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PROJECT PAPER AMENDMENT

WATERSHED AND APPLIED RESEARCH DEVELOPMENT

(WARD)

655-0017

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WATERSHED AND APPLIED RESEARCH DEVELOPMENT PROJECT
Project Paper Amendment
655-0017

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LIST OF ACRONYMS

ACDI	Agricultural Cooperative Development International (U.S. PVO managing the PL 480 Title II program in Cape Verde for food importation and local currency generation)
AID	Agency for International Development
AID/W	AID/Washington
CP	Condition Precedent
CRSP	Collaborative Research Support Program (between AID and universities)
DCSEA	INIDA's Department of Social Sciences and Agricultural Economics
DFA	AID's Development Fund for Africa
DGADRP	MPAAR's Directorate General for Animation of Rural Development and Fisheries
DGASP	MPAAR's Directorate General for Agriculture, Silviculture and Fisheries
DGCSAFER	Predecessor agency to INERF
DP	Direct Payment
EOPS	End-of-Project Status
FA/OP/TRANS	AID's Directorate for Finance and Administration/Office of Procurement/Transportation Division
FAO	Food and Agriculture Organization
FX	Foreign Exchange
GOCV	Government of Cape Verde
HRDA	Human Resources Development Assistance Project of AID's Bureau for Africa
HRDO	Human Resources Development Officer
IARC	International Agricultural Research Center
IFAD	International Fund for Agricultural Development
INERF	MPAAR's National Institute for Rural Engineering and Forestry
INFAP	MPAAR's National Institute for Agricultural and Animal Husbandry Promotion
INIA	Prior acronym for INIDA
INIDA	MPAAR's National Institute for Agricultural Research and Development
IQC	Indefinite Quantity Contract
LC	Local Currency
LOP	Life of Project
M&E	Monitoring and Evaluation
MDRP	Predecessor to MPAAR
MPAAR	Ministry of Fisheries, Agriculture and Rural Animation
OAR	Office of the AID Representative
PL-480	Public Law 480
PLI	People-Level Impact
PP	Project Paper
PSC	Personal Services Contract
PVO	Private Voluntary Organization
R&D	AID's Bureau for Research and Development

RD&E	Research, Development and Extension
REDSO/WCA	AID's Regional Development Support Office for West and Central Africa, located in Abidjan, Cote d'Ivoire
SWC	Soil and Water Conservation
TA	Technical Assistance
UNDP	United Nations Development Program
UNSO	United Nations Sahelian Office
USAID	U.S. Agency for International Development - refers to the agency as a whole or an individual overseas mission
WARD	Watershed and Applied Research Development Project
WDP	Watershed Development Project - predecessor of WARD

I. INTRODUCTION

A. Background

The WARD project was designed in 1991 to consolidate and build upon the results of two predecessor projects: Food Crops Research (FCRP) (655-0011) and Watershed Development (WDP) (655-0013). The Food Crops Research project, which ended in August 1992, assisted Cape Verde's National Institute for Agricultural Research, a government agency that was subsequently converted to a parastatal known as the National Institute for Agricultural Research and Development (INIDA). FCRP reinforced INIDA's institutional capacity to conduct adaptive research on crop varieties best suited to Cape Verde's environment.

The Watershed Development project, which will terminate September 30, 1993, operates through the National Institute for Rural Engineering and Forestry (INERF), also a new parastatal that formerly was part of the government under a different name. The Watershed project has helped protect and develop Cape Verde's very limited soil and water resources through thousands of rock walls, checkdams, reservoirs, canals, pipelines and other structures, and through the planting of more than five million trees.

WARD was designed as a seven-year project (1991-1998) to be financed with \$9.0 million in USAID development assistance, and with a Government of Cape Verde (GOCV) participation of (a) \$8.443 million derived from PL 480 Title II local currency generations, and (b) \$1.4 million in personnel costs and in-kind contributions. Total project funding was to be \$18.843 million.

Although WARD was authorized in September 1991, the project has not yet been activated. Implementation was held up initially by an intensive review of options for contracting for technical assistance, then by delays in meeting conditions precedent, and finally by a need to reconsider the project in light of the decision to focus the program of USAID/Cape Verde on a single strategic objective.

Upon her arrival in Cape Verde in February 1993, the new AID Representative met with a large number of government officials. It was agreed that if USAID/Cape Verde had to select only one area in which to focus its assistance efforts, the highest priority would be export promotion and private sector development and the creation of productive employment. In this context, it was further agreed that WARD would be implemented on a reduced scale to support the highest-priority activities described in the WARD project paper, utilizing the existing obligated funds of \$3.8 million and a lesser amount than originally planned of PL-480 local currency funds.

To reflect these new circumstances, USAID/Cape Verde hired a design consultant in May 1993 to prepare a project paper amendment. The specialist reviewed project documents; consulted with the AID Representative and AID/Washington; held discussions with the Director General of Agriculture, Silviculture and Animal Husbandry (DGASP) and with the other concerned departments and institutes of the Ministry of Fisheries, Agriculture and Rural

Animation (MPAAR); and visited both the institutes' facilities and typical watershed farming areas.

B. Comparison of the Original and the Amended Project Designs

The amendment maintains the original project goal, and consolidates the multiple purpose statements into one statement that stresses Cape Verdean inter-agency coordination and community involvement in the project. The end-of-project status, outputs and inputs are modified to reflect not only the reduced project length and funding, but also the changed institutional setting of the project. That setting was in flux two years ago when WARD was being designed but has now taken firm shape. The principal characteristics of the new institutional framework, reflected in this amendment, are (1) the designation of DGASP as the locus of the directorship for WARD, and (2) the conversion of three of the five entities of MPAAR participating in the project from government departments to parastatal institutes that will operate under contract to DGASP. This arrangement should facilitate both operational and policy coordination of the project (see Section II.B for full discussion.)

The descriptions of the outputs remain essentially the same in the PP amendment as in the initial PP. However, with WARD now limited to a three-year effort and less than half the original funding levels, realistic implementation planning (see sub-section C below) will probably dictate relatively modest physical output objectives. Thus, although it may be possible to embark upon the full range of agricultural research initiatives set forth in the original PP, the results of the experiments after three years will in some cases be more tentative than would be the case after seven years. The number of soil and water conservation structures built, of hectares of land developed for irrigation, and of trees planted in various watersheds will of necessity be reduced. Moreover, as implementation planners weigh the different time horizons, costs, and complexities for completion of the various listed activities, they may find it prudent to curtail some activities more sharply than others, as opposed to curtailing everything proportionally. An example would be the development of new land for irrigation, which may not be possible within three years. Similarly, large-scale afforestation efforts may prove too ambitious for the shortened WARD project (it is noted that other donors and the GOCV are also funding forestry projects).

On the other hand, WARD has an excellent chance during the three years to establish a pattern of coordinated research and development action among the MPAAR units and the local communities participating in the project. Facilitating this outcome will be two factors: (1) DGASP and the WARD Coordinating Council, as noted above, will exercise centralized authority over the project. (2) WARD can count on working with three well-established institutes, two of which -- INIDA and INERF -- already have a long history of cooperation with USAID.

The third institute, INFAP, which has a national mandate to promote crop and livestock production, can contribute substantial benefits to producers at little or no cost to the WARD project. INFAP has its own assistance base (FAO) and will only need advice and on-site training for coordination of its efforts with the other project entities. For these reasons, INFAP production

assistance to farmers in the target watershed(s) is included as a new component in the amended PP.

If the proposed pattern of coordinated research and development is successfully established under WARD, it will serve as a model for achieving sustainable agriculture in many of the fragile watershed areas of Cape Verde. It may also provide important research and development lessons to be applied elsewhere.

C. Pre-Project Planning

The amendment will serve as the guideline for a detailed implementation planning effort to be undertaken jointly by GOCV personnel and USAID-financed technicians. The latter will be procured through the same central AID/R&D project which ultimately is to provide implementation services through a USAID/Cape Verde "buy-in."¹ The implementation plan will fall within the context of a broader GOCV plan for development of all watersheds on Santiago Island. The GOCV wishes to prepare the broader plan on a priority basis before WARD target areas are selected and the WARD implementation plan is developed.

Completion and approval of the implementation plan is a condition precedent for release of project funds. To facilitate this planning, the PP amendment provides a set of EOPS indicators for each of the participating MPAAR entities. The details forthcoming from the implementation plan and from the pre-project collection of baseline data will provide the activity and quantitative data necessary for assessment of performance and impact against the indicators. The planning process will also permit quantification of outputs and a more detailed listing of inputs than was possible during preparation of the PP amendment.

Other planning activities that must be completed before the project is launched are the preparation of a training plan and an inventory of equipment purchased under WDP and FCRP that can be made available to WARD.

This amendment includes only those sections of the PP that need revision to reflect the above-mentioned changes. The original PP contains a great deal of analytical and technical information that remains valid and should be thoroughly exploited by the planning and implementation teams. The teams should also avail themselves of the various studies and evaluation reports prepared under the two predecessor projects.

¹ The plan under the original seven-year project was to implement WARD through a competitively selected Title XII university team working in collaboration with a private voluntary organization (PVO). Given the need in a three-year project to field technicians quickly and, if possible, avoid having to manage two teams; and given the availability of R&D central resources well-suited to meeting the varied objectives and technical requirements of WARD, the Mission has decided that contracting with a single, competent entity through a buy-in is the most expeditious and effective means to implement the amended project.

II. PROJECT DESCRIPTION

A. Project Goal

The goal of the WARD project is to increase sustainable agricultural productivity in Cape Verde and, concomitantly, increase sustainable incomes from agriculture. Agricultural productivity is based on irrigated and rainfed crop yields and production of forage, livestock, and forest products.

Measurable indicators include the following:

- Biophysical changes - soil depth, fertility levels, pH levels, % of organic matter, extent of erosion, % of available water, ratio of runoff to rainfall, density and composition of key tree species, volume of wood.
- Productivity changes - ratios of crop and livestock yields to inputs.
- Behavioral changes - number or percentage of hectares treated with agroforestry or other improved cropping systems and practices, number of adopters of improved practices, amount of land unsuitable for cropping that is cultivated.
- Income changes - levels of income from productivity increases, extent of diversity of income-producing activity, extent of reliance on workfront labor for income.

B. Project Purpose

The purpose of the WARD project is to strengthen the capacity of the Ministry of Fisheries, Agriculture and Rural Animation (MPAAR) and three of its parastatal institutes to undertake, monitor, and evaluate (1) agricultural research, (2) soil and water conservation activities, and (3) agricultural promotion and extension in a coordinated manner that seeks producers' cooperation in establishing sustainable and productive practices.

The project will focus most of its activities on development of one or two target watersheds, to be selected during implementation planning according to a set of practical criteria (see Section C1. below).

The ministry departments and institutes concerned, their project roles, the expected achievements of each by the end of the project, and indicators of achievement are cited below. This information will serve as a guideline for preparation of a detailed implementation plan, baseline data for the project's monitoring & evaluation (M&E) system, and quantified outputs -- all conditions precedent to disbursement of funds. (See further discussion of this process in Section C3. below on outputs and Section IV on the M&E system.) The combination of these plans and data will make it possible to measure performance against both the EOPS and output indicators.

1. The Directorate-General of Agriculture, Silviculture and Animal Husbandry (DGASP) will provide the national project director, coordinate the

operations of the four participating government entities mentioned below, and sign contracts with the three of the four entities which are semi-autonomous institutes. DGASP's coordination will be based, first of all, on a detailed description in the implementation plan of the functions of each of the operational entities and their inter-relationships. These descriptions will also be reflected in the contracts with the three institutes. The national project director will ensure coordinated implementation through:

- frequent field visits to monitor progress, identify problems, and seek prompt solutions;
- continuing contact with the technical assistance group, the directors and staffs of the participating entities who have WARD responsibilities, and the Director General of DGASP who will be the project director's superior;
- control over project finances and allocation of project resources to the participating entities (a responsibility to be shared, as appropriate and as defined in the project agreement, with the technical assistance team leader and USAID); and
- regular reports and referral of major problems to the Coordinating Council, which is discussed next.

Supporting and advising the operational leadership of the project will be the WARD Coordinating Council. Under the original project concept, which did not provide for a DGASP role and a project director as described above, the council would have had to become far more involved in day-to-day coordination than will now be the case. Under the new concept, the council can concentrate more on providing policy guidance, approving work plans and budgets, and overseeing implementation. The council can also back up the operational coordinator where necessary. For example, if a problem arises that the project director cannot resolve -- say, a conflict between a project entity and an external one that also has responsibilities in the project zone -- the council can intervene at a high government level to seek a solution.

The Coordinating Council will be chaired by the Minister of MPAAR or his/her designee. Members will include the heads of each of the participating MPAAR entities, the Director General of International Cooperation of the Ministry of Foreign Affairs, the USAID project manager, the contractor chief of party, the PVO administering the PL 480 Title II monetization program, the municipalities (comparable to county governments in the U.S.) responsible for the watershed areas in which the project will be active, and the farmers' associations representing those areas.

By the end of the project, it is expected that DGASP will be (1) directing an ongoing program of coordinated research and development activities in WARD-assisted watersheds, and (2) using data produced by the monitoring and evaluation system established under WARD to review and adjust current programs and to help prepare plans for the development of additional Cape Verdean watersheds. The Coordinating Council will continue its role in

the project area as long as post-project activities warrant; similar oversight mechanisms will be installed for other watershed development projects.

Indicators of achievement are:

- The office of the WARD project director and the Coordinating Council are carrying out their functions on a timely basis and as defined in the implementation plan and project agreement.
- The project director and the council have used the monitoring/evaluation reports emanating from the WARD system (see below) to make mid-term corrections in the WARD implementation plan or in individual activities of the project.
- DGASP has launched a process to plan, seek financing for, and implement similar plans for the coordinated development of other watersheds.
- Depending on how far this process has progressed by the end of the WARD project, any plans for additional watershed development projects show evidence that they incorporate those WARD management practices found to be successful, and modify, or find alternatives for, those practices which WARD found to be deficient. Any plan for development of another watershed that may be under consideration or is being implemented at the time of WARD termination also provides for appropriate coordination and oversight mechanisms.

2. The National Institute for Agricultural Research and Development (INIDA) will participate in three areas: on-farm research; research on production systems (including livestock) and water management; and evaluation/monitoring in both biophysical and socio-economic spheres.

When the project is completed, it is anticipated that INIDA will be (1) producing an increased quantity of useful research on cropping systems; soil/water management; crop varieties; and tree, shrub and grass species; (2) undertaking an increased portion of its research on producers' fields; and (3) operating a permanent M&E system to provide data for measuring the performance and impact of watershed research and development projects such as WARD. (DGASP also intends to use the data to report to the government on WARD's contribution to the current Third Development Plan.) The M&E system will involve the various project entities but be based in INIDA's Department of Social Sciences and Agricultural Economics (DCSEA). Baseline socio-economic and physical survey data for the system will be compiled from available sources or be developed through selective studies before the project begins. Thereafter, DCSEA will coordinate ongoing data collection and analysis and the monitoring of people-level impact (PLI).

Indicators of achievement are:

- The M&E system definitions of anticipated progress and impact for each project activity, the baseline data established, and the progress data

subsequently added have been adequate for monitoring and evaluating the project as a whole to GOCV and USAID standards.

- Applying the M&E system to INIDA's agricultural research, project monitors and external evaluators have made use of the definitions and the data to assess progress and impact in terms of capacity-building, scientific findings in each of the above areas of research, and application of those findings to improve production and environmental practices in the WARD zone of intervention.

- The conclusion of the independent evaluators is that the performance and impact objectives set for INIDA under the project have been achieved in both qualitative and quantitative terms.

3. The National Institute for Rural Engineering and Forestry (INERF) will carry out (1) soil and water conservation (SWC) activities (including agroforestry and afforestation), with emphasis on rehabilitation, improvement and maintenance of existing watershed structures that support WARD agricultural research, production and extension efforts; (2) improved design and siting of new project structures; and (3) development of alternative implementation approaches that rely less on traditional public employment schemes and more on the participation of local communities.²

By project end, it is expected that INERF will regularly be using the construction design, siting and maintenance approaches applied under WARD. Where appropriate, INERF will be carrying out conservation activities with community participation.

Indicators of achievement are:

- INERF activities under WARD have been selected and located so as to complement INIDA on-farm research and INFAP agricultural and livestock promotion.

- INERF structural work for soil/water conservation incorporates the latest designs available as per the following: prior evaluations, WARD studies of structural work done under the prior watershed projects, and current engineering advice received.

- Structural and vegetative work is coordinated wherever both are needed to control erosion and increase water infiltration.

- Maintenance work on structures is planned and implemented on a timely basis.

- Farmers directly benefiting from INERF's work under WARD have agreed to (1) monitor the structures for repair needs and (b) contribute, with

² Generating community participation in the various facets of WARD will be the responsibility of all the departments and institutes participating, as well as of the municipalities concerned.

little or no pay, timely maintenance services that are within their physical means to provide, rather than wait for the government to do all the maintenance work.

- The above patterns are being replicated by INERF wherever feasible outside the project zone.

4. The National Institute for Agricultural and Animal Husbandry Promotion (INFAP) will undertake in the WARD project zone what it already does in various parts of the country, namely, promote the use of proven technologies (such as drip irrigation), seed varieties and livestock species for the production of horticulture crops and livestock. This will provide early and direct benefits to many of the participating farm families in the WARD area. INFAP's promotion methods include seed and plant selection and multiplication, livestock selection and breeding, technical assistance in growing and processing crops and livestock for market, provision of market information, and sale of inputs through revolving funds. (See Section C5. for a possible source of credit assistance for farmers' purchase of inputs).

By the end of the project, INFAP will have established a pattern of working in a watershed zone in close coordination with the other institutes and departments involved in WARD, and will have met the material and technical support needs of producers as defined in the upcoming implementation plan.

Indicators of achievement are:

- INFAP's promotion work under the WARD project shows evidence of close coordination with INERF and INIDA, e.g., expansion of production only in areas whose soil and water resources are deemed adequately protected, or production efforts integrated with agroforestry experiments.

- Implementation plan targets for production assistance have been met. These targets have not only reflected the above need for coordination with INERF and INIDA; they have also struck a careful balance among the farming groups selected for assistance, e.g., between farmers working lowland, irrigated fields and those farming less favored hillside, rainfed areas.

- The above pattern is being replicated elsewhere, to the extent plans are being prepared or implemented for development of other watersheds at the time the WARD project is ending.

5. The Directorate-General of Animation for Rural Development and Fisheries (DGADRP), which is responsible for animation nationwide, will assign animators/extensionists and communicators to the project to become familiar with the work of the three institutes, to assist in animating the population in the target zone to cooperate in all the project activities, and to help extend technical information to the farmers.

By the end of the project, these agents will be qualified to participate in similar coordinated watershed projects elsewhere, and will have technical knowledge that they can extend to individual farmers and communities outside

of project zones. DGADRP will have established linkages with the institutes that will assist them in programming the work of their entire cadre of animators/extensionists and communicators.

Indicators of achievement are:

- Agents assigned to WARD have carried out animation and extension tasks per the implementation plan and as assigned in the field.
- DGADRP is incorporating techniques and knowledge gained under WARD into its general extension program nationwide.
- DGADRP communication specialists are producing written, visual and broadcast material promoting WARD-tested extension messages.

C. Project Elements

WARD project elements are described below with an overview of the project sites, WARD strategies, expected project outputs, inputs required to achieve these outputs, and the entities responsible for carrying out project activities. WARD is designed on the principle of flexibility in order to allow USAID, the implementation team and the GOCV to monitor, assess, and respond to the evolution of MPAAR's new institutional arrangements, the results of adaptive research, and the body of socio-economic knowledge that will evolve through a fully-developed monitoring and evaluation system.

C1. Project Sites

The Target Watershed(s)

Project activities will be organized on the basis of one or two target watersheds and other selected watersheds. The purpose of designating target watershed areas is to focus applied research, soil and water conservation, and promotion of tested technologies and crop varieties in a defined area. This will facilitate interaction among the three participating institutes and the animation/extension service (DGADRP), and provide a more integrated setting for selected water management studies and for monitoring and evaluating impacts of technologies and practices designed to increase agricultural productivity and sustainability.

Criteria used in the original project paper to select the target watershed³ stipulated that (1) a cross-section of major agro-ecological zones be represented, (2) researchers and visitors have ready access to project sites, and (3) there be no overlap or conflict with other donor-funded projects. Additional essential criteria for selection of a pilot watershed are as follows:

- The area's potential for agricultural production is significant.

³ Ribeira Seca was selected as the target watershed under the original project paper.

- It has existing conservation structures that at most need repair or improvement, allowing for meaningful results during the short life of the project. The concern here is to avoid giving priority attention to opening up new land for irrigation that might require costly and time-consuming construction of new conservation works.

- Well-researched, basic studies on the watershed are available from the Food Crops Research and Watershed Development projects and from other sources. This will reduce the cost in time and money for studies to complete the data base.

Consultation with host government personnel has tentatively resulted in the selection of Ribeira Seca as a target watershed -- the same as in the original project paper. It meets the above criteria. However, a final selection of one or two target areas awaits an overall plan for Santiago Island watershed development which the GOCV wishes to prepare first. >

In order to further target land units for research, development, and impact assessment, WARD will concentrate its activities on sub-watersheds within the target zone(s). The sub-watersheds will be chosen on the basis of site visits, local surveys, complementarity with other nearby projects, and discussions among the Cape Verdean implementing agencies, the USAID contract team, and local inhabitants. These areas will represent the major agro-ecological zones found on eastern Santiago Island.

Project Management Facilities

The host country project director will operate from an office at Achada Sao Felipe outside of Praia. This site is also the headquarters of the Director General of Agriculture, Silviculture and Animal Husbandry (DGASP), to whom the project director will report; and of INERF. The USAID-financed watershed management advisor, who will serve as the technical assistance team's chief of party, will also have office space at Achada Sao Felipe. This location will enable the advisor to be in close, regular contact with both the project director and the director and staff of INERF. The advisor will live in a house in Praia. A house will also be rented in Praia for short-term and recurring advisors working with INERF and DGADRP, the animation service, if a house proves to be more cost-effective than having the consultants live in hotels.

INIDA will manage its WARD activities from its facilities at Sao Jorge. Two houses used by research personnel under the former Food Crops Research project will be rehabilitated and maintained for technical assistance personnel assigned to INIDA. One house will be used by the agronomist serving as long-term advisor to INIDA; the other will serve as a guest house for use by recurring and short-term TA personnel.

Recurring and short-term personnel will be assigned working space at the respective institutes and departments upon arrival.

USAID's project manager, who will be hired under a personal services contract (PSC), will work out of an office at USAID. The technical assistance

team, when in Praia, will hold meetings and do necessary office work either in GOCV facilities, in team residences in Praia, or -- if available to USAID -- in a U.S. Embassy conference room.

C2. WARD Strategies

WARD activities fall into four broad categories: agricultural research, soil and water conservation, agroforestry, and agricultural promotion/production. All will be supported by extension. There is embedded overlap and integration of activities, as described in Section B.

SWC and forestry elements are designed to reorient land use and afforestation/revegetation to reflect the need to stabilize soils, diversify the use of tree, shrub, and grass species, and improve the use of irrigable land.

The WARD approach will emphasize participation of men and women producers as co-researchers and co-developers, both in on-farm research, development and extension (RD&E) and in community- or group-level initiatives in which producers suggest or select, negotiate and contract with the project to institute trials, SWC works, or other local activities for which the group agrees to assume subsequent responsibility.

C2.1. Soil and Water Conservation

The SWC work carried out by INERF will be carefully prioritized, designed and coordinated in light of the following considerations:

(1) The amount of PL-480 local currency funds to be made available to WARD will be limited to the amounts originally budgeted for the first three years of the seven-year WARD project (see also Sections II.C5 and VII). One of the categories for use of the funds is SWC and forestry work, to be carried out by INERF-hired workfronts. Following is a suggested range of priorities which implementation planners may wish to apply in scheduling and budgeting for SWC and forestry work (forestry is further discussed under C2.2):

(a) The repair of SWC structures and the planting of trees necessary for the conduct of on-farm trials, agroforestry experiments, and production efforts deemed important for the project in the target watershed(s).

(b) The building of new structures to support the above efforts -- e.g., to open up new land for irrigation in the target areas -- provided that both the structures and the on-farm work they support can be carried out during the life of the WARD project.

(c) The repair of other important degraded structures and the completion of useful structures that may have been left unfinished in the past, either in the target zone(s) or in other watersheds.

(d) The building of new SWC structures, and the execution of agroforestry and afforestation activities in other Santiago watersheds.

(2) Repair work and new construction will take into full account the assessments made of past watershed work, as well as relevant existing studies and those that WARD may undertake with respect to the design and impact of SWC structures.

(3) The methods used for organizing and executing watershed work may evolve if research and extension work undertaken in the target watershed develops new approaches, as discussed below.

On-farm Soil and Water Conservation. In a major redefinition of soil and water conservation, WARD considers soil conservation as the design and application of land-use systems that not only preserve or enhance soil fertility but are also attractive to the user. In a phased expansion that targets selected parts of the pilot watershed, WARD will improve extension to promulgate its on-farm land husbandry message. This message will be based on contour practices designed to improve soil moisture storage, conserve soils, and improve crop, livestock, and forestry yields. WARD's practices will concentrate on encouraging land uses that match land capacities. Its methods will include practices such as hedgerow agroforestry, stripcropping, contour tillage, and planting to optimal densities. Use of species such as Caianus caian, Leucaena, and other shrubs, trees and grasses will be tested and, where found suitable, promoted to achieve maximum benefit for producers in terms of soil stabilization, water infiltration, and production of fruit, fodder and fuelwood.

In this connection, WARD will pay particular attention to the many existing contour rock walls (muretos in Portuguese) built under the prior Watershed Management and Watershed Development projects. These walls present two problems: (1) Where they need repair, the producers in the area await INERF repair crews to undertake the work rather than do what they can themselves. The producers were not involved in the original construction of the walls except perhaps as paid laborers and appear not to appreciate their value. (2) The sediment accumulated behind rock walls that have long been in place has risen to the height of the walls, allowing erosion to continue over the top. As observed by the design officer on a visit to the IFAD project site in Ribeira Seca, a row of vegetation (which can include fruit, fodder and fuelwood species) placed immediately behind a wall can keep pace with rising sediment and prevent further erosion while increasing water infiltration. Perhaps INERF, backed by INIDA research and DGADRP extension, can work jointly with producers to repair walls and plant appropriate vegetation behind them.

Off-farm Soil and Water Conservation. Structural soil and water conservation practices have been the keystone of Cape Verde's SWC effort since before its independence. These methods have persisted to today and were a major component of USAID/Cape Verde's previous watershed development projects. While the effectiveness of dams, gully plugs, and drop-inlet spillways to reduce erosion is limited to the area controlled by their reservoir, they do retain sediment, store water and provide employment. Because these structures

rapidly fill with sediment, their water storage capacity is essentially that of an upwardly unconfined sand aquifer. Wells in the vicinity of these structures play an important role in meeting domestic water requirements and, during years with adequate rainfall amount and distribution, providing water for irrigation.

Many of the structures built during the early years of the previous Watershed Development project suffer design faults; some of them risk aggravating soil erosion; others risk collapse. Because of this, WARD will rehabilitate and improve existing structures. Subject to the budgetary and time limits of the project, it will construct new structures where a watershed management plan and engineering design show they provide an essential, sustainable benefit. These structures will provide important experience in engineering design according to hydraulic and other specifications. In planning these structures and monitoring/evaluating their operational efficiency, it will be necessary to provide for streamflow and sediment measures.

Need for Maintenance Plans, Training, and a Study on Farmer Participation. Plans for maintaining SWC structures in project areas will be prepared for inclusion in each annual work plan. The plans will identify the structures to be repaired, list the type of repair work and the estimated funds required, and provide for necessary training of work crews including local farmers. As an initial project activity, a study will be made to determine what approaches and incentives are necessary to induce local farmers to help monitor the structures for repair needs, and to contribute, with little or no pay, timely maintenance services that are within their physical means to provide. The municipalities and farmers' associations concerned will be consulted as part of the study.

Development of Irrigable Lands. Preliminary reconnaissance shows that the majority of potentially irrigable land in the target watersheds is already developed. During drought years, much of this land is not irrigated because of inadequate water supplies. The underlying basalt over much of the basin is unsuitable for further groundwater exploitation. Channel-bottom alluvium is already exploited to its near maximum by a dense network of hand-dug wells. Downstream well development poses considerable risk of salt water intrusion.

Subject to (1) the priority to be given to support from INERF for research to improve cropping systems management and productivity on existing irrigated land, and (2) the limitations of funding and time under the shortened life span of the amended WARD project, WARD will develop additional, potentially irrigable land in the target zone in order to demonstrate more appropriate irrigation design for application elsewhere in Cape Verde.⁴ To

⁴ The original PP, in Annex D.2, p. SWC-26, stated "...we estimate WARD can develop up to 9 additional hectares of potentially irrigable land in Ribeira Seca. We assume that planning and design activities will occupy WARD's first 2 years, and that actual construction will not commence until year 3. We further estimate that 9 hectares of additional irrigated land will require up to 3 diversions and up to 10 km of lined canals. Total

provide water to these areas, it will construct lined canals, develop springs and wells, or construct diversions across tributary or main channels. The surface area to be developed, the length of canals, and the type and size of other structures, diversions, spring development or wells will be determined during watershed planning and engineering design.

C2.2. Forestry and Agroforestry

Forestry, Agroforestry, and Sylvopastoral Research. WARD will promote collaborative applied research on new tree, shrub, and grass species for use in Cape Verde. Research on forage species for planting in different agro-ecological zones will be included to foster more efficient use of livestock resources. INIDA will conduct socio-economic prefeasibility studies of proposed interventions for production of fuelwood, secondary tree products, and livestock. On-farm trials will evaluate the appropriateness of promising technologies.

Agroforestry and Sylvopastoral Development. Agroforestry and sylvopastoral development will be promoted by (a) developing demonstration sites for promotion in various agro-ecological zones, (b) producing and distributing fruit trees and examining micro-enterprise and market-strategy alternatives for fruit and other tree products, and (d) working with extension personnel to improve farmer participation and feedback by offering training and risk-minimization incentives if necessary.

Optional Activities, Subject to Availability of Project Time and Resources. Two worthy activities planned under the original seven-year project are likely to prove beyond the limited capacities of the revised WARD to undertake, at least in their full dimension. They are listed here in the event implementation planners deem a portion of them feasible within the three-year LOP.

- Support to Forestry. As was done under WDP, WARD would support select activities of INERF by overseeing tree nurseries, selection and preparation of planting sites, and planting of trees in various watersheds (the original PP proposed three million trees). Management responsibilities would be passed on to the Forestry Department during the project on a watershed-by-watershed basis. This would allow evaluation of institutional capacity while the project was still being implemented. WARD would also improve record-keeping and planning within the Forestry Department, drawing first upon successful initiatives under WDP.

- Promotion of Private Sector Forestry Activities. A feasibility study would be conducted focusing on private enterprise potential for activities in tree seedling production, tree planting, and fuelwood harvest. In addition, current forest product enterprises would be evaluated in order to develop and promote small enterprises that would

construction labor based on terracing and retaining wall construction will be about 3975 person months assuming current work norms apply."

increase income to rural families and decrease their dependency on public workfronts for employment. With or without WARD technical assistance, perhaps private forestry enterprises could benefit from loan financing through credit sources (separate from WARD) using local currencies generated by the PL 480 Title II program. (See Section II.C5.)

C2.3. Applied Agricultural Research

WARD supports INIDA in three areas: applied research; monitoring and evaluation; and institutional strengthening.

Applied Research. WARD will assist in building INIDA's capacity to conduct applied cropping systems research through selected research activities in the target watershed and through well-planned short- and long-term training activities and technical assistance. Specific WARD activities in cropping systems research over the LOP will focus on the following areas:

- Water Management Research. More efficient use of water is key to increasing agricultural productivity. Reducing evaporation from soil surfaces, selecting/managing crops to use water more efficiently, and applying water in ways that conserve it should have a significant impact on yield. Examples of research topics in this area include irrigation management, mulching to reduce water loss, water-use efficiency, fertilizer-water response, water harvesting, and alternative water delivery systems.

- Cropping Systems. Although water supply is a major factor in crop yields, crop management is the leading cause of inefficiencies in water use, both on rainfed and irrigated fields. On rainfed systems, cropping methods such as contour tilling, hedgerow agroforestry, stripcropping, and terracing can have a major impact in preventing soil loss and increasing productivity. For example, cultivating crops in rows on a contour increases infiltration of rainfall and decreases water and soil losses.

The constraints to introducing such technologies in Cape Verde may be significant. Cropping systems research should be partly based on socio-economic data on farmer receptivity and through multi-disciplinary, on-farm research. Given Cape Verde's high rainfall variability, its general propensity for drought-related crop failure on rainfed slopes, and the lengthy gestation period required for many agroforestry initiatives, it may take several years to achieve widespread results throughout Santiago Island.

Varietal Improvement. WARD will support adaptive research on varieties of root and tuber crops, forage crops, dryland crops that address soil erosion problems, and irrigated horticultural crops (the last in close coordination with INFAP). INIDA has some relevant varietal work in progress which can be supported early in implementation. Varietal development will be adaptive, taking advantage of IARC, CRSP, university, and regional plant breeding programs for material to test. Plant selection criteria will focus on

drought-tolerant, short-growing-season varieties. Testing of forage species and crop-shrub-tree combinations for livestock browse and soil conservation will constitute new areas of varietal research for INIDA. As noted in Section C2.1 above, this work will in part need to be coordinated with INERF work on contour rock walls.

Monitoring/Evaluation (M&E). WARD will strengthen the GOCV's capacity to monitor and evaluate both the performance and impact of projects such as WARD that are aimed at increasing sustainable agricultural productivity. This capacity-building will be broadly focused, covering the institutional, biophysical, economic and social aspects of development activities. Without this capacity, planning is grounded in unreliable assumptions and projects risk wasting scarce resources.

The M&E system will be housed at INIDA where it can profit from existing research facilities. In addition, INIDA has the supporting infrastructure (soils and water analysis lab, computer facilities, and a socio-economics department) necessary for data collection and analysis. However, M&E is a responsibility which personnel from all the entities participating in a project such as WARD must share, both in terms of supplying data on a continuing basis and of using it to make judgments about past, current and planned activities. Hence WARD technical advisors will work with INIDA researchers as well as personnel from the other project entities to develop a sustainable M&E capability. Baseline data related to WARD project indicators will be established prior to project inception (see Section IV). Both the baseline data and the information subsequently added to the M&E system will be used for review and planning of activities.

Institutional Support to INIDA.

- On-farm Research Methodology. Training and field implementation in on-farm research methodology and trials is provided in order to strengthen INIDA's adaptive approach to research and to support WARD activities in soil and water conservation and agroforestry. On-farm research trials will be conducted, in part, on technical issues related to other project components.

- Research Management. A modest amount of technical assistance and training will be furnished on specific topics of research management and administration, including proposal writing, research priority setting, record-keeping, and administration. Training in contracting and personnel management may also be considered if deemed necessary to WARD implementation, in view of INIDA's new status as a parastatal institute.

C2.4. Production Assistance

This component represents a broadening of the original project concept to include assistance to producers in the production of crops and livestock when the following conditions apply:

- the technologies and species to be applied have already been tested and found suitable for WARD target zone conditions; and

- the areas of intervention have been carefully selected to ensure (a) the presence of adequate SWC structures, (b) full coordination -- or absence of conflict -- with the work of the other two institutes, and (c) careful balance between the groups and areas assisted to avoid the appearance of favoritism.

The justification for adding this component to WARD while the project is being curtailed in time and funding is that the institute able to provide the assistance, INFAP, is well-established, is receiving Dutch-financed FAO technical and financial assistance, will need no WARD assistance in performing its tasks beyond advice and on-site training for coordination of its efforts with the other project entities, and has considerable expertise and material resources to offer producers in the WARD target areas.

INFAP has three directorates general: one for agricultural promotion, one for animal husbandry promotion, and one for processing and marketing of products. The institute can assist farmers in the following ways:

- through a revolving fund, sell producers (a) tested seeds or plants for the production of improved tomatoes, onions, cabbage, potatoes, strawberries, tree fruits, and other horticultural crops; (b) various types of improved livestock; and (c) fertilizer, drip irrigation materials (whose use permits water savings of 40-50 percent), wood and screening for storage sheds, and other materials;
- provide technical assistance in growing and processing crops and livestock for market (e.g., based on INFAP experiments with storage of potatoes in specially designed sheds at elevations of 1,000 meters or higher, some farmers are now storing potatoes from March to July with only a 4% loss. Thus, without having to invest in expensive, artificially-cooled storage facilities at lower elevations, farmers are able to store part of their crop for marketing or planting at more favorable times of the year);
- provide market and price information (INFAP's service has already helped farmers obtain a 16 percent rise in producer prices, simply by giving them up-to-date information on market conditions); and
- monitor the use of bank credits furnished to participating farmers (see Section II.C5 for possible sources of credit).

INFAP has several bases of operation near Praia, including extensive warehouses, a seed and plant multiplication and storage center, and livestock breeding facilities. In addition, smaller facilities exist on each of the other islands. To staff these facilities and provide outreach to farmers, INFAP's Directorate General for Agricultural Promotion has mid-level and lower-level ("professional") technicians in seed production and conservation, seed distribution, drip irrigation, and credit and marketing. The DG for Animal Husbandry Promotion has four upper-level technicians -- two livestock production specialists and two veterinarians; a mid-level range specialist who is also an extensionist and trainer at INIDA; and one laboratory technician.

Many of the technicians work directly with farmers, although they may have little or no formal training in extension methodology.

C2.5. Extension

As one of the steps to implement the recently authorized reorganization of the MPAAR, the Directorate General of Animation for Rural Development and Fisheries (DGARP) is planning to sign cooperation agreements with each of the three institutes connected to WARD -- INIDA, INERF and INFAP -- to define responsibilities for pre-extension, extension, animation and communication. Pre-extension refers to preparation of a technical package to be extended. Extension and animation are overlapping concepts, with extension emphasizing the provision of technical information and animation seeking to generate farmer acceptance and participation. Communication refers to extension messages transmitted through radio, television and printed bulletins.

The ministry reorganization plan provides that the institutes will be responsible for pre-extension and extension, and DGADRP for animation and communication. In carrying out their responsibilities, the institutes are expected to aim at two audiences: (1) to prepare the technical packages in their respective spheres for use in their own contract extension activities; and (2) to pass the technical findings on to the DGADRP. The DGADRP, in turn, is to transmit the packages to the farming public at large (a) through five journalists on its staff who are responsible for communication, and (b) through 56 animators/extensionists who are attached to the DGADRP. Of the 56 agents, 23 are assigned in Santiago, specifically in the regions of Praia, Santa Catarina, Santa Cruz, and Tarrafal. An additional 21 extensionists who worked under the former Rural Assistance Program of the Watershed Development project remain on the MPAAR payroll. Those among them who have the requisite qualifications to be a Level 1 technician (11 years of schooling plus two years of technical training) could be attached to the WARD project and, hopefully, to DGADRP on a more permanent basis so they could participate in a follow-up program to WARD.

As of this writing, the functions of the DGADRP animators/extensionists and their relationship to the work of the institutes remain to be fully defined. Another factor to note is that, although INIDA provides the basic training for GOCV extension agents, the only institute which has a few extension agents of its own is INFAP. This means that DGADRP agents assigned to WARD will need to play a significant role in extension as well as animation, especially with respect to the INIDA and INERF components of the project.

The basic assignments of animators/extensionists from DGADRP and of selected agents from the former Rural Assistance Program will be as follows:

- INIDA: Agents will be trained, as necessary, in on-farm research methodology and will participate in farmer group selection, conduct of field trials, and dissemination of results through demonstrations and other extension means. The agents, along with the researchers they support, will approach producers in a spirit of collaboration -- e.g.,

by engaging them in a consideration of technical options wherever possible, rather than simply prescribing improved farming practices.

- INERF: Another group of animators/extensionists will assist with the maintenance and construction of soil/water conservation structures. The agents will help INERF establish work patterns that rely less on paid workfronts and more on cooperative efforts involving contributions of labor from benefiting local communities. In addition, the agents will serve as liaison between INERF and producers in agroforestry experiments, distribution of fruit tree seedlings, and afforestation activities.

- INFAP: DGADRP agents will receive training from and provide support to INFAP technicians and extension agents as they focus on their institute's promotion of tested crop and livestock species and technologies to expand production in the pilot watershed(s).

Implementation planners, including representatives of DGADRP and the institutes, will decide on the number of animators/extensionists needed in the WARD target areas, their training requirements, and their specific assignments. The planners will determine whether a separate group is needed to work with each of the institutes or whether some overlap in assignments would be in order.

During project implementation, the project director and the technical advisors will ensure that the three institutes and DGADRP communication specialists prepare materials that transmit to producers not only technical information that is readily usable, but also a sense of the WARD idea of coordinated watershed development and the role that each participant must play in it.

Also during the course of implementation, project leadership will consult with DGADRP on ways in which WARD extension techniques and knowledge can be incorporated into its national program. Where possible, this extension of the WARD approach through DGADRP should be carried out in conjunction with the work of the three institutes outside the WARD area.

Any project funding that is required to supplement DGADRP financing of its agents will be drawn from WARD's PL 480 local currency account, pursuant to the project implementation plan and budget.

C3. Project Outputs

Following is a general description of the project outputs. More precise, quantified outputs will be established when MPAAR and technical assistance personnel develop a project implementation plan with specific activity targets; these targets, in turn, will form the basis for annual work plans for the project as a whole and for each of the participating entities. The implementation plan will be prepared pursuant to the guidelines cited under "Project Purpose" in Section B above.

A completed implementation plan will be a condition precedent for release of USAID project funds. However, preparation of that plan must await (1) a plan for the development of Santiago watersheds which the MPAAR will undertake on a priority basis, and (2) within that context, final selection of one or two target watersheds for the WARD project.

The outputs and their magnitudes should be carefully defined in light of the time and funding constraints of the redesigned WARD project, to ensure that the projected results can realistically be achieved. Once the outputs are established, the end-of-project status description and indicators in Section B will need to be reviewed and adjusted as necessary to ensure that the anticipated end results of the project are fully consistent with the outputs.

The numerical placement of the outputs below may indicate priority in timing but not greater or lesser importance of one output over another. A further description of some of the outputs may be found in the original PP, Section II.C3.

1. Coordinating mechanisms will be established through DGASP and the Coordinating Council, setting a pattern for further development of the WARD target areas after the project ends, and for the coordinated development of other watersheds. The mechanisms will include implementation plans, contracts with institutes, centralized allocation of project resources, clear delineation of responsibilities for each participating entity, and close supervision of project activities.

2. A monitoring and evaluation system, based at INIDA, will be developed to service the entire project. Before the project commences, MPAAR and technical assistance personnel will compile baseline data against which to measure project performance and impact.

3. The applied research capacity and output of INIDA will be increased in areas of cropping and livestock systems, water management, soil/water conservation, and varietal improvements. Research planning and administration also will be improved. Staff will receive training and conduct on-farm trials as part of their research.

4. Soil and water conservation measures, improved cropping systems, agroforestry and pastoral management techniques, and improved crop varieties will be tested jointly by the institutes and farmers on rainfed land. Those measures, systems and varieties that are found to be effective will be applied wherever suitable in the project zone.

5. Improved cropping systems, conservation measures and horticulture crops will be introduced on irrigable land which has existing conservation structures that are sound or can be readily rehabilitated. INERF and participating farmers will rehabilitate structures where necessary. Use of drip irrigation for horticulture crops will be expanded.

6. If project resources and time are sufficient, additional irrigable land will be prepared for crop production. This work will serve as a training

and demonstration device for INERF in the building of new hydraulic structures. Farmers and landowners will bear the costs of production on the land opened for irrigation.

7. Off-farm soil/water conservation structures will be rehabilitated or be designed and constructed new, as needed in support of the watershed plan.

8. New tree, shrub and grass species will be introduced and tested, with emphasis on finding alternative varieties to Prosopis juliflora and Acacia holosericea. The original PP proposed a reduction in the planting of these two species to 30% of the total number of trees planted.

9. To the extent deemed feasible by implementation planners, appropriate trees (3,000,000 per the original PP) will be planted in various Santiago watersheds, conserving soil and water resources while increasing availability of fuelwood. In addition, fruit tree seedlings (30,000 under the original PP) will be produced and distributed.

10. Production will be increased on farms that receive INFAP assistance, pursuant to project workplans and careful coordination with the work of INIDA and INERF.

11. Technology transfer will be improved through strengthened linkages between the institutes on the one hand, and DGADRP and its animation/extension agents and communicators on the other. DGADRP personnel, as well as qualified agents from the former Rural Assistance Program, will be attached to on-farm research, SWC/forestry activities, and food production schemes in the project zone in order to learn the technologies and help pass them on to the farmers.

12. The technical capacity of MPAAR personnel will be upgraded through a combination of long- and short-term training, mainly at the project site and at INIDA classes, but also in the United States and other countries, as deemed appropriate and as project resources permit.

C4. Project Inputs

Over the three-year life of the project, USAID will use the \$3.8 million already obligated to provide technical advisors, both long- and short-term; pay the external costs of training; purchase equipment and supplies needed from abroad; and provide for USAID project management and external evaluation and audit.

The Government of Cape Verde will supply an estimated \$4,216,000 in local currency to pay for work fronts, training in Cape Verde, and other local project costs. These funds will be generated from the PL 480 Title II monetization program being managed by a U.S. PVO, Agricultural Cooperative Development International (ACDI). In addition, the government will provide an in-kind contribution valued at \$320,000 U.S. for facilities made available to the project, and personnel whose cost to the government is valued at \$230,000.

C4.1 Development Fund for Africa

Technical Assistance

WARD will use three modes of technical assistance: long-term, recurring, and short-term. The technical specialties required and length of service necessary to conform to project objectives are based on the technical analyses conducted during the design of the original PP and reviewed during the redesign that has led to this document. The original PP programmed three long-term technical advisors: a watershed management specialist/team leader, an agronomist, and an anthropologist/rural sociologist/socio-economist. The last position has been dropped; necessary services in these fields will be provided on a short-term or recurring basis. Implementation planners are referred to the qualifications and responsibilities for this position in the original PP as guidance for hiring short-term and recurring specialists in these fields. Because a project implementation plan remains to be developed, no other specific recommendations are made for short-term and recurring TA at this time. However, the planning and implementation teams are advised to utilize, wherever appropriate, qualified technicians available locally from the GOCV, other-donor projects, and the private sector. This will avoid duplication of effort and stretch the limited funds available to WARD.

Long-Term Technical Assistance

Watershed Management Specialist/Team Leader. A watershed management specialist will serve as a long-term technical advisor and team leader to WARD for the full three years of project implementation. This person will serve as the principal technical advisor and counterpart to the Cape Verdean project director in coordinating the overall project effort. The advisor also will be charged with coordinating support to INERF and providing oversight to continuing project efforts in soil and water conservation. Qualifications important to this assignment are: (a) broad experience in watershed development involving multiple agencies and in natural resources management in semi-arid zones; (b) knowledge of hydrology and hydraulic engineering; and (c) fluency in Portuguese. Specific tasks to be performed by the specialist include:

1. Advise the project director in coordinating the efforts of all entities participating in the WARD project, and ensure that all project technical advisors operate as a close-knit team.
2. Provide management and technical advice on rural engineering work and tree-planting conducted in project watersheds.
3. Represent the technical assistance team in collaborative efforts to establish and manage a watershed monitoring and evaluation program.
4. Coordinate planning and implementation of research in forestry, agroforestry, and sylvopastoral systems. Interface among short-term specialists, INIDA researchers, and INERF counterparts.

5. Provide leadership to short-term TA, and assist counterparts in directing extension agents and INERF field personnel in the promotion of agroforestry and improved pasture systems.
6. Schedule and organize the visits of short-term and recurring TA in conjunction with the project director and the agronomist.
7. Develop terms of reference and provide orientation to all short-term TA working in watershed development components.
8. Collaborate with counterparts and other advisors in developing training plans for short- and long-term training candidates and tracking progress of candidates in training. Advise on training locations and core subject areas.
9. Take major responsibility for fulfilling all TA team reporting requirements and for reporting the results of socio-economic research; assist the project director in meeting his/her reporting requirements to GOCV and USAID.

Agronomist. The project agronomist will work with INIDA for three years to develop applied research programs in the areas of water management, cropping systems research, and on-farm research. His/her expertise will be in the area of cropping systems, water management, or irrigation. Other qualifications expected for this position include: broad experience in research methods, statistical analysis, and design of field experiments; experience in advising or supervising young research staff; good writing skills and reporting habits; and fluency in Portuguese. Specific responsibilities include:

1. Support the President and Research Director of INIDA in research planning, coordination, and research staff supervision.
2. Support INIDA research programs through advice and training in cropping systems, agricultural water management, irrigation, and varietal improvement.
3. Coordinate and supervise recurring and short-term technical assistance to INIDA including developing terms of reference, and providing arrangements for logistical support.
4. Help INIDA design and implement research in water management, water-use efficiency, and cropping systems research.
5. Help INIDA develop linkage with the DGADRP on extension training, participation in on-farm research trials, and development of extension materials.
6. Assist in developing training plans for short- and long-term training candidates and tracking progress of candidates in training. Advise on training locations and core subject areas.

There is some overlap in duties between the two positions, reflecting the breadth of activities each advisor will become involved in. As the two positions are not in the same institute and do not always overlap during the project, it is important that both have experience and skills commensurate with those of a project team leader.

Short-term and Recurring Technical Assistance

An illustrative list of anticipated recurring and short-term technical assistance requirements is provided in Table 2, Annex J of the original PP (attached). This list will need to be revised by the implementation planning team to meet the specific needs of the plan and to fall within the reduced budget and time frame of the amended WARD project.

Short-term TA under WARD will be limited to special topics and services that are not likely to be repeated during the LOP. Recurring technical assistance is support provided by individuals who make repeated visits, on an as-needed basis, to work on selected topics or with individual GOCV counterparts throughout project implementation. The concept of recurring TA works particularly well with research, and has been proven effective in AID's Collaborative Research Support Programs (CRSPs) world-wide. Recurring TA comprises a key component for the WARD project. WARD will benefit from a variety of technical specialties to conduct in-country training courses, advise research and conservation personnel on specific project-related activities, provide field-level instruction and supervision, assist in management of project studies, and perform other services. WARD will utilize both U.S. and local-hire consultants for short-term and recurring TA.

Each short-term and recurring technical advisor will be required to leave a report detailing how his/her services were used, tasks accomplished, and specific recommendations for follow-on TA, if any. During the first visit in-country, recurring TA will develop a tentative workplan for remaining years of the project.

Training

Training details for the project are outlined in Section III.B.

Commodity Procurement

A condition precedent for disbursement under this project will be an inventory of all equipment purchased under the prior Watershed Development and Food Crops Research projects, a status report on its condition, where it is being used, and how and when equipment that remains useful will be made available to WARD. This inventory will be needed in compiling a list of commodities to be procured with WARD financing, a list that will form part of the implementation plan (also subject to a condition precedent).

Commodities required for project implementation -- either from available inventory or new procurement -- include project vehicles and spare parts, construction materials for SWC structures, research and lab equipment, scientific instruments, tools, visual aids and office supplies. Procurement

of any of these commodities will be predominantly off-shore since few are available in-country. Some project vehicles with spare parts and other minor items will be obtained by USAID/Cape Verde using AID Direct Procurement procedures. Priority items can be ordered by the project manager even before the arrival of the TA team. All other procurement will be the responsibility of the implementation team. Additional details are provided in Section III.C.

Annex J of the original project paper (attached) provides an illustrative list of commodities to be procured for \$752,000 plus the cost of packing/insurance/freight. The budget in Section VII estimates that \$400,000 plus shipping costs will be available for commodities under the revised project. The major cut is likely to have to be in vehicle procurement, for which Annex J budgets \$392,000.

C4.2 PL 480 Food Programming

The reader is referred to this section in the original PP for background information. PL 480-generated local currencies have been used extensively to support watershed management activities under prior projects. As noted earlier, the amount of currencies available to WARD will equal the amount budgeted for the first three years under the original design. The budget in Section VII lists three expenditure categories and estimated totals for each in dollar equivalents, as follows:

- Payments to workfronts for the construction and maintenance of SWC structures and for activities in forestry/revegetation -- \$3,580,000.
- Payment of local costs for in-country training programs conducted at the National Training Center at INIDA -- \$366,000.
- Other local costs -- \$270,000 -- including:
 - Local research support: hiring temporary field labor, rural survey workers, and purchase of local materials.
 - Miscellaneous costs such as income guarantees⁵ to farmers participating in on-farm research trials, and rehabilitation of the two INIDA houses for technical advisors (the last item, originally charged at \$50,000 to the AID budget, can no longer be financed therefrom because of other requirements for the very limited dollar funds).

The total amount is \$4,216,000. The three sub-totals above are the same as those shown for the first three years in the original WARD budget. However, implementation planners for the revised project may find it necessary

⁵ For example, the project might enter into a contract with a farmer whereby he agrees to an experiment on one of his plots, in return for a guarantee that if the experimental plot yields a lower return in the next growing season than the farmer's other fields planted with the same crop, the project will make up the difference.

to alter the breakdown in light of updated requirements for the shortened project. For the first category -- workfronts -- a guide for prioritizing the use of available funds is proposed in Section C2.1 above.

These local currency funds stem from the multi-year PL 480 Title II monetization program managed by a U.S. PVO, Agricultural Cooperative Development International (ACDI). ACDI will allocate the funds to WARD and deposit them in a separate bank account to be established by the GOCV. Disbursement of the funds for WARD activities will be the shared responsibility of the GOCV project director, the technical assistance team leader, and the USAID project manager; the exact responsibility of each will be defined during implementation planning. Disbursement will not be made out of the WARD bank account until the accounting system and internal control procedures assessment have been satisfactorily completed and approved by the Regional Controller, REDSO/WCA.

ACDI has responsibility for additional local currency funds stemming from the Title II program that are attributed to various USAID-sponsored initiatives for private sector development. Among these initiatives are a small credit union fund and a loan fund for small-scale enterprises, either of which may be an appropriate source of credit for farmers in the WARD target areas who wish to expand their operations.

C4.3 GOCV Inputs

The above \$4,216,000 in Title II local currencies will constitute the bulk of the GOCV's contribution to the WARD project. The General Counsel of AID has recognized that host country-owned local currencies (including PL 480) can be used by the host country to fulfill the 25% country contribution requirement. Since the Title II contribution exceeds the AID dollar input, the 25% host country contribution is easily met.

The GOCV also will support WARD by financing the salaries and benefits of MPAAR staff working on the project. Office space at Sao Jorge and Achada Sao Felipe, and housing at Sao Jorge will be provided for the project team. This contribution is estimated at \$550,000 for the life of project.

D. Beneficiaries

WARD will be implemented principally in one or two target watersheds to be selected on Santiago Island's eastern, windward coast. Subject to availability of project resources and as determined during implementation planning, selective activities will also be undertaken in areas outside the target watersheds.

Members of workfronts constitute the most direct and immediate beneficiaries of WARD. However, this is a temporary benefit as financing of workfronts with PL 480 local currency generations will cease with the termination of the WARD project. Across the LOP, a total of \$3.58 million in PL 480 local currencies is programmed for workfront salaries. This translates into employment for approximately 1,800 individuals annually, assuming a work season of ten 26-day months and the rule of one employee per family.

Calculated at a family size of 5.7, this means that 5,400 rural Santiagoans will benefit from an average workfront income of \$600 (calculated at a mean of 170 escudos per day X 260 days at the present rate of approximately 75 escudos = U.S. \$1.00).

Assuming Ribeira Seca is selected as the target watershed, as was done in the original PP, up to 13,000 men and women producers⁶ and their families who are resident there will benefit from the project. Pursuant to the implementation plan, a selected number of the producers will benefit directly through recruitment as co-researchers and co-developers (1) in WARD studies and on-farm trials to elaborate more productive, cost-effective, and locally "do-able" SWC and farming strategies, and (2) in applying proven technologies and improved crop varieties and livestock species to production efforts in areas that have both suitable soil and water conditions and the necessary SWC structures. Recruitment will be voluntary, and risk-sharing arrangements between producers and the project will be made where appropriate. The remainder of the watershed population will benefit through direct observation of the activities and through formal or word-of-mouth extension of the technologies being applied in the watershed.

As throughout Cape Verde, producers in Ribeira Seca can be categorized in several cross-cutting ways. One is by ecozone: humid, subhumid, semiarid, arid. Another is by general farming system -- i.e., rainfed, irrigated, or mixed rainfed/irrigated -- with all three typically including stockraising. Another is by household headship, i.e., a male-female pair or a female only. While WARD will address all these producer groups, it will pay special attention to female-headed households since they comprise 40 percent of all rural families on Santiago. Moreover, they are confronted with a distinct set of farming-system constraints.

As WARD SWC and farming systems interventions are tested and phased in, tangible benefits to producers will include, but not be limited to: increased diversity within a farming system and thus decreased risk; higher farm yields, e.g., of staple foodstuffs, vegetables, meat, dairy items, fruit, fuelwood, forage, and fodder; related to both the foregoing, better balance in family diets; and augmented, stabilized, and/or more independent household income flows resulting from increased sales of and/or decreased expenditures on purchase of such products.

Additional secondary, intangible, or subjective benefits can also be anticipated for agricultural families and communities in the target watershed. More difficult to predict or quantify, however, these may include: a greater sense of self-determination, choice, and control on the part of individuals or groups; generally expanded SWC and agro-sylvo-pastoral knowledge and skills; improved quality of home life due to less need for fathers to emigrate or for children to work so as to secure family survival; and enhanced communication and mutual appreciation between producers on the one hand and research, rural engineering, and extension services on the other.

⁶ 1995 estimate based on Table D.4.1 in the original project paper.

Economic and dietary benefits will also accrue to rural and urban consumers over the longer term. Lower-income and poor consumers in particular can take advantage of the cheaper food prices that typically result from higher yields and/or lower production costs. New crop varieties and species may place a greater range of healthful foods on the market. Expanded irrigation and improved SWC, cropping, crop storage, and stockraising techniques may remove some seasonal constraints on the availability of nutritious foodstuffs.

Over the longer term and depending upon the strengthening of extension systems and/or the expansion of coordinated efforts similar to WARD's into other areas of Santiago, producers and consumers in other watersheds stand to reap the same benefits as those detailed above. The environmental and especially the socio-economic situation in many of the other watersheds reportedly differ little from Ribeira Seca's. Thus there should be few barriers to extension of WARD accomplishments to these areas. At a conservative estimate, this beneficiary group totals 45,000 individuals or some 9,000 families.

In the longer term still, inhabitants of other watersheds of Cape Verde will benefit in two ways: (a) insofar as WARD strengthens the capacity of Cape Verdean scientists, extensionists, and institutions to modify and diffuse technologies, practices, and socio-organizational strategies; and (b) insofar as the GOCV, supported by expanding market and credit facilities and the donor community, actively promotes sustainable agriculture schemes throughout the country.

III. IMPLEMENTATION PLAN

A. WARD Implementation and Coordination Matrix

A detailed schedule of project activities must await completion of the implementation plan, which is a CP to disbursement of funds under WARD. What follows is a matrix which (a) lists each type of activity to be undertaken, and (b) for that activity, marks the responsibility of each project entity concerned in terms of either a leading role, a supporting role, or an advisory function.

WARD IMPLEMENTATION AND COORDINATION MATRIX

ACTIVITY	DGASP & Project Director	WARD Coord. Council	INIDA	INERF	INFAP	DGADRP	Municipality	Farmers Assoc	Tech. Asst'ce Team	USAID Project Manager	ACDI (PL-480)
<u>Project Coordination</u>											
-Pre-project activities:											
--Select target watershed(s)	L	S									
--Prepare implementation plan	L		S	S	S	S	S	S	L	L	S
--Prepare training plan	L		S	S	S	S			L	L	
--Prepare equipment inventory and determine procurement needs	L		L	L					L	L	
--Collect baseline data for M&E system			L	S	S	S			L		
-Prepare annual work plans	L		S	S	S	S	S	S	L	L	S
-Contract w. institutes	L		S	S	S				A	A	
-Allocate financial and material resources to 3 institutes & DGADRP	L								A	L	S
-Direct implementation	L										
-Coordinate respective lead roles of project director, TA team, USAID project manager, and ACDI	L								L	L	L
<u>Project Oversight</u>											
-Provide policy guidance		L									
-Approve work plans and budgets		L									
-Oversee implementation		L									
-Resolve jurisdictional and other conflicts		L									

ACTIVITY	DGASP & Project Director	WARD Coord. Council	INIDA	INERF	INFAP	DGADRP	Municipality	Farmers Assoc	Tech. Asst'ce Team	USAID Project Manager	ACDI (PL-480)
<u>Monitoring/Evaluation and Audit</u>											
-Collect progress data			L	S	S	S			A		
-Monitor implementation	L		L	S	S	S	S		L	L	S
-Evaluate/adjust activities on ongoing basis	L		S	S	S	S	S		L	L	S
-Assess people-level impact	S		L	S	S	S	S	S	L	L	
-Conduct final evaluation (external lead)	S	S	S	S	S	S	S	S	S	S	S
-Conduct audit (external lead)	S	S	S	S	S	S	S	S	S	S	S
<u>Agricultural Research</u>											
-Conduct water management research			L	S		S	S	S	A		
-Conduct cropping systems research			L	S		S	S	S	A		
-Conduct varietal research			L			S	S	S	A		
-Strengthen on-farm research methodology			L						A		
-Improve research management			L						A		

ACTIVITY	DGASP & Project Director	WARD Coord. Council	INIDA	INERF	INFAP	DGADRP	Municipality	Farmers Assoc	Tech. Asst'ce Team	USAID Project Manager	ACDI (PL-480)
<u>Soil and Water Conservation, Forestry, and Agroforestry</u> -Repair SWC structures and plant trees in support of on-farm research and production efforts in target areas -Build new structures to support on-farm work and, if warranted, open new land for irrigation in target areas -Repair other important structures and complete useful unfinished ones in target zones or elsewhere -Undertake SWC, agroforestry and afforestation activities in other Santiago watersheds (Above 4 items prioritized)			S	L	S	S	S	S	A		
			S	L	S	S	S	S	A		
			S	L	S	S	S	S	A		
			S	L	S	S	S	S	A		

ACTIVITY	DGASP & Project Director	WARD Coord. Council	INIDA	INERF	INFAP	DGADRP	Municipality	Farmers Assoc	Tech. Asst'ce Team	USAID Project Manager	ACDI (PL-480)
<u>Soil and Water Conservation, Forestry, and Agroforestry (continued)</u> -Involve and train farmers in maintenance of SWC structures -Undertake collaborative research on new tree, shrub and grass species -Carry out agroforestry and sylvopastoral demonstrations and promote tree production for fruit and other products -Optional activities, subject to availability of time and resources: --Undertake large-scale tree planting in various watersheds --Develop private forestry enterprises			S	L	S	S	S	S	A		
			L			S	S	S	A		
			S	L	L	S	S	S	A		
				L		S	S	S	A		
				L	L	S	S	S	A		S
<u>Production Assistance</u> At sites in the target zones coordinated with the work of INERF and INIDA, INFAP will: -Sell tested crop and livestock species and other production inputs to producers in WARD target areas -Provide technical assistance to farmers in growing and processing their output for market -Provide market and price information to producers -Monitor use of credit furnished to producers					L			S			S
					L	S		S			
					L			S			
					L			S			S

B. Training Plan

Training Planning and Management

The original PP design team began the identification of skill gaps and the preparation of guidelines for development of a training plan. This is reflected in Annex J, Tables 3 and 4 of the original PP (attached) and in the updated text below. A condition precedent for disbursement under the amended project is a detailed plan for long-term training, short-term third-country training, and in-country training must be completed for inclusion as an annex in this PP amendment. The plan will be prepared in conjunction with the overall implementation plan. A training specialist, in consultation with heads of counterpart agencies, will conduct a training needs assessment and analyze in-country training facilities, programs, and human resources. In conjunction with the other members of the implementation planning team, the specialist will create a global training plan that meets the needs and resource parameters of WARD.

REDSO/HRDO will provide technical assistance and guidance for the development and implementation of the training plan. REDSO/HRDO will also assist USAID/Praia with the monitoring of the contractor to ensure compliance with AID training regulations and requirements.

For overall management of WARD training, a training committee will be formed of project long-term TA, the USAID project manager, and representatives of participating Cape Verdean institutions. With oversight provided by the WARD training committee, the project will develop annual training plans that schedule activities, assign responsibilities, and define budgets. A special arrangement, described below, will be used for selection and management of long-term trainees.

Long-term Training

WARD will sponsor Cape Verdeans in Master's degree and possibly Bachelor's degree training programs at selected American universities. The number of long-term trainees and their specialties will be determined in the training plan. Training is to begin at the earliest opportunity. Long-term training will be carried out with project funds transferred to the USAID's Human Resources Development Assistance (HRDA) training account. Selection and management of the WARD long-term trainees will be the responsibility of a joint USAID-GOCV committee established for all USAID-financed long-term trainees.

The USAID-GOCV committee, working in coordination with the WARD internal training committee, will review biographical data of proposed students and the needs and priorities of the employing institutions. Student selection criteria will include but not be limited to: GOCV priorities, USAID priorities, applicant's job performance, and applicant's language capabilities. Criteria for selection of universities or other American training institutions to host WARD long- or short-term trainees will include: program relevance to the participant's job description, flexibility to custom-design study programs to specific participant needs, similarity of ecology and

climate of the institutions's locale with Cape Verde, faculty experience internationally, and the institution's experience in hosting international students.

The WARD training committee will take an active role in closely tailoring academic programs and thesis topics to each participant's personal needs and job responsibilities. This will be achieved through communication with the students' graduate advisors/major professors. Active participation of graduate advisors in project research activities will be promoted and supported by WARD. This approach will help assure an academic program relevant to the situation in the field.

Student progress will be monitored most intimately by the student's major advisor and/or committee chairperson. A contractor representative located in the United States will provide the communications link between student advisors and project managers in Cape Verde. At six-month intervals, this representative will produce progress reports on all long-term trainees. When appropriate, he/she will also facilitate attendance by trainees in summer or mid-winter seminars or short courses at other institutions.

The joint GOCV-USAID group preparing the implementation plan will consider a proposal in the original PP to finance the attendance of up to 30 students at a two-year course held at the National Training Center in Sao Jorge. This training is part of the regular curriculum of the Center and is designed for mid-level technicians for employment within the MPAAR. In addition to the normal curriculum, additional course work in on-farm research, survey and reconnaissance methods, and other special topics will be programmed.

Short-term Training

Short-term training with WARD will be diverse both in program content and target audience. The project will seek to upgrade the skills and knowledge of participants including researchers and staff, forestry and rural engineering management personnel, field technicians, extension agents, collaborating farmers, and community groups. While opportunities for relevant training programs will be explored in the U.S. and third countries, the majority of short-term training will be conducted in-country.

The selection process for participants in short-term programs will differ based on the type of audience targeted. For training designed to address specific research or technical needs (e.g., training in socio-economic survey methods), the proper individual to receive the training might be obvious. In other cases, such as the selection of forestry technicians to participate in a short course on agroforestry methods, WARD long-term TA and supervisors and advisors with INERF would reach a consensus based on geographic distribution of the agents, job performance and level of interest, and financial resources available. For other types of training, such as workshops for extensionists or cooperating farmers, the audience may be small enough to allow everybody to participate. In all cases, WARD annual training plans will consider scheduling carefully so as not to conflict with key

project activities or, in the case of producers, with critical points in the agricultural cycle.

Opportunities for short-term training in topics not covered in programs held in Cape Verde will be explored in the United States and in countries such as Portugal, Senegal, and Brazil. More frequently, however, short-term training will take place "on the job" or be held at the National Training Center in Sao Jorge. Besides offering the regular post-secondary curricula for mid-level technicians destined to work for the MPAAR, this center hosts short courses and workshops managed and financed by other institutions or projects such as WARD. In addition, WARD may sponsor participants in courses offered by other programs. For example, the FAO/Belgium Forestry Project offers a variety of courses including: Training of Trainers, Extension Methods, Sylvopastoralism, Forest Law, and Community Forestry. To the extent possible, WARD will employ local trainers, training managers, and support personnel. Substantial field work/study will be included in all short courses. Each training program will conclude with a debriefing/evaluation where participants can assess their own progress, evaluate the appropriateness of course content, quality of trainers employed, etc., and make recommendations on improvements needed in course content and teaching methods.

C. Procurement Plan and Methods of Financing

Overview

The WARD project is being financed from three sources of funds: the USAID Development Fund for Africa (DFA), GOCV-owned local currency generations from a PVO-managed PL 480 Title II monetization program, and GOCV funds for salaries and in-kind contributions.

DFA funds, totaling \$3.8 million (44.4 percent of total project cost), will be used to obtain necessary project inputs in support of WARD activities, outputs, and purposes, including technical assistance, training, commodities, evaluation and audit services, and project management.

GOCV contributions from the Title II local currency generations, totaling the equivalent of approximately \$4,216,000 (49.2 percent of total project cost), will support rehabilitation and construction of soil and water conservation structures, agroforestry and afforestation activities, in-country training, research, extension, and rehabilitation of housing for USAID-funded technicians at INIDA. Additional GOCV contributions, valued at approximately \$550,000 (6.4 percent of total project cost) will be used for salaries of GOCV personnel and in-kind costs (office space, etc.).

As noted in Section II.C4.1, commodity procurement under WARD will be subject to the needs identified in the implementation plan and an inventory of equipment available from predecessor projects. All procurement funded from DFA will follow DFA procurement guidelines. The project will use goods and services of U.S. source and origin to the extent practicable. It is anticipated that the long-term technical assistance will be of U.S. origin. Short-term and recurring TA is also expected to come from the U.S., except for locally recruited consultants.

Any vehicles procured will be from the United States. Long-term participant training will be undertaken in the U.S. Other training will be at local or regional institutions or in other developing countries. USAID/Cape Verde, with the assistance of AID/Washington's Transportation Division (FA/OP/TRANS), will seek to ensure that commodities procured directly by AID or the AID contractors will be shipped on U.S. flag carriers in compliance with the U.S. Cargo Preference Act. The USAID/Cape Verde project manager will maintain records on all project procurement by AID geographic code and will report this information annually to AID/W's Africa Bureau.

Procurement of Services

DFA-funded technical services will be procured through a buy-in to an AID/R&D central project that provides contract services to mission efforts concerned with achieving sustainable agriculture on fragile lands such as those in Cape Verde. Contracting and payment actions will be handled through AID/W. The contractor will provide a watershed management specialist/team leader for three years, an agronomist for three years, and recurring and short-term TA as programmed in the implementation plan.

USAID/Cape Verde will hire a project manager under a personal services contract (PSC) funded by WARD. The PL 480 monetization program, upon which WARD will draw for local currency support, is being managed by ACDI through an AID/Washington grant funded under Section 202(e) of the 1990 Farm Bill.

Procurement of Commodities

Approximately \$375,000 worth of equipment -- 10 motorcycles, 6 dump trucks, and 6 pick-ups -- are being ordered under the Watershed Development project and will be available for use under WARD. Subject to the above-mentioned inventory and implementation plan, the following types of commodities may be procured with WARD funds: project vehicles and spare parts, research and laboratory equipment, office supplies, visual aids, construction material, tools, and scientific instruments. Some vehicles with spare parts and other priority items may be obtained by USAID/Cape Verde using AID direct procurement procedures. All other procurement will be the responsibility of the contractor.

Participant Training

The WARD participant training program will be detailed in the implementation plan, taking into account project requirements and resources. Long-term degree candidates financed by the project will be processed through the Africa Bureau's HRDA project for training at selected American universities. Short-term training, for the most part, will take place in-country, although a portion may be programmed in the U.S. or third countries. Offshore costs involved in short-term training will be handled on a direct payment basis through the technical assistance contract. Local costs will be borne by the GOCV using Title II local currency generations.

Financing Mode

Technical services for WARD will be procured through a USAID/Cape Verde buy-in to a requirements contract available under a central R&D project. Method of financing will be direct payment. The contractor will be responsible for procurement and direct payment for all technical services, training, commodities, and operating expenses other than the following: long-term training processed through HRDA and priority commodities purchased by USAID/Cape Verde before the team arrives. The USAID-procured commodities will be financed by direct payment through purchase orders.

The services of the WARD project manager will be financed by direct payment under a PSC. An external evaluation and a local audit will be financed by direct payment through an IQC delivery order and/or a separate contract.

Project element 9, Contingency, in the table below will be used only for budget realignment. No expenditures will be made under the line item Contingency.

Methods of Implementation and Financing
(DFA-funded goods and services)

Project Element	Method of Implementation	Method of Financing	Estimated Cost (\$ 000)
1. Technical Assistance	Contract	DP	2,150
2. Training, long-term	Contract	DP	400
3. Training, short-term - US/3rd ctry	Contract	DP	150
4. Commodities plus packing/ins./freight	PO (USAID procurement)	DP	100
	Contract	DP	440
5. Operating Expenses	Contract	DP	200
6. Project Manager	PSC	DP	130
7. Evaluation	IQC Delivery Order	DP	80
8. Audit, local	Contract	DP	20
9. Contingency	n/a	n/a	130
TOTAL COST			3,800

Key: DP - Direct payment
 PO - Purchase order
 PSC - Personal services contract
 IQC - Indefinite quantity contract

D. Project Management

USAID/Cape Verde has a two-person U.S. direct-hire staff: an AID representative and a program officer. As soon as the WARD project is authorized, USAID will recruit a PSC project manager to be financed with project funds. This person will have day-to-day responsibility for:

- managing AID inputs to the WARD project;
- helping program the use of Title II local currencies for agreed WARD purposes;
- monitoring the use of these currencies;
- ensuring that project performance and impacts are properly monitored through the project's M&E system; and
- working with the host country project director and the contract team leader to facilitate the operations of the project Coordinating Council (see Section II.B.1).

The person selected to be project manager will have a strong background in project management, agricultural and/or natural resource management, and analysis of project performance and impact.

As a Schedule B mission, USAID/Cape Verde project implementation actions are subject to the concurrence of the REDSO director in Abidjan. Therefore, management of the project will benefit from and require the ongoing technical and programmatic support of REDSO personnel. In addition, REDSO will provide scheduled assistance as necessary in financial management, commodity procurement, training, and food aid. Regular field consultations will also be conducted by the appropriate technical offices of REDSO (e.g., agriculture, environment). Legal assistance will be provided by the regional legal advisor/Abidjan. The regional contracting officer in Dakar will assist with contracting actions other than the technical assistance contract funded through a buy-in -- that will be the responsibility of AID/Washington.

IV. PROJECT EVALUATION, MONITORING, AND AUDITING

WARD will benefit from implementation monitoring by project personnel, the USAID project manager, and the USAID direct-hire staff. In addition, WARD will undergo a final evaluation and an audit of local project accounts, both financed by the project. Because the contract team will be furnished through a central R&D project, its headquarters operations relative to the WARD project will be subject to central audit. Audits will be conducted per AID regulations and guidance.

A. Data Requirements

The WARD M&E system will require data in the three aspects of watershed development: biophysical, socio-economic, and institutional. The planning and implementation teams will need to give special attention to data selectivity

and to mechanisms such as rapid surveys for obtaining the data at minimum cost in time and money. Such cost-saving measures are necessary to (a) accommodate the scarce funding and short timeframe available to the project, and (b) enhance the durability and practicality of the M&E system so it may effectively serve both project and post-project needs. As discussed in Sections II.B and II.C2.3, the M&E system will be centered at INIDA but involve the cooperative effort of all project entities.

The first step in creation of the M&E plan will be the collection of baseline data on the socio-economic and biophysical condition of project watersheds, and institutional data on the various entities participating in the project -- government departments and institutes, municipalities, and local associations. Since compilation of baseline data is a condition precedent to disbursement for project activities, the collection effort will be made part of the implementation planning process. GOCV and AID-financed specialists will compile and synthesize data available from existing sources such as the original WARD project paper, documents of the predecessor projects, reports and records of the GOCV and other donors, and interviews with the officials and technicians concerned with WARD. The specialists may also need to conduct short studies to gather baseline data not yet recorded. Finally, the specialists may identify a need for lengthier studies to expand knowledge of conditions in certain areas; however, these in-depth studies will be left for priority action after project commencement.

Baseline socio-economic data collection and studies will investigate key elements such as (1) farm-level income, (2) sources of that income, (3) total and average-per-family amounts of irrigated and rainfed cropland, (4) patterns of land tenure, (5) crop yields under irrigation, (6) yields of rainfed crops, (7) cropping practices and preferences, (8) livestock role in agriculture, (9) rural nutrition, and (10) market data on agricultural products. Potential key farmers and controls will be identified at the outset to facilitate monitoring.

Items (5) and (6) will also form part of the project's baseline of biophysical data. Other biophysical data collection efforts necessary before project commencement include:

- a review of the effectiveness of soil and water conservation structures on Santiago Island, making maximum use of already-compiled data;
- a quantification of impact area and land under cultivation as a result of SWC structures, using on-ground survey work and available aerial photography;
- a measurement of the structural soundness of dams and other structures; and
- analysis of soil evolution and crop yields behind check dams, water table depth and salinity changes.

Baseline data will be established to reflect the institutional setting of the WARD project at its inception, so that progress in achieving the end-of-project status outlined in Section II.B can be measured. Personnel from all the project entities concerned will work with the data specialists in establishing this baseline. It will describe the existing capacities and activities of each of the participating GOCV entities as well as their current interactions. This base of information will allow performance to be measured in terms of both the capacity growth of the individual project entities, and their inter-relationships in coordinating watershed activities.

In addition to compiling baseline data, the M&E system specialists and their GOCV counterparts will establish guidelines and mechanisms for ongoing data collection during the life of the project and the post-project period. This will allow for tracking of changes and of people-level impact (PLI) throughout the life of the project and beyond.

B. WARD Programming Flexibility

Section IV in the original project paper called for programming flexibility to deal with initial implementation issues that might arise, and with GOCV organizational changes that were under consideration at the time of design (1991) but whose final form was not yet known. The means set forth for achieving flexibility were an early evaluation (two years after project authorization), a possible institutional assessment during the first year of implementation, and flexible programming of recurring technical assistance through annual work plans.

The situation has changed considerably since 1991. First, the reorganization has taken place and the design has been adjusted accordingly through this PP amendment. Second, the project has been reduced to a three-year effort. Needed programming flexibility can be assured through the development of a three-year implementation plan by a joint GOCV-USAID team, successive preparation of annual work plans, programming of technical assistance to allow for responses to special needs including unanticipated institutional issues, and close monitoring of project operations (see below).

C. Project Monitoring

Monitoring of the WARD project will be on four levels. From the project management perspective, a monitoring plan will be put in place to allow both USAID/Cape Verde and the GOCV to monitor the delivery of GOCV and U.S. inputs and gauge the performance of project staff. Mechanisms for doing this will include quarterly and annual project reports prepared by the contract team in collaboration with its counterparts, and regular meetings of the GOCV project director and the USAID project manager with project implementers and the WARD Coordinating Council.

The monitoring plan will also track institutional progress in melding the participating entities -- DGASP, DGADRP, INIDA, INERF, INFAP and the municipalities and communities concerned -- into an effective, coordinated instrument for watershed development. Given the quality and experience of the existing institutional base and the clear lines of project authority and

responsibility planned by DGASP, the most significant progress during the brief project timeframe of three years may well occur in the institutional area.

In another, more technical sense, monitoring biophysical processes in the project zone will improve engineering and hydrologic design of WARD SWC structures and methods. Described in detail in sections of the original PP concerning soil and water conservation, this monitoring system will record and analyze rainfall, runoff, and soil erosion data. Information gained through this process will be crucial in assessing the sustainability of current and proposed cropping systems in terms of conservation of soil fertility and water use equilibrium, as well as providing the basis for adjustments of activities designed to achieve SWC targets.

The WARD project goal of increased sustainable agricultural productivity in Cape Verde and concomitantly increased incomes to agricultural producers requires a monitoring system of even greater depth: assessing impact in terms of biophysical and socio-economic, people-level indicators (see Section II.A for a list of key indicators). The challenge of quantifying sustainability, and the possibility that an increase in agricultural sustainability may, on lands inherently unsuitable for annual cropping, decrease producer incomes in the short run will make project monitoring a key element in gauging WARD's success. The monitoring plan will clearly define both the indicators that will reveal progress and the means for their measurement. Considering that WARD is now a three-year project and that definitive evidence of progress at the goal level may in some cases take longer than the LOP to obtain, the monitoring plan should provide for long-term measurement by the GOCV.

D. Evaluations

The original PP provided for three evaluations: the above early evaluation after two years, a mid-term evaluation four years after project authorization, and a final evaluation. The redesigned project provides for a single evaluation during the third and final year of the project. Issues that arise during the first two years of the project which, in longer projects, might be left for evaluators to sort out, will need to be confronted, analyzed and resolved promptly throughout the course of implementation. This will require project implementers and monitors to continually ask themselves the same kinds of questions that the final evaluators will ask (see below).

Facilitating this "continuous evaluation" process will be very careful selection of a contract team, project manager, and GOCV project director to ensure high levels of technical and managerial competence; sensitization of the above persons and the WARD Coordinating Council to the need for an ongoing problem-solving approach; and non-stop monitoring and communication of findings. Also facilitating this process will be the requirement for preparation of annual workplans. These will include a detailed analysis of the previous year's activities and expenditures, a description of the activities planned for the coming year, and an estimate of the funds required for those activities.

The evaluation to be undertaken in Year 3 will be an external review, with a team recruited and administered by an IQC firm. The exact team composition and individual terms of reference will be established by USAID/Cape Verde in consultation with the GOCV. The evaluation team would probably include persons with expertise in (a) agricultural economics with emphasis on small farm operations, (b) applied agricultural research and water management, (c) upland soil and water conservation, (d) agroforestry, and (e) extension/community development.

The evaluation team will assess the quality, appropriateness, timeliness, and effectiveness of project inputs from all parties; the progress made towards achieving the outputs, purpose and goal of the project; the impact of the project in terms of people-level indicators against earlier baseline data; the capability of the GOCV implementing entities to continue WARD-type activities after the project ends; and the need for follow-up activities by the GOCV and the donor community.

In preparation for the evaluation, USAID and the project manager will coordinate with the GOCV in establishing schedules with U.S. and Cape Verdean project personnel for protocol meetings, personal interviews, and field visits. The project manager and his counterparts will arrange lodging, office space, and transportation; collect relevant literature; and arrange other logistics in advance of team arrival.

V. CONDITIONS AND COVENANTS

A. Conditions Precedent

Disbursement of funds will be governed by conditions precedent, which in substance will be as follows:

First Disbursement. Prior to the first disbursement under the Grant, or to the issuance by AID of documentation pursuant to which disbursement will be made, the Grantee will, except as the Parties may otherwise agree in writing, furnish to AID, in form and substance satisfactory to AID, the following:

1. A statement of the name(s) of the person(s) acting on behalf of the Government of Cape Verde for purposes of implementation of the WARD project, together with a specimen signature of such person(s).
2. A statement confirming that a WARD project director has been designated, along with the name of such person.
3. A statement confirming that a WARD project coordinating council has been designated, along with the names of the persons comprising the council and the name of the chairperson of the council.
4. A statement confirming that a special account has been established, along with the number of that account, for deposit of

all P.L. 480 revenues that are to be used to support WARD project activities.

5. An implementation plan, jointly prepared by the Grantee and AID-financed technicians in accordance with the guidelines contained in the amended WARD project description, which designates the target watershed for the project, and sets forth respective responsibilities, specific activities, estimated output targets, inputs, an implementation schedule, and a budget calculated within available project funding, all designed to achieve WARD's end-of-project objectives.
6. An inventory of all equipment purchased with AID funds under the Watershed Development project and the Food Crops Research project; a status report on its present condition, location and use; and a statement on how each item of equipment that remains useful will be made available to WARD if and when needed.
7. A training plan related to the implementation plan that specifies WARD's long- and short-term training needs, schedules the training, and identifies the training locations and institutions, if possible by name, otherwise by type.
8. A set of baseline data for the WARD monitoring and evaluation system, pursuant to (a) the guidelines in Section IV of the WARD project paper amendment and (b) the project objectives as outlined in the amendment and further specified in the implementation plan.

B. Covenants

In addition to standard general covenants, the project grant agreement will contain special covenants, which in substance will be as follows:

1. The individuals trained under the WARD project will, assuming satisfactory completion of training, return to or become members of the staff of the appropriate service or institute of the Ministry of Fisheries, Agriculture and Rural Animation (MPAAR), as defined in contracts signed with the trainees in advance of their training.
2. The implementing offices of MPAAR will maintain thorough and up-to-date inventory records, documenting receipt, use, and disposition of AID-financed commodities.
3. No funds provided under the Grant, nor goods or services financed under the Grant shall be used in connection with the purchase, application, transport or storage of pesticides other than those approved by the United States Environmental Protection Agency for the particular purpose for which they are to be used.

4. MPAAR and project management will make their best efforts to monitor, assess, and mitigate any adverse environmental impacts resulting from project activities.

VI. SUMMARY OF ANALYSES

This section has not been amended. Please see the original project paper.

VII. COST ESTIMATES AND FINANCIAL PLAN

The illustrative budget and schedule of annual expenditures below reflect the writer's best estimate of project costs based on the budget in the original PP and the inputs as revised by this amendment. The two tables will be carefully reviewed by implementation planners to ensure that the figures at project start-up accord with the specifics of the upcoming implementation plan and with the more precise cost estimates that can be obtained during the planning exercise.

A. Cost Estimate

Illustrative Budget
(US \$ 000)

<u>Project Element</u>	<u>USAID</u>		<u>GOCV</u>		<u>PL 480</u>	<u>Total</u>
	<u>FX</u>	<u>LC</u>	<u>FX</u>	<u>LC</u>	<u>LC</u>	
Technical Assistance	2,150					2,150
Training	550				366	916
Commodities	540					540
Operating Expenses	50	150			270	470
Evaluation	80					80
Audit	*	20				20
Project Management	22	108				130
Workfront Payments					3,580	3,580
GOCV Personnel				230		230
In-Kind Contribution				320		320
Contingency	100	30				130
TOTAL	<u>3,492</u>	<u>308</u>		<u>550</u>	<u>4,216</u>	<u>8,566</u>

*Assume central funding of audit for the R&D central project which will be the source of the WARD contract team.

Note: The \$3.8 million in USAID funds have been obligated. The \$4.216 million in estimated PL 480 local currency generations will become available through annual Title II food importation and sales programs.

B. Schedule of Annual Expenditures - Illustrative - (US \$ 000)

<u>USAID</u>	<u>Item</u>	<u>Total</u>	<u>Year One</u>	<u>Year Two</u>	<u>Year Three</u>
	Technical Assistance				
	Long-term	1,150	400	375	375
	Short-term & Recurring	1,000	400	300	300
	Training				
	Long-term U.S.	400	50	175	175
	Short-term U.S.	100	50	50	
	Short-term 3rd Country	50	25	25	
	Commodities	400	200	150	50
	Packing, Insurance, Freight	140	70	53	17
	Operational Expenses				
	TA Support Costs	100	30	35	35
	Admin. Assistant & Driver	100	30	36	34
	External Evaluation	80			80
	Audit (Local)	20		20	
	Project Management	130	40	45	45
	Contingency	130	40	45	45
	TOTAL	<u>3,800</u>	<u>1,320</u>	<u>1,316</u>	<u>1,164</u>
	<u>GOCV/PL 480</u>				
	Work Front Payments - SWC				
	Structures and Forestry	3,580	1,000	1,470	1,110
	In-country Training	366	100	133	133
	Other Local Costs	270	125	73	72
	TOTAL	<u>4,216</u>	<u>1,225</u>	<u>1,676</u>	<u>1,315</u>
	<u>GOCV</u>				
	In-kind Contribution	320	100	100	120
	Personnel	230	70	80	80
	TOTAL	<u>550</u>	<u>170</u>	<u>180</u>	<u>200</u>
	GRAND TOTAL	<u>8,566</u>	<u>2,715</u>	<u>3,172</u>	<u>2,679</u>

ANNEX 1

LOGICAL FRAMEWORK

WATERSHED AND APPLIED RESEARCH DEVELOPMENT

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Assumptions
<p><u>Goal</u></p> <p>To increase sustainable agricultural productivity* in Cape Verde and, concomitantly, increase sustainable incomes from agriculture.</p> <p>(*Based on irrigated and rainfed crop yields and production of forage, livestock, and forest products.)</p>	<ul style="list-style-type: none"> - Biophysical changes - soil depth, fertility levels, pH levels, % of organic matter, extent of erosion, % of available water, ratio of runoff to rainfall, density and composition of key tree species, volume of wood. - Productivity changes - ratios of crop and livestock yields to inputs. - Behavioral changes - number or percentage of hectares treated with agroforestry or other improved cropping systems and practices, number of adopters of improved practices, amount of land cultivated that is unsuitable for cropping, extent of maintenance of soil/water conservation (SWC) structures and forests by GOVCV and communities. - Income changes - levels of income from productivity increases, extent of diversity of income-producing activity, extent of reliance on workfront labor for income. 	<ul style="list-style-type: none"> Appropriate soil and water measurements Agricultural statistics Site surveys, monitoring reports Farm surveys 	<ul style="list-style-type: none"> No severe drought that would discourage farmer risk-taking Producers have ready access to credit and markets Land tenure or use rights favor widespread farmer acceptance of sustainable practices Necessary food aid continues

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Assumptions
<p style="text-align: center;"><u>Purpose</u></p> <p>To strengthen the capacity of the Ministry of Fisheries, Agriculture and Rural Animation (MPAAR) and three of its para-statal institutes to undertake, monitor, and evaluate agricultural research, SWC activities, and agricultural extension in a coordinated manner that seeks producers' cooperation in establishing sustainable and productive practices.</p> <p>Note: ACRONYMS used in second column represent the following Government of Cape Verde (GOCV) entities:</p> <p>DGASP - Directorate-General of Agriculture, Silviculture and Animal Husbandry</p> <p>DGADRP - Directorate-General of Animation for Rural Development and Fisheries</p> <p>INIDA - National Institute for Agricultural Research and Development</p> <p>INERF - National Institute for Rural Engineering and Forestry</p> <p>INFAP - National Institute for Agricultural and Animal Husbandry Promotion</p>	<p style="text-align: center;"><u>End-of-Project Status</u></p> <p>1. Overall Coordination - DGASP and Coordinating Council</p> <ul style="list-style-type: none"> - Respective project functions of DGASP and Council carried out on timely basis. - Results of monitoring/evaluation system at INIDA used by DGASP to help direct the improvement of ongoing programs and the preparation of long-term watershed development plans. - Coordinated research and development efforts among WARD project entities institutionalized under DGASP and Council direction. <p>2. Agricultural research and monitoring/evaluation system - INIDA</p> <ul style="list-style-type: none"> - Increased quantity of useful research being produced on cropping systems; soil/water management; crop varieties, esp. horticultural; and tree, shrub and grass species. - Increased portion of research undertaken on producers' fields. - M&E system data base has proved adequate for monitoring, adjusting and evaluating WARD project - M&E system has budget and procedures for continued operation after project ends. <p>3. SWC - INERF</p> <ul style="list-style-type: none"> - Priority SWC structures existing in target zones and other areas rehabilitated/improved. - Design and siting of new SWC structures improved. - Agroforestry and afforestation activities integrated with WARD agricultural research & extension activities. - Reliance on public employment decreased and community involvement increased in carrying out SWC/forestry work. 	<p>Monitoring and evaluation reports</p> <p>MPAAR budget, contracts with institutes, watershed project reports</p> <p>Peer reviews, monitoring and evaluation reports</p> <p>MPAAR budget, contract with INIDA for maintenance of M&E system, MPAAR guidelines for M&E work</p> <p>Soil and water measurements show improvement as result of improved structures and increased vegetation</p> <p>INERF records, monitoring reports, evaluations</p>	<p>MPAAR entities, municipalities, farmers' associations and individual producers are ready to cooperate in joint WARD effort</p> <p>GOCV continues to foster appropriate natural resource management policies</p> <p>The three participating institutes are well-managed and receive sufficient contracts and resources to thrive and maintain staff continuity</p>

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Assumptions
	<p><u>4. Production Assistance</u> <u>- INFAP</u> - INFAP meets implementation plan levels for production assistance to target zone producers. - INFAP assistance well-coordinated with INIDA and INERF activities.</p>	Monitoring and evaluation reports	
	<p><u>5. Extension (DGADRP)</u> Animators/extensionists integrated into work of above three institutes. - Communication specialists producing materials that promote WARD-tested extension messages. - Techniques and knowledge gained under WARD integrated into DGADRP's national program.</p>	Monitoring and evaluation reports	
<u>Outputs</u>	<u>Magnitude of Outputs</u> <u>(X's to be quantified by implan. planning team)</u>	Project records, progress reports, monitoring and evaluation reports	Adequate rainfall Trainees return to their assignments
1. Coordinating mechanisms for WARD and other watershed programs established at DGASP and Coordinating Council.	Workplans developed, contracts with institutes let, resources allocated, implementation supervised, monitored and evaluated.	Project records, progress reports, monitoring and evaluation reports	Adequate rainfall Trainees return to their assignments
2. Monitoring and evaluation system, based at INIDA, developed to service WARD and other watershed development projects.	System regularly updates and expands data base, covering full range of project activities.	Project records, progress reports, monitoring and evaluation reports	Adequate rainfall Trainees return to their assignments
3. INIDA's capacity for applied research, research planning, and administration improved.	Per project workplans, specified research carried out and improvements made in planning and administration.	Project records, progress reports, monitoring and evaluation reports	Adequate rainfall Trainees return to their assignments
4. Soil and water conservation measures, improved cropping systems, agroforestry and pastoral management techniques, and improved crop varieties tested and implemented jointly by institutes and farmers on rainfed land.	X hectares of rainfed land improved in target zones. X sites included for agroforestry and pastoral management demonstrations.	Project records, progress reports, monitoring and evaluation reports	Adequate rainfall Trainees return to their assignments
5. Improved cropping systems, conservation measures and horticulture crops introduced on irrigable land which has existing conservation structures that are sound or can readily be rehabilitated.	X hectares improved; INERF and participating farmers rehabilitate structures where necessary.	Project records, progress reports, monitoring and evaluation reports	Adequate rainfall Trainees return to their assignments

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Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Assumptions
<u>Outputs (continued)</u>	<u>Magnitude of Outputs (continued)</u>		
6. Additional irrigable land prepared for crop production as demonstration.	New hydraulic structures built on X hectares of irrigable land as training and demonstration for replication elsewhere. Farmers and land-owners bear costs of production.		
7. Off-farm SWC structures designed and constructed or rehabilitated.	- X tributary channel structures built. - X main channel structures built. - X principal structures rehabilitated.		
8. New tree, shrub and grass species introduced and tested.	X varieties tested; planting of alternative varieties to <u>Prosopis juliflora</u> and <u>Acacia holosericea</u> increased.		
9. Afforestation carried out in various watersheds.	X trees planted in designated watersheds.		
10. Fruit tree seedlings produced & distributed.	X seedlings.		
11. Farmers increase production as result of INFAP assistance.	X farmers assisted pursuant to project workplans.		
12. DGADRP animators/ extensionists and communication specialists trained and assigned to work with INIDA, INERF and INFAP on WARD field activities.	X agents and X communicators participate in on-farm research, SWC/forestry, and agricultural production activities. X radio messages, X television broadcasts, X printed bulletins, and other materials prepared to extend information based on WARD tests and experience.		
13. DGADRP agents trained to extend project technologies beyond project zone.	X DGARP animators/ extensionists receive project training.		
14. Technical skills of selected MPAAR institute and agency personnel upgraded through short- and long-term training.	X candidates trained in SWC, applied research, and agroforestry, including X trained to Bachelor's level and X to Master's level. X candidates trained in-country to fill positions at technician level in (fields to be determined).		

<u>Narrative Summary</u>	<u>Objectively Verifiable Indicators</u>	<u>Means of Verification</u>	<u>Assumptions</u>
<u>Inputs</u>	<u>Level of Effort</u>		
<u>USAID - DFA:</u>			
1. Technical assistance	\$2,150,000	- Contractor reports	Inputs provided in timely fashion
2. Training	550,000	- REDSO/WAAC records	
3. Commodities	540,000	- MPAAR records	Suitable U.S. personnel with foreign language skills can be recruited
4. Operational expenses	200,000	- PL 480 local currency account records	
5. Evaluation and audit	100,000		Workfront workers are paid promptly
6. Project management	130,000		
7. Contingency	<u>130,000</u>		
TOTAL	\$3,800,000		
<u>GOCV - PL 480:</u>			
Work front payments - SWC structures and forestry	\$3,580,000		
In-country training	366,000		
Other local costs	<u>270,000</u>		
TOTAL	\$4,216,000		
<u>GOCV:</u>			
In-kind contribution	\$ 320,000		
Personnel	<u>230,000</u>		
TOTAL	\$ 550,000		

ANNEX 2

SUMMARY OF ACCOMPLISHMENTS OF WARD PREDECESSOR PROJECTS AND LESSONS LEARNED

The design of the WARD project is based on USAID/Cape Verde's experience with two predecessor projects: the Food Crops Research project (FCRP) (655-0011); and the Watershed Development project (WDP) (655-0013).

Accomplishments

FCRP was authorized in August 1982 at a level of \$4,688,000. The project activity completion date (PACD) was August 30, 1992. The purpose of FCRP was "to assist the GOCV Ministry of Rural Development and Fisheries (MDRP) to develop and implement an adaptive agricultural research capacity and capability at INIA, the National Agricultural Research Institute."¹ Under the project, technical assistance was provided to INIA through the University of Arizona, a Title XII university. In addition, the project funded nine Masters and two Ph.D. degrees for Cape Verdean participants in various agricultural disciplines. Facilities constructed under the project include a management/administration center, a soils laboratory, a plant physiology lab, plant protection labs, an agronomy field lab, a library, and four houses. The project also provided significant amounts of equipment.

With FCRP support, INIA tested and released improved vegetable varieties including (1) disease-resistant tomato varieties, (2) a disease-resistant sweet potato that yields 50 percent more than local varieties, (3) warm-weather cabbage and lettuce varieties that have the potential to significantly expand the growing season, and (4) higher-yielding varieties of potatoes, cowpeas, beans and cassava. INIA also conducted research on purge nuts, an oil-producing nut used for making fuel and soap, and coffee (which is rust-free in Cape Verde, enhancing the potential for export of coffee seed.) Biological control of common cabbage insects, water-saving irrigation regimes, and new legume/forage mixtures were introduced for hillside planting. In addition, INIA researchers and advisors analyzed food policy in Cape Verde.

Concurrently with the Food Crops Research project, INIA became an active participant in various regional and international agricultural research efforts.

The Watershed Development project was originally authorized in June 1984 with an authorized LOP level of \$7,611,000. Its extended PACD is September 30, 1993. The project purpose is "to protect and develop the soil and water resources in project watersheds and thereby assist in reducing the underlying causes of food shortages in Cape Verde." Under the project, the Directorate General for Soil, Water and Forest Conservation and Rural Engineering (DGCSAFER)² received technical assistance, first from a U.S. consulting firm

¹ The successor to MDRP is the Ministry of Fisheries, Agriculture and Rural Animation (MPAAR). INIA is now known as the National Institute for Agricultural Research and Development (INIDA).

² The successor to DGCSAFER is the National Institute for Rural Engineering and Forestry (INERF).

and then from a personal services contractor who departed post in December 1992.

Monetized PL 480 food has provided payment to workers and covered other local costs. By March 30, 1993, the project had completed a large number of engineering works, including 3,920 small dams and gullies, more than 15.2 kilometers of longitudinal walls and groins, 1,464 km of contour rock walls, 22 catchment dams, 32 reservoirs, 31.2 km of canals and pipelines, 4.4 km of structural maintenance, and 196 km of road maintenance. Forestry works accomplished include 2,412,259 micro-catchment basins, 1,323 km of contour furrows, 4,653,084 planting pits, 5,150,830 trees planted, and 9,250 kg of congo bean seeded. These works were carried out in 12 watersheds on Santiago Island, and in one watershed on Santo Antao Island.

Other accomplishments include training of 21 extension agents who worked with farmers on new cultivation methods and natural resources management; organization of 32 community-based work fronts and employment of some 3,000 rural people per year for the engineering and forestry works; short- and long-term participant training; and construction and equipment of a project office, warehouse and shop complex.

Evaluations

FCRP and WDP were jointly evaluated in early 1990. The evaluation report said the projects were "well designed, competently managed, and effectively assisted by project technical advisors." Inputs to the projects were provided at approximately the planned levels. The report stated that "INIA, while still in the early stage of its long-term development, is set on a sound path of growth that will further mature and accelerate with the return of trainees and with broadening and improvement in its research program and strategies....The WDP experience demonstrates the feasibility of protection of watershed resources. Likewise, the capacity of INIA to produce research results applicable to both agriculture and conservation can now be foreseen."

The evaluation team noted that FCRP's training program had produced a staff of researchers of strong potential. INIA's strategic, administrative, and research planning capacity were rated as good, though weaknesses remained in analysis and in the dissemination and utilization of outputs. Although research products had begun to flow, field experiments and demonstrations were still limited in number. "INIA is only now at the point where it can begin to develop research applications with direct utility to conservation and agriculture."

The evaluation cited some lessons learned from FCRP:

- Several of the trainees had trouble readjusting after returning to INIA. Some of the problems were caused by insecurities resulting from a lack of experience and from the high expectations placed upon them immediately after returning. They suffered from a lack of individual guidance and direction in their research programs. This problem needs to be addressed in the training plan under WARD to ensure that returning researchers are given proper guidance.

- The number of INIA staff sent for long-term degree training overwhelmed the capabilities of technical advisors and INIA administrators to set research agendas and priorities. More attention should be given to carefully matching institutional needs with long-term training. This implies envisioning what INIA will be focusing on over future planning horizons.

- The FCRP focused on adaptive research and varietal trials to increase agricultural productivity and INIA institutional capability. This work continues, but varietal improvement should be complemented by increasing water-use efficiency through adaptive cropping systems and water management research.

While noting the physical accomplishments of the WDP, the evaluation team raised concerns about the durability and maintenance of the structures created and the failure to carry out integrated watershed planning. (Since the evaluation, phased watershed development plans have been completed for most of the project watersheds. These will be reviewed by the GOCV in preparing a comprehensive Santiago watershed development plan prior to the launching of WARD.)

The original WARD project paper said that DGCSAFER was fairly well-staffed with university-trained specialists in soil/water conservation and forestry, but there have been departures of trained personnel from government service, and those remaining could be overtaxed by projects in many separate locations. The number of mid- and lower-level forestry personnel responsible for field supervision and technical oversight appear to be inadequate; however, the opportunities for in-country technical training should be adequate for most of WARD project needs.

Also according to the original WARD PP, little on-the-job training in soil and water conservation appears to have occurred during the life of the previous project. Watershed management plans and soil surveys are authored by contractor personnel; rainfall analyses are done by foreign collaborators; and analyses related to erosion and sediment control borrow heavily from published works, are complex, and give no indication of Cape Verdean participation. Similarly, little training other than in gabion construction appears to have been given to participating populations.

WARD implementation planners will need to take these assessments into account in structuring their plans for training and short-term and recurring technical assistance. In this regard, a thorough review of the original PP and the 1990 evaluations of WDP and FCRP is recommended to the planners.

ANNEX 3

RELATIONSHIP OF WARD TO OTHER-DONOR ACTIVITY

Since independence, donor financing and technical support have been divided among Cape Verde's various islands. As a result, certain islands along with technical areas of intervention have become "reserved" for specific donors. West Germany focuses its assistance on Fogo and Brava, France on Sao Nicolau, the FAO on portions of Santiago Island and Maio, Switzerland on Boa Vista, and the Netherlands on Santo Antao. While this protocol remains valid today, more donors are entering the pool. The GOCV would like to have more control in distributing donor financing and activities throughout Cape Verde.

Table 1 in Annex J of the original project paper (reproduced here as Annex 4) lists the major donor projects in land and water resources and agriculture for Santiago. Several reforestation projects are in progress at different locations. Livestock needs are being addressed in two projects: the Dutch PVO, NOVIB, is implementing a goat project in arid and semi-arid zones, focusing on nutrition. The Community-based Agricultural and Livestock Development project (referred to hereafter as the IFAD project) is promoting integrated crop and livestock production (see below).

Several donors, including USAID, are implementing watershed management activities on Santiago Island. Two small projects are being executed, one with Swiss aid and the other with UNDP/UNSO support (see below), in selected watersheds. These projects are not expected to compete for resources with the WARD project, nor does there appear to be an overlap of project objectives or locality.

The IFAD project is potentially the most relevant to activities under WARD. It is a pilot project focused on three areas of Ribeira Seca. The agreement was signed in February 1991, and implementation began in May 1991. Total project cost is \$8.45 million, including an IFAD loan of \$5.6 million, \$1.3 million from France, and contributions of \$1.3 million from the GOCV and \$0.2 million (in kind) from the beneficiaries.

The project fosters integrated crop and livestock production in rainfed areas, with particular attention in the higher, more humid zones to the planting of bushes and trees that provide forage or fruit and at the same time serve as erosion barriers and increase soil depth and humidity. Project technicians are testing such plants in connection with stone contour structures that were built under the Watershed Development project but now have soil eroding over them. This experimental IFAD work should be of particular interest for the WARD team (see Section II.C2.1, sub-head "On-farm Soil and Water Conservation" for further discussion).

The IFAD project works with community associations, often involving contracts between renters and owners agreeing to specific conservation measures on the land they till. Farmers will receive credit and training, and participate in community workfronts to build project works. The community efforts will be evaluated in 1995 after two years of experience.

The project will undertake studies on biomass and on use of reforested areas. It will also provide training of 38 extension agents and institutional support. Expatriate technical assistance consists of three long-term technicians and a national coordinator.

The WARD and IFAD projects should profit from coordination, especially with respect to technology transfer, extension training, and INIDA activities such as sociological surveys and on-farm research. The WARD implementation planning team should propose a means of maintaining close contact with IFAD project personnel and look for efficient opportunities for collaboration.

Another project with direct relevance for WARD is the UNDP/UNSO initiative in the Sao Joao Baptista watershed. This project runs from 1990-1994 at a level of \$2,058,000 financed by Norway, and is being implemented by the United Nations Sahelian Office. UNSO is headquartered in New York at the UNDP's Office of Project Services. The project falls under a watershed development plan that is expected to take until the year 2005 to complete.

The objectives of the project are to (1) carry out public works to develop the Sao Joao Baptista watershed, (2) carry out animation-extension activities to promote participation of the resident population in follow-up "private" conservation works, i.e., works on and around their property, and (3) evaluate the results and impact of the project. Thus far the project has worked principally on objective 1, namely to construct anti-erosion works such as check dams; to control water courses and construct reservoirs so as to minimize loss of rainwater and retain the maximum amount possible for irrigation; to dig irrigation canals; and to carry out reforestation. The project pays 250 laborers organized as workfronts to carry out these tasks. In 1992 nearly all the rain received by the basin fell in torrents on one day, wrecking many of the structures built. Such a deluge occurs about once every 20 years. However, seeing how the heavy rains weakened or destroyed the structures, UNSO has redrawn plans to make the structures more resilient. Antoni Zubrzycki, the principal technical advisor to the project, prepared all the plans himself.

During an interview with the writer, the advisor noted that it is difficult at project outset to establish anything more than approximate estimates of the volume of the individual structures required, and of how much one can accomplish in a given period of time. For one thing, the rains have been sparse and unpredictable, and the water courses are functional only when it rains.

With regard to objective 2, an expatriate technician is working with a local helper to undertake extension work with farmers on a one-to-one basis.

ANNEX 4

REPRODUCTION OF ANNEX J OF THE ORIGINAL PROJECT PAPER

Supplemental Tables

Table 1. Other Activities Related to Natural Resource Conservation and Agricultural Development in Cape Verde

SANTIAGO ISLAND		
DNCR	ACTIVITY	LOCATION
UNSD/UNDP	Soil/Water Conservation	São Joao Babtista
Swissaid	Soil/Water Conservation	Praia Formosa
FAC/Belgium	Reforestation	Santiago, Maio
Local Funding	Reforestation	Santa Catarina Tarrafal Santa Cruz
IFAD	Rainfed Agr./Livestock	Santa Cruz
NOVIB (PVO)	Livestock (goats)	Arid Zones
Swissaid	Rural Extension	Rebeira Seca
CILSS/EEC	Regional Solar Power	All Islands
UNDP/DTCE	Water Development	JRH
EEC	water wells	Island-wide
UNICEF	Rural Water Supply	Santiago/S. Antão
FAC/Belgium	Livestock Development	Santiago
FAC/Dutch	Seed Production	Santiago
National	Locust Control	All Islands
CILSS/EEC/ Italy	Agricultural Statistics	All Islands

Table 1. (continued)

SANTIAGO ISLAND		
DONOR	ACTIVITY	LOCATION
EEC/FAC-Belg	Aerial Reconnaissance	All Islands
Dutch	Alternative Energy	All Islands
AGRHYMET	Meteorology	All Islands
CILSS/EEC	Reforestation	Santiago/S. Antão/ S. Nicolau
FAC/Italy	Training Center Support	São Jorge
Japan	Agricultural Inputs	All Islands
ADB	Agricultural Credit	All Islands
CILSS/EEC	Seed Improvement for Corn, Beans, and Sorghum	São Jorge
FAC	Food Quality Control	Praia
Portugal	Coffee Seed Production	Santiago

TABLE 2: Proposed Recurring and Regular Short-Term TA

Position	LOE (pms)
Recurring	
Agroforester	5.5
Range/Livestock Specialist	4.5
Private Enterprise Specialist	4
Fruit Production Specialist	4.5
Hydrologist (Monitoring)	9
Watershed Agronomist	3
Soil Erosion Specialist	5
Irrigation Specialist	10
Extension Specialist	8
Research Planner	5
Farming Systems Researcher	4
Regular Short-Term	
Training Specialist	1.5
Tree Seed Specialist	1.5
Tree Legume Specialist	1.5
Forage Specialist	2
Animal Nutritionist	2
Hydrometeorologist	1.5
Civil/Agricultural Engineer	1.5
Land-Use Planner	1.5
Statistician	2
Computer Specialist	2
Soils Specialist (Laboratory)	2
Agricultural Training Specialist	3
MIS Specialist	1

TABLE 3: Proposed Long-Term Training		
Training Topic	Degree	LDE (pys)
U.S.A		
Irrigation Management	M.Sc.	2.5
Agronomy	M.Sc.	2.5
Agricultural Economics	B.Sc.	4.5
Watershed Hydrology	M.Sc.	2.5
Agroforestry (2)	M.Sc.	5.0
Range Management	B.Sc.	4.5
Civil Engineering	M.Sc.	2.5
Watershed Management	B.Sc.	4.5
In-Country		
Technician/Extension	-	60
Technician/Forestry	-	18

TABLE 4: Proposed Short-Term Training	
Training Topic	LDE (pms)
U.S.A	
Monitoring and Evaluation	3
Extension Methods	4
Technical Training	15
Computer Training	3
Agroforestry Methods	4.5
Small-Scale Water Management	5
Third Country	
Research Management/Administration	2
Irrigation Management	6
Soils Workshops	4
In-Country	
Farming Systems Research Methodology	20
Socioeconomics Field Methods	6
On-Farm Research	30
Experimental Design/Statistics	15
Proposal Writing	15
Field Preparation	10
Farmer Orientation	80
Research for Sustainable Production	10
Research/Extension Linkages	20
Business Management	2
Computer/Statistics	20
Training of Trainers	10
Extension Methods	15
Sylvicultural Techniques	24
Agroforestry	20
Community Forestry	12
Fruit Tree Grafting	9
Fruit Production & Marketing	10
Small Enterprise Management	15
Hydrometeorology	1.5
Structural Evaluation	1.5
Soil Erosion Research	5
Management Systems	5

ILLUSTRATIVE PROCUREMENT PLAN
 000 dollars

ITEM	EXT- ENSION	RESEARCH	SOIL & WATER CONSER- VATION	FORESTRY	PROJECT ADMIN- ISTRATION	TOTAL
Vehicles, Motos, Spares	34	98	96	76	88	392
Laboratory equipment		10				10
Office supplies/equipt.	4	18		49	20	91
Visual aids	2					2
Construction material			67			67
Tools			22	12		34
Instruments			17	6		23
Planting sacs				45		45
Miscellaneous	29	20		25	15	88
TOTAL	68	146	202	213	123	752

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 29-Jul-91

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