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GAMBIA AGRICULTURAL RESEARCH

and

DIVERSIFICATION PROJECT

FIRST ANNUAL REPORT

JANUARY 1986 - JUNE 1987

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I. OVERVIEW

The first annual report of The Gambia Agricultural Research and Diversification (GARD) Project covers the 18-month period up to the end of June 1987. In the future, the annual reports will coincide with the periods covered by the annual workplans, namely from July through June of the following year.

The first section provides an overview of the Project, including its objectives, history, components and principal accomplishments. The next four sections review the Project's four main elements: the Agricultural Research Management System, On-Farm Research, Component Research, and Research/Extension Liaison and Promotional Activities. Each of these sections contains a presentation of specific objectives and a review of activities.

The sixth section provides a comprehensive review of Training activities. The seventh section reviews Project Administration in The Gambia and in the United States, while specific information on expenditures and staffing are found in Annexes A and B.

A. OBJECTIVES

The Project's objectives are:

1. Institutionalization of a stronger agricultural research system;

2. Production of research results which are relevant to Gambian farming conditions;

3. Adoption of innovations emanating from the research system by Gambian farmers.

The relationship among these objectives is expressed in the following extract from the first Annual Workplan for 1986/87 (p.1, June 1986);

> Institutionalization of a stronger agricultural research system is the highest priority of the Project. This involves developing an improved agricultural research management system as well as upgrading the skills of the researchers themselves. Assigning top priority to institutionalization does not mean that attention will not be given to producing useful research results nor to extending those results to farmers. These will be addressed

by developing and institutionalizing farming systems research and extension within the agricultural research system, by providing technical and material support to research programs and by facilitating and stimulating the promotion programs of the extension service and private voluntary organizations.

Giving highest priority to institution-building means that Gambian researchers and administrators must play leading roles in the implementation of the Project. The contractor team works with and through Gambian counterparts. The Gambia is small country and trained personnel are scarce. Thus, this Project "philosophy" may imply slower progress in technology development and promotion than if institution-building were not the primary objective. However, GOTG, USAID, and the contractor all agreed that GARD's success will ultimately be measured by the level of sustainable, enhanced agricultural research capacity in The Gambia after completion of the Project.

The GARD Project is one of several donor-funded projects providing support to agricultural research in The Gambia. These include UNDP/FAO (FAO Fertilizer Use Project; support to PPMU), World Bank (ADP II), ODA (agricultural economics; seed technology), and Caisse Centrale (Cotton Project). In addition, a number of private voluntary organizations (PVO's) carry out trials and other important adaptive research and research/extension liaison activities in the country. These include the Catholic Relief Service, CARITAS, the Freedom From Hunger Campaign, Save the Children (USA) and Action Aid. A number of international centers and regional programs provide support to The Gambia's agricultural research system including ICRISAT, IITA, WARDA, ISNAR, IFPRI, IFDC, CILSS, SAFGRAD and ILCA. The Gambia is host country for the International Trypanotolerance Center (ITC). Virtually all these activities and projects were initiated prior to the inception of the GARD Project. In view of its institution-building objective, GARD has channeled its support to the research programs of those departments and ministries responsible for agricultural research in a fashion which complements the efforts of other projects and agencies.

B. HISTORY

The Request for Proposals for the GARD Project was published in July, 1984. In September 1984, the University of Wisconsin (U.W.) along with Virginia State and Michigan Universities was awarded a collaborative mode contract to work with GOTG and USAID to write the Project Paper and negotiate a contract for the Project's implementation.

The Project Paper was drafted jointly by USAID, GOTG, and the contractor in early 1985 in The Gambia. It was authorized by USAID in June 1985, and six months later, in December, the contract with Wisconsin was signed. The Chief of Party and Project Administrator had arrived in the country in November in anticipation of signing.

C. PROJECT COMPONENTS AND INPUTS

The principal components of the Project include:

1. Establishment of an Agricultural Research Management System (ARMS), and improvement of research support services.

2. Provision of long- and short-term training.

3. Support to on-station component research and on-farm research activities.

4. Assistance to pilot promotion activities.

During the first 18 months of the Project, these inputs have been provided generally in accordance with the schedules specified in the contract as modified by the interim workplan and the first annual workplan which cover the period through June 1987. During this period five Gambians commenced degree programs in the U.S. - four of them at the University of Wisconsin. In addition, several Gambian researchers benefited from short-term training and networking programs to the U.S., Europe, and other countries in Africa. Four of the five Senior Technical Assistance positions scheduled for the first year of the Project have been filled: Chief of Party/Socioeconomist; Project Administrator; Research/ Extension Liaison Officer; and Cropping Systems Agronomist. It was decided not to proceed immediately with a Long-Term Adviser in Forage Agronomy based on a reassessment of past progress and uncertain potential for this element of the research program.

In addition, the Project provided four research associates: two in agronomy (rice and cropping systems), one in horticultural marketing, and one in rural sociology (water control systems). There were a total of fifty-two visits by short-term training advisers (STTA's), consultants and administrative personnel from the three participating universities. Five of these visits were funded from Title XII funds from the University of Wisconsin and not charged to the Project. GARD also engaged the services of a limited number of locally-hired staff to assist with research support services and internal project management in such areas as accounts, secretarial services, computer hardware and software operations, maintenance and security. As of mid-1987, seven Peace Corps Volunteers had served with the Project in various aspects of on-farm and on-station research and research support services in different parts of the country.

Three staff houses were constructed at Sapu Research Station and are now in use. A major portion of the vehicles, equipment and research supplies ordered for the first phase of the Project have been received.

D. PRINCIPAL ACCOMPLISHMENTS

The principle accomplishments of the Project during the period under review include the following:

1. PROJECT MANAGEMENT AND ADMINISTRATION: An Interim Project Committee (IPC) composed of senior Gambian civil servants was established to oversee the operations of the Project. An administrative unit was established at Mile 7 to manage the construction, accounts, procurement, disbursement and support services under the direction of the Project Administrator.

2. ARMS: An interdepartmental working group on ARMS was established and submitted its report in 1986. The recommendations were accepted and implementation commenced with the assistance of ISNAR, specifically in the area of budgeting.

3. FARMS: A working group on Financial Administration and Research Management Systems (FARMS) was established and submitted its report in 1986. Implementation of the recommendations has commenced.

4. COLLABORATION WITH OTHER PROJECTS: Discussions were held with several donor agencies including ADP II, FAO Fertilizer Use Project, ODA, ITC and several PVO's, aimed at furthering collaboration and complimentarity among projects supporting agricultural research in The Gambia.

5. RESEARCH TASK FORCES: In accordance with the recommendations of the ARMS Working Group, a series of research Task Forces were formed to assist research program leaders with the assessment of past activities and the planning of future programs.

6. STRENGTHENING OF THE AGRICULTURAL RESEARCH ADVISORY BOARD: The effectiveness of ARAB in directing the research activities of the Department of Agriculture (DOA) was improved as a result of the recommendations of the ARMS working group including the establishment of the research task forces. Participation was expanded to include representation from other departments responsible for agriculture research, most notably the Department of Animal Health and Production (DAHP).

7. IMPROVEMENTS IN RESEARCH: The quality and quantity of research activities particularly in the Department of Agriculture increased significantly. Four pilot areas to carry out on-farm research were established in the country. A study of four non-pump water control project was carried out under the auspices of the Department of Water Resources. Research activities were planned and initiated by DAHP on small ruminants, feed management, and draft animals.

8. RESEARCH/EXTENSION LIAISON AND PROMOTION: Efforts were made to improve communications between research and extension services in the planning and implementation of research programs. Extension staff participated in the on-farm and multi-locational trials. A pilot promotional campaign for cowpeas was planned and implemented by the extension service of DOA and CRS.

9. IMPROVEMENTS IN AGRICULTURAL STATISTICS: The Project provided training, short-term technical assistance, supplies, and equipment to the Planning, Programming, and Monitoring Unit (PPMU) to strengthen the National Agricultural Samples Survey (NASS) in collaboration with support from UNDP/FAO and CILSS. A comprehensive report on the 1986/87 NASS was issued by PPMU in 1987.

10. EXTENSION OF RESEARCH SUPPORT SERVICES: The Project provided a range of research support services including computer services, administration, accounting, procurement, repair and maintenance of vehicles, equipment and facilities.

11. TRAINING: A Training Committee was formed to select candidates for training. Long-term training was initiated for B.S. and M.S. participants. Gambian researchers received short-term training, in-country, in the U.S. and in other African countries.

12. INTERNAL EVALUATION: An internal evaluation of the Project was carried out in April/May 1987 with participation from U.W., VSU, GOTG and USAID.

II. AGRICULTURAL RESEARCH MANAGEMENT SYSTEM

A major focus of GARD support has been on developing an improved Agricultural Research Management System (ARMS). Focusing upon high priority issues and improving the efficiency of resource management are critical to increasing the productivity of the agricultural research system. As envisaged in the Project Paper, the initial year and a half of the Project has been spent in developing detailed plans for an improved ARMS; obtaining GOTG concurrence to those plans; and commencing implementation. Shortly after the Project began in January, 1986, an ARMS Working Group (WG) was established to review the existing management

system and make recommendations for its improvement. The WG was represented by all the departments in the Ministry of Agriculture (MOA) as well as the Departments of Water Resources and Forestry in the Ministry of Water Resources, Forestry & Fisheries (MWRFF).

In an effort to improve ARMS, the Ministry of Agriculture formally requested the assistance of the International Service For National Agricultural Research (ISNAR) with support from the GARD Project. Dr. Matthew Dagg from ISNAR provided advisory assistance to the WG in the course of two visits during the first half of 1986. In September, the Assistant Director of Agriculture (Research), Mr. M. S. Sompo-Ceesay, travelled to ISNAR to finalize the report of the WG for submission to the Government for consideration. It is anticipated that ISNAR involvement in The Gambia will continue through the implementation stage. In support of the WG, a survey of research manpower was launched in March 1986, focusing on the departments involved in agricultural research in MOA and MWRFF. The initial stage of the survey was completed in 1986 and the results have been utilized in efforts to improve manpower planning and training programming.

A. PRINCIPAL RECOMMENDATIONS

The principle recommendations of the WG accepted by the Government include the following:

1. Establishment of a National Agricultural Research Board (NARB) to set research priorities and approve research programs;

2. Establishment of a Technical Secretariat (TS) to service NARB;

3. Establishment of research Task Forces to formulate research programs in accordance with priorities specified by NARB;

4. Introduction of a Program Budgeting System (PBS);

5. Introduction of improvements in financial administration and research management;

6. Extension of the research manpower survey and development of a comprehensive manpower plan and program for training.

Following submission of the report in late 1986, a Cabinet Memorandum establishing the NARB was drafted and circulated to interested Ministries for comment. A committee was established on Financial Administration and Research Management Systems (FARMS) under the chairmanship of the Management Development Institute (MDI) representative. The Chairman was assisted by the GARD Project Administrator and Charles Steedman, adviser from the Center for Research and Economic Development (CRED) of the University of Michigan. The Committee submitted its report in late 1986 which

included recommendations for improving the disbursement of funds, accounting, and the management of resources. As a follow-up to this effort, an improved budgeting system was introduced for the 1987/88 financial year for the research programs in DOA and DAHP. A seminar on PBS for research program leaders was held in April/May 1987, with the assistance of two consultants from ISNAR, Rene Devred and Jon Sands.

Perhaps the most significant feature in the implementation stage of the ARMS WG report has been the establishment and operation of interdepartmental and multi-disciplinary research Task Forces to review past research results and define future research activities for formal consideration by ARAB. The meetings of ARAB in April 1987 were, by all accounts, substantially improved over previous years. Reports from the Task Forces were reviewed in the course of a week-long meeting and decisions were made on research activities for the coming season. Although the authority of ARAB is officially limited to DOA research programs, representatives of DAHP and the Department of Forestry participated in the discussions. In turn, decisions made by ARAB provided the basis for the budgeting exercise which followed. Although the new budgeting system will require further modifications, substantial progress has been made in developing the essential linkages between research programming on the one hand and budgeting and expenditure on the other.

The implementation of the ARMS and FARMS WG reports has been effected by a study of MOA structure and functions, initiated in early 1987 by a group of ODA consultants. Approval of the Cabinet Memorandum on the establishment of NARB was delayed by the national elections in April 1987 and the formation of the new Cabinet in May. (Cabinet approval was eventually obtained at the end of November 1987.)

As part of the MOA review, the ODA consultants incorporated most of the ARMS Working Group recommendations and proposed a new Division of Research and Special Services (DRSS). If accepted, DRSS will encompass the research activities currently carried out by DOA, Crop Protection Service (CPS), and the Irrigation/Reclamation Division of the Department of Water Resources. Forestry and fisheries research will remain the responsibilities of the existing departments in MWRFF, pending a proposed parallel review of the structure and functions of that Ministry. The existing research programs will continue to operate across departmental lines where appropriate, and ARMS/NARB will serve all agricultural research activities.

The Directors of the Departments of Agriculture and Forestry visited U.W. and Virginia State University in November to discuss institutional linkages, research program issues, and GARD backstopping.

A. AGRICULTURAL STATISTICS

The principle source of agricultural statistics in The Gambia is the National Agricultural Sample Survey (NASS) which is administered nationally by PPMU with support from UNDP/FAO and CILSS. The GARD Project Paper recognized that agricultural research requires supporting services in several areas, one of which is agricultural statistics. For this reason, a commitment was made to provide limited support to assist PPMU in improving the national agricultural data system for The Gambia. Specific areas targeted for GARD support were: design of the NASS; processing, analyzing, and reporting NASS results; and liaison with agencies that use NASS output. The primary form of this support was to be STTA missions (Aaron C. Johnson and John Rowe) and purchase of equipment needed to accomplish the stated goals. Additional support by way of training was specified. The original plan provided five person-months of STTA missions during the first 18 months of the Project.

At the end of the 18-month period, seven person-months had been provided in-country plus an additional two person-months at U.W.. The sampling and estimation procedures were substantially revised, incorporating appropriate statistical methods to produce unbiased estimates and computing variances of the estimates. Other improvements included redesigning the questionnaire, preparing a training manual, and conducting enumerator training sessions to improve the quality of field procedures. The summary system for handling data and preparing estimates was completely redesigned. The entire system is fully computerized, beginning with entering data from the questionnaire to preparing the final report. This allows for rapid data processing and permits, for the first time, the distribution of results to users in a timely fashion.

In early 1987, PPMU issued its most comprehensive report in years on production for the 1986/87 season. Attention was also given to improving communications with users of agricultural statistics. A two-week course in methodologies for the analysis of agricultural data was held for 16 representatives from the various agricultural departments.

GARD supported long- and short-term training programs for PPMU staff and strengthened the computer center by providing computer supplies, software and hardware. In addition GARD computer personnel assisted PPMU staff by conducting training in the operations of software and the maintenance and repair of computer hardware.

B. COMPUTER FACILITIES

As envisaged in the Project Paper, GARD provided a range of computer services, the demand for which increased dramatically during the initial year and a half of the Project. By mid-1987, the

research system was supported by three IBM/PC-XT computers at the Mile 7 Office and two computers at the DOA Cape. A plan was developed to extend computer facilities to Sapu and Yundum agricultural stations by late 1987. Cadre staff associated with the computer services included a computer hardware manager, Manucher Timajchy; two Agricultural Economists/Computer Specialists provided by Peace Corps, Patricia O'Neil and Brad Mills; and one locally-hired computer operator, Momodou Conteh. In addition to providing advisory assistance to researchers and overseeing the operations of the computer center, a number of training courses on computer software were offered to researchers and support staff from research programs. Data files were assembled on population, agronomy trials, rainfall, livestock production, land use, and price and trade information. Additional support was provided by the computer facility for budgeting and inventory systems.

III. ON-FARM RESEARCH

Special attention was given in the Project Paper to the expansion of on-farm research. The Farming Systems Support Project (FSSP) conducted introductory workshops on farming systems research and extension methods in The Gambia in 1984 and 1985. A third workshop in 1986 specifically focused on the methodology for conducting on-farm trials. Earlier, the FAO Fertilizer Use Project had initiated a program of on-farm trials and demonstrations primarily focused on fertilizer use in collaboration with the DOA extension services.

Shortly after the commencement of GARD in 1986, John Caldwell arrived in The Gambia for an STTA mission in horticulture. This visit coincided with the initiation of a Horticultural Research Task Force which included representatives of several MOA departments and units. A series of reconnaissance surveys were carried out in February and March which defined farmers' constraints; proposed research themes; and identified sites for horticultural trials.

In May 1986, following the FSSP workshop, a second STTA mission (John Caldwell and Federico Poey) helped developed a plan for initiating on-farm research activities in four locations in the country under the direction of two regional teams or Steering Committees. Steering Committees were established in both Yundum and Sapu and four pilot area teams were created. Each area team consisted of the District Extension Supervisor, a Research Assistant, a Livestock Assistant and a Divisional Supervisor from PPMU. The teams in the east also benefited from the participation of two Peace Corps volunteers, David Gaines and Glen Langan.

Finally, three Senior Technical Assistants, Joshua Posner, Ibrahim Diallo and Elon Gilbert, along with the ODA-supported Farm Management Economist based at Sapu, Duncan Boughton, devoted significant amounts of

time to the on-farm research activities during the 1986 season. A second ODA-supported Agricultural Economist, Andrew Jones, joined the Yundum-based on-farm research activities at the end of 1986.

The four pilot areas included Mankama Kunda extension area in URD, Sare Sofi extension area in MID South, Somita extension area in WD and Central Baddibu District in NBD. Activities associated with each site included:

A. Reviews of existing information on rainfall, soils and farming systems;

B. Reconnaissance visits and surveys of the areas; and

C. A trials program carried out in the mixed-farming centers and on farmers' fields.

The on-farm trials program in the pilot areas were a subset of a country-wide program of demonstration trials carried out with support from the FAO Fertilizer Use Project. Most of these trials examined fertility and variety interactions for groundnuts, upland cereals, and rice grown as sole crops and in various associations. The intercropping research which is a major theme of the Cropping Systems/Resource Management Program benefited from two short-term missions by Mr. Bob Willey in 1986 and 1987 [1]. The results of these trials are included in the Annual Research Report of the Department of Agriculture for 1986/87. Particularly significant were the findings on groundnut plant populations. Farmers are planting for stands of approximately one hundred and sixty thousand (160,000) plants per hectare which is consistent with current recommendations, but realizing less than a third of that figure at harvest time. Most of the loss is associated with poor germination and other factors at the early stages of growth. Given the significant scope for increases in production and productivity through higher plant stands this issue will receive further attention in on-farm work during the 1987/88 season.

Following the 1986 cropping season, a special two-day ARAB meeting was convened in December to review the experiences in the pilot areas and discuss future directions. The overriding issue was the continuing search for an approach to on-farm research which would be feasible and appropriate within the context of the Gambian agricultural research system. The experiences of the past season had underlined the considerable resource requirements, particularly manpower, needed to carry out on-farm research. While a project such as GARD might be utilized in a short/medium term to provide the needed inputs, the approach utilized during the past season would probably not be sustainable in the longer run.

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[1]. The initial mission in February/March 1986 was funded by ODA.

In spite of the very binding constraints facing the Gambian research system for the foreseeable future, it was felt that on-farm research should continue to be strengthened as part of the research program. During the main ARAB session held in April 1987, it was decided to consolidate all on-farm research work in four "Cluster Sites", located in areas that are representative of the major ecological systems in the country. Somita DEC was retained in Western Division. The new sites included Bakendik DEC in Upper Niumi District, NBD; Kuntaur DEC in Niani District, MID (North); and Giroba Kunda DEC in Fulladu East District, URD. Individual research programs assumed responsibility for the supervision of their trials at each location with senior research staff dividing their time between on-farm and on-station research activities. This approach helps to ensure strong linkages between the on-farm and on-station research activities for component and commodity research activities.

In July, seven Gambian researchers from DOA and PPMU visited the Djebelor Research Station in Cassamance, primarily to exchange ideas on on-farm research activities. They were accompanied by the GARD Cropping Systems Agronomist and the Research/Extension Liaison Officer (RELO).

IV. COMPONENT RESEARCH

As with most other research systems in the region, the Gambian research services are organized primarily along component or commodity lines. DOA has responsibility for research on crops and agricultural engineering. The DOA research programs include: Upland Cereals, Cropping Systems/Resource Management (formally Cultural Agronomy), Rice Improvement, Horticultural Crops, and Grain Legumes/Oil Seeds. Forage crops and agricultural engineering/animal traction are treated as components of the Cropping Systems/Resource Management Program. Research on crops is centered at the two main research stations - Yundum in the west and Sapu in the east. In addition, multi-locational trials were carried out during the 1986 season primarily at the Mixed Farming Centers in the four pilot areas. Livestock research is the responsibility of the Department of Animal Health and Production which has its headquarters at Abuko, with a small sub-station at Yorro Beri Kunda (YBK) in MID south.

Nearly all research on crops and livestock that is carried out by the Gambian research services, whether on-station or on-farm, is the responsibility of one or more of the above programs. The actual mix between on-farm and on-station research varies significantly between program and over time for individual programs. Gambian researchers provide the leadership in all programs.

Research on pest management was carried out by the Crop Protection Service with support from the USAID- and FAO-funded Regional Integrated Pest Management Project. That Project came to an end in early 1987 after

which discussions were initiated involving DOA research programs, CPS, and the GARD Project with a view to continuing and integrating pest management research into the other existing research programs.

Finally, agriculture-related research in the Ministry of Water Resources, Forestry and Fisheries was limited to a special DWR study of non-pump irrigation systems in The Gambia which was directed by Christine Elias, a GARD-supported research associate.

As envisaged in the Project Paper, GARD provided a range of support to the commodity and component research programs including vehicles, equipment, supplies, technical assistance, training, support staff and services complementing resources available from the Gambian Government and other donor-funded projects, notably ADP II, FAO Fertilizer Use Project, and ODA. The research services also receive significant assistance from regional and international centers including ICRISAT, WARDA, SAFGRAD and IITA. In addition, The Gambia is the home of ITC which is affiliated with ILCA and ILRAD.

A. AGRONOMY AND SOILS

Aside from the establishment of the pilot areas discussed in the previous section, GARD involvement in agronomy and soils research during the 1986 season can be characterized as providing support for ongoing programs.

The ARAB meetings held at the Cape in April 1986, formulated the annual research plan for 1986/87. Special emphasis was given to on-farm work. Continuing from 1985 were the fertilizer demonstration trials while a new component, intercropping, was proposed for both on-station and at various mixed-farming centers. It was also decided to continue the varietal evaluation trials and a number of the long-term agronomy trials (cultivation, continuous cropping, crop rotation). The main emphasis in soil fertility was placed on the residual effects of various phosphorus sources and nitrogen management on maize (source, application, timing).

In order to ensure that the 1986 season would be well-managed, a number of improvements were made at Yundum and Sapu. An administrator and secretary were hired for each station and infrastructure improvements included revamping the storerooms and offices at both locations. Cropping Systems Agronomist Joshua Posner and Research Associate Jeff Wright arrived in June to begin work at Yundum and Sapu, respectively. Prior to the rainy season, the Upland Cereals, Cultural Agronomy, and Soil Fertility programs were the subjects of STTA missions by Earl Gritton, Bob Willey, Emmett Schulte and Fred Madison. A second Research Associate. Tom Remington, and an ODA-supported Agricultural Economist, Andrew Jones, joined the Yundum team in October.

In November, Dr. Tijan Jallow, head of the Grain Legumes Program at Yundum, visited IITA in Nigeria and SAFGRAD in Burkina Fasso to review cowpea research programs.

The 1986 season went well and reliable information was gained from the on-station and on-farm trials. The rainy season was excellent in the East (Sapu 815mm) and adequate in the West (Yundum 771mm) although the late start of the rains in Western Division caused problems for both farmers and researchers alike.

Harvesting of the trials began in October. At that time, MSTAT was introduced as a useful statistical software package. During the ensuing months most DOA researchers became fluent in its operation. The results of component research activities in agronomy and soils for the 1986 season are summarized in the Annual Research Report of the Department of Agriculture.

The major ARAB meeting was held in April 1987, with 35 participants. The research Task Forces presented reviews of past results and suggestions were made for the 1987 research program. The meeting's proceedings were published, reporting the major decisions taken by the Board. In general, it was felt that the 1987 meetings were more productive than those of 1986.

B. ANIMAL TRACTION

Despite its major importance and long history in The Gambia, animal traction has received relatively little attention from the research services in recent years. An Animal Traction Task Force (ANTRAC) with representation from the Agricultural Engineering Unit, other DOA research programs, as well as DAHP and the Extension Services was established in 1986.

GARD supported a short-term mission in animal traction by Paul Starkey to explore the possibilities of a collaborative arrangement involving the Gambian research services, ITC, and the existing animal traction network to support animal traction research and development efforts in The Gambia and the subregion. A by-product of this mission was a report on animal traction in The Gambia and an annotated bibliography.

Three representatives from the Departments of Agriculture and Water Resources viewed animal-powered water lifting and grain milling devices in Thies, St. Louis, Pout and Kaolack in Senegal. They were accompanied by the GARD Cropping Systems Agronomist and RELO.

In early 1987, a country-wide reconnaissance survey was carried out by members of the ANTRAC Task Force. The results of this survey led to a list of proposals presented to, and approved by the April 1987 ARAB meeting. These proposals included:

1. to study the effect of seeder opening shoe design on groundnut seed placement and stand establishment;

2. to evaluate a fertilizer bander for the Super-Eco seeder;

3. to investigate donkey supply and production;

4. to study the effects on milking and reproduction of cows used as draft animals; and

5. to introduce animal traction into the traditional rice production system.

Work is continuing in these areas.

C. HORTICULTURE

The GARD Project Paper recognizes the scope for improvement in production and productivity of horticultural crops. Horticulture crops offer the opportunity to increase nutritional status, provide jobs in marketing, increase the income of the rural farmer, and add to foreign exchange through a reduction in imports and an increase in exports. However, given the limited resources and staff of the Horticulture Unit, it is difficult to take advantage of these opportunities.

During 1986/87, GARD assisted the Horticulture Unit by providing training, equipment, supplies, and technical assistance (3 missions by John Caldwell in 1986/87). In early 1986, a Horticultural Research Task Force was established to identify horticultural research priorities through a reconnaissance survey undertaken in thirteen villages. The analysis classified villages into domains according to climate, market outlets, water availability, and management practices. These were used to guide horticultural intervention plans and to provide a base for a second reconnaissance.

The second reconnaissance was undertaken in March 1986. This identified marketing as the highest priority for horticultural research. The specific problems were transportation difficulties and seasonal gluts for onions and tomatoes. Five areas of applied research were recommended to alleviate these problems: cultivars with differing maturities, staggered planting dates to spread production, diversification into new vegetable crops, storage techniques, and a consumption study to identify market windows. Trials based on these results were designed.

The activities of PVO's in horticultural gardening were reviewed and PVO personnel were included in the reconnaissance surveys teams.

The 1986/87 dry season trials included mulching, watering frequency, planting dates, and intercropping combinations. These results were presented at the April 1987 ARAB meetings, although the 1986/87 dry-season trials were in progress at that time. For this

reason, the Horticulture Unit was asked to analyze the results of the dry-season trials for presentation at a second ARAB meeting in October.

The Horticultural Unit requested the services of a research associate for one year to study horticultural marketing improvements. Research Associate Lisa Daniels and her advisor Gerald Campbell made a brief visit to The Gambia in January 1987, to design and initiate the Horticultural Marketing Research Plan in collaboration with Gambian counterparts. This three-week mission was supported by the Title XII Program Support Grant of the University of Wisconsin. The research plan emphasizes the implementation and evaluation of marketing improvement programs in collaboration with the Horticultural Unit, PPMU, and PVO's.

During the first half of 1987, data were collected on the distribution of horticultural gardens in Western Gambia. Ms. Daniels returned in June to begin her one-year assignment.

D. LIVESTOCK

Livestock research in The Gambia is the responsibility of the Department of Animal Health and Production (DAHP) which also implements animal health programs and livestock/range development projects. This large mandate in conjunction with a small staff meant that livestock research was not an active program at the start of GARD although, under MFP, there had been work on forages and grazing.

The GARD contract does not call for long-term technical assistance to the livestock program until year three. This timing was dictated by the impossibility of starting all components of the Project simultaneously, and also by the time needed to assess priority research areas in livestock, to consider training possibilities and to determine what follow-up to the MFP work was desirable.

STTA's Jane Homan and Tom Yuill made a preliminary visit to The Gambia in September/October 1986, to lay plans for a workshop in December. This was attended by 20 representatives from DAHP, DOA, Forestry, and PPMU. GARD provided input from seven scientists; Michael Ezekwe (Nutrition, V.S.U.), Bernard Wentworth (Poultry, U.W.), Art Pope (Small Ruminants, U.W.), William Bosu (Reproduction, U.W.), Tom Remington (Forage, U.W.), and Margaret Dentine (Dairy, U.W.).

The workshop report recommended a broad-based approach with several areas of emphasis including small ruminants, forage, poultry, and related socioeconomic studies. Training was recommended in small ruminants and poultry. The Director of DAHP has stressed the need for a senior advisor to help organize and coordinate the overall research effort.

Following the first STTA mission by Homan and Yuill in 1986, data collection on production parameters for small ruminants was started in a small number of villages. The objective was to provide a baseline for comparison with future interventions, and a basis for extrapolation and utilization of more extensive data sets and research elsewhere in West Africa. At least a year's accumulation of data would be necessary before interpretation was possible.

In addition to participating in the ANTRAC Task Force mentioned previously, DAHP researchers attended the April ARAB meetings at Sapu and presented research proposals in feed management, draft animals, small ruminants and poultry. Staff and resource limitations, however, delayed the initiation of these activities. In June/July 1987, a review team from DAHP and DOA assisted by STTA Steve Lawry, assessed the status of the deferred grazing sites established by MFP.

E. WATER CONTROL STUDIES

The Water Control Studies formally commenced under the auspices of the Department of Water Resources (DWR) in March, 1986. A DWR irrigation engineer was assigned to work full time on the studies along with a GARD-sponsored Research Associate in Rural Sociology, Christine Elias.

The original study plan focused on developing design options for the rehabilitation of the many pump-irrigation perimeters which had fallen into disuse. Subsequently, it was decided to expand the scope of the studies to include investigations into non-pump water control designs for rainfed and tidal rice-growing areas as well. Given these expanded terms of reference, the engineer and research associate worked out a plan of action; the research associate was to focus on the non-pump, irrigated sector while the irrigation engineer took responsibility for the pump-irrigation designs.

Four projects had been testing different non-pump technical designs over a period of 2 to 5 years [1]. None of these experiences had been properly studied so as to define the farming systems within which they have worked and the factors which have affected project development and outcome. Therefore, the studies were designed to first examine the range of local experiences with water-controlled rice production in The Gambia.

In collaboration with the four ongoing non-pump projects, case study villages were selected which represented the whole range of experiences with both technical designs and implementation approaches

[1] These are under the direction of (1) the Soil Water Management Unit of MOA, (2) the Ministry of Water Resources and German Aid, (3) the Freedom From Hunger Campaign, and (4) the Jahally Pacharr program with Dutch Aid.

in different rice-growing ecologies. Field data collection in these case study areas commenced in June and continued through the harvest. A two-tiered study design was adopted which combined informal survey work at the village level and detailed resource allocation data collection at the household level. Data from the latter were coded and analyzed using the Gambia Agricultural Data System (GADS), designed by the MFP and PPMU.

Staff from the Water Control Projects, ADP II, Peace Corps, the Farm Management Economics Unit, and the Extension Service participated in the data collection and provided valuable background information to guide the interpretation of the raw data. Short-term consultant Petra Mueller- Gloddle was employed to assist with the economic analysis for each of the ongoing programs.

Several months into the studies, the irrigation engineer assigned to the studies resigned from government service, leaving no one to continue the research on pump irrigation. With only one engineer remaining in the Irrigation and Swamp Reclamation Division of DWR, it seemed clear that outside expertise would be needed if any progress were to be made on the pump-irrigation component of the studies. An irrigation engineer, David Karmeli, was employed as a short-term consultant for three weeks in May 1987, to compile a preliminary report on the pump schemes.

The draft final report of the non-pump component of the studies was completed in May 1987. Based on the collective experiences of the four projects, the report presents a project replicability checklist for use in future project site selection as well as in the design of alternative types of interventions. It also recommends four follow-up activities, the first two being short-term and the others requiring longer time investments:

1. assisting the respective project staffs in incorporating a basic monitoring program into their workplans;

2. institutionalizing the use of the replicability checklist in the four projects for future project site selection;

3. initiating a research program on water-control options for the freshwater tidal rice ecology; and

4. mapping potential development sites in the various rice-growing ecologies.

V. RESEARCH/EXTENSION LIAISON AND PROMOTIONAL ACTIVITIES

The Project Paper envisaged a limited but important role for the GARD Project by focusing on promotional activities that ensure that improvements emanating from the research system are made available to

farmers through the extension service and PVO's. A number of projects and various PVO activities focusing on the strengthening of extension services and promotional activities in general, were already in existence including ADP II, FAO Fertilizer Use Project, the Cotton Project, CRS, Action Aid, SCF, The Methodist Mission, CARITAS and FFHC. It was envisaged that the GARD Project would give special attention to the research/extension liaison function to facilitate communications between the research services and those responsible for promotional activities. GARD inputs were intended to complement ongoing research/extension linkage activities supported by the FAO Fertilizer Use Project and ADP II. Accordingly, Ibrahim Diallo, a Research/Extension Liaison Officer (RELO) was stationed in Sapu in early 1986 to focus on the Sapu research station and the promotional activities in the eastern part of the country.

During the 1986 cropping season, the two significant areas of research/extension interaction were the four pilot areas with their associated regional Steering Committees, and the nationwide program of on-farm demonstration trials run by the extension service with support from the FAO Fertilizer Use Project. Aside from some assistance in the data analysis for the demonstration trials program, GARD support was largely centered on the pilot areas. As discussed in the previous section on on-farm research, the two regional Steering Committees based at Yundum and Sapu and the four field teams included representation from both research and extension. In addition, the RELO at Sapu devoted a major portion of his time to the pilot areas in the east during the 1986 farming season.

The GARD Project assisted with the importation of sufficient seed of two groundnut varieties from Senegal, 73-33 and 55-437, for inclusion in the 1986 demonstration trials program. The results were very promising and a seed multiplication program was planned for the 1987 season.

As noted in the earlier section on ARMS, at the conclusion of the 1986 season, research Task Forces were established, all of which had representation from the extension services and PVO's. For example, the Horticultural Task Force included representatives from the Extension Aids Unit, the Soil and Water Management Unit, DAHP, Action Aid and CARITAS in addition to the Horticultural Unit of DOA. Attention was given in the Task Force meetings both to innovations which might be ready for dissemination and to feedback from those already involved in promotional activities on progress in promoting current recommendations. In some instances, Task Forces carried out reconnaissance work or made special visits to Senegal to assist in identifying promising innovations and better defining research priorities.

One outgrowth of this process were plans for a Cowpea Promotion Campaign involving the DOA extension service, CRS, and the Grain Legume/ Oilseeds Research Program of DOA. A series of demonstrations were planned throughout the country for implementation during the 1987 season with CRS focusing upon the western part of the country and DOA/CARD concentrating its efforts in the east.

In response to enquiries from various PVO's, a letter was sent out from DOA in April 1987, to all PVO's and government units involved in agricultural promotional activities, informing them of the availability of funding for pilot promotional activities under the GARD Project. Responses are expected during the coming year.

VI. TRAINING

The GARD Project Paper (PP) identified a scarcity of qualified research personnel as a major constraint to the Gambian research system and included training as one of the five components of the Project. Preparation for the implementation of the training component began in December 1985 with the formation of a Training Committee and a visit by Sharon Baumgartner to review training policies and assist in establishing procedures. Ms. Baumgartner is the Training Coordinator for the University of Wisconsin's International Agricultural Programs. Membership of the Training Committee includes the Assistant Director of Agriculture/Research (and Committee Chairman), the Director of PPMU, the GARD Chief of Party, and the USAID Project Manager. Responsibilities of the Committee are to advise and, where appropriate, act on behalf of the Interim Project Committee (and subsequently ARMS) in the areas of: i) establishing training priorities; ii) selection criteria and nomination procedures; iii) program and trainee selection; and iv) coordination of GARD training activities with those of other agencies/projects.

Implementation of the training component commenced in January 1986. A local Training Coordinator, Connie Tucker was employed. The Training Committee began its work by establishing nomination procedures, selection criteria, and broad training priorities in horticulture, social science, agronomy, biometrics, animal production, and farm mechanization. Subsequently, heads of departments involved in agricultural research were notified, and the process of nomination and program/trainee selection was activated.

The Committee endeavored to further refine priorities, considering factors such as redeployment, departmental collaboration, and training complementary to research priorities. A Research Manpower Survey was completed (for details, see Section II., B. Computer Facilities) which provided much of the information needed to accomplish further refinement of training priorities. However, a study on reorganization of the Ministry of Agriculture and a manpower assessment preempted the endeavor.

With the notable exception of the International Food Policy Research Institute (IFPRI), efforts to coordinate GARD training with other donors were not successful. Investigations found no local agencies providing substantial support for training of researchers. For the most part, training sponsorships from other donors were offered on an ad hoc basis, primarily for short-term programs. Often agencies such as international

agricultural research centers did not have offices in the country. Having made little progress with inter-agency/project coordination, a different approach was effected. Researchers participating in programs sponsored by another donor in the U.S. or third-countries were supported by the Project for side trips to U.W., and/or granted extensions to pursue information or training for specific research activities. Four programs of this type were supported during this reporting period.

Training conducted January 1986 through June 1987 included:

A. Long-term training for two Masters degree programs in agronomy at U.W.-Madison and Cornell University, and three Bachelors degree programs at U.W. with two participants majoring in agronomy and one in agricultural economics.

B. Short-term training for ten U.S.-based programs in horticulture, water management, soils, agronomy, computers, and rice policy; and four animal traction programs - three in Sierra Leone and one at ILCA in Ethiopia. One of the U.S. agronomy participants made a stopover at East Anglia University in the United Kingdom for training with an intercropping specialist.

C. In-country training for researchers and GARD support staff on computer applications; 118 DOA Extension and Research personnel and Peace Corps Volunteers on the modified version of the Gambia Agricultural Data Systems for use in on-farm trials/demonstrations and water control studies; a workshop on farming systems research/extension for 14 DOA personnel and PCV's; data analysis workshop for sixteen participants from the Departments of Water Resources, Animal Health and Production, Agriculture, Forestry, Fisheries, and Central Statistics, PPMU, ADP II, MEPID, and Jahally Pacharr; a workshop on Program Budgeting Systems (PBS) with an additional sixteen participants from Departments of Animal Health and Production, Fisheries, Forestry, Agriculture, and Wildlife.

Additional details on training are provided in the training annexes. Reports on individual training activities are available at the GARD Cape Office.

VII. PROJECT ADMINISTRATION

In The Gambia, the GARD Project is under the direction of the Chief of Party, Elon Gilbert, who works closely in the overall planning and management of Project activities with the senior Gambian counterpart, M.S. Sompo-Ceesay, the Assistant Director of Agriculture for Research. The Chief of Party (COP) and the Assistant Director serve as members of the Interim Project Committee (IPC) chaired by the Permanent Secretary of the Ministry of Agriculture with representatives from the Ministry of

Water Resources Forestry and Fisheries (MWRFF) and the Ministry of Economic Planning and Industrial Development (MEPID). The IPC provides overall direction to the Project from the GOTG side. The COP also works closely with the USAID/Banjul Project Manager, Tom Hobgood, to ensure compliance with AID regulations and the requirements of the Project contract. The GARD Project Administrator, David Gibson, is charged with setting up and running the day-to-day Project administration and with assisting in the institutionalization of improved research administration in GOTG.

In the U.S., overall responsibility for the Project rests with the University of Wisconsin's Associate Dean of International Agricultural Programs, Ken Shapiro, who also serves as the U.W. Campus Coordinator. Campus Coordinators at the University of Michigan and at Virginia State University are Charles Steedman and Michael Joshua respectively.

A. IN THE GAMBIA

The GARD Project represents a major expansion of funds and personnel devoted to agricultural research in The Gambia. A primary objective is institutionalization of improved research administration. Thus, Project personnel have taken care to identify those administrative activities that must be absorbed by GOTG as distinct from those which relate primarily to internal administration of the U.W.-USAID contract. During the first 18 months, both types of activities were, of necessity, carried out largely by Project personnel. Efforts will be made to move the former types of activities into GOTG structure during 1987/88.

The contractor provided a major portion of the supplies, equipment, and vehicles needed for the 1986/87 research program. This required rapid design and mobilization of an entire system of procurement, distribution, and record keeping. In terms of the immediate objectives the system functioned well and, according to the 1987 Internal Evaluation Report, it greatly facilitated research activities.

The support system for 1986/87 operated somewhat independently of the GOTG system. This was necessary because of the rapidity with which the system had to be developed, problems in the GOTG system, and the need to await the results of a report on the Ministry of Agriculture structure and functions.

During the first 18 months, the Project Field Office focused primarily on procurement, personnel recruitment, construction of staff residences and office space, and development of communication linkages between the physically separated units of Yundum, Sapu, Cape and MOA - all of which were involved in the implementation of the Project.

At the beginning of the period, the initial challenge faced by the Project was the establishment of a base of operation. This was greatly helped by the facilities provided by the Mixed Farming Project which included office space, vehicles, support staff and important lessons of experience. The Field Office had to operate virtually on two tracks at the same time: setting up a base of operation, and meeting the support needs of the research program as specified in the first Annual Workplan. The research program had to be supported with a wide range of materials, equipment and supplies. As the demands on the system increased, there was need for additional recruitment of staff at all levels.

The major areas requiring ongoing support included construction and rehabilitation of research facilities, field quarters, staff housing and offices; procurement of supplies and commodities; the acquisition of new vehicles; and maintenance and repairs of existing and new vehicles and equipment. Construction and rehabilitation included the renovation of offices and storage buildings at the Yundum and Sapu research stations. Extensive renovations were required at the Sapu guest house, staff quarters at research sites, DOA Cape offices, and staff residences at two locations.

The Field Office works closely with the Wisconsin Office in accounting, coordinating training, preparing reports (annual, quarterly, workplan, short-term training advisors) and clearing expatriate staff. Finally, the Field Office has responsibility for the long- and short-term expatriate team. There were technical assistance personnel in residence by June 1986, and there have been 51 short-term visits in the first 18 months of the Project.

B. IN THE U.S.

At Wisconsin, the Campus Coordinator works with a staff that has the following responsibilities: (1) training; (2) TA clearances and travel; (3) reports and correspondence; (4) procurement; and (5) accounting. The Campus Coordinator also works with the academic departments recruiting TA's, keeping faculty abreast of current GARD developments, and coordinating campus-based technical backstopping (e.g., literature searches). Similar, but smaller operations are in place at Virginia State and Michigan.

Three of the Wisconsin support staff, Nancy Fox, Sharon Baumgartner, and Loretta Erdahl, have visited The Gambia to work with the Field Office in setting up and conforming procedures for correspondence, reporting and office operation, training, and accounting. Campus Coordinators visit each May to help develop the Annual Workplan. The U.M. Campus Coordinator helped draft the FARMS Working Paper in November 1986. U.W. and V.S.U. provided two of the internal evaluators, John Murdock and Winfrey Clarke, for the May 1987 internal evaluation.

The University of Wisconsin has used non-Project funds to support activities not directly under the contract, but which U.W. and GOTG have agreed are valuable.

GARD PROJECT DISBURSEMENTS

January 1986 - June 1987

	Disbursements*	Contract Budgets**	Percent Disbursed
Commodities	$ 611,492	$ 1,000,000	61%
Construction	145,774	150,000	97
Local Costs	380,590	937,000	41
Long-Term Advisors	389,374	2,071,923	19
Researchers	97,372	502,072	17
Short-Term Advisors	373,073	3,609,818	10
Training	170.710***	2,061,013	8***
Home Office	239,237	622,309	38
Total Direct Costs	$2,407,622	$11,014,735	22%

* As of June 30, 1987 (first 18 months of Project)
** For five years
*** As of June 30, 1987, approximately $800,000 had either been expended or committed (approved training programs).

An additional $101,000 was spent by the University of Wisconsin from non-Project funds.

RESIDENT STAFF AS OF JULY 1, 1987

1. TECHNICAL ADVISORS

Elon Gilbert	Chief of Party and Economist
David Gibson	Project Administrator
Ibrahim Diallo	Research Extension Liaison Officer
Joshua Posner	Agronomist

2. RESEARCH ASSOCIATES

Tom Remington	Agronomist (Rice)
Jeff Wright	Agronomist (Cropping Systems/Resource Management)
Lisa Daniels	Horticultural Economist (Horticultural Marketing)
Christine Elias	Rural Sociology (Water control studies) [completed assignment May, 1987]

3. SUPPORT STAFF

Lawrence Bruce	Administrative Assistant (Mile 7)
Penda Carroll	Receptionist/Secretary (Mile 7)
Baboucar Gai	Motor Mechanic (Kanifing)
Ibrahim Jarbch	Accountant (Mile 7)
Ousman Jobe	Vehicle Coordinator (Mile 7)
Pa Jobe	Motor Mechanic (Kanifing)
Abdoulie Ndoye	Assistant Account (Mile 7)
Ebrima Njie	Administrative Assistant (Sapu)
Max Njie	Facilitator (Mile 7)
Bintu Nying	Administrative Secretary (Cape)
Leon Prom	Maintenance Manager (Mile 7)
Joan Robertson	Editor (Cape)
Jainaba Saidy	Secretary (Sapu)
Abdoul Aziz Samba	Administrative Assistant (Yundum)
Bunjah Sanyang	Office Clerk (Cape)
Tims Thomas	Motor Mechanic (Kanifing)
Manocher Timajchy	Computer Facilities Manager (Mile 7)
Deborah Touray	Secretary (Cape)
Matarr Touray	Warehouse Manager (Kanifing)
Connie Tucker	Training Coordinator (Cape)

4. PEACE CORPS VOLUNTEERS

Steve Cockfield	Research Assistant (Yundum)
David Gaines	Research Assistant (Giroba Kunda, URD)
Glen Langan	Agricultural Economist/On-Farm Trials Supervisor (Sapu) [completed June 1987]
Bradford Mills	Agricultural Economist/Computer Specialist (Sapu)
Patricia O'Neil	Agricultural Economist/Computer Specialist (Mile 7)
Howard Uible	Farm Manager (Sapu)
Judith Wilcox	Research Assistant (Bakendik, NBD)

SHORT-TERM STAFF - NOVEMBER 1985-JUNE 1987

1. Short-Term Advisors

Short-Term Advisors	Expertise	Date	Person Months
Bailey, Mary - VSU	Library	11/16-12/12/86	.90
Baumgartner, Sharon - UW	Training Coordinator	11/28-12/15/85	.40
Bosu, William - UW	Livestock Planning	11/25-12/20/86	.90
Clarke, Winfrey S.- VSU	Internal Evaluation	04/13-05/0[illegible]	.70
Dentine, Margaret R - UW	Livestock Planning	12/0[illegible]-12/2[illegible]	.60
Diallo, Ibrahima-VSU	Extension Agronomy	03/17-09/30/86	6.50
Ezekwe, Michael-VSU	Livestock Planning	11/28-12/21/86	.80
Gibson, David M.- UW	Adm./Finance Officer	11/27-12/19/85	.70
Gritton, Earl T.- UW	Agronomy	2/27-03/27/86	1.00
Gritton, Earl T.- UW	Agronomy	08/06-08/23/86	.60
Homan, E. Jane - UW	Vet Medicine	09/13-10/04/86	.70
Homan, E. Jane - UW	Livestock Planning	11/23-12/21/86	1.00
Johnson, Aaron C. - UW	Agr. Statistics	01/20-02/15/86	.90
Johnson, Aaron C. - UW	Agr. Statistics	02/15-03/29/87	1.50
Lawry, Steven W. - UW	Deferred Grazing Rev.	06/17-07/08/87	.80
Madison, Frederick W.-UW	Soil Science	05/10-06/01/87	.80
Murdock, John T. - UW	Human Resources Dev.	04/08-5/13/87	1.20
Pope, Arthur - UW	Livestock Planning	11/26-12/21/86	.90
Rowe, John S. - UW	Agr. Statistics	01/20-02/15/86	.90
Rowe, John S. - UW	Agr. Statistics	04/10-05/04/86	.90
Rowe, John S. - UW	Agr. Statistics	09/13-10/14/86	1.00
Rowe, John S. - UW	Agr. Statistics	02/15-03/29/87	1.50
Schulte, Emmett E.- UW	Soil Science	02/27-03/27/86	1.00
Steedman, Charles - UM	Agr. Research Mgmt.	10/26-11/20/86	.90
Wentworth, Bernard - UW	Livestock Planning	11/26-12/21/86	.90
			28.70

2. Consultants

Caldwell, John S.-VPI	Horticulture	01/03-2/16/86	1.20
Caldwell, John S.-VPI	Horticulture	04/26-5/18/86	.80
Caldwell, John S.-VPI	Horticulture	02/15-3/16/87	1.00
Dagg, Matthew-ISNAR	Research Management	02/05-02/19/86	.50
Dagg, Matthew-ISNAR	Research Management	04/22-05/07/86	.50
Devred, Rene-ISNAR	Research Management	04/20-05/02/87	.50
Karmeli, David	Irrigation Eng.	05/10-05/28/87	.60
Patrick, Neil A.	Agr. Data System	06/14-07/14/86	1.00
Poey, Raul Federico	Seeds & Farming Sys.	04/28-05/03/86	.20
Posner, Joshua L.-MSU	Crop Agronomy	03/23-04/01/86	.30
Posner, Joshua L.-MSU	Crop Agronomy	05/26-05/28/86	.10
Sands, Jonathan-ISNAR	Research Management	04/20-05/02/87	.50
Starkey, Paul H.	Animal Traction	02/26-03/29/86	1.00
Willey, Robert W.	Cropping Sys. Res.	06/02-06/13/87	.40
			6.40

3. Administrative Visits--Overseas

Erdahl, Loretta - UW	Admin.Visit	10/12-10/31/86	.70
Joshua, Michael - VSU	Annual Review	5/11-6/1/86	.70
Joshua, Michael - VSU	Annual Review	5/05-5/27/87	.70
Shapiro, Kenneth H. - UW	Annual Review	5/11-6/4/86	.80
Shapiro, Kenneth H. - UW	Annual Review	5/05-5/27/87	.70
Whyte, Charles - VSU	Director, Int'l Fed. Relations	03/19-03/21/86	.10
			3.70

4. Title XII Supported Staff (not funded by GARD project)

Campbell, Gerald R. - UW	Agr. Economics	12/25/86-1/12/87	.60
Daniels, Lisa - UW	Agr. Economics	12/25/86-1/19/87	.80
Fox, Nancy J. - UW	Admin.	05/10/87-5/27/87	.60
Madison, Frederick - UW	Soil Science	02/27-3/27/86	1.00
Yuill, Thomas M. - UW	Vet. Medicine	09/13-09/30/86	.60
			3.60

TRAINING ATTACHMENTS

1. LONG-TERM TRAINING SUMMARY
2. THIRD COUNTRY TRAINING SUMMARY
3. U.S. TECHNICAL TRAINING
4. IN-COUNTRY TRAINING SUMMARY

GARD PROJECT
THIRD COUNTRY TRAINING SUMMARY

January, 1986-June, 1987

Name of Participants	Employer in Gambia	Field of Training	Starting Date of Training	Ending Date of Training	Institution & Location of Training
JARJU, Sidi M.	Dept. of Agriculture	Animal traction, implements, harvesting, milling and grinding equipment	9/19/86	9/25/86	FSSP & Sierra Leone Work Oxen Project, Sierra Leone
			9/26/86	10/2/86	Work Oxen Project Sierra Leone
MARONG, Alphu	Dept. of Agriculture	Animal traction, implements, harvesting, milling and grinding equipment	9/19/86	9/25/86	FSSP & Sierra Leone Work Oxen Project, Sierra Leone
			9/26/86	10/2/86	Work Oxen Project Sierra Leone
SARR, Dawda	Dept. of Afgriculture	Animal traction techniques and implements	9/26/86	10/2/86	Work Oxen Project Sierra Leone
SOWE, Jabel M.	DAHP	Animal traction techniques and implements	6/13/87	6/23/87	Addis Ababa, Ethiopia

0140j/14

GARD PROJECT
LONG-TERM TRAINING SUMMARY

January, 1986-June, 1987

Name of Participant	Employer in Gambia	Field of Training	Starting Date of Training	Est. Date of Completion	Location of Training	Degree Goal
CAMARA, Ebrima	PPMU GOTG	Agricultural Economics	8/12/86	5/90	University of Wisconsin Madison, WI	B.S.
COLE, Mohammed	Dept. of Agriculture GOTG	Agronomy	1/9/86	12/88	University of Wisconsin Madison, WI	M.S.
MBALLO, Amidou	Dept. of Agriculture GOTG	Agronomy	8/12/86	12/90	University of Wisconsin Madison, WI	B.S.
MBENGA, Musa	Dept. of Agriculture GOTG	Agronomy	1/9/86	5/89	Cornell University Ithaca, NY	M.S.
TRAWALLEY, K.	Dept. of Agriculture GOTG	Agronomy	8/12/86	6/90	University of Wisconsin Madison, WI	B.S.

0140j/15

GARD PROJECT
U.S. TECHNICAL TRAINING
JANUARY 1986 - JUNE 1987

Name of Participant	Employer in Gambia	Field of Training	Starting Date	Ending Date	Location of Training
SEY, Mamour	Dept. of Agr. GOTG	Orientation Program	6/21/86	6/28/86	Washington Int'l. Center, Washington, DC
		Vegetable Crop Production & Marketing TC 130-11	6/30/86	8/25/86	Rutgers New Brunswick, NJ
JASSEH, Fatou	Dept. of Agr. GOTG	Orientation Program	7/10/86	7/12/86	Washington Int'l. Center Washington, DC
		Water Management & Runoff Farming Methods for Small-Scale Agriculture TC 120-25	7/13/86	8/10/86	University of Arizona Tucson, AZ
GAYE, G. O.	Dept. of Agr. GOTG	Int'l. Horticulture Congress	8/10/86	8/18/86	University of California Davis, CA
		Post-Congress Sub-Tropical Fruits Tour	8/19/86	8/22/86	Madera & Northern Fresno CA Counties, Tulare Co., Kern Co. & Goleta, CA
		Horticulture	8/23/86	8/28/86	University of Wisconsin Madison, WI
ANK, Musa	Dept. of Agr. GOTG	Soil Testing & Management	8/19/86	12/22/86	University of Wisconsin Madison, WI
TOURAY, K.	Dept. of Agr.	Soil Science	12/20/86	12/23/86	University of Wisconsin Madison, WI

GARD PROJECT
U.S. TECHNICAL TRAINING

(Cont.)

Name of Participant	Employer in Gambia	Field of Training	Starting Date	Ending Date	Location of Training
COX, Albert	Dept. of Agr. GOTG	Agronomy	1/15/87	1/16/87	Cornell University Ithaca, NY
			1/17/87	2/19/87	University of Wisconsin Madison, WI
JALLOW, Malick	PPMU GOTG	Computer	1/17/87	4/23/87	University of Wisconsin Madison, WI
SENGHORE, Thomas	Dept. of Agr. GOTG	Agronomy	1/17/87	2/7/87	University of Wisconsin Madison, WI
			2/8/87	2/23/87	University of E. Anglia United Kingdom
OWENS, Solomon	Dept. of Agr. GOTG	Agronomy	1/22/87	2/2/87	University of Wisconsin Madison, WI
JOHM, Ken	PPMU	Review Gambian Rice Policy	05/10/87	07/05/87	IFPRI Washington, DC

GARD PROJECT
IN-COUNTRY TRAINING SUMMARY
January, 1986-June, 1987

Participants	Employer in The Gambia	Field of Training	Starting Date of Training	Ending Date of Training	Name of Institution Providing Training
6	Dept. of Agr. - 3 Dept. of Agr./PCV - 2 Crop Protection Ser. - 1	On-Farm Trials	4/7/86	4/25/86	FSSP
8	Dept. of Agr./PCV - 1 Dept. of Agr. - 1 DAHP - 4 FD - 1 PPMU - 1	On-Farm Trails	4/18/86	4/25/86	FSSP
7	ADP II - 2 Dept. of Agr. - 3 GARD - 2	Instruction on GADS Data Collection	5/26/86	5/30/86	GARD STTA
8	Dept. of Agr.	Instruction on GADS Data Collection	6/16/86	6/16/86	FAO/GARD STTA
9	Dept. of Agr.		6/17/86	6/17/86	
14	Dept. of Agr.		6/18/86	6/18/86	
2	Dept. of Agr./PVC		6/18/86	6/18/86	
9	Dept. of Agr.		6/19/86	6/19/86	
19	Dept. of Agr.		6/28/86	6/28/86	
7	Dept. of Agr.		6/30/86	6/30/86	
12	Dept. of Agr.	Instruction on GADS Data Collection	7/1/86	7/1/86	GARD
2	Dept. of Agr.		7/2/86	7/2/86	
9	Dept. of Agr.		7/3/86	7/3/86	
11	Dept. of Agr.		7/4/86	7/4/86	
9	Dept. of Agr.		7/7/86	7/7/86	
16	CS/GOTG - 1 FD/GOTG - 1 DF/GOTG - 1 PPMU/GOTG - 4 ADP II/GOTG - 1 DWR/GOTG - 1 DAHP/GOTG - 1 CILSS/PPMU/GOTG - 1 DOA-EXT/GOTG - 3 MEPID/GOTG - 1 JPP/GOTG - 1	Agr'l. Statistics for Developing Countries	2/23/87	3/6/87	GARD/U. Madison

GARD PROJECT
IN-COUNTRY TRAINING SUMMARY
January, 1986-June, 1987
(Continued)

Participants	Employer in The Gambia	Field of Training	Starting Date of Training	Ending Date of Training	Name of Institution Providing Training
16	DAHP/GOTG - 3 PPMU/GOTG - 1 FD/GOTG - 1 DOF/GOTG - 1 WD/GOTG - 1 DOA/GOTG - 7 PVC - 2	Program Budgeting Workshop	4/22/87	5/1/87	GARD/INSAR
	GARD Support Staff DOA/PPMU Researchers	Computer Training	July 1986	On-going	DOA/PPMU/GARD

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