, including financial, administrative and operational plans and procedures.

4. Prior to subsequent disbursements under the Grant after June 1988, or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made, the Grantee shall, except as the Parties may otherwise agree in writing, furnish to A.I.D., in form and substance satisfactory to A.I.D. evidence that the permanent structure of the Grantee's Agricultural Research Management System has been established and is operational.

C. Covenants:

1. The Grantee agrees to use its best efforts to assume on an annual basis an increasing proportion of operational costs for research under the Project, towards the goal of assuming approximately 50 percent of such costs by the beginning of the final year of the Project.

2. The Grantee agrees to ensure that all personnel trained under the Project will be appointed to established positions or otherwise integrated into government service on or before the conclusion of their training.

3. The Grantee agrees to grant the contractor and AID the use of all equipment, vehicles, houses and office space provided under the Mixed Farming Project when this Project terminates or ceases to make use of such commodities and structures.

ATTACHMENT C

LOGICAL FRAMEWORK

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
	PROJECT GOAL		
Goal			**Purpose to Goal Assumptions**
To achieve food self reliance in The Gambia.	-Emergency food donations unnecessary to satisfy local food demand except in cases of extremely unfavorable climatic conditions. -Increased food crop production reduces need for food imports. -Increased cash crop production provides foreign exchange resources to cover necessary food imports.	-National Agricultural Production Statistics -Other Donor Economic Reports -GOTG reports, surveys, and independent evaluations	--GOTG practices sound fiscal and support policies in pricing, credit, and marketing favorable to increase production. --GOTG commitment to increasing production remains high priority. --Demand for foreign exchange earnings to cover non-food imports is controlled. --Technologies can be introduced in ways that maintain the resource base at present levels or improve it.
	PROJECT PURPOSE		
Purpose	**EOPS**		**Output to Purpose Assumptions**
To test, generate, adapt and promote the adoption of improved crop and livestock technologies that meet farmers' needs and expand and diversify Gambia's agricultural economy.	--Production constraints identified and removed by appropriate technologies. --Increased use by farmers of improved varieties of seed, and labor saving devices. --Employment of improved cultural practices. --Reduced farmer vulnerability to erratic rainfall by a mix of animal and crop activities most appropriate for zone and resource limitations.	-GOTG reports -Evaluations -Site visists and visual observation	--Agricultural input delivery system improved and extension service strengthened by other projects. --Agricultural research receives high priority.
	PROJECT OUTPUTS		
			Inputs to Outputs Assumptions
1. An effective Agricultural Research Management Systems (ARMS).	1. A. ARMS, established and functioning, determines research priorities based on national objectives, farming needs and available resources, developes yearly program plans and monitors	1. Official documents establishing ARMS and technical secretariat. -Close monitoring of ARMS and technical secretariat.	-IARC's, regional research centers and other ex-country research centers produce basic research results that offer promising application in The Gambia.

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
	implementation.		
	1. B. Technical secretariat established and functioning, screens, reviews research proposals, advises ARMS on research investments and assists in coordinating/monitoring activities of participating agencies.	-Review of decisions made by ARMS alloting funds, establishing priorities, establishing agricultural research program. Reports, minutes, plans, reviews and other documentation developed by ARMS and the technical secretariat.	
. Component agriculture esearch programs developed	2. A. Promising component research in crops, livestock, agroforstry, socioeconomics resources is being implemented.	2. Yearly plans for component research.	-GOTG resources as supplemented by other donors for support of agricultural research programs are available and employed in an effective manner.
		-Specific research program documents.	
	2. B. Links with IARCs and regional research centers established - library facilities adequate to needs of programs in place.	-Monitoring research in progress.	
		-Review of research reports.	
. On-Farm Farming Systems esearch methodology stablished and functioning.	3. Two regional farming systems research/extension teams and up to 16 village-based teams established and conducting farming systems research and linking it with component research and extension programs.	3. Monitoring team establishment, training, plans for FSR/E and implementation of FSR/E programs.	
		-Review of documentation for above and describing results of FSR/E activities.	-GOTG budget availabilities will increase over the life of the Project to absorb an increasing proportion of the recurrent costs for support of the agriculture program.
. Gambians trained in arious agricultural isciplines and management.	4. Nine research scientists trained to MS level and five trained to BS level employed in research programs. Additional agriculture research personnel trained in management and various agricultural disciplines through in-country and short-term ex-country training employing their skills in program.	4. Observing trained participants use knowledge and skills acquired.	
		-Participant training reports.	
		-Reports of trainers, and technical experts on results of in-country training activities.	
			-Inputs, credit, market's etc., necessary for Gambian farmers to realize benefit from adopting research results will be in place.
. Promising innovations merging from Agriculture esearch program promoted mong Gambian farmers.	5. Promotional programs developed and implemented for promising research results in coordination with appropiate extension organizations.	5. Review of research results.	
		-Review of plans for promotion of specific results.	
		-Monitoring promotional campaigns. Evaluating results of promotional campaigns.	

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NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS

PROJECT INPUTS

AID

1. Technical Assistance	$4673	29 person years
2. Training	$3581	
International	$2074	9 MS and 5 BS 102 short study tours
In-country	$1507	In-country workshops's/ seminars, on the job training
3. Commodities	$1000	Vehicles research equipment Office equipment books, journals
4. Construction	$ 110	3 staff houses at Sapu
5. Operating Costs	$1146	Research costs Vehicle maintenance Local personnel
6. Other Costs	$7191	Monitoring evaluation Audit Contingencies Inflation Campus support

GOTG

1. Operating Costs	$1542	Personnel Research costs Office space
2. Operating Expenses		Vehicle operation and maintenance

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