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On-Farm Productivity Enhancement Program
First Annual Report

USAID Cooperative Agreement
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Winrock International Institute
for Agricultural Development

in cooperation with

Center for PVO/University
Collaboration in Development

Save the Children Federation

Agricultural Cooperative Development International

September 29, 1993

WINROCK INTERNATIONAL

September 29, 1993

Ms. Sallie Jones
Office of Private and Voluntary Cooperation
Bureau for Food and Humanitarian Assistance
Agency for International Development
1515 Wilson Boulevard, Room 725
Arlington, VA 2209

Dear Ms. Jones:

On behalf of Winrock International, the Center for PVO/University Collaboration in Development, Save the Children Federation, and Agricultural Cooperative Development International, I am pleased to submit eight copies of the first OFPEP Annual Report (five for your office, and one for the AID Mission in Senegal, The Gambia, and Uganda).

Through a previous correspondence, I asked for your concurrence to submit this report on September 29, 1993, rather than August 29, 1993, in order to fully capitalize on the information collected during workshops and on-site visits that took place in each target country during September, 1993, and focused on the detailed implementation plan, and the monitoring and evaluation of the program. I believe you concurred with the request.

Because the program is implemented in three separate countries, and had a rather different content during the first part of Year 1, the format used in this report primarily centers around each country, taken separately, rather than around successive program components. You may want to comment on that format for future annual reports.

Since the annual report is actually submitted on the last day of the first year, the financial report does not cover the entire year, since several major expenditures won't be reported before October or November 1993.

Overall, I am personally very happy with the achievements of Year 1: we have been able to finalize key cooperative agreements in each target country, raise the necessary matching funds, and undertake field activities with thousands of

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participating farmers or extension staff. I also believe that we have been able to meet the challenge of combining two different projects into a single, coherent program, and to recruit well-qualified staff for all positions.

I will be glad to provide you with additional information, if necessary.

Sincerely,

Pierre Ph. Antoine
OFPEP Program Director

jf

c: M. L. Surgi, Center for PVO/University Collaboration in Development
H. Panlibuton, Agricultural Cooperative Development International
B. Holloway, Save the Children Federation

I. Background to Grant and Project Context

The On-farm Productivity Enhancement Program (OFPEP) combines and builds upon the experiences of two innovative activities: the On-farm Seed project (OFSP), implemented in Senegal and The Gambia from 1987 to 1992, and the Biological Nitrogen Fixation/Legume Management (BNF/LM) project, implemented in Senegal and Uganda from 1989 to 1992. OFSP and BNF/LM projects were initially managed as separate projects. Implementing institutions were already participating in OFSP or BNF/LM projects. Winrock International is the lead contractor for OFPEP and lead agency in Senegal. It is supported by the PVO/University Center for Collaboration in Development, responsible primarily for linkages and information dissemination/gathering, and by Save the Children Federation (SCF) and Agricultural Cooperation Development International (ACDI), lead agencies in The Gambia and Uganda, respectively.

The Issue of Seeds

This part of the program addresses one of the most pervasive problems of small farmers in developing countries -- the lack of ready, low cost, timely access to the seeds needed to grow the crops on which they depend. This effort will continue to help farmers get better seeds by working with them to improve their seed selection, production, and storage practices.

Launched in Senegal and The Gambia in 1987, the On-farm Seed Project (OFSP) uses a process that begins with discussions and surveys relating to seed. These discussions involve farmers, representatives of local NGOs, and where available, Peace Corps Volunteers. They gather data and analyze the strengths and weaknesses of traditional seed production and storage systems, including divisions of labor by gender. Then, they design programs and train NGO staffs and extension agents working with local seed producers. They identify appropriate local or improved seed varieties and modify, as necessary, seed practices to local conditions. They conduct demonstrations to increase awareness among farmers and create demand for improved seeds, thus stimulating local seed production.

OFPEP institutionalizes the activities in Senegal and The Gambia, paying special attention to providing technical assistance in marketing and in developing private seed enterprises. In addition, on-farm seed activities are initiated in Uganda, where there already is an ongoing soil fertility project.

Winrock provides technical assistance in seed technology in collaboration with Mississippi State University. Other PVOs may be called upon to provide assistance in marketing and the development of private enterprises, while a number of NGOs will assist with training and related activities in each country.

The Soil Fertility Issue

From 1989 to 1992, a consortium of PVOs, universities, and the Peace Corps, has explored soil improvement needs of smallholders in developing countries. The group identified unmet needs and a growing demand for technical assistance in soil fertility. It began to mobilize, coordinate, and provide technical assistance to scores of NGOs and PVOs working with smallholder families in Haiti, Nepal, Senegal, Uganda, and Indonesia.

During the pilot Biological Fixation/Legume Management (BNF/LM) Outreach Project, the consortium focused primarily on the use of rhizobium. Soil management innovations through use of improved germplasm in nitrogen-fixing bacteria and cover crops promise low-cost, environmentally sound, sustainable means to increase the smallholders' productivity. The pilot project combines scientific knowledge from U.S. universities with outreach experience of PVOs.

In each of the three target countries, OFPEP establishes networks to assess traditional soil management practices, coordinate demonstrations, distribute inoculum and soil management services, and exchange information on soil management and fertility enhancement techniques. In addition to BNF, alternative approaches to soil fertility management are included. These include fertilization, agroforestry interventions, agronomic interventions, and soil conservation. One goal of OFPEP is to foster economically sustainable enterprises to facilitate production and marketing of inoculum, fertilizers and other productivity materials.

Marketing and Distribution

OFPEP gives special attention throughout implementation to the problems associated with marketing and distribution of seeds, inoculum, and other materials produced by farmers and NGOs or acquired by them as necessary production inputs. Experiences of initial phases of the seed and soil fertility projects are analyzed as the first step.

Product and Process

OFPEP recognizes that a principal concern in a program of this nature is the capacity to integrate the sound technical knowledge relating to the technology being delivered with the social, cultural, and educational conditions at the farm level. This requires the successful integration of product and process.

The program responds to farmers' needs and tailors its approaches to their resources and goals. By enhancing productivity without requiring heavy use of purchased inputs, OFPEP offers farmers a set of technologies that are economically sustainable as well as environmentally sound. Within AID's programmatic frameworks, productivity enhancement objectives of OFPEP also fall primarily into the category of Family and Development activities. But major themes of the program fit other AID areas of concern -- including Environment, Democracy, and Partnership for Business and Development.

Product, as used here, refers to the scientific/technical support needed to work with farm inputs and technologies essential to increase farm/smallholder productivity. Process is the continuing refinement of the information, communication, and learning methods that facilitate the integration, acceptance, and utilization of the technical product by the smallholders. This is the social, cultural, and knowledge transfer dimension appropriate to the particular environment, population, and problem being addressed. The more subtle and dynamic aspect of the process is that the technology or product is identified and defined through the process.

A Partnership

These activities require the ability to work at the farm level on a sustained basis in many settings throughout the world to implement successfully the program and disseminate both the product and the process. OFPEP expects that an effective approach will involve the collaboration of the university and PVO communities and similar organizations working at the grassroots level, such as the Peace Corps and indigenous NGOs. The OFPEP approach is well-positioned to maximize implementation activities.

No less important are the established relationships among PVOs and Peace Corps and the indigenous NGO community. These relationships enable products and process elements to be delivered through local organizations.

Monitoring and Evaluation

The OFPEP strategy relies heavily on farmer participation. The approach is to build from the indigenous knowledge base related to seeds and soil fertility management in small and sustainable steps. This process requires a well-designed system of monitoring and evaluation to provide feedback over the course of project implementation. Winrock International, the PVO/University Center, and the lead agencies in the target countries are developing and instituting a three step process of baseline data collection, periodic monitoring, and evaluation.

The guiding principle of the monitoring and evaluation system is that of participatory rural assessment. Collaborating NGO staff members, Peace Corps volunteers, and extension agents receive training in the techniques of participatory rural assessment (PRA). Baseline data collection precede any technical intervention in an area. Periodic monitoring is flexible enough to be adapted to the variable situations in the target countries and is not so cumbersome as to overburden staff of the implementing agencies. Evaluations will be conducted in the middle and at the end of the life of the project and will use the LogFrame as the basis for evaluation. Each element will contribute to a process which is iterative and responsive to the expectations of local farmers. Such a process will guide sustainable improvements in seed production and soil fertility management.

Integration in Implementation

Under OFPEP, all in-country activities (seed, soil, productivity, and process) are integrated in implementation. This includes combining existing advisory groups into a consolidated OFPEP advisory group for each country, combining technical assistance personnel and efforts so as to address seed and soil issues, and reviewing geographical work areas so as to concentrate seed and soil efforts in the same areas.

II. PVO Approach

A. Project Goal, Purpose, Activities

Project Goal

The Project Goal is to improve nutrition, income, and well being of small farmers in targeted developing countries.

Project Purpose

The Project Purpose is to achieve sustainable agricultural productivity and conservation of natural resources through improved management of community and individual resources, inputs, and knowledge (indigenous and introduced) pertaining to soil fertility management and seed production and handling.

Project Activities

- Train NGO staffs, farmers, suppliers, and others in productivity enhancement technologies
- Assemble, test, and document training methods and materials
- Develop and test specialized procedures manuals for use in local contexts
- Develop a database of concerns special to target areas
- Establish and maintain systems and links for appropriate technology identification and sources of supplies, including rhizobia for inoculation of legume tree and crop seeds
- Establish monitoring and evaluation procedures

B. Approach, Methodology and Strategy

The OFPEP is based on three premises: (a) smallholder farmers throughout the world have more knowledge about agricultural production than they realize; (b) increasing smallholders' consciousness of the agricultural knowledge they already possess could lead to increased food productivity under environmentally sound conditions, and (c) much productivity can be attained through the use of locally available technical inputs.

While farmers observe phenomena on a daily basis, they do not always draw appropriate conclusions that enable them to enhance productivity. This approach is not a substitute for experimentation, research, and new technical inputs; rather, it augments other methods to increase agricultural productivity on a low-cost, sustainable basis. It is an awareness building and training program to strengthen the ability of farmers to use their

existing knowledge and powers of observation to improve productivity in specific crop situations and under differing cultural practices and environmental conditions.

While suggestive of traditional agricultural extension programs in that it seeks to bring knowledge of agricultural practices directly to the farmer, OFPEP has several unique factors:

- it assumes some knowledge base exists but requires training to make effective use of it;
- while the underlying principles may be complex, the on-farm applications are simple;
- practices selected will require few additional external inputs subject to the vagaries of supply or cost;
- training methods will be based on well-established principles of adult learning and will not depend on literacy skills or previous formal education;
- PVOs, Peace Corps, indigenous NGOs, and other local organizations transmit knowledge and sustain the program, responsibilities for which they are appropriate instruments;
- farmer access to good seeds and knowledge and understanding of ways to conserve and build soil fertility are essential elements in increasing farm productivity on a sustainable basis;
- universities and research centers will serve as the technical resource for the selection of specific new technologies;
- sustainability is a core goal component and methods to ensure sustainability are integrated throughout the program

Success of the farm-oriented approach of OFPEP will depend on constant attention of involved staff staff to three interrelated activities: gender analysis, monitoring, and evaluation.

Gender analysis demands high priority as many of the decision-makers and operators in smallholder agriculture in the developing world are women. Such analyses proceed generally in two steps. In step one, the staff and consultants identify where gender may be a significant factor in social and economic production systems. They seek answers to such questions as: How is labor allocated for household, agricultural, and non-farm activities? Who provides what sources of income for the household? Who is responsible for what elements of family expenses and welfare? Who has access to and control of what resources?

In step two, the staff analyzes the implications of significant gender differences for project design. Existing activities may be adapted if necessary. The staff looks at the key differences between men's and women's constraints to participation in development activities (labor, time, access to credit, training, etc). Also, the staff seeks opportunities to

identify the special skills and knowledge, based on gender roles, that can be used to increase economic productivity.

These analyses, in turn, help define factors to be taken into account in monitoring progress throughout the life of the project. This renewed and significant emphasis on gender considerations adds depth and perspective to monitoring. It thus becomes critical to disaggregate data by gender so that the resulting information provides useful feedback regarding project implementation and helps refine strategies to involve women.

OFPEP staff collaborate with in-country NGOs and others to provide training for gender analysis and subsequent implementation, and to design and operate monitoring procedures.

OFPEP is a holistic approach to sustainable development within the context outlined above. Thus, a centralized overall program framework incorporates these on-farm, low-input, simple knowledge-base perspectives. Evolving from the core set of concepts, OFPEP organizes discrete projects or activities that exemplify these general principles applied to different technologies in a variety of geographical and cultural environments.

OFPEP is organized to provide the comprehensive framework and support for an initial set of discrete activities in support of two specific technical productivity enhancement areas -- seeds and soil fertility. This provides the basis for sharing lessons learned in a variety of contexts and enhancing the capacity of each area to increase its effectiveness. While there may be some area-specific activities, every effort is made in each country to integrate training, data collection, and information dissemination.

The educational, people-involvement approach of the OFPEP is no "quick fix." It requires patient, careful monitoring, giving local participants a full chance to participate, criticize, make suggestions, gain confidence and competence, and, eventually, assume full responsibility. Changes in the behaviors of at least two sets of characters are involved: farmers learn new roles, and "change agents" (or professionals), experienced in "telling" people what to do, learn to observe, ask and answer questions, organize groups and discussions, establish links, and facilitate farmer interaction. These change agents learn that success depends on their ability to work with farmers as much as on their technical skills.

This approach was chosen, in the beginning, to determine whether a tried-and-proven method of working with adults would have more long-run success than conventional "top-down" extension programs. The evidence, to date, confirms that it will. The ultimate test will be the acceptance and use of the approach, as modified by experience.

Key elements in the approach, as learned from OFSP's experience, are:

- Use a collaborative approach with local organizations to reach farmers.
- Use a process approach in developing seed-related activities with farmers.
- Reinforce practical training with follow-up visits.
- Establish links with research institutes and sources of technical assistance.
- Create in-country advisory councils early in project operation.

III. Project Activities
September 15, 1992 to September 29, 1993

A. Overview

Overall, the results recorded for year 1, and the project achievements can be considered impressive.

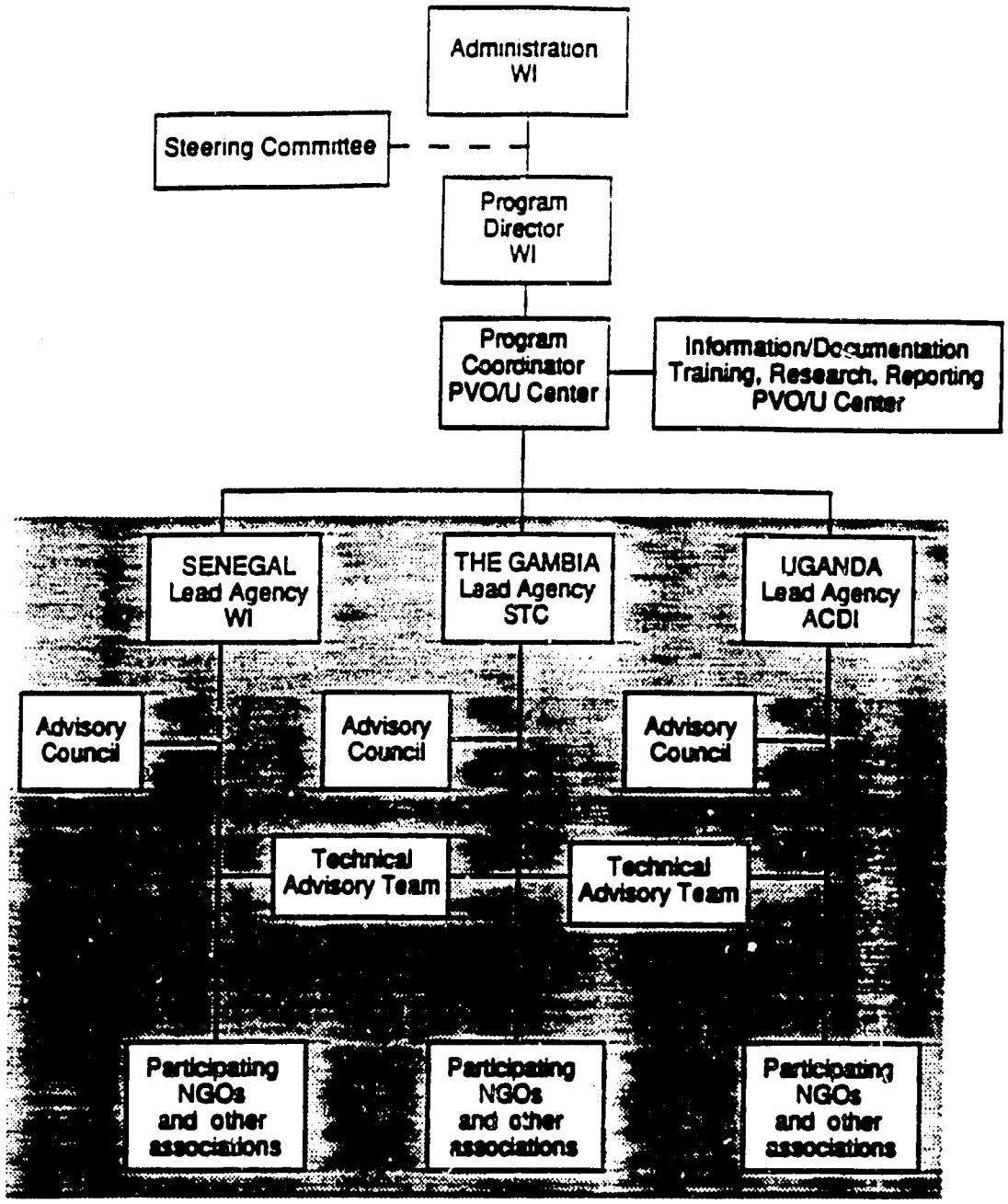
A major focus during the first half of year 1 was placed on the coordination of activities between the U.S.-based institutions and the three lead agencies in Senegal, The Gambia, and Uganda; the definition of the respective roles of each participating institution; the identification of prospective partners; the development of collaborative agreements; the formation of Advisory Councils; and the recruitment of staff for some key positions. These tasks constituted a real challenge given the complex structure of the program (**Figure 1**), and the suddenly expanded terms of reference of the program, when compared with OFSP or BNF/LM project activities during the previous years. There is no question, however, that by the end of year 1, there now is "an OFPEP message and an OFPEP approach," which are identical in the three target countries, and which single out OFPEP among a number of extension or development program initiatives implemented in the same regions.

Given the continuity of personnel from OFSP to OFPEP in Senegal, project activities started earlier in that country. Moreover, the already strong linkages with the Peace Corps and some NGOs (World Vision and Christian Children's Fund), the Senegalese Agricultural Research Institute, and the common interests in soil management/fertility and crop production, helped achieve fast results in survey work, and the establishment of demonstration plots.

In The Gambia, Save the Children (SCF) took its role as new lead agency of OFPEP very seriously, recruited well-qualified personnel for the programs, and proceeded with a number of field initiatives and cooperative agreements which placed the program into orbit during the second half of year 1. The technical assistance team based in Senegal made some solid contributions to The Gambia program, at the request of, and in cooperation with, SCF.

In Uganda, the challenge of expanding BNF/LM into OFPEP was greater than in the other two countries, given the fact that BNF/LM was a narrowly focused technical activity during the 1990-1992 period, with relatively few program partners. Moreover, the approval of local matching funds was delayed for a variety of reasons, thus preventing the start-up of field activities at an early date. By September 1993, however, the program was well under way, the local budgets available, and the key personnel and partner organizations identified and operational.

In September 1993, a comprehensive detailed implementation plan (DIP) was completed for the three target countries and submitted to USAID.



WI: Winrock International
ADCI : Agricultural Cooperative Development International
STC: Save The Children
PVO/U Center: Center for PVO/University Collaboration in Development

* Note: Indicated in-country lead agencies or participating NGOs are illustrative, as of the date of this proposal.

Figure 1. Roles and responsibilities of implementing institutions of the On-Farm Productivity Enhancement Program (OFPEP) during year 1.

Winrock played the dual role of supervisor of the program, as well as of direct implementor.

The OFPEP program director, located at the Winrock headquarters, kept in daily communication with all partners, in the field and in the U.S.A., visited project sites on a regular basis (4 visits in Senegal, 2 in The Gambia, 3 in Uganda during year 1), and organized two Steering Committee meetings in Washington, D.C. (minutes of the second meeting in **Appendix** 1).

As an implementing institution, Winrock was the lead agency in Senegal. In addition, program personnel also participated in implementation and design work in The Gambia and Uganda, at the request and in support of the OFPEP lead agencies in these countries.

The specific inputs of each implementing institution and country lead agency are presented in detail in the following sections.

B. Role and Inputs of Center for PVO/University Collaboration in Development

Overall Responsibilities

As a core cooperating coordinating institution, the Center for PVO/University Collaboration in Development (the Center) is charged with the responsibility for:

1. facilitating linkages among PVOs, national NGOs, grassroots organizations, farmers, producer groups, etc., with the OFPEP core participating organizations, the OFPEP staff, other collaborators, and other interested groups;
2. promoting the collaborative process among these groups;
3. documenting, refining, and disseminating methods and approaches for the training of trainers, OFPEP outreach activities, and data collection;
4. information dissemination: including the publication, production, and distribution of newsletters; responding to requests for technical information and advice by sending technical bulletins, journal articles; locating sources of information; and referrals to technical personnel;
5. arranging for U. S. technical consultants as requested by the OFPEP program office in Senegal, other core participants, and Winrock International;
6. fostering participant resource exchanges;
7. provision of financial and administrative management support for the Center staff assigned overseas (the process and linkages specialist), and technical consultants;
8. participation in project planning and monitoring project progress;
9. ancillary technical assistance in agroforestry.

Personnel Support and Activities

During the first year of the project, the Center provided the following personnel support:

- Process and Linkages Specialist. The Process and Linkages Specialist is 8 full-time member of the Technical Advisory Team based in Dakar. Ms. Sarah Workman is an agroforestry specialist who is assisting the OFPEP partners in the areas of resource and needs assessment and baseline data collection, monitoring and evaluation, forming linkages with government and nongovernment institutions, and the dissemination of information about project processes and results. She also provides technical assistance in agroforestry and biological nitrogen fixation.

- Program Coordinator. The part-time Program Coordinator based in the U.S., Ms. Mary Lou Surgi, provides overall coordination and information-sharing and dissemination about project activities among the U.S.-based OFPEP partners. Ms. Surgi assists in program planning, training, and project monitoring. She is currently participating in the planning and team-building workshops in Senegal, The Gambia, and Uganda. She also coordinates the provision of technical assistance through a network of the Center members, recruits consultants and is responsible for overseeing the OFPEP newsletter. She coordinates administrative and financial management support for the Center staff and technical consultants.

- Information/Communication Specialist. A part-time Information/Communication Specialist based in the U. S., Mr. William Collins, serves as the editor of the OFPEP newsletter, "Of Soils and Seeds". He is responsible for its lay-out, production, and distribution and for the production of other documents related to the project. He also handles the gathering and forwarding of technical information and other documents of interest to project partners in the three countries, helps to identify sources of technical information, and maintains a referral system for project participants and technical specialists.

- Other Personnel Support. Dr. Robert Gurevich, Executive Secretary of the Center, served on the planning team to develop implementation strategies and procedures both in the field and in the U. S. Mr. Ralph Montee, Program Director for the Center, provides programmatic backup and administrative support.

Technical Assistance Support

Technical Resource Bank

The Center has established an informal technical resource bank comprised of specialists in such fields as agroforestry, tropical soils, credit analysis, agronomy, etc. At the present time, there are twenty scientists from seven universities plus NifTAL, who have shown their support of OFPEP by agreeing to provide technical information as needed without incurring costs to the program. The Center contacts them by FAX, telephone, or E-mail whenever it receives requests from the field. The Center also has access to library and research facilities to provide backstopping for information needs.

Technical Information Support

Technical Communication to OFPEP Staff. The Center averages about three communiques with OFPEP field staff per week (since February 1993). These technical requests for specific project information, materials, equipment, reference sources, etc., have concerned twenty project-related issues ranging from specifics on species of vetiver grass to where to buy equipment for rhizobium production. The Center has contacted thirty-five sources (in several cases multiple times) to respond to the twenty technical issues identified in the field.

Technical Consultants. The Center has recruited consultants, either in-country or from outside, who provided expertise in special studies, data analysis, project design, technical assessment, evaluation, and trouble-shooting, or in conducting country or regional workshops. In the first year of the project, the Center has coordinated the work of five consultants:

- Ms. Jane Marten - designed the computer program for entering and analyzing baseline data for the Senegal program;

- Dr. William Hargrove - provided input into the soil management practices of areas covered by Peace Corps collaborators in Senegal, and Save the Children in The Gambia. Dr. Hargrove's participation is an example of the linkages with other projects, in this case the Sustainable Agriculture Natural Resource Management Collaborative Research Support Program (SANREM CRSP), possible through the Center.

- Ms. Danièle Heinen - did an analysis of the seed marketing practices and potential in the World Vision working areas in Senegal.

- Dr. Francis Byrnes - facilitated workshops in each of the three OFPEP countries with all partners in order to produce a Detailed Implementation Plan.

- Mr. Alioune Dieng - is providing training to the OFPEP Technical Team in Dakar on advanced statistical analysis of the baseline data.

For four of the five consultants, the Center was able to leverage limited funds by attracting consultants who provided valuable services to the project without charging recognized daily consultancy rates. Dr. Hargrove provided his services to the project at no charge as he was in West Africa on another project of which the Center is also a member. Thus, AID funds have been prudently stretched to provide the maximum amount of technical input possible.

Newsletter

The first issue of the 12-page newsletter, "Of Soils and Seeds", was published in both French and English editions (**Appendix 2**). This newsletter has a worldwide circulation of over 600 subscribers in English, and 200 in French. This newsletter, aimed at the field

level agricultural worker, is designed to be a forum for exchange of ideas among the various collaborators in the three countries that make up the OFPEP program.

Field Visits

In the first year, the program coordinator made three visits to the West African sites. Only one of these was fully charged to OFPEP, as she was able to coordinate these trips with other activities in the region. The purpose of the first trip was to become oriented to the project and meet with project partners and AID. The second trip was to accompany a consultant and to give input into the development of an NGO support proposal. The third trip was to gather information to be included in the Detailed Implementation Plan and the Annual Report and to meet the partners in the East African site, participate in workshops in Senegal, The Gambia, and Uganda to facilitate planning and team building for the project.

C. Senegal (Lead Agency: Winrock International)

Some described activities started prior to October 1992 under the OFSP but results, yields and feedback were obtained afterward and therefore are reported as part of OFPEP. In addition, activities undertaken in 1993, but not completed as of September 30, will be described.

Advisory Council

An OFPEP introductory meeting was conducted by WI, The Center and OFPEP staff in Dakar, Senegal on November 10, 1992. The idea was to present the OFPEP to potential collaborators: WV, Peace Corps, Africare, CRS, CCF, USAID, ISRA, CONGAD and the GOS. The response was enthusiastic. The first advisory council meeting was conducted soon thereafter, on December 15, to keep the initial momentum alive and to discuss protocols, collaborative program plans, and the baseline survey in soil fertility.

A second council was conducted in July 1993 to update collaborators on activities such as the survey, OFPEP staff changes, and finalize plans for the rainy season.

A third council meeting/workshop was conducted on Sept 15th to discuss the detailed implementation plan with the US based and Senegal based OFPEP staff.

Project Activities

A summary of activities undertaken in Senegal during year 1 of OFPEP is presented in **Table 1**. Areas of intervention are presented in **Figure 2**.

Table 1. OFPEP Activities, Senegal,1993

Region	Village	Technical orientation	Type of activity	Number in target group	Females
Dakar					
	Dakar	Agroforestry	Meeting	15	5
	Dakar	Seed	Meeting	40	20
sum				55	25
Kaolack					
	Ndiayene Post	Seed/Soil	Meeting	20	20
	Koular Sarakhol	Seed/Soil	Meeting	14	14
	Koular	Seed	Meeting	8	8
	Soukouto	Seed	Meeting	16	16
	Ndiaye Counda	Seed	Meeting	13	13
	Nioro	Soil/AgF	Meeting	9	4
	Nioro	Agroforestry	Meeting	14	7
	Thiadiaye	Seed	Training	12	0
sum				106	82
Kolda					
	Dar Salam	Seed/Soil	Meeting	18	18
	Sare Kuffa	Seed/Soil	Meeting	12	12
	Dabo	Seed/Soil	TA/Field Visit	39	35
	Linguewal	Seed/Soil	Meeting	13	13
	Missira Camara	Seed	Meeting	12	12
	Lingueto	Seed/Soil	Meeting	28	28
sum				122	118
Louga					
	Kebemer	Seed/Soil/AgF	Meeting	8	1
	Kebemer	Seed	Training	17	2
sum				25	3
Thies					
	Thiadiaye	Seed/Soil	Meeting	12	0
	Thies	Seed/Soil	Meeting	1	0
	Baback	Seed/Soil	TA/Field Visit	1	0
	Thies	Seed	Meeting	10	0
	Baback Fandene	Seed/Soil	Meet/TA/FV	13	0
	Fandene	Soil	Meeting	7	0
sum				44	0

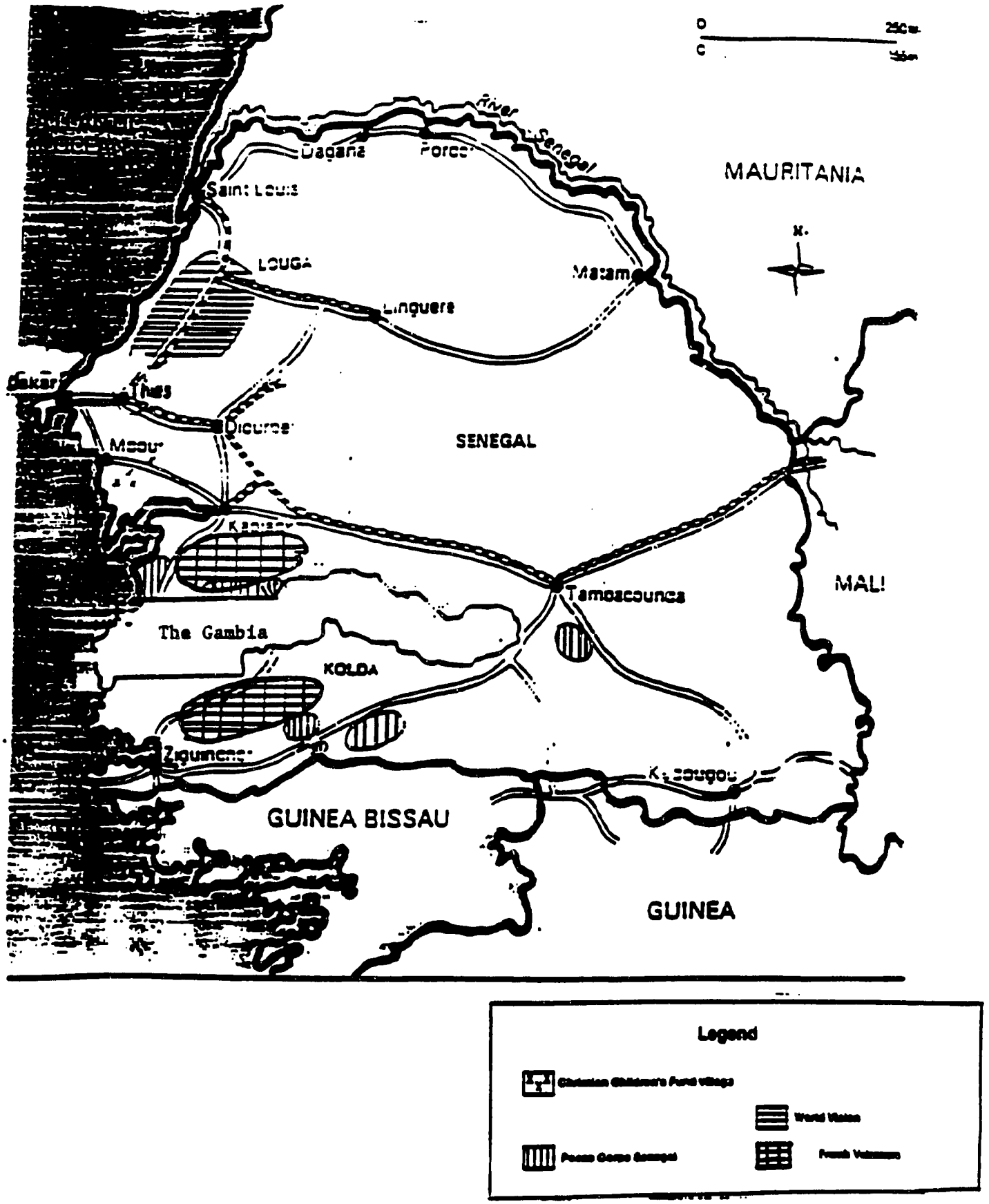


Figure 2. Areas of Program Intervention in Senegal.

Seed Activities

World Vision 1992 Program Results. Seed activities were started in 102 villages with training provided to 1622 farmers in the previous reporting period. The results were encouraging despite the severe drought in the WV intervention zone. The drought conditions have reinforced farmers need and demand for earlier maturing varieties that can produce a crop even under reduced rainfall.

Seed production involved the following varieties and areas planted.

Millet:	Variety IBV 8004	58 ha
Cowpeas:	Variety Bambey 21	10 ha
	Variety Ndiambour	2 ha
	Variety 58-57	8 ha
	Variety TVX	2 ha
	Total	22 ha
Forage cowpeas:	58-74	4 ha
	Variety 66-35	6 ha
	Total	10 ha

*Figures from WV Annual report 1992.

Estimates of the seed produced from the area planted in 1992 demonstrate the severity of the drought. WV staff estimated total crop failure at 70% for millet and 50% for cowpeas. ISRA estimates for yield in a poor year is 200 kg/ha for millet and 150 kg/ha for cowpeas. If we assume that 1/2 of the seed produced is available for sale or barter, there would have been 5,800 kg of millet and 2400 kg of cowpeas produced by the program in 1992. While this is not a large amount of seed it does represent a significant quantity of improved seed that is available at the village level.

World Vision/OFPEP 1993 Seed Program. Concern for the famine situation and persistent lack of seed in their intervention zone prompted WV to request special drought relief funding from WV International. They produced cowpea seed through ISRA under irrigation during the dry season. This dry season production enabled WV to distribute a much greater quantity of seed (5-10 tons) than would have otherwise been available. The seed was distributed to the villages on a cost or loan basis for seed and foodgrain. This action demonstrates the important commitment WV places on the seed program as a way to improve the well being of farm families.

This is the fourth year of collaboration between World Vision and OFSP/OFPEP. WV field staff and farmers have considerable experience in seed production. Meetings were conducted with WV contact farmers to obtain valuable feedback that resulted in greater participation by farmers in training and program decisions. The role of OFPEP for this season was to assist WV to fine tune the program through program planning, training design, specialized seed training for WV field staff with ISRA, and reinforcing the link with ISRA for a local source of technical assistance.

- The irrigated off season seed production of cowpeas provided over 6 tons that can seed nearly 400 ha. In addition, WV collected an additional 2 tons of cowpea and millet seed from farmers. WV field staff distributed the seed to farmers during July.

- OFPEP staff and researchers from ISRA were involved in training design and a training of trainers workshop in April. WV Staff: 11 men 3 women; and bush consultants: 7 men and 1 woman.

- During late May and early June World Vision staff and bush consultants provided training in 247 villages to 1200 farmers. The villages involved, farmers trained, and seed distribution was less than expected because of a lower than expected quantity of seed produced during the dry season by ISRA.

- Areas planted of registered seed production include:

Millet	IBV 8004	42 ha
Millet	IBV 8001	20 ha
Cowpeas	IS275 Mouride	31 ha

- Areas planted to certified seed production:

Millet	IBV 8004	153 ha
	IBV 8001	63 ha
	SounaIII	250 ha
	Total	466 ha
Cowpeas	Mounge	19 ha
	Bambey 21	26 ha
	58-57	26 ha
	Ndiambour	9 ha
	Forage 58-74	18 ha
	IS275 Mouride	293 ha
	IS504 Malex	300 ha
	Total	691 ha

*Figures from WV report to the Seed Division of the Ministery of Rural Development.

- OFPEP engaged a consultant to examine seed marketing in the World Vision area (see attached report). The findings of the report were that a considerable quantity of seed was being marketed in the region at the village level and at weekly markets. Estimates of the quantity were not possible but recommendation focused on better monitoring by WV field staff so that production and quantity marketed can be better estimated.

- WV, OFPEP, and ISRA conducted joint field visits to 10 field in 5 work zones during August.

OFPEP/Christian Children's Fund Seed Program 1992 Results. The program with CCF involved improvement of traditional varieties of millet that are adapted to the zone. It builds on the indigenous technical knowledge of farmer. 1991 was the training phase in which 10 farmers from each of 5 villages were trained through sessions and field visits to explain and show farmers the techniques being proposed and get farmers feedback on the techniques. In 1992 the 50 trained farmers put into practice the techniques that they had learned on their own field in 400M2 seed plots. The farmers followed the procedure of seed cleaning and selection before planting, planting and thinning to one plant per hill, elimination of diseased plants and selection of plants with several uniform head that are free of disease at harvest tc retain for seed.

- The yield on the seed plot averaged 17 kg while the average yield on the traditional control plots were 13 kg which is an yield increase of 30%! This yield difference translated to 425 kg/ha for the seed plot compared to 325 kg/ha for the control plot. Therefore with the 50 demonstration farmers an estimated 850 kg of seed was produced primarily for use by the farmers and sales or barter in the village. Despite drought, poor soils, insect attack and plant diseases the result convinced the farmer the procedure was sound.

- Field days were conducted OFPEP and CCF staff with 10 farmers and an additional 10-20 farmers per village to review and discuss the results. A total of 100-150 farmers were involved in the field days.

OFPEP/Christian Children's Fund Seed Program 1993. In the current year the OFPEP/CCF collaborative program is at an extension phase beyond the initial 50 farmers. Each demonstration farmer is to work with 2-5 farmers each so that 100-500 farmer will be involved in the activity. The CCF extension agent in each village has a key leadership and monitoring role in the activity. Rains have been promising and the insect and disease and drought pressure is lower this year so results are expected to be very good.

OFPEP/Peace Corps Senegal Seed Program 1992. Rice demonstration activities were conducted in 4 departments involving 37 villages and 258 demonstrations. Results of the demonstrations were variable. In the Kolda region results were excellent because of the bountiful rains and dedicated work or the volunteers and women farmers. The modified production practices and improved varieties are spreading rapidly. In Foundiouge results were mixed due to drought spells and variable rains.

Department	# Villages	# Demonstration
Kolda	13	135
Seidou	6	23
Foundiougne	13	69
Wakanguna	5	31
Total	37	258

Results: The average yield difference between the demonstration plots and the control plots was 20%. Adoption rates were over 80% and the women are very satisfied with the

improved varieties and practices. If we assume that only 5 women saw each demonstration plot then over 1200 women were touched by the demonstrations. Yield varied greatly but if we assume an average yield of 40 kg from the 200M2 (2000 kg/ha) demonstration then over 10,320 kg of rice seed was produced and diffused at the village level.

In a simple NPK fertilizer trial by one woman in the village of Nematoba Mandink the control plot of 200m2 yielded 54kg (2700 kg/ha and the fertilized plot yielded 94 kg (4700 kg/ha) on the investment of 1000CFA ($4) in fertilizer for a cost benefit ratio of 1:5.4. This year 12 women will apply NPK and Urea fertilizer base on these results.

Impact: On the average a woman cultivates .5 ha. If she can realize a 20% yield increase from 800 kg to 960 kg on the entire .5 ha she can provide her family with rice for an additional 5 weeks or sell the additional yield for 21,600CFA ($80). This kind of tangible differences in production is the reason that the introduced varieties and practices are spreading rapidly in the villages and prompting requests for assistance from surrounding villages.

OFPEP/Peace Corps Senegal Seed Program 1993. Based on the results of last years activities were scaled back in some departments and expanded in others. Overall there are 39 villages with 454 women demonstrators that are monitored by 20 Peace Corps volunteers.

- Improved rice varieties are being extended in the demonstrations include DJ12-591, ROK 5, and Peking.

- Improved agronomic recommendation include nursery bed management, plowing, row seeding, transplanting young seedings.

- Soil fertility recommendations include application of manure to nursery beds, application of mineral fertilizer and liming in demonstration plots.

Department	# Villages	# of Women Doing Demonstrations
Kolda	17	244
Wakanguna	5	136
Foundiougne	12	43
Tambacounda	5	31
Total	39	454

In most of these villages there have been OFPEP/PC activities for several years. The women that have done demonstration for several seasons are familiar with the improved rice varieties and understand the improved production practices. Increasingly the women chosen by the village women group will have a key role in extension activities, data collection and providing feedback about problem and new directions for the activities. In

this approach the women identified the need to improve soil fertility through mineral fertilizer. Composting will be added to the soil fertility work next season.

- Training of new PCVs and assistance in training design was provided by OFPEP.

- Meeting were conducted with women farmer groups and PCV for feedback and planning for 1993 production season.

- Additional seed for new villages in the program was obtained by OFPEP and distributed to PCVs and farmers in June 1993.

- Field visit to farmers and PCV to identify problems and provide advice in June, July, August and September.

Soil Fertility

Soil Improvement. The soil fertility survey has been the initial step in the development of soil fertility activities. Pilot soil fertility demonstrations have been undertaken with WV in and with CCF in Baback. The support and collaboration of the ISRA-Bambey soil fertility team has been an essential element in starting this program (see attached ISRA project summary). These demonstrations involve the comparison of plots with traditional treatment manure, compost, mineral fertilizer, compost/mineral fertilizer and compost/phosphate. As part of this program 2 WV and 2 CCF field staff have been trained in compost production and will serve as trainers of farmers in compost production next year. These initial demonstration will be important evidence to review with farmers during field days to encourage farmers to produce and apply compost. It is anticipated the soil fertility demonstration will cover 20 villages with 100 farm families involved in production and application of compost.

Soil Conservation. Live fencing is a way to protect soil from wind and water erosion, and evapo-transpiration, protect crops and crop residue against animals. Live fencing is a indigenous technology in Senegal and only lacks a direct incentive for being undertaken. Protecting cassava with live fencing provides the incentive since cassava is an important cash crop and hungry season food. OFPEP decided to to provide funding through CCF for farmers to buy cassava cuttings with the agreement that they would enclose the plot in a live fence. In addition the farmer will provide cassava cuttings to another farmers next year. In the village of Baback 22 farmers are live fencing 1/4-1/2 ha of cassava.

Soil Conservation and Compost Surveys. The PC volunteers, did not carry out the original baseline survey. They decided it was too 'large' a task and did not account for their work constraints. A group of dedicated volunteers worked to revise the OFPEP survey by splitting it into two parts, a 'compost' survey and a 'soil conservation' survey, that satisfy both OFPEP's information needs as well as PC capabilities. Both will be used for baseline data in designing OFPEP activities with volunteers in their villages. The two surveys are currently being tested in one pilot region and will be ready for use early in OFPEP year two.

Pigeon Pea Trials. Pigeon pea trials - Peace Corps Senegal obtained eight varieties Cajanus cajan, a drought resistant multi-use legume from ICRISAT/Hyderabad. OFPEP

is assisting the Peace Corps to design and implement adaptability trials at twenty sites ranging through five bio-climatic zones of Senegal and the Gambia. The results of the trials will indicate which varieties are best suited to which zones. Trials are being conducted primarily with PC volunteers but there is also participation of Catholic Relief Services personnel in Senegal at 6 sites and Save the Children and The Good Seed Mission in Gambia. Information from these research trials will supply OFPEP field agents with valuable knowledge on the vulgarization of the species in their work zones.

Baseline Survey Preliminary Results

Introduction. The baseline information survey was designed to gather quantitative data on soil fertility and natural resources. It was pretested with extension agents of collaborating NGOs and contact farmers at village and regional workshops. Nearly 40 interviewers from the collaborating organizations have surveyed approximately 247 households between April and August 1993. A preliminary analysis of the general village conditions and organic matter availability has been completed (two out of four sections of the survey). Analyses of survey results will supply information from which appropriate field activities can be developed.

The information from this survey helps the OFPEP staff:

- identify the constraints related to soil fertility improvement and the needs of target groups (i.e., farmers).
- establish a benchmark against which OFPEP and its collaborators will measure progress attributable to their actions.
- develop training material for extension agents of collaborating partners and farmers.
- identify appropriate applications of technologies generated by ISRA (Senegalese Institute for Agricultural Research).

Present Status. All planned surveys with World Vision(WV) and Christian Childrens Fund(CCF) have been conducted or are close to completion. CCF has conducted 3 of 4 parts of the survey. They plan to complete the last part before the end of 1993. The PC volunteers did not carry out the original baseline survey. They revised the OFPEP survey by splitting it into two parts, a 'compost' survey and a 'soil conservation' survey. The two surveys are currently being tested in one pilot region and will be ready for wider use late in 1993.

The data was entered into Lotus123 and analysis of the data is underway using SPSS software. Analysis will be finished by December 1993 and a full report will be available early in 1994.

Results. The WV zone receives less than 250 mm annual rainfall and the CCF zone receives around 400 mm annual rainfall. The WV zone is not only drier than the CCF zone, it is also less densely populated. This will be reflected in all the data.

	World Vision	Christian Children's Fund
Population		
Number of villages surveyed	29	32
Population per village (range)	110-800	242-3099
Surface Area Cultivated		
Per Household		
>5.0ha	10%	5%
3.5ha-5.0ha	80%	90%
0.5ha-3.5ha	10%	5%

Observations: Given that most area cultivated per household fall into the 3.5 ha-5.0 ha range there should be some quantity of dry matter available for composting or other.

Number of Active Members (over 15 years old)		
Per household		
(range)	4-16	6-12
Average	8	10

Observations: It appears that there is labor available if additional labor is required for soil management activities is not during peak periods.

Water Availability		
Wells/village (range)	1-3	2-10
Depth of wells	33 m	10-70 m

Observations: Water availability is not as great in the WV zone and this has implication for production of compost since some degree of watering is required. Intensive dry season compost that required periodic watering would not be possible in the drier zone and there may not be sufficient rainfall for the less intensive rainy season compost production. Conversely the wetter zone may offer the possibility of dry season and rainy season compost production.

Crop Residue Availability		
>5.0ha	7.5-15.0	7.7-15.0
3.5ha-5.0ha	7.5-11.5	7.8-11.0
0.5ha-3.5ha	1.12-7.8	1.12-7.0

Observations: 800 kgs of crop residue is required to produce compost for .25 ha (assuming all area cultivated in millet). Given most farmers have 3.5 ha-5.0 ha of land to cultivate, there is potential for some compost production even if all cultivated area is not in millet.

Utilization of Dry Matter		
Collected for use	66%-100%	33%-70%
Left in field	10%- 33%	14%-66%
Sold	15%	0

Observations: There is competition for use of crop residues, particularly in the drier World Vision zone. Even when the crop residues are collected for building materials, the old crop residue being replaced can be used for compost. Crop residue fed to animals is transformed into manure that will be useful in compost and soil management. Crop residues left in the field may be converted into manure through grazing or could be collected for compost production. Though manure is often left in place or broadcast on fields as a soil management practice, it could be much more effectively utilized.

Conclusions. It requires 3 tons of crop residue and 140 person hours to produce compost for 1 hectare according to ISRA research. The labor requirement includes collection, preparation of a pit, watering, turning, and application of the compost to the field. This scale of compost production may not be possible in the drier norther region of World Vision activities but, smaller scale production and composting of manure may be possible. In the CCF zone compost appears to have more potential given the labor, water, and crop residue resources available.

Research Activities in Support of OFPEP

OFPEP is not a research program, but cannot have a maximum efficiency without continuous inputs from the research community (newly released, better adapted, crop varieties, proven soil management technologies...).

In order to remain on the cutting edge of development, and ensure that technology extended at the farm level are of first quality, formal or informal cooperative agreements were developed with the Senegalese Institute for Agricultural Research (ISRA), regarding pre-demonstration trials and adaptive research at the field level, laboratory, analysis, and statistical interpretation of survey data. The major focus of these agreements is placed on soil management, soil fertility, and weed control.

Assistance to The Gambia

The Dakar based OFPEP team has provided periodic assistance on demand to OFPEP activities in The Gambia. Steve Gronski started as OFPEP coordinator for The Gambia in December of 1992. Since the Dakar staff have extensive experience in The Gambia with the collaborators orientation and meeting were conducted with Steve and Gambian collaborators to facilitate OFPEP development there. In addition technical assistance was provided in agroforestry and soil fertility survey design and rice training for PC Gambia.

1/25-27	SCF The Gambia OFPEP Coordinator visit to Senegal
3/3-5	OFPEP visit Banjul for meeting with collaborators
3/30-31	OFPEP visit to Kerewan
4/23-24	OFPEP visit to Kerewan with OFPEP director Pierre Antoine
4/23-29	OFPEP agroforestry assistance
5/17-19	OFPEP visit to collaborator in Mansakonko
6/1-2	OFPEP visit to Kerewan with OFPEP coordinator Mary Lou Surgi and consultant Bill Hargrove
7/13-15	Meeting with NGO/PC collaborators in Banjul The Gambia
8/23-24	OFPEP visit to collaborators in Mansakonko

8/24-25 PC PST training in rice cultivation
9/6-10 DIP meetings and workshop in Banjul

Consultants

Jessica Tjornhom, Winrock Program Assistant, set up the publications database and the program activities monitoring database. She aided in production of the baseline survey (**Appendix 3**).

Jane Marten also aided in production of the baseline survey. She was contracted as a consultant to code the survey for entry into SPSS/PC and develop an guide outline for use of SPSS/PC analysis of baseline survey results (**Appendix 4**).

Alioune Dieng has been engaged to provide TA and training in SPSS statistical analysis for OFPEP staff with the baseline surveys.

Danièle Heinen, World Vision Zone - seed marketing summary. Her survey of OFSP impacts and report on current market status in the WV zone supplies recommendations for monitoring seed production and improving marketing activities. In addition to seed multiplication for varieties consumed by people, it is anticipated that production of cowpea fodder will be increased in the zone to supply to herders that do not farm (**Appendix 5**).

W. H. Hargrove input ideas for soil conservation techniques and use of leguminous vegetative cover. The consultancy report can be used alongside survey results to design future activities. Dr. Hargrove's visit was coordinated to serve OFPEP-Gambia as well as Senegal (**Appendix 6**).

Interns

Mamadou Faye, HCN, full time, intern, agricultural extension assistant, training of workers, supervision of field activities

Bene Henock, third country national, 7-10/93 intern, economic analysis of composting

William Antebi, expatriate, 8-10/93 intern, MIS, graphics, and documentation

Detailed Implementation Plan

A detailed implementation plan for years 2 to 5 was completed in September 1993, and submitted to USAID in a separate document. **Tables 2** and **3** summarize the schedule of activities under OFPEP.

Table 2.

DIP SCHEDULE OF ACTIVITIES IN SENEGAL 1993-1994

	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER
PROGRAM													
ADVISORY COUNCIL MEETING													
PROGRAM PLANNING AND REVIEW													
INFORMATION COLLECTION ANALYSIS & DISSEMINATION													
ANALYSIS AND DISSEMINATION													
SURVEY DEVELOPMENT													
SURVEY TRAINING AND IMPLEMENTATION													
SURVEY ANALYSIS													
MONITORING AND EVALUATION													
TECHNICAL PUBLICATIONS													
TRAINING / EXTENSION MATERIALS													
ANNUAL REPORT PREPARATION													
NEWSLETTER													
FIELD ACTIVITIES													
SEED PRODUCTION STORAGE & MARKETING													
TRAINING OF TRAINERS													
TRAINING OF FARMERS													
DISTRIBUTE INPUTS													
SEED DEMOS / PRODUCTION													
FIELDS VISITS													
SOIL FERTILITY													
TRAINING OF TRAINERS													
TRAINING OF FARMERS													
DISTRIBUTE INPUTS													
SOIL FERTILITY DEMOS													
AGROFORESTRY PLANTING													
LIVEFENCING PLANTINGS													
PIGEON PEA DEMOS													
FIELDS VISITS													
MIDTERM EVALUATION													
FINAL EVALUATION													

= denotes a week

Table 3. **DIP SCHEDULE OF ACTIVITIES IN SENEGAL 1995-1997**

	1	9	9	5	1	9	9	6	1	9	9	7
	QTR 1	QTR 2	QTR 3	QTR 4	QTR 1	QTR 2	QTR 3	QTR 4	QTR 1	QTR 2	QTR 3	QTR 4
PROGRAM												
ADVISORY COUNCIL MEETING	x	x	x		x	x	x		x	x	x	
PROGRAM PLANNING AND REVIEW		x				x				x		
INFORMATION COLLECTION ANALYSIS & DISSEMINATION												
ANALYSIS AND DISSEMINATION		xxx				xxx				xxx		
SURVEY DEVELOPMENT												
SURVEY TRAINING AND IMPLEMENTATION												
SURVEY ANALYSIS												
MONITORING AND EVALUATION	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
TECHNICAL PUBLICATIONS		xx	x			xx	x					
TRAINING / EXTENSION MATERIALS		xx	x			xx	x					
ANNUAL REPORT PREPARATION				x				x				x
NEWSLETTER		x	x			x	x			x	x	
FIELDS ACTIVITIES												
SEED PRODUCTION STORAGE & MARKETING												
TRAINING OF TRAINERS	x		x		x		x		x		x	
TRAINING OF FARMERS	x		x		x		x		x		x	
DISTRIBUTE INPUTS			x				x				x	
SEED DEMOS / PRODUCTION				xxx				xxx				xxx
FIELDS VISITS				xxx				xxx				xxx
SOIL FERTILITY												
TRAINING OF TRAINERS	x				x				x			
TRAINING OF FARMERS	x				x				x			
DISTRIBUTE INPUTS			x				x				x	
SOIL FERTILITY DEMOS				xxx				xxx	x			xxx
AGROFORESTRY PLANTING				xx				xx				xx
LIVEFENCING PLANTINGS				xx				xx				xx
PIGEON PEA DEMOS												
FIELDS VISITS				xx				xx				xx
MIDTERM EVALUATION												
FINAL EVALUATION											xxx	

x denotes a month

quarter begins in October

Monitoring and Evaluation (M&E)

The M&E system is designed to maximize use of information from farmers (resource and needs assessment), incorporate existing NGO collaborator methods and capabilites, and accomodate changes and expansion of program activities. The system provides for continual update and assessment in a relatively simple and timely manner. It is used to generate program performance data to inform managers and document resulting program impacts.

The process is iterative and provides feedback from farmers as well as indicates measurable impacts on field practices and productivity. Thus far three instruments are being used as the basis for monitoring and evaluation: 1) Baseline data collection; 2) Collaborative Plans; and 3) Activity forms and synthesis reports.

Baseline surveys have been developed and implemented with collaborators. **Appendices** 7 and 8 illustrate the surveys conducted jointly by OFPEP and the Senegalese Institute for Agricultural Research (ISRA). The implementation of the survey has been a massive effort for OFPEP and its collaborators. WV and CCF have mobilized 35 of their staff for this significant effort to better understand farmers resources and constraints before proceeding with farmer participatory interventions in a total of 61 villages with 220 household interviews conducted. CCF has conducted 2 of 3 parts of the survey. They plan to complete part 3 before the end of 1993.

The Peace Corps volunteers, did not carry out the original baseline survey. They felt it was too 'large' a task and that it did not account for their work constraints. A group of dedicated volunteers worked to revise the OFPEP survey by splitting it into two parts, a 'compost' survey and a 'soil conservation' survey, that satisfy both OFPEP's information needs as well as PC capabilities. Both will be used for baseline data in designing OFPEP activities with volunteers in their villages. The two surveys are currently being tested in one pilot region and will be ready for use early in OFPEP year two.

Collaborative Program Plans have been developed with each collaborator to describe the collaborative strategy, objectives, activities, and impact indicators. This plan outlines the anticipated interaction between the OFPEP staff and each NGO. It serves as a template for monitoring and updating program activites.

Appendix 9 illustrates the steps used in the development of a Collaborative Plan in Senegal. **Appendix 10** presents the content of a specific Collaborative Plan (with Peace Corps).

DATAEASE software is used for OFPEP activity forms and reports. Each OFPEP staff member completes an activity form for each field activity, meeting, or training session. Information is entered into the database and the database summarized every 3 months. Summary documents can be customized to show, for example, how many villages OFPEP has undertaken seed training for rice production, or, the number of women growing cowpea in the World Vision intervention zone.

Activity forms are used to make periodic monitoring notes and quartery reports used as references for activity evaluation by OFPEP staff. The information entered into

DATAEASE software is compiled and then incorporated into collaborative program plan updates. Report evaluation can thus be used for program adjustment based on farmer participation and activity impact.

D. The Gambia (Lead Agency: Save the Children Federation)

Overview

The On-farm Productivity Enhancement Program (OFPEP) in The Gambia is the continuing effort styled after the On-farm Seed project (OFSP). It is expanding the seed multiplication project to include soil fertility so that the maximum benefit can be realized from the improved varieties disseminated over the last five years. During that period, OFSP went a long way in increasing the supply of improved seeds. This was accomplished by bringing together government agencies and Non-government Organizations (NGOs) to discuss and coordinate activities to achieve particular objectives. There is still a demand for seed by farmers although that demand may be shifting. The OFSP concentrated heavily on rice and millet, which have been distributed in large amounts. Millet, since it can be multiplied very rapidly, is not a target crop of OFPEP, for the time being. Rice, as foundation seed, is still being made available, though the effort can be slowed as its distribution is now such that villages can supply themselves and the dependency on NGOs can be lessened. Other seeds in need of distribution include maize, pigeonpea, cover crop legumes/green manures.

A recent survey by Save the Children/USA (SCF) showed that 47% of rice farmers only produce enough rice to last one to three months after harvesting. The rest of the year they have to purchase rice, using their very limited money supplies. As long as this continues there will always be dependency on governments or NGOs to supply seed for planting. The poor quality of West African soils is well known. Organic matter content is disastrously low due mainly to the annual burning of crop residues. These fertility problems, coupled with salt intrusion and acid toxicity, severely reduce the impact of even the best of the improved seed varieties available. OFPEP, therefore, is concentrating on soil fertility and agricultural techniques in order to get maximum yields from the varieties distributed.

Women especially are being targeted for productivity enhancement since they are the major producers of food crops. Some NGOs work mainly with women, such as the Freedom From Hunger Campaign Women's Rice Project (FFHC/WRP). In fact, FFHC/WRP has employed women extensionists to work with groups of rice growers. SCF works heavily with women also, but includes some men in their training in order to get them to assist their wives with land preparation via animal traction.

SCF is the lead agency for OFPEP within The Gambia. SCF efforts have been in recruiting NGOs to participate in OFPEP and coordinate the efforts either by the NGOs alone or by bringing in outside assistance. One immediate source is the Winrock OFPEP team based in Dakar, Senegal. Over the first six months of 1993 the OFPEP/SCF coordinator has acquainted himself with The Gambia, the OFPEP system, and making contacts with the NGOs. Progress has been slowed due to the lack of transportation, since

a vehicle has not yet been procured. Therefore, visits to NGOs have to be coordinated with SCF transport. At times there is no problem, but often there is a conflict with SCF's other activities. Other delays have occurred mainly due to the fact that NGOs have their own agendas, as well as responsibilities to their donors. Meetings have not always been honored or the representation of the NGO falls short of expectations. This is one of the drawbacks of working through NGOs. Their organizational depth and management skills may be lacking. However, seven NGOs have established a dialogue with varying degrees of success so far. The NGOs are concentrating on developing baseline information from which more detailed objectives and activities will be derived The time frames can then be scheduled in accordance with each NGO's network. The agencies within The Gambia willing to participate in the program are: Peace Corps/The Gambia (PCTG); Action Aid The Gambia (AATG); Association of Farmers Educators and Trainers (AFET); Catholic Relief Services (CRS); Freedom From Hunger Campaign (FFHC); Good Seed Mission (GSM); and Save The Children/USA (SCF). Departments within the Ministry of Agriculture/The Gambia, have been identified, but no linkages have developed to date.

Figure 3 presents the areas of intervention of the main NGO collaborators of OFPEP.

Project Activities

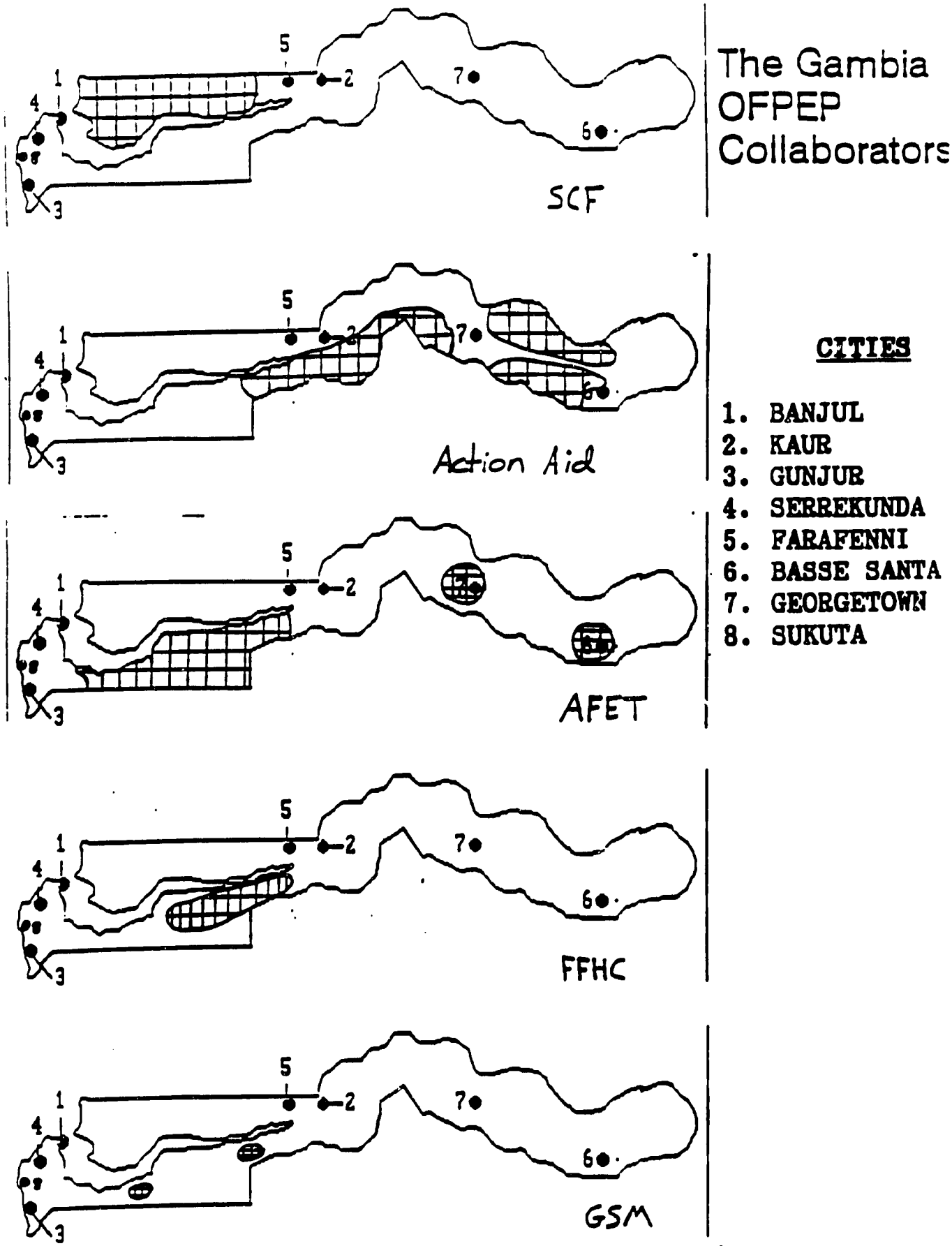
A summary of activities organized by the lead agency in The Gambia, and the technical assistance team based in Dakar, is presented in **Table 4**.

NGO Collaborators

Peace Corps/The Gambia

Develop Agriculture Extension Package. PCTG has new PCVs coming into the country in July of each year. This is followed by 3 months of pre-service training at which time the PCVs will be well versed on rice production, grafting, vegetable gardening, agroforestry, and soil fertility. PCTG is developing a Project Plan for the agriculture volunteers that has the stated purpose of increasing the farmers (particularly women) capacity to produce rice and garden produce and thus generate higher incomes. By introducing the PCVs to the OFPEP program at this time, a collaborative effort can begin in order to set up the framework of achieving the PCTG purpose and goals.

As extension agents they will be implementing the activities drawn up by themselves, APCD, and OFPEP. These activities are derived from baseline information collected by each PCV and may vary according to the PCV's circumstances.



* The Peace Corps works throughout the country.

Figure 3.

Table 4.

OFPEP Activities organized by Technical Assistance Team based in Dakar, Senegal, and by Save The Children Federation, The Gambia, 1993

Region	Village	Technical orientation	Type of activity	Number in target group	Females
Banjul					
	Banjul	Agroforestry	Meeting	2	0
	Banjul	Seed/Soil	Meeting	3	0
	Banjul	Agroforestry	TA/Field Visit	4	1
sum				9	1
Fatick					
	Medina Djikoye	Seed	Meeting	15	15
	Ndrame Escale	Agroforestry	TA/Field Visit	1	1
	Lambaye	Agroforestry	TA/Field Visit	1	0
	Pansy	Agroforestry	TA/Field Visit	2	0
	Missira	Seed	Meeting	6	6
	Betenti	Seed	Meeting	4	4
sum				29	26
Lower River					
	Massembe	Agroforestry	TA/Field Visit	1	0
	Mansa Konko	Agroforestry	TA/Field Visit	2	
	Manso Konko	Agroforestry	TA/Field Visit	7	2
	Mansa Konko	Agroforestry	TA/Field Visit	20	18
	Tendaba	Seed	Training	4	2
	Mansa Konko	Seed/Soil/AgF	Meeting	4	0
	Massembe	Seed	Meeting	1	0
	Massembe	Agroforestry	TA/Field Visit	1	0
	Massembe	Agroforestry	TA/Field Visit	1	0
sum				41	22
North Bank					
	Kerewan	Soil/AgF	TA/Field Visit	0	0
	Kerewan	Agroforestry	TA/Field Visit	3	0
	Njawara	Agroforestry	TA/Field Visit	3	1
	Chogan	Agroforestry	TA/Field Visit	1	0
	Njaba Kunda	Agroforestry	TA/Field Visit	1	0
	Bakendik	Agroforestry	TA/Field Visit	5	1
sum				13	2

The baseline information is used to assess the knowledge and techniques used by the farmers as well as set standards for measuring future improvements. One of the constraints the PCVs have to deal with is the untimely commencement of their service. After three months of training, they begin service by the end of September which is when rice is being harvested. To gather baseline information at this time is not optimal, but unavoidable. The PCVs who came into the country last year have begun collecting the full range of data from their contact farmers, but the new PCVs will have to do the best they can to collect any data considering their late arrival in the rice season. The following is a list of data each PCV is gathering from a minimum of four farmers per village:

Ecology

Soil type
Soil toxicity - salinity, acidity, other
Rainfall/drought periods
Soil moisture at each stage of growth

- sowing
- germination
- 1st weeding
- 2nd weeding
- booting
- milking
- pre-harvest maturity
- harvest

When is there standing water in the plots?
Problems?

Practices and Timing

When and how are the fields:

- plowed? (by hand or animal traction)
- planted? (broadcast or row seeding)
- weeded?
- fertilized? (organic or inorganic and amounts/type)
- harvested?

If rice is transplanted, when is the nursery bed prepared and how and age of seedlings at transplanting?
How long does it take to plow, plant, weed, etc., a plot of a given size?
How do men participate?

Varieties used

Variety - local or improved (try to verify local seeds as improved)
Source of the seed
Characteristics:

- height at harvest
- tillers/plant
- days to 50% flowering

How are seed stored?
Are seeds saved for planting next year? How much?

Yield

Measure the yield of 100sqm by weighing bundles from that area and thresh if possible
Number of plots the farmer has and size of each
Yield per hectare
How long does the harvest last? (months of feeding the families)

Once the baseline information has been gathered and analyzed, PCTG and OFPEP meet to put together activities to address the problem areas. It is hypothesized that farmers are not using farm inputs at an adequate rate and thus limiting yields below potentials. The survey identifies to what extent this is true. This is scheduled for January, 1994, and sets the agenda for the '94 planting season.

Rhizobia Demonstration Trials. The objective is to show whether or not Rhizobia inoculation in the nursery is useful for the field planting of leguminous trees and thus begin making a case for having Rhizobia inoculum available in country. This demonstration is a collaborative effort between OFPEP, SCF, PCTG, and five farmers. Six species have been selected to be outplanted into the farmers fields. Half the trees will be inoculated with Rhizobia and half un-inoculated. The species are : Acacia nilotica, Cajanus cajan, Gliricidia sepium, Leucaena leucocephala, Prosopis juliflora, and Sesbania grandiflora. Rhizobia, supplied by the NifTAL project in Hawaii, has been applied, via seed coating, to 3,000 seedlings in the SCF nursery in Kerewan. These seedlings are to be outplanted onto five farms identified by PCVs. These farms are located in the northwest region of the country in the villages of Njawara, Chogin, Njaba Kunda, Bakindik, and Fass. The farmers are responsible for providing land, protection, and weeding. The PCVs are responsible for identifying the farmers, monitoring and measuring of seedlings. And OFPEP is responsible for trial design, analysis, and reporting.

The first year time frame has been as follows:

April '93 - collect soils from sites, soil tests, fill polybags
May '93 - plant seeds in the nursery
July/August '93 - outplant seedings to sites
September '93 - arrival of new PCVs

Freedom From Hunger Campaign

FFHC is a medium-size NGO based in Mansa Konko on the south bank. They have been working in seventeen villages (soon to be 25) exclusively with women and with whatever crops these women wish to grow, which in The Gambia is traditionally rice. FFHC was involved in the OFSP, promoting improved varieties of rice and techniques to increase production. They would like to collaborate in OFPEP in the areas of soil fertility and conservation, and training of their extensionists.

Initial contacts with FFHC have resulted in the design of an informal survey. This survey will be used to develop a problem statement and objectives, activities, and indicators. FFHC staff will be conducting the surveys in all seventeen of their villages to a minimum of three women and three men. The surveys will cover agronomic practices, manuring,

and crop residue management and are scheduled for the first week of August. After analysis of the surveys is completed, FFHC and OFPEP will sit down to define objectives for the program and outline activities. These activities will begin after the 1993 harvest or early next year.

Action Aid The Gambia

AATG is a large NGO covering a majority of the country, mostly on the south bank. They are involved in many fields, one of which is agriculture and natural resources. They are based out of the villages of Mansa Konko, Bansang, and Kuntaur. Their interests lay in the areas of seed multiplication, soil fertility and conservation, and biological nitrogen fixation.

Initial meetings with AATG have moved slowly as the agency has had some staff changes. They are interested in collaborating and using their expertise in Participatory Rural Appraisals (PRAs), which would be a unique strategy for OFPEP. Potential efforts lay in the areas of extensionist training and demonstrations in composting, manuring, and nitrogen fixing plants (legumes and trees).

There are possibilities for cross NGO exchanges (training) where AATG can teach other NGOs the PRA techniques. Currently AATG is planning a series of PRAs in early August that OFPEP is interested in participating in, but no schedules have been forthcoming. Again, this is a case of the NGO adhering to their own system and respect for their autonomy. Discussions are continuing with AATG to set the level of collaboration and come up with a time frame of activities.

Association of Farmers Educators and Trainers

AFET is a local NGO based out of the village of Brikama, on the south bank. They are medium in size, but are spread out over the length of the south bank. Their activities are wide ranging as well and they are interested in rice production, soil fertility, and biological nitrogen fixation. CRS as an institution builder is helping to support AFET.

Several contacts have been made with AFET, but due to constraints with transportation nothing further has developed. They are interested in collaborating, especially in the areas of manuring (trainings in use and demonstrations of growth affects on rice), use of fish scales/bones (ground up) as soil amendments, and rice production training of extensionists. AFET still needs to clearly identify their goals. They have innovative ideas, such as fish scales/bones, but these ideas need to be thought out in regards to labor inputs and resource availability. OFPEP, in the month of August, will continue to meet with AFET to set up the baseline information and from there problem and objectives statements can be developed.

Good Seed Mission

Good Seed Mission is a small, one man run, NGO located in Massembe, south bank. Tom Cosier, the director, has 25 years' experience in The Gambia. Tom has farm equipment and assists farmers in his area with land preparation and advice. His involvement in the OFSP project was mainly in conducting small scale research and demonstrations. His role in OFPEP would be much the same, as well as advising. To date he is field testing seven varieties of Cajanus cajan (pigeonpea) to observe growth and yield. Pigeonpea seed, green or dry, can be used for food, the plant for fodder or green manure, and it fixes nitrogen to increase soil fertility. These were planted in July 1993 with results due in November '93 (or later as one variety is a perennial). OFPEP will promote the best varieties through the other NGOs starting with the next rainy season.

Save The Children/USA

SCF is a medium-size NGO based out of Kerewan, on the north bank. They are involved in many fields, and the Food Production Sector has been given the responsibility for overseeing the OFPEP program in The Gambia. As it did in the OFSP project, SCF will continue its efforts in seed multiplication. In July 1993, 3,075 kg of rice seed has been distributed to 510 women. The varieties received from the Seed Technology Unit are:

1.	Peking	1,065 kg
2.	Rock 5	280 kg
3.	DJ 12	630 kg
4.	Parasana	360 kg
5.	DJ 11	180 kg
6.	Kambandingo	560 kg
		3,075 kg

The last three varieties are new to SCF and will be monitored to judge their performances. Included in this total rice amount are portions to be distributed to the communities of Njawara and Bakindik, where SCF is implementing a Natural Recource Management Project. Some of the activities of this project are soil conservation, using vetiver grass as a vegetative hedge, and liming to combat soil acidity. The lessons being learned here will be transferable into the OFPEP programs and SCF can share this information with the other NGOs. The SCF seed multiplication program is shifting away form contract farmers and more towards promoters. Promoters are farmers who are given foundation seed, on a pay-in-kind loan, given training in improved techniques and through their communities are local examples of enhanced production. SCF feels that at this stage of the project more women can be reached through the promoters and, therefore, improved seed and technologies spread quicker. Already in June of this year SCF conducted seven trainings on seed varieties being promoted and animal traction for land preparation and row seeding. Another 20 trainings are planned for the rice season on an on-site basis. These will take place in August and September.

Also, for the first time a corn variety, NCB, is being promoted. The 420 kg of seed are distributed to 40 farmers on the north bank.

Inter-NGO Activities

During September 21-23, a soil fertility field trip/workshop was held for the managers of the participating NGOs. Two persons from each NGO were invited on the field trip into Senegal, held at the ISRA (Senegalese Agriculture Research Institute) station in Bombey. The purpose of this first workshop was to introduce NGO field managers to the field trials and activities being carried out by ISRA to cope with the farmers' problems of poor soil fertility and decreasing yields. The interventions included composting, manuring, and crop residue management and gave the participants ideas for adopting such activities into their current programs. When these NGO managers send their extension agents and trainers to future workshops, they will have a good perspective of the knowledge their NGO staff will be receiving. Also, contact has been made for continued collaboration between The Gambia NGOs and neighbors to the north in areas which are feeling the ecological efforts of reduced rainfall more acutely than The Gambia.)

Dr. William Hargrove, a cover crops consultant, passed through The Gambia and Senegal in June. He recommended that OFPEP pursue leguminous cover crops to enrich farmers' soils. He also sent a number of variety samples such as Lublaba sp (2), Vigna umbellata (2), Canavalia ensiformis (1), and Mucena sp. (2). These seeds were received in small samples and will be multiplied as they are being field tested. The varieties showing promise will be made available to interested NGOs and the seed further multiplied and demonstrated. Dr. Hargrove's consultancy report is presented in **Appendix 6**.

Detailed Implementation Plan

At the end of September '93, the detailed implementation plan for Years II through V of OFPEP was prepared and submitted to USAID in a separate document.

Table 5 summarizes the schedule for past and future activities in The Gambia through the five years of the program.

Conclusions

In reviewing the schedule for the first year, the following has been accomplished:

- an advisory council was established including members from the NGO community and the government
- collaboration networks are beginning to be set up with and between NGOs
- resources and needs assessment were carried out for each NGO and for farmers through baseline data gathering
- training has not been carried out extensively as each of the NGOs, along with OFPEP, are identifying where best training is needed
- identification of farming practices through baseline data
- the first Rhizobia demonstration/trial has been designed and planted
- monitoring and evaluation is an ongoing process
- the 4-year detailed implementation plan has been completed

Table 5. Schedule of Activities: The Gambia

	Year One	Two	Three	Four	Five
Advisory council meetings (3x/yr)					
Program planning and review					
Collect and analyze information					
1. Baseline surveys/PRAs					
2. Baseline surveys analyses					
3. Progress monitoring/evaluation					
4. Training/extension materials					
5. Prepare case studies on experience					
6. Process, distribute information					
Seed					
1. Training of trainers					
2. Training of farmers					
3. Distribute inputs					
4. Seed demos/multiplication					
5. Field visits					
Soil fertility					
1. Training of trainers					
2. Training of farmers					
3. Distribute inputs					
4. Soil fertility demos					
5. Cover crop/green manure trials					
6. Agroforestry planting					
7. Live fence planting					
8. Pigeonpea demos					
9. Rhizobia demos					
10. Field visits					
Monitoring and evaluation					
Service requests for information (consultants)					
Introduce, test new technology					

E. Uganda (Lead Agency: Agricultural Cooperative Development International)

Overview

OFPEP's first year activities in Uganda were primarily characterized by an expansion of activities already undertaken during the BNF/LM project, and by the development of three strong cooperative agreements with three NGOs or female farmers' groups operating in southeastern Uganda (Christian Children's Fund, Multipurpose Training and Employment Association (MTEA), and a female farmers' group also supported by Heifer Project International).

Other OFPEP activities had a slow start, due mostly to some uncertainties regarding the availability of matching funds for OFPEP. The problem was finally resolved in August 1993. At the end of Year I, however, a detailed implementation plan has been drawn, participating NGOs and farmers are ready to implement soil management activities relying on methods other than biological nitrogen fixation, and specific seed program activities and workshops are scheduled to start during the first part of October '93.

Dr. Moses Onim, East African OFPEP Coordinator on behalf of Winrock, spent approximately three months in Uganda during Year I, helping Mr. Francis Oching, Country Coordinator, to develop the necessary collaborative agreements, design baseline surveys, and draw the detailed implementation plan.

Project Area

The initial project area includes the districts of Mukono, Iganga, and Tororo in southeastern Uganda (**Figure 4**). The economies of these districts depend heavily on agriculture.

The project area was chosen because of the following reasons:

- the area has had previous experience with BNF
- ease of monitoring project activities for the start
- it is accessible
- collaborating NGOs are active in the area
- there are well-organized farmers' groups, associations and cooperatives.
- there is need to improve agricultural productivity per unit area in view of population pressure.

Throughout the whole project area, there are the basic administrative units known as the Resistance cells. At the same time there are the farmers group, associations, and cooperatives which do not necessarily follow the administrative demarcations. This is especially true for Iganga. For Tororo, CCF has mobilized farmers into project families (each project area comprises 20 farmers, and there are seven such project areas). These are the family aggregates which OFPEP will work with.

Figure 4. Project Area in 1993 (▪▪▪▪).

Economy

Mukono

- Cash crops are mainly cotton, coffee, sugarcane, and tea.
- Lies at an altitude between 1158-1219 meters above sea level. Mukono enjoys heavy rainfall and temperatures are almost uniformly high.
- The main ethnic group is the Baganda who speak Luganda.
- Mukono is also engaged in dairy farming and fishing on Lake Victoria.

Iganga

- Cash crops are cotton, coffee, and rice.
- Fishing is done on Lake Victoria.
- Lies at an altitude of 1070-1161 meters above sea level with annual rainfall of 1250-2200mm. Temperatures are almost uniformly high (over 2f C), and vegetation here includes tropical rain forest.
- The main ethnic group is the Basoga who speak Lusoga.

Tororo

- The main cash crop is cotton. Moderate rainfall and high temperatures.
- The main languages are Japadhola, Lusamia-Lugwe, Ateso, Lugwere, and Lunyoli.

Major Food Crops

The major food crops grown throughout the project area are finger millet, rice, maize, cassava, groundnuts, sweet potatoes, sorghum, beans, soya, sunflower, irish potatoes, field peas, and yams. Other crops grown include tomatoes, onions, pineapples, vanilla, chilies, passion fruits, and cabbages, as well as local vegetables.

Religion

The main religions are Islam, Protestantism, and Roman Catholicism.

Literacy

Generally speaking, illiteracy is high in the whole project area. Agricultural production is handled by the impoverished small-scale farmers.

Climatic Constraints

In Tororo, the weather pattern has been unpredictable with rather prolonged droughts.

Economic Constraints

The vast majority of people in the project area have very low incomes indicating that the buying power of the masses is very low.

Agricultural Research and Extension Infrastructure

Researchers are linked to the farmers through Ministry of Agriculture. There is very little direct contact between the farmers and researchers.

The extension services consists of district extension agents, country extension agents as well as sub-county extension agents. The sub-county agents are either certificate or diploma holders. But these extension agents are ill-equipped as well as ill-funded. The baseline survey indicated very little interaction at local level between farmers and extension agents.

Current Status and Substance of Agreements with Governmental Departments and NGOs

NGOs, and other relevant institutions, that will play an important role in the project are as follows:

- Makerere University and research institutes will play the role of support entities and of consultants. Makerere will continue producing the inoculants while the research institutes will work on a refinement of farming interventions.

- The Extension Agents (MOA) and the collaborating NGOs will play an implementing role.

In order to foster sustainability, the following steps are taken:

- close collaboration between OFPEP NGOs in project areas
- strengthening of the relationship between producers, processors, and marketing agents
- effective linkage with MOA
- farmers are involved in income-generating activities
- the multiplier-effect principle is fully utilized

Survey Findings

A 3-week survey done in the project area yielded the following farmers' priorities and concerns:

- soil fertility
- pests and diseases (especially the vertebrate pests-mole rats)
- yield of food crops
- storage
- improved seeds and planting materials
- seed and food processing facilities
- land/soil/water management skills
- training in soya bean utilization

- training in agronomic principles
- exploration of other protein deficiency remedial measures, e.g., rearing of small animals and poultry
- OFPEP activities focusing on women preoccupations
- marketing
- credit
- afforestation

It was very evident form the baseline information that farmers welcome OFPEP activities. This may be an indication that the small-scale farmers benefit little from the extension service at the present time.

A sample of survey results is presented in **Appendix 11**.

Advisory Council Meetings

Makerere University, research institutes, the Seed Project, and USAID/Kampala are serving as members of the project's Advisory Council. Makerere University and research institutes are providing consultants and resource persons.

Five Advisory Council meetings took place in Uganda. As an illustration, minutes of the February 2, 1993, meeting are presented in **Appendix 12**.

Field Activities During Year 1
Detailed Implementation Plan, Years 2-5

At the end of Year 1, BNF demonstration sites were in place in seven sites of the Tororo district (**Figure 5**), in 15 sites in the Iganga district (**Figure 6**), and in one site of the Mukono district.

During Year 1, the field activities were essentially related to an expansion of the demonstration plots for inoculum use with legumes. By mid-September, a more comprehensive plan of work was prepared, and field activities ready to begin, focusing not only on BNF, but also on:

- improved seed/storage facilities
- training in agronomic principles
- use of agroforestry technologies
- use of organic or animal manures
- soil/land/water conservation

Tables 6 and **7** illustrate the schedule for activities planned for Years 2-5.

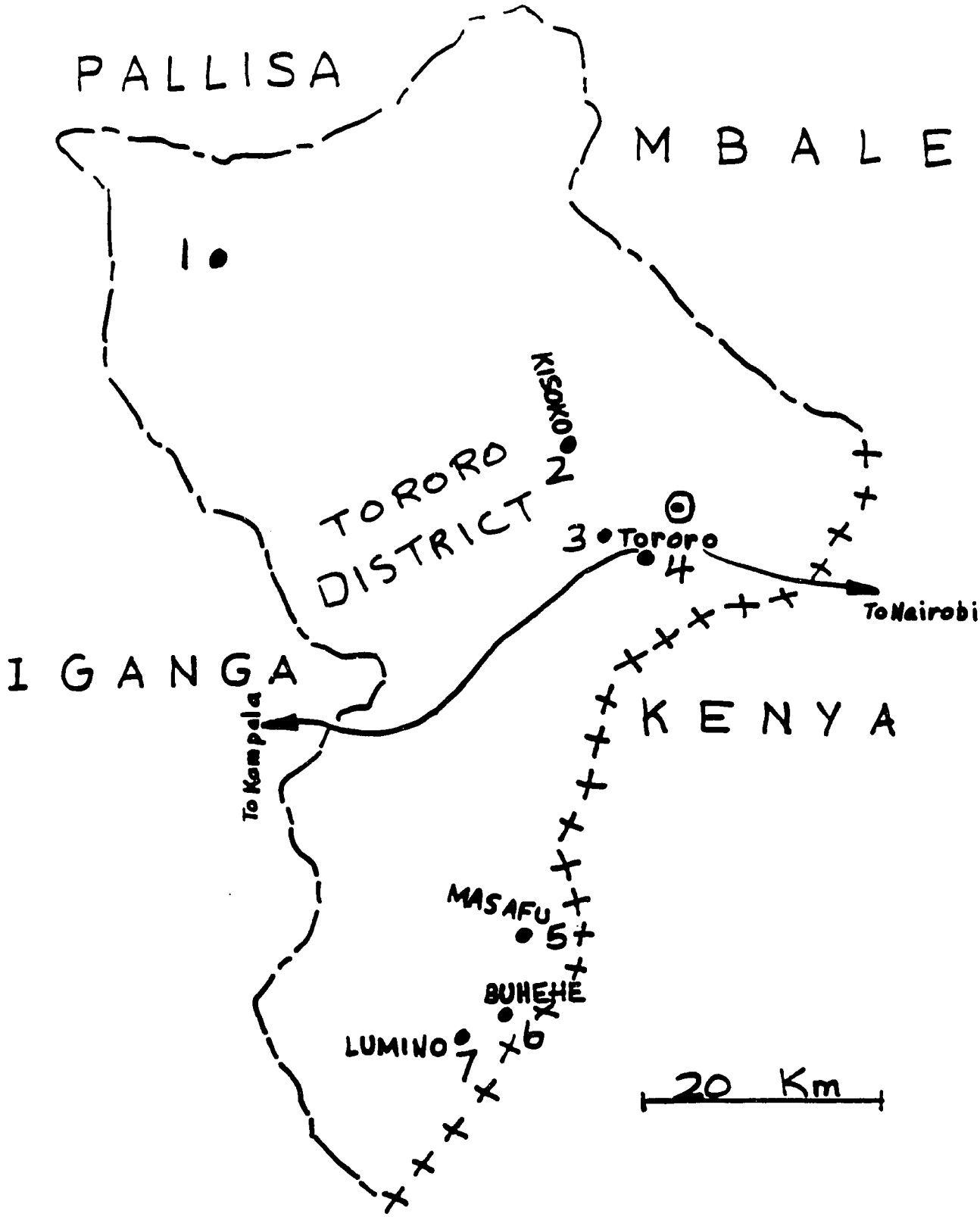


Figure 5. Demonstration Sites in Tororo District.

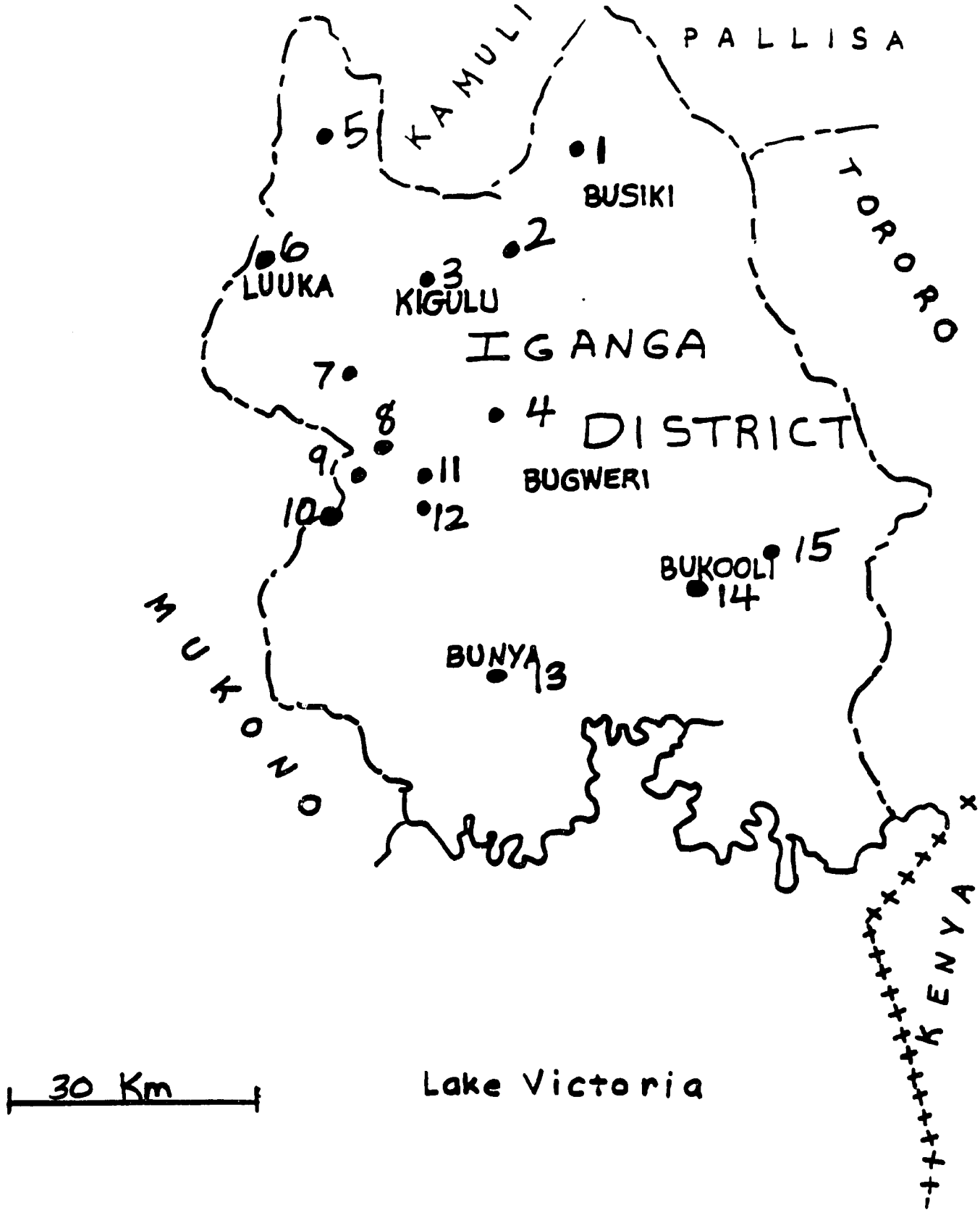


Figure 6. Demonstration Sites in Iganga District

Table 6. DIP schedule of activities in Uganda, 1993-1994.

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Program												
Advisory council meeting				X								
Employ extension specialist		X										
Budget discussions												X
Information Collection and Dissemination												
Baseline survey	XX	XX	XX									
Write reports, articles				X			X			X		XX
Field Activities												
Training in seeds	X	X				X						XX
Follow-up on demo plots	X											X
Demo plot assessment; visit farmers		XX						XX				XX
Order demo plots impact			X	X								
Prepare demo plots					X					X		
Plant demo plots						X					X	
Train farmers - on-farm		X					X					X
Monitor demo plots								X				XX
Evaluation with farmers										X		
Procure inputs for second planting										X		
Train NGOs										XX		
Conduct refresher course										X		

Table 7. DIP quarterly schedule of activities for Uganda for the Years 3, 4, and 5.

Planned Activities	Year 3 1st Qt	Year 3 2nd Qt	Year 3 3rd Qt	Year 3 4th Qt	Year 4 1st Qt	Year 4 2nd Qt	Year 4 3rd Qt	Year 4 4th Qt	Year 5 1st Qt	Year 5 2nd Qt	Year 5 3rd Qt	Year 5 4th Qt
1. Establishing demos and field activities	X	X			X	X			X	X		
2. Training farmers	X	X			X	X			X	X		
3. Training NGOs/extension agents	X	X			X	X			X	X		
4. Introducing new technology	X	X	X	X	X	X						
5. Monitoring and evaluation (midterm)			X									
6. Monitoring and evaluation (final)											X	
7. Progress monitoring and evaluation	X	X	X		X	X	X		X	X	X	
8. Establishing input supply system	X	X	X		X	X	X		X	X	X	
9. The seed program	X	X	X		X	X	X		X	X	X	
10. Processing and distributing information	X	X	X		X	X	X		X	X	X	
11. Preparing case studies on experience					X	X	X		X	X	X	
12. Refining and describing production and distribution models					X	X	X		X	X		
13. Developing training and extension materials	X	X	X		X	X	X		X	X		
14. Service requests for information and TA	X	X	X		X	X	X					

Inoculum Production

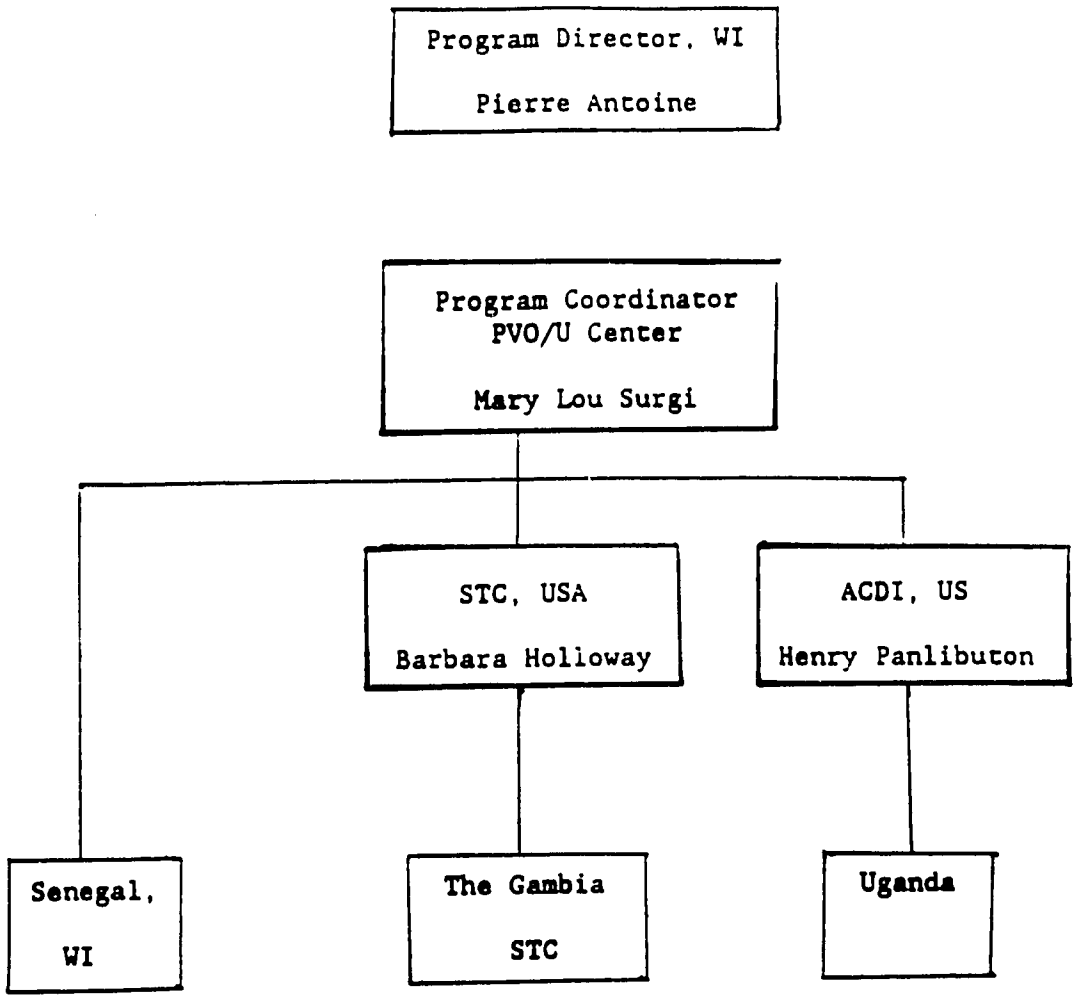
In September 1993, discussions were held with a private entrepreneur regarding the purchase of a plant designed to sterilize peat and produce inoculum with a longer shelf life, than presently available. If funding is available, as anticipated, the number of farmers' communities having access to inoculum will be greatly increased, and the initiative by the private entrepreneur may signal a minor revolution in the contributions of the private sector to bio-fertilizers use in Uganda.

IV. Organization, Management, and Staffing

The organization structure of OFPEP has been presented on page 9 (**Figure 1**). If funds from external sources become available, it is possible that, in future years, secondary target countries be added to the program target areas. A proposal to link the northwestern Kenya region to the Uganda southeastern region has been submitted to a private donor agency.

Most of the observations regarding in-country organization, project management, logistic support, monitoring and evaluation, and miscellaneous management issues have been presented under each country report, in Section III.

Figures 7, 8, 9, and **10** that follow, present in more detail the responsibilities of each specific individual assigned to OFPEP, and the relationships with his/her institution, implementing partner, and(or) collaborator.



Legend

WI:	Winrock International Institute for Agricultural Development
PVO/U Center:	Center for PVO/University Collaboration in Development
STC:	Save the Children
ACDI:	Agricultural Cooperative Development International

Figure 7: U.S. based representatives of collaborating institutions, OFPEP, 1992.

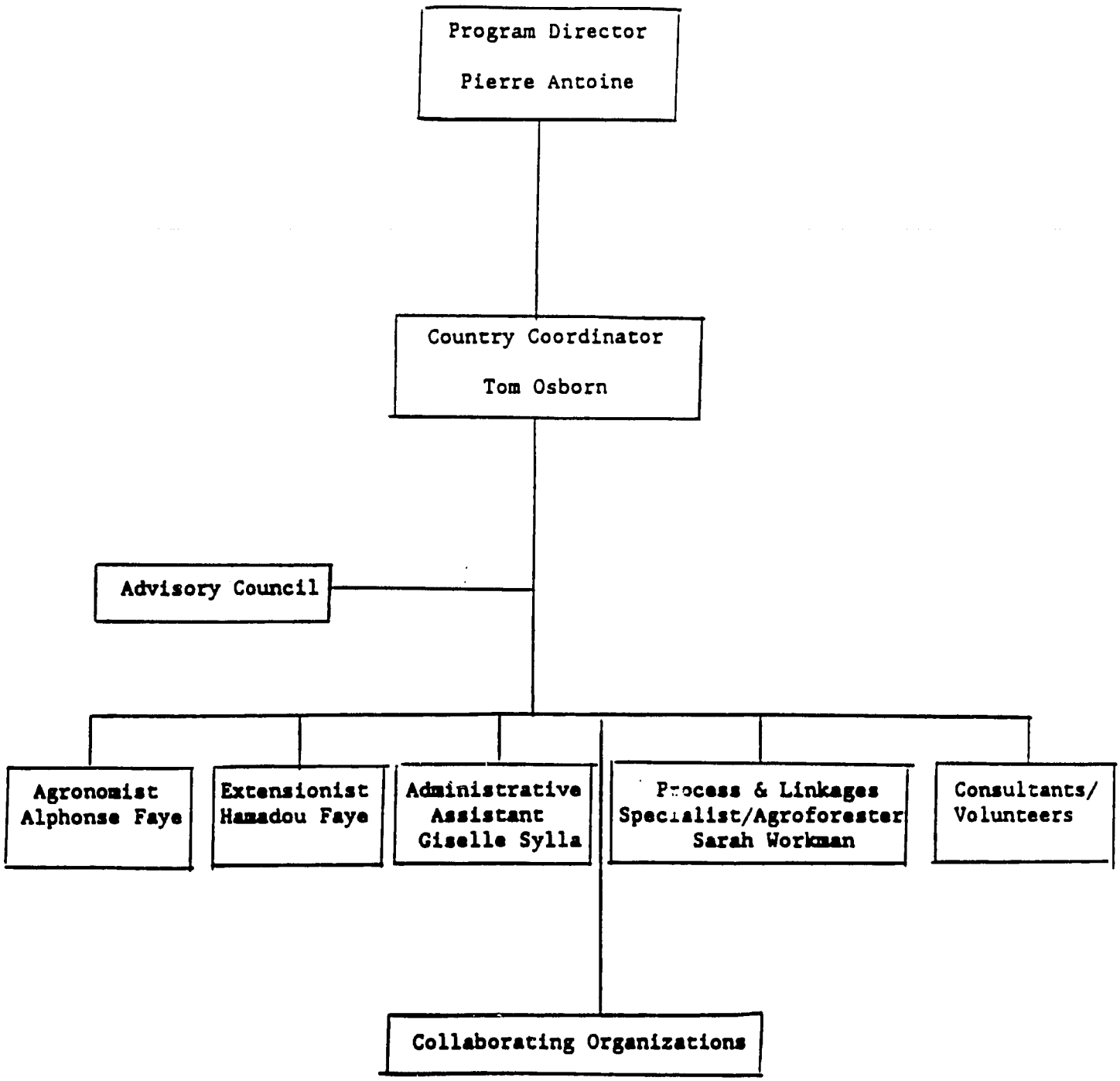


Figure 8: Staffing and organization of OFPEP in Senegal, year I.

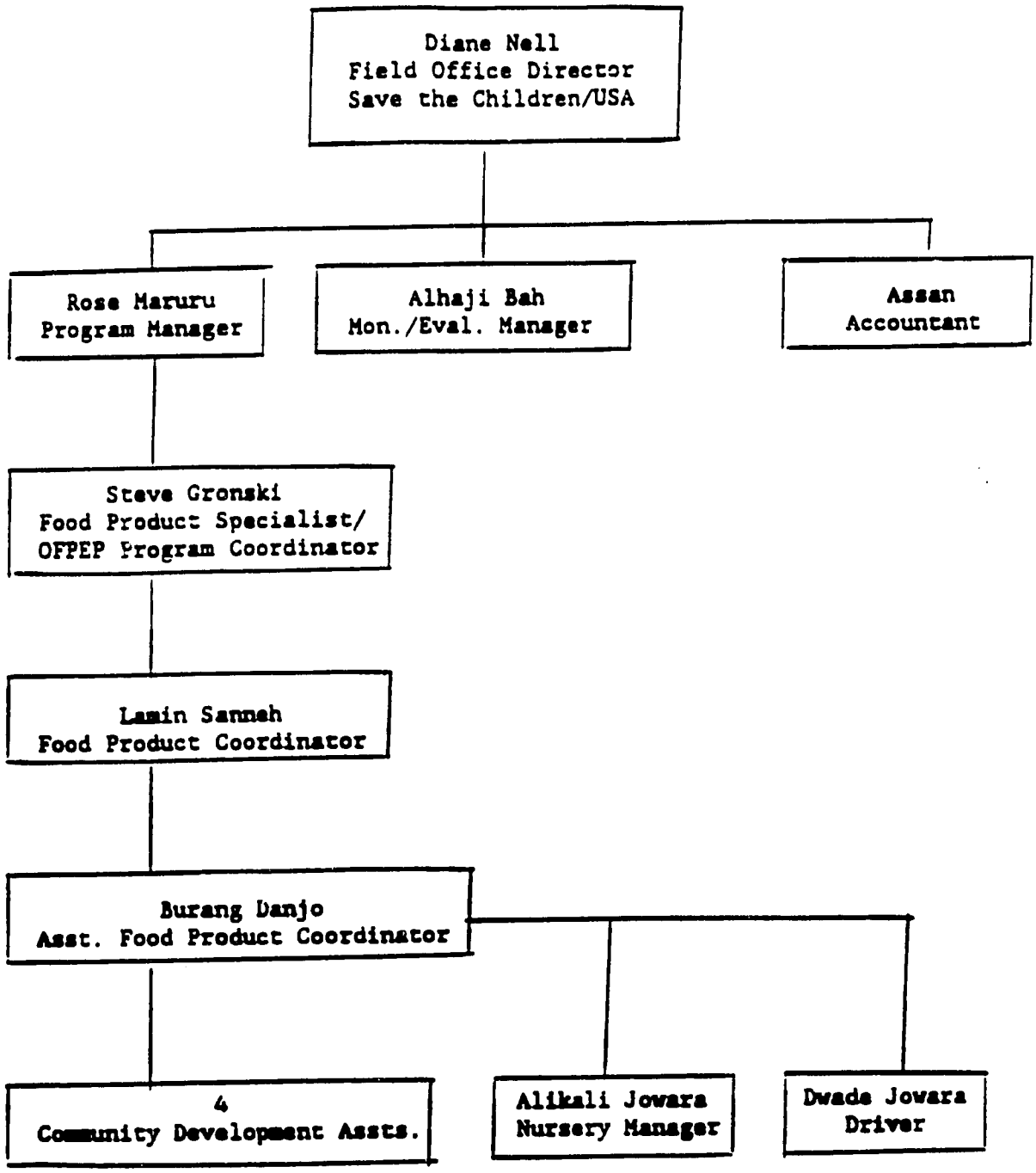


Figure 9. Staffing and organization of OFPEP in The Gambia, Year I.

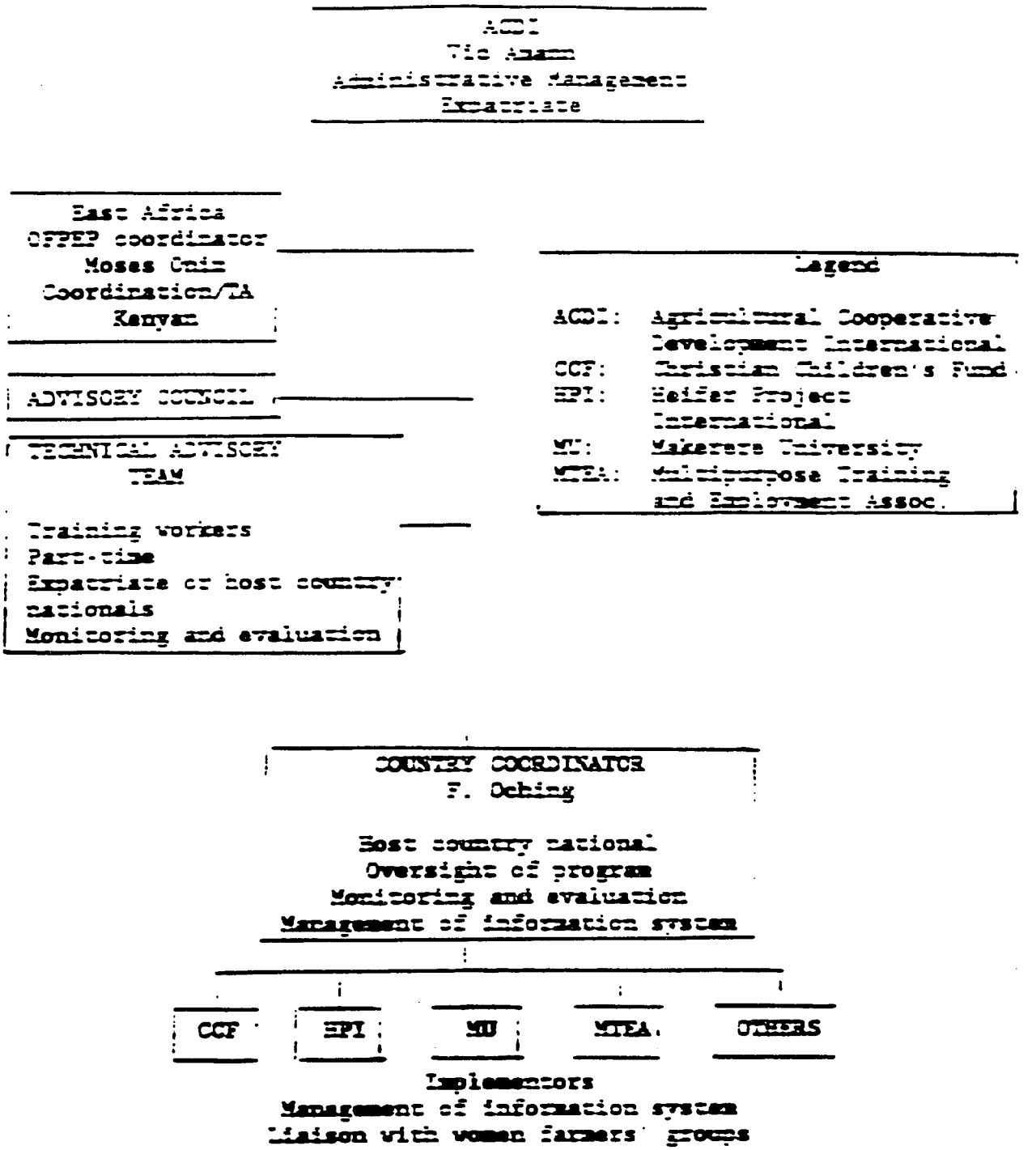


Figure 10: Staffing and organization of OFPEP in Uganda, year 1.

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V. Financial Report

Table 8 presents the expenditures officially reported by all implementing institutions, as of August 31, 1993. It must be noted, however, that the cumulative balances presented in that table, especially in regard to the subcontractors' line item, are well below the actual expenditures incurred during year 1 of OFPEP. This is due to the fact that the Annual Report, this year, is actually submitted on the last day of year 1, while reporting of expenditures generally lags several weeks or months, after actual disbursement.

It is estimated that the USAID-funded expenditures made by Winrock and the Center for PVO/University Collaboration in Development will closely approximate the available budgets. In the case of SCF and ACDI, some of the USAID-funded activities initially intended to be distributed evenly during year 1, have been skewed toward the end of year 1 or the beginning of year 2. This, however, should not negatively affect the overall level of effort, and the number of project activities scheduled for the 5-year program.

Matching funds have been identified by each implementing institution, as agreed upon in the contract. A final itemization of in-country contributions received from individuals (consultants) or collaborating partners (e.g., World Vision) has not been completed, at the time of submission of this document, but it can be reported that innovative ways to raise funds and(or) save program funds were used by all partners. Even the for-profit private sector became interested in OFPEP activities, with Monsanto Corporation providing a small grant to facilitate weed control work in rice fields targeted by the program.

Alliances and cooperative agreements with ISRA (Senegal) also enabled OFPEP to maintain strong linkages with research organizations, in support of the program. One such cooperative agreement is partly supported by the USAID-funded Natural Resources Management project in Senegal (NRBAR).

Proposals will continue to be submitted to a variety of funding sources, in order to strengthen the program.

Table 8

WINROCK INTERNATIONAL INSTITUTE FOR AGRICULTURAL DEVELOPMENT
FINANCIAL STATUS REPORT
FOR THE PERIOD: AUGUST 1 - 31, 1993

ON-FARM PRODUCTIVITY AND ENHANCEMENT PROJECT
COOPERATIVE AGREEMENT NO. FAO-0158-A-00-2054-00

	MATCHING FUNDS			AID FUNDS			TOTAL	
CATEGORY	BUDGET	THIS PERIOD	CUMULATIVE	BUDGET	THIS PERIOD	CUMULATIVE	THIS PERIOD	CUMULATIVE
SALARIES & WAGES	0.00	0.00	0.00	314,944.00	8,513.15	88,843.29	8,513.15	88,843.29
FRINGE BENEFITS	0.00	0.00	0.00	107,569.00	3,966.80	24,604.81	3,966.80	24,604.61
SHORT-TERM SPECS.	0.00	0.00	0.00	93,676.00	0.00	4,865.25	0.00	4,865.25
TRAVEL & PER DIEM	0.00	0.00	0.00	181,257.00	1,320.00	23,492.75	1,320.00	23,492.75
ALLOWANCES	0.00	0.00	0.00	17,520.00	2,531.03	12,515.37	2,531.03	12,515.37
IN-COUNTRY COSTS	0.00	0.00	0.00	430,265.00	5,315.78	29,469.50	5,315.78	29,469.50
OTHER DIRECT COSTS	0.00	0.00	0.00	30,503.00	4.53	4,572.69	4.53	4,572.69
PROCUREMENT								
VEHICLE	0.00	0.00	0.00	18,000.00	0.00	0.00	0.00	0.00
OFFICE EQUIPMENT	0.00	0.00	0.00	15,500.00	0.00	1,549.43	0.00	1,549.43
SUBCONTRACTS	691,787.00	9,343.90	42,249.75	1,630,456.00	32,954.99	84,050.54	42,298.89	126,300.29
INDIRECT COSTS	354,081.00	9,238.49	78,160.45	159,706.00	2,183.99	20,704.80	11,422.48	98,865.25
	1,045,868.00	18,582.39	120,410.20	2,999,396.00	56,790.27	294,668.23	75,372.66	415,078.43

CERTIFIED TRUE AND CORRECT:

September 14, 1993
DATE

Jay Carter
JAY CARTER
ACCOUNTING MANAGER/CONTRACTS

Appendix 1

OFPEP Steering Committee Meeting

Washington, D.C.

June 23, 1993

ON-FARM PRODUCTIVITY ENHANCEMENT PROGRAM

Steering Committee Meeting
June 23, 1993

In Attendance:

Barbara Halloway - Save the Children
Bill Ramo - USAID/Information Management Resources
Mary Lou Surgi - PVO/University Center
Pierre Antoine - Winrock International
Henry Panlibuton - ACDI
Josh Walton - ACDI
Scott Lewis - Peace Corps
David Challinor - NFTA
Elise Fiber-Smith - Winrock International
Jessica Tjornhom - Winrock International
Tom Osborn - Winrock International

Agenda:

1) Introduction and overview of current program activities
2) Country reports by lead organization in each country
3) Management Information Systems
4) Gender Issues/Activities
5) Detailed Implementation Plan
6) Upcoming Needs
7) Other, Annual Report

All those present introduced themselves and their institutional affiliation. The meeting then opened with a brief statement by Pierre Antoine outlining the agenda and giving some background information on the program. Pierre also discussed his recent visits to the three OFPEP sites in Senegal, The Gambia, and Uganda and commented on the progress made as well as issues that still needed action. Two areas of need included private sector marketing of both innoculum and seed.

Mary Lou Surgi addressed matters of new staff, consultancies, and the newsletter. Sarah Workman, Process and Linkages Specialist based in Dakar, was introduced and her terms of reference were discussed. Short-term technical assistance since OFPEP commenced included: Jane Marten, working with SPSS for base-line survey analysis in Senegal; Danielle Heinen, doing a credit and marketing study in Senegal; and Bill Hargrove, who assisted with soil analysis in Senegal and The Gambia. Mary Lou also described the PVO/University Center mandate and how it is able to contribute to the program.

Josh Walton mentioned that the challenge for The Center was communication; keeping all the partners current on program activities. Mary Lou agreed that The Center should be the clearinghouse for all information generated by the program. Barbara Halloway indicated that she would be interested in receiving more information on the program as they currently hear only from their staff in The Gambia. Mary Lou mentioned the need for more material on Uganda as there is already quite a bit of contact between Senegal and The Gambia.

To address some of this Josh Walton gave a brief report on activities in Uganda. He expected approval for the use of local currency funds which has been a major obstacle for program development in Uganda. Josh was to travel to the country the following week to finalize negotiation and he believed that program activities would begin soon after. Pierre mentioned that Mary Lou should develop a proposal on information coordination. Quarterly and yearly reports by the different projects and submitted to their head institution should be circulated through The Center.

Tom Osborn detailed the current activities in Senegal starting out by commenting on the differences between the On-Farm Seed Project and OFPEP. He commented that the staff is nearly the same in Senegal with the addition of Sarah Workman as Process and Linkages Specialist and Agroforester through The Center. The Gambia has a new lead agency with SCF and the emphasis is still on seed but expanding into agroforestry. Uganda is focusing on BNF and has not done much in the area of seeds. Tom stated that the program is at different stages in the three counties and that it would take time to coordinate among them.

Activities in Senegal are moving forward quite quickly said Tom. World Vision has assisted in the area of cowpea and millet production, has been a catalyst for many of the OFPEP training activities, and has provided support in field activities. CCF, active in five villages, is working to improved cultivation of traditional varieties of millet. In both cases weather has been an issue over the past years.

The kick off workshop, attended by Bob Gurevich, Alphonse Faye, Tom Osborn, Mosis Onim, and Pierre Antoine, was held in early November of last year. Many of the NGO collaborators were present. OFPEP staff explained the program and the new foci of soil fertility and agroforestry. The Advisory Council Meeting of early December also helped to secure OFPEP's role with its collaborators and gave participants a forum for discussing lessons learned from the OFSP and to introduce a framework for future collaboration.

Tom then explained that the baseline survey was already underway in Senegal and included sections on soil fertility, seeds, and agroforesty while focusing on socio-economic data. World Vision, CCF, and Peace Corps are doing the survey work while analysis will take place at the OFPEP office in Dakar. Tom mentioned that The Gambia would profit more from informal survey tools with a PRA strategy rather than the more formal survey being done in Senegal. He was unsure of the best approach for gathering baseline data in Uganda.

Other activities in Senegal include working with ISRA to design the survey and use of the ICRAF D&D approach for the agroforesty section. Implementation of the survey by means of village meetings, training of surveyors, testing of the survey, etc. Elise Smith inquired whether women were involved in the survey process. Tom maintained that women are still very much a focus of the program in all of its activities, including the survey.

Pierre then stated that OFPEP .s an extension program. With seeds we know that the issue is sound technical practices but with soil fertility there is still a question as to what are message should be. Tom added that OFPEP will disseminate promising technologies developed by the national research system in Senegal, ISRA. Josh asked how involved farmers were in identifying needs and in designing the strategy to deal with those needs. Tom clarified that farmers are quite involved; a package is explained in a village meeting, some farmers agree to participate in the program, and the package is adjusted to meet individual needs. Barbara asked if this was done on their own property. Pierre explained that we don't do experiments, we do demonstrations. He added that Francis Oching is more focused on experiments and not the extension nature of the program.

Josh maintained that the extension method is meant to help farmers start experimenting on their own; they will adopt one intervention at a time. We show them the system; we introduce the new technology; the farmers run with the solutions that work for them. Instead of teaching we are facilitating self-teaching. Pierre added that one problem we are facing is the proliferation of new problems and the inability to deal with these problems in an accelerated fashion. Josh maintained that instilling in farmers a sense of ownership is most important when introducing any new technology. Pierre commented that this participatory approach is the "slow" approach and may not work fast enough. Josh ended by saying that it is important to spend time to build a good foundation; then, he said, growth is sustainable.

Scott was then asked to give the group an idea of the Peace Corps involvement with OFPEP. He explained that PC-Senegal has 65 PCVs in Agriculture and Forestry and Natural Resources collaborating with the program in 10 work zones. Interested PCVs agree to work with the program in anything from rice work, surveying, and doing on-farm trials. PC is currently working with Sarah Workman in Senegal and Steve Gronski in The Gambia on trials for nitrogen fixing tree species. Comments were then made by participants as to the possible contribution of Pigeon Pea to the diet, time constraints in preparation, adoption rates, and other issues involved with the introduction of a new food crop. This information would be helpful for a variety of different crops associated with the program.

Josh gave a brief update on Uganda activities. Inoculum is close to being available in the private sector in Uganda but we have made no progress on this front in either Senegal or The Gambia. The issue was again raised as to how best to coordinate activities among the collaborators. Tom mentioned that he has begun to create collaborative program plans with each of the in-country collaborators. The survey and and MIS program would then monitor and strengthen these relationships and co-activities. Reference was made to other Winrock programs such as the Farmer to Farmer Program and African Women Leaders in Agriculture and the Environment Program and their potential contribution to OFPEP.

Barbara mentioned that, although she was not that familiar with SCF work in The Gambia, the majority of activities still center around seed. She

also mentioned that a new country directory will be in The Gambia soon; her name is Diane Well. Josh also announced that Henry Panlibuton would be backstopping the program in Uganda. The work done by ACDI so far has included the training of over 150 extension agents in a variety of activities. Beans and maize have been primary crops promoted especially from Kampals to the Kenya frontier. There are some groups very interested in private rizobium production and other inputs; activities should commence in this area over the next 6 months. There is still a need to estimate demand and project need for these products.

Pierre introduced the topic of technical support citing the future trip of Tom Osborn to Uganda to work with Moses Onim as an example maximizing human resources. Josh indicated that there were local consultants identified in Uganda who had potential and that this could be a source of consultants at lower rates. Mary Lou stated that short-term consultants used by any one of the collaborators could potentially be used at other program sites and that these visits should be coordinated to maximize their use by the program. Tom brought up the subject of marketing at this point indicating that for some crops such as soybeans farmers could buy a higher quality seed than they could produce. There was, therefore, high potential for marketing these types of seeds. Josh added that the marketing potential for seeds is great in Uganda due to the past conflicts in the area.

Elise inquired as to the problems of incorporating women into the program; are women benefiting from OFPEP resources. She indicated that technology as well as policy must be sensitive to gender concerns. Elise then gave the background of Winrock's African Women Leaders Program which has a two part mandate; to develop the leadership of women in certain areas and to facilitate long-term professional development of those women in their country of origin. She then introduce four points important to OFPEP activities. First, base-line survey data should be disaggregated along gender lines. Second, are women more than just benefactors form the program; are they incorporated in the decision making process at all stages. Third, utilize gender analysis as a tool to be included in training of trainers and other program activities. Finally, make gender issues visible in the criteria for program evaluation.

The next subject the participants discussed was the Management Information System for the program. Jessica introduced the approach Winrock endorses taking in the future to include sections on accounting, procurement, and program activities. The participants all agreed that the Detailed Implementation Plan would be pivotal in the design of a monitoring and evaluation system. Josh and Barbara indicated that ACDI and SCF respectively have a M&E system already used for their components of the program. It was decided that technical assistance was needed to design such a system for the entire program.

Finally, it was indicated that a monthly conference call with all stateside backstoppers participating in order to discuss issues such as technical assistance needs and current program activities would facilitate program coordination. The meeting was then closed due to time constraints of many of the participants.

Appendix 2

OFPEP Newsletter

"Of Soils and Seeds"

OF SOILS AND SEEDS

Number 1, 1993

An Expansion of Seed Sowers/Les Semeurs

Newsletter of the On-Farm Productivity Enhancement Program

THE ON-FARM PRODUCTIVITY ENHANCEMENT PROGRAM: LINKING SEEDS AND SOILS AT THE FARM LEVEL

Since October of 1992, the On-Farm Seed Project and the Living Soils Consortium have been integrated into the On-Farm Productivity Enhancement Program(OFPEP). OFPEP will focus on on-farm seed technologies to include production, selection, storage, and handling of seed. In addition, the project will incorporate management technologies to improve soil fertility including biological nitrogen fixation and legume management, bette use of organic matter, and agroforestry interventions. These soil technologies will also assist in erosion control. Along with the technical areas of focus, OFPEP will continue to develop participatory methodologies that are at the heart of OFPEP's outreach. A joint venture of Winrock International, the Living Soils Consortium, and the Center for PVO/University Collaboration in Development (PVO/University Center), OFPEP 's success will largely depend on the participation of many organizations, government ministries and agencies; however, OFPEP's most valued collaborators will be the farmers, local groups, and rural-based NGOs of Senegal, The Gambia, and Uganda.

Currently, the OFPEP networks in Senegal , The Gambia, and Uganda are busy setting in motion the project's initial activities with the assistance of professional staff in Dakar and lead agencies' staff in The Gambia and Uganda. The project's staff includes:

• Dr. Pierre Antoine, Program Director, working out of the Winrock International HQ in Morrilton, Arkansas, USA, will oversee project activities, monitoring, evaluating and administrating both program and personnel.

See OFPEP, p. 2

Village members slow rainfall runoff in their fields, diverting excess water to irrigate community rice fields. In Africa, agricultural and community development are closely linked, making OFPEP's participatory approach all the more appropriate. Photo courtesy of: Jessica Tjornhom

OFPEP from p. 2

• Mr. Alphonse Faye, Agronomy/Seed Technologist, will become West Africa Project Coordinator in OFPEP's second year. Alphonse will be continuing his instrumental research and extension efforts initiated during the OFSP.

• Mr. Steve Gronski, OFPEP Country Coordinator for The Gambia, is on the staff of Save the Children in The Gambia, OFPEP's lead agency in The Gambia, and he will oversee project activities in The Gambia.

• Mr. Francis Oching, OFPEP Country Coordinator for Uganda, in on the staff of Agricultural Cooperative Development International (ACDI) and will oversee activities in Uganda.

• Dr. Moses Onim, East Africa Program Coordinator, will offer technical support to Uganda, facilitate communications between Uganda and other project staff, as well as assist in program monitoring and evaluation.

• Mr. Tom Osborn, West Africa Program Coordinator, will also serve as the Senegal Country Coordinator. Mr. Osborn, who was the Project Leader for the OFSP, will supervise and coordinate project activities in Senegal, as well as , offer support to the West Africa sites and facilitate communication flows among Senegal , Gambia, and US support offices.

• Ms. Mary Lou Surgi, OFPEP Program Coordinator, at the PVO/University Center, will facilitate communications between field and US support offices, supervise information dissemination, and be the primary support for locating technical assistance for the project as needed.

• Ms. Gisèle Sylla, Administrative Assistant in Dakar, will be supplying administrative support to OFPEP.

• Ms. Sarah Workman, Process and Linkages Specialist, will promote linkages and collaboration among PVOs/NGOs, government agencies, and local groups, as well as, monitor, evaluate, and make recommendations on outreach activities of the project. She is based in Dakar.

Of Soils and Seeds, the newsletter of the OFPEP, will be updating the activities of the project, providing information on soils and seeds, and providing a forum for our many partners.

OFPEP COLLABORATORS—HOW THEY WERE SELECTED

At an Advisory Council meeting held in Dakar in November 1992, an interesting question was put forth: "How are groups chosen to collaborate with OFPEP?" Alphonse Faye responded by describing the criteria used in selecting a group or organization who wishes to benefit from the technical support offered by OFPEP.

"The group should, have a strong presence in a rural area, have an agricultural program which would be complemented by activities in seed & soil fertility enhancement, have staff available for project activities, and accept the OFPEP process." Alphonse further elaborated this OFPEP process by explaining that it follows three steps: The first step is the diagnosis—which includes a detailed field study of existing agricultural data to assess the need for a seed and soil fertility program The second step is training--one of the centerpieces of the OFPEP project. The third step is the introduction of selected appropriate technologies. This last step involves several preconditions which must be evaluated. First is a feasibility study which establishes what, if any, techniques could contribute to the solution of the problem. Second is an economic viability analysis of the proposed solution given the particular local situation. An estimate is then made if the proposed solution will be accepted by the local population. And finally, monitoring of the adoption process is done. As the technique is adopted by farmers, it is closely monitored to see what improvements are being made by the farmers and what constraints they encounter.

Over the next years of the OFPEP project, the team hopes to be able to expand the number of local organizations who become involved with the dissemination of these simple technologies that can have a major impact on rural agriculture.

Of Soils and Seeds is the newsletter of the On-Farm Productivity Enhancement Project (OFPEP). OFPEP is designed to assist farmers at the local level in Senegal, The Gambia, and Uganda in seed and soil practices that will increase productivity at the farm level. The newsletter is issued by the Center for PVO/University Collaboration in Development, Bird Building, Western Carolina University, Cullowhee, NC 28723-9056, USA. Telephhone (704) 227-7492, FAX (704) 227-7422. Inquiries, comments, suggestions, and submissions are encouraged and welcome.

OFPEP BASELINE SURVEY IN SENEGAL

OFPEP promotes a participatory approach that bases field activities on observations, interviews, and meetings with farmers thus, making farmers partners in the development process. At previous village meetings, farmers had already expressed their concern about soil fertility, traditional approaches to soil improvement and the need to search for new approaches. A survey was developed around the confidence and feedback already gained from the farmers. Designed to gather qualitative information on soil fertility and natural resources, this baseline survey is being carried out through the OFPEP collaborators: Christian Children's Fund, The Peace Corps, and World Vision. The information from this survey will help the OFPEP staff:

- identify the constraints related to soil fertility improvement and the needs of target groups (i.e. farmers).

- establish a benchmark against which OFPEP and its collaborators will measure progress attributable to their actions.

- develop training materials for extension agents of collaborating partners and farmers.

- identify appropriate applications of technologies generated by ISRA (Senegalese Institue for Agricultural Research).

The survey has been pretested with extension agents and contact farmers at survey workshops at both the village and regional levels. Nearly 100 interviewers from the collaborating organizations have surveyed approximately 900 farmers, during April and May 1993. A preliminary analysis of survey results is underway and full analysis will provide the basis for development of appropriate field activities. A better understanding of the knowledge, attitudes, and on-farm production practices of farmers will be obtained from the survey. Thus, agronomic and agroforestry interventions will be designed to fit farmer's needs and capabilities in terms of soil fertility and conservation.

CREATING THE SURVEY

During a 1992 review of soil fertility research, Alphonse Faye discovered Francis Ganry of IRAT (Institute for Tropical Agronomic Research) had developed a soil fertility survey to use in Senegal. A wealth of research was conducted, and research continued with the soil fertility team of ISRA : Mme Aminita Niane Badiane, the head of the soil fertility team, and Phillipe Robert, a French collaborator. These ISRA researchers, along with ISRA agroforester Babou N'dour, expressed interest in working with the OFPEP activities. The ISRA approach used for development of pilot field activities with farmers had two levels: the macro level, a division of the country into ecological zones, and the micro level, a survey of farm family resources. The ecological zones of the country, based on rainfall, vegetation, and soil type, provided an indication of the potential technical activities that could be undertaken by farmers in that zone; i.e. crop residue management, composting, manure application, liming and improvement plantings. At the micro level, a survey modified from the IRAT/ISRA design and combined with an agroforestry diagnostic and design survey, was pretested with farmers who had previously worked with OFPEP collaborators.

Continued on p. 4

The OFPEP baseline survey was introduced to farmers in village meetings like this one in Senegal. Photo courtesy of: Jessica Tjornhom

Alphonse Faye worked closely with ISRA personnel to combine the two surveys, reduce duplication, and simplify the work of the interviewers. A section on farmer seed sources and practices was added to the revised survey. Jessica Tjornhom, Winrock Program Assistant (temporarily in Senegal), worked with Faye to finalize the layout and wording of the twenty page survey in both English and French.

Included in the survey were:

- Land: area cultivated with what crops, area in fallow,
- Labor: work force available, division by age and gender,
- Equipment: cart, plow, seeder,
- Animals: for animal traction and for cash,
- Crop residues and manure: quantities and utilization of organic materials,
- Current and traditional practices for soil management,
- Time of availability and resource use,
- History and condition of the land: changes in land and tree resources over time, land and land use, availability of water,
- Tree related activities: use of trees/tree products, species that are desirable, species that have been planted.

The survey had a seed component, developed by the OFPEP technical staff, a soil fertility component by the Soil Science Division of ISRA /Bambey, and agroforestry diagnosis & design survey components developed by the International Council for Research in Agroforestry (ICRAF).

CONDUCTING THE SURVEY

Christian Children's Fund used the **simple random method** of farmer selection in their six village working area , the Peace Corps and the World Vision used **multi-stage sampling.** **(See page 5)** In all the being surveyed villages interviewees were chosen by random selection from established census lists of village residents.

USES OF THE SURVEY

Since one cannot assume that all farm families within a zone have the same resources or, that the same technical package will be acceptable to all, the survey provides specific information about the farm family. From this detailed information, OFPEP will develop farm profiles, matching technical interventions to farmer's conditions. In addition, the selection of the technologies to be promoted could be evaluated regarding:

—the feasibility of a given technology to solve a targeted problem.

—economic viability of the proposed technology relative to the particular local situation.

—acceptability of the proposed technology by the local population.

OFPEP emphasizes the participation of women farmers, Africa's chief food producers. Photo courtesy of: Jessica Tjornhom

64

ACDI LEADS OFPEP ACTIVITIES IN UGANDA

Agricultural Cooperative Development International (ACDI) is the lead agency for the OFPEP in Uganda. As part of the Living Soils Consortium, ACDI worked closely with local NGOs in Uganda on soil fertility issues, chiefly Biological Nitrogen-Fixing (BNF) technologies. (See bottom of p. 6) Many of the programs being built upon in Uganda focused on BNF technologies and will now begin to incorporate other technologies, such as on-farm seed selection and storage techniques. To date, baseline studies for various crops have been conducted in the districts of Iganga, Jinja, Kamuli, and Tororo in preparation of OFPEP's growing programs there. The studies have touched on cultural/traditional methods of production, harvesting, storage, and eventual use and distribution of various crops.

In addition to the studies in preparation of upcoming activities, three BNF training workshops have been conducted with a fourth workshop to take place the last week of June and first week of July 1993 in Tororo, covering the districts of Pallisa, Soroti, Tororo, Mbale, Kapchorwa, Moroto, and Kotido. The workshops will center around demonstration plots planted on farmers' fields. The technologies will be applied to raising beans, peanuts, soya, alfalfa, and leucaena.

OFPEP, under the guidance of Francis Oching at ACDI/Uganda, will offer assistance in technical areas, while seeking to establish greater collaboration with local NGOs and community groups in Uganda.

SIMPLE RANDOM METHOD AND MULTI-STAGE SAMPLING**

Simple random method uses a two stage sampling technique, the first stage is to draw sample villages of farmers from a list of all villages of farmers in a random manner (like choosing the winning name in a lottery). The second stage is to randomly select a list of farmers within each village from the sample villages indicated in stage one.

In areas where several villages are included, more steps are normally involved; this is **multi-stage sampling**. All districts in the zone are listed and sample districts chosen randomly from the list. From all the villages in the sample district, the desired number of sample villages is selected. Individual farmers are then designated as described above.

Selection must be carefully made so representative results can be obtained. Advanced consideration and planning of the sampling method and sample sizes is necessary. For example, the number of villages and farmers adequate to represent the sample population must be decided. Choices are based on the purpose of the study and nature of the research (investigative or demonstrative), the organization of the sampling area (lists available), knowledge of the area; and practical consideration of field work and funds available for the study.

**reference: P. Anandajayasekeram (ed.) 1985 [draft]. Teaching notes on the diagnostic phase of OFR/FSP concepts, principles and procedure. CIMMYT Occasional Series: No. 14. Nairobi, Kenya

RHIZOBIA FIELD TRIAL IN THE GAMBIA

The beneficial effect of **Biological-Nitrogen-Fixing** plants has been well documented throughout the world. However, in The Gambia there has been little work done on establishing whether inoculating BNF trees in the nursery is worthwhile. Therefore, OFPEP, in collaboration with Save the Children/USA and Peace Corps/The Gambia, is embarking on on-farm field trials in order to observe the difference in growth of seven tree species inoculated with **Rhizobia** versus non-inoculated trees.

Five sites have been selected in the North Bank Division of The Gambia. These are: Njawara, Chogan, Njaba Kunda, Bakindik, and Fass. Peace Corps Volunteers have contacted one farmer in each area to provide a minimum of 60m x 30m to plant the trees and give protection from grazing, fire, and pruning. The species chosen are: *Leucaena leucocephala, Gliricidia sepium, Sesbania grandiflora, Prospis juliflora, Acacia nilotica, Albizia lebbeck, Cajanus cajan.*

At each village site, four plots will be planted for each of the species listed above. For each species, two plots will be planted with inoculated tree seedlings and two will use seedlings without inoculant. All tree seedlings will be planted at a 1.5m x 1.5m spacing. All seedlings will be started in the Save the Children/USA nursery in Kerewan to assure uniform care.

The soils in the Kerewan nursery have different levels of nutrients from those soils at the various sites, and the nursery soils may contain Rhizobia that might accidentally come in contact with the seedlings that are not to be inoculated. In order to negate the positive or negative influences that the nursery soils might have, all the seedlings will be raised in soils brought in from their designated sites. A complete analysis of soils at the different sites will be done in order to evaluate the effects the trees have on nutrients. The analysis will be conducted by the soils laboratory in Yundum, The Gambia or the one in Senegal. Peace Corps Volunteers will monitor the trees, measuring tree height and stem diameter at ground level every four months. They will also record an observation of overall healthiness.

Steve Gronski of Save and a local farmer in Bakindik, The Gambia collect soil for a distant tree nursery. The trees will be raised to seedlings in the Kerawan nursery but transplanted to this site in Bakindik.

To date, five farmers have been selected. The seven strains of Rhizobia have come from the Nitrogen Fixation n Tropical Agricultural Legumes (NiFTAL) project in Hawaii, and the seedlings have been planted in the nursery. By the end of July, all seedlings will be planted in their respective sites.

Biological Nitrogen Fixing (BNF) plants (most often leguminous plants or trees) refers to certain plant species that may serve as hosts to soil bacteria called Rhizobia. These bacteria in association with the BNF plants are able to convert the nitrogen present in the air into ammonia. The Rhizobia will form nodules on the roots where the conversion or "fixing" of nitrogen will take place. The BNF plant will be able to use the nitrogen in the form of ammonia. This is very important since nitrogen is essential for the growth of all plants. In some cases, the BNF plant will not use all the nitrogen produced in its nodules, so the extra nitrogen will be released into the soil. This nitrogen can then be used by plants that cannot "fix" their own nitrogen.

66

SOIL AND SEED NOTES: ORGANIC MATTER

Organic matter is any material that is derived from a living source (living or deceased) and thus contains carbon compounds. Crop residues and manure are common forms of organic matter one might find being used on a farm.

Organic matter is an important component of soil that directly affects crop production. In striving to reach a level of self-sufficiency, farmers today are cultivating their land more intensively to meet the increasing need for cereal grains. There are also shorter and shorter fallow periods for the land, meaning there is less soil organic matter build up available for the crops. Because cereal plants must take nutrients from the soil to produce grain, the less organic matter and nutrients available, the less grain will be produced.

Organic matter in the soil is important in at least three ways:

1—It influences the physical properties of the soil, especially its structure, thus making it less likely to be eroded by wind and water.

2—Organic matter increases the soil's ability to retain water. The more organic matter, the more the soil will hold water.

3—It influences the soil's fertility because organic matter is comprised of complex chemical compounds that are rich in elemental nutrients usable by plants. Organic matter supports increased microbial activity, increases soil cation exchange capacity, and decays slowly so that its presence has long lasting effects.

The only cost effective way of maintaining the fertility of the soil is to bring in organic matter, since natural regeneration of soil fertility is less and less possible with limited fallow lands and chemical fertilizing is costly as well as short-lived. There are at least two ways to increase organic matter in the soil: through the direct addition of organic amendments, such as manure, and through the addition of composted materials.

Where composting and organic amendments are feasible and socially acceptable, three criteria determine the suitability of using crop residues as a composted material:

1—the quantity of cellulose matter, such as stalks, straw, leaves, etc...available, as well as other factors determining its supply;

2—what the straw is being used for at the present time, if anything, and whether this use can be modified; and

3—traditional soil restoration techniques and current farm practices.

It is not simply matter of burying straw into the ground. For example, in using straw, which is the most available source of organic material for aquatic or rain-fed rice production, farmers should not bury it since it can cause serious problems in wet sandy soils. Burying straw can cause an imbalance of nutritive elements and sometimes lead to toxic excesses being built up in the soils.

(Next issue we will address the issue of composting.)

Goats foraging on whatever they can find during the dry period. In West Africa, crop residues left from the last harvest may be used as animal fodder and the animal manure used for organic fertilizer to grow the next crop.

67

OFPEP TECHNICAL HOTLINE

The availability of appropriate technical information that can help farmers and OFPEP teams to find their own solutions to the problems they face with regards to seed production and soil fertility is an important adjunct to the participatory process that is the cornerstone of OFPEP. In addition to the in-country teams who provide technical assistance to OFPEP collaborators, the **Center for PVO/University Collaboration in Development** is supporting OFPEP activities by establishing a bank of technical experts fromthe Center's member universities in the United States. These professionals are available to answer specific questions in technical areas such as nitrogen fixation, tropical soils, soil fertility, cross-cultural awareness, credit analysis, agronomy, forestry, and many other related questions coming from OFPEP collaborators. The Center contacts them by FAX, telephone or e-mail whenever it receives requests from the field for literature, comments on proposed activities, answers to specific questions, or even just general information on a subject. The Center also has access to library and research facilities to provide backstopping for information needs.

Another service provided by the Center is the recruitment of consultants, either in-country or from outside, who can provide expertise not readily available in program countries. Consultants may be involved in special studies, project design, evaluation, and trouble shooting, or in conducting country or regional workshops. When a request is made and Scope of Work developed by the requesting OFPEP team, it is circulated among the program countries to see if appropriate consultants are available there. If not, the Center can cross-check with its own and other Center members' projects to determine if it is possible to link up with appropriate consultants who are already scheduled to be in the general area who could perform the consultancy on the same trip. In this way, several projects can benefit from sharing information and combining resources to support complementary activities. For more information contact **Center for PVO/University Collaboration in Development, Bird Building, Western Carolina University, Cullowhee, NC 28723-9056, USA. Telephhone (704) 227-7492, FAX (704) 227-7422.**

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68

Appendix 3

Consultancy Report of Jessica D. Tjornhom

Trip Report
OFPEP Senegal

Jessica D. Tjornhom
February 2-April 30, 1993

Background

The On-Farm Productivity Enhancement Program, the second and expanded phase of the On-Farm Seed Project, began activities in October of 1992. With this new phase the Program has diversified its mandate to include soil management and agroforestry activities. In real terms this has meant the addition of a long-term process and linkages specialist; the transfer of program coordination activities in West Africa to Alphonse Faye, the long-term agronomist; an increase in office activity and, therefore, a need for an administrative assistant; and a proliferation of activities performed and supported by the project. It was necessary to ensure that this transition was a smooth one and that the program would evolve administratively to effectively handle new activities. Thus, a need was identified for a person who would develop, organize, institutionalize and document the administrative procedures in the On-Farm Productivity Enhancement Program's West African Office in Dakar, Senegal. As a result, I was sent to work with the project from February 2 to April 31, 1993. Within the first few days after my arrival a Terms of Reference was developed with the input of Alphonse Faye and Tom Osborn. In addition to providing daily administrative support my responsibilities included:

- designing a cataloging system for technical documents
- establishing a filing system for project documents, correspondence, and financial documentation
- operationalizing new and existing software programs, tailoring the software to program needs
- developing a basic project monitoring system to track project activities, activities with collaborators, and project outputs to facilitate reporting
- organizing budgeting procedures to interface with the Winrock and PVO/University Center's budgeting systems
- preparing the terms of reference for the OFPEP Administrative Assistant and for consultants as needed

70

Accomplishments

To a great extent I was able complete to all tasks outlined in the terms of reference to include the following:

- all new software packages were installed on the project computers
- a database for the OFPEP library was created using Paradox an most of the publications were entered before my departure
- the filing systems for correspondence, budgeting and project documents were re-organized
- the monthly budget report and annual projected budget were computerized using Lotus 123 which was responsive to Winrock budgeting requirements
- other administrative needs such as a fax log, personal vehicle use record, photocopy record, etc. were created and put into operation
- a manual was prepared explaining administrative procedures in the office
- the terms of reference were drafted for the new Administrative Assistant, the position was advertised, candidates were interviewed and a qualified person was hired
- organized and coded the baseline survey which was then distributed to our collaborators in Senegal.

MIS System and Database Management

Other accomplishments included the use of DataEase to create a trial reporting system for project activities which would fulfill some program MIS needs. The system designed had two parts. First, one database recorded program activities such as training sessions, meetings, and on-farm visits documenting the date, area, who was involved and what was accomplished. An Activity Report Form was created and is now completed by OFPEP staff members after each visit in the field or training session. Second, a database was developed to document on-farm activities. This part was organized by village and provided useful information on each farmer participating in OFPEP on-farm interventions. The system was designed to interface with Peace Corps recording practices so that the data could be filled in by Volunteers or OFPEP personnel while in the field using a laptop computer. This database should make it easier to determine the impact of OFPEP activities at the farm level, rate of adoption of new interventions, and yield increases due to the different interventions promoted by OFPEP.

71

Recommendations

There are a variety of things still lacking in the project that need to be addressed in the near future. The most urgent need is for a comprehensive yet user friendly MIS system for the program. This system should address six areas:

1. a database of the specific objectives of the OFPEP proposal and tasks, deliverables, indicators and outputs correlated with these objectives;

2. a database of short-tern technical assistance

3. appropriate budgeting practices

4. a database of training and on-farm activities

5. procurement inventory

6. any special informational needs

There is currently a system in place for budget and monthly expense reporting. Also, as described above, a database of training and on-farm activities as well as a database on on-farm interventions (this would fall under special information needs) have been partially developed but not completely operationalized. A logframe style database, as described in area one above, will be possible after the completion of the Detailed Implementation Plan although the appropriate software for this system has yet to be identified. Finally, databases on short-term technical assistance and procurement need to be created. Please see my discussion paper on MIS needs for more detail.

The program must also set up a comprehensive communications system; this is currently being designed. Other continual needs such as computer software and budget support will be dealt with on an as needed with help from the Home Office backstoppers at both The Center and Winrock.

Final Commentary

It is my belief that many of the administrative needs of OFPEP Senegal have been fulfilled by the work accomplished before my departure and the addition of an administrative assistant for the program. It should no longer be necessary for the long-term professionals on the project to spend time on communication, data entry, budgeting, procurement, and other administrative tasks. This will facilitate more activities in the field as envisioned by the OFPEP proposal.

72

Appendix 4

Consultancy Report of Jane Marten

Consultancy Report

Jane Marten
Dakar, Senegal

ON-FARM PRODUCTIVITY ENHANCEMENT PROGRAM (OFPEP)

Data Base Survey

The Data Base Survey was designed by OFPEP technical staff in order to assess the needs of the village farmers and to provide information on the agricultural practices currently in use. The survey selects, at random, approximately 30% of the villages in collaborator work zones to participate in the data collection. The research is carried out by extension agents of OFPEP's collaborators: Peace Corps (PC), World Vision (WV) and Christian Children's Fund (CCF). The random selection process of the individual farmers is left in the hands of the field researcher.

The Data Base Survey has been divided into five main sections.
Data on the village as a unit is the first section within the survey. Questions on crop production, livestock, water source, the working population (breakdown of women, men and children) are addressed at the village level.

The next four sections deal with the individual farmer within the village. The survey is aimed at a farmer who may in turn run his farm with the assistance of several households depending on the familial situation of the farmer. The number of people working on the farm is broken down by gender, age and work duties basis. In theory, it appears that the women's work is with the production of subsistence crops and the men's with the cash crops. There is a specific question on the most difficult periods for the farm, the reasons for the difficulties, and the means of production, i.e. livestock, fertilizer sources, agricultural tools & equipment and the output level of each crop produced.

The livestock has three main divisions: the method of raising the livestock; - available food sources, the work they perform, reasons for keeping livestock; - consumption, sale or for farming, the fertilizer benefits; - technique for gathering the manure, the amount produced. The constraints on both household and cash crop production is addressed.

The third section under the individual farmer data information is concerned specifically with seed selection and source - germination, post and pre-harvest technology currently in use and storage methods.

Agroforestry is the last section on the survey. The gender breakdown in the agroforestry aspect of farm production is addressed. The use of surrounding trees, the source of the trees -planted or naturally occurring - are some topics of the collected information.

The survey addresses the topic of seasonal workers and the availability of farm help during certain periods - ie. the rainy season, the dry season, planting time or harvest time.

The data collected from the survey will be entered into a data base using Lotus 123 software on IBM compatible computers. The data will then be translated into SPSS/PC+ files. The SPSS/PC+ program will then be used for analysis. The priorities for OFPEP are the analysis of the following: agricultural material, tool and labour availability, population and age

structure of the village, use of fertilizer, regeneration of trees and the level of livestock production.

The first reports will be a village by village comparison and secondarily will be a farmer by farmer comparison within the same village and then between villages. An example of an inter-village analysis would be population groups (ie. 20-35, 36-45, 46-55, 56+)
for each village within the same rural community or department.

The data will be entered as it is received from the extension agents. As of 15 July 1993 OFPEP had received 150 surveys from World Vision.

Base Line Survey for OFPEP
Senegal

The survey was designed to assist the OFPEP staff in determining the needs of the rural communities throughout Senegal. The results of the findings will serve as a starting point in meeting those needs in the most suitable manner.

The survey is made of four parts: village generalities, organic materials available and/or being used, agroforestry history of and awareness of crop production results.

Section A.

I. Population

1.1.1 Region 1.1.2 Department 1.1.3 S.Pref
1.1.4 Com Rurale 1.1.5 Village name 1.1.6 Est. date
1.2.1 Village area 1.2.2 Area change 1-3 1.2.3 set 1-2
1.2.4 Why 1.2.5 Population 1.2.6 Active pop

1.2.7. Gender - no response
1.2.7.1 Men (#) 1.2.7.2 Women (#) 1.2.7.3 Child (#)
1.2.8 Ethnicity 1-6(oth) 1.2.9 Seas workers 1-2 1.2.10 Num (#)
1.3.1 Compounds (#) 1.3.2 Households (#) 1.3.3 Wells (#)
1.3.4 Depth of wells (#)

1.3.5 Availability - no response
1.3.5.1 where is the source 1-2
1.3.5.2 Distance off farm (#)
1.3.5.3 Quality on farm 1-3 1.2.5.4 Quality off farm 1-3

II. Land

2.1 Primary land tenure 1-4 2.2 Total cul. area (#ha) 2.3 Total fallow area (#ha) 2.3.1 Annually (#ha)
2.3.2 long/length (#ha)

III. Equipment

3.1 Type of equip available 1-5
3.2 Animals 1-2
3.3 Animal specific 1-7

IV. Types of Crops

75

4.1 Main crops 1-7 (other)
4.2 Limits 1-8 (other)
4.3 Why limits 1(1-3)-5
4.4 Plant growth 1-7
4.5 Rotation 1-3
4.6 Crops no longer cul. 4.7 Why 4.8 Fertilized 1-2
4.9 What type 1-2 4.10 needs met monthly 1-4

SECTION B

I. Characterization of the Agricultural Farms
1.1 Village name 1.2 Compound head 1.3 Farm head
1.4 Ethnic group 1.5 Date of visit 1.6 Interviewer

II. Population
2.1 Population (#) 2.2 working pop (#)

2.3 GENDER - no response
2.3.1 Male (#) 2.3.2 Female (#) 2.3.3 Children (#)
2.3.4. Seasonal residents (#)
2.4 Number of households (#) 2.5 Farm head - age 1-3

2.6 Farm members and their activities - no response
Name:
2.6.1 Sex 1-2 2.6.2 Age 1-5
2.6.3 Work 1-3 (2=1-5) (3=1-4)

2.7 difficulties - no response
2.7.1 Periods 1-3 2.7.2 Cause 1-5
Solutions/comments

III. Means of Production
3.1 Types of agr. equipment 1-8
3.2 Means acquired 1-4 (other)
3.3 Types of tools 1-6

3.4 Inputs used - no response
3.4 Number of fields (#)
3.4.1 area 1-3 3.4.2 fertilizers 1-2 3.4.3 crop type 1-6

3.5 Agricultural production on farm - no response
3.5 Number of fields (#)
3.5.1 area 1-3 3.5.2 # of cartloads 1-5
3.5.3 Quantity sold 1-6 3.5.4 Use of Leftover 1-3
3.5.2 & 3.5.3 broken down into 3 types: grain, straw, shells
3.6 Cereal straw 1-4 3.7 Peanut leaves 1-4

3.8 Annual fallow lands - no response (re-generate lands)
3.8.1 Area 1-3 3.8.2 Animals allowed to graze 1-2
3.8.3 Quantity of grass reaped 1

3.9 Long fallow lands - no response
3.9.1 area 1-3 3.9.2 other vil animals dry season 1-2
3.9.3 other vil animals wet season 1-2
3.9.4 Quantity of grass reaped 1-3

IV. Cattle Raising Conditions

4.1 Farmer have animals 1-2 4.2 What 1-7
4.3 looked after by 1-3 4.4 together 1-2
4.5 Guarded dry season 1-2 4.6 Guarded wet season 1-2
4.7 Unfarmed area 1-[illegible] 4.8 Fallow land cycle 1-3
4.9 Night holding p[illegible]ry 1-2 4.10 night holding place wet 1-2
4.11 Migratory herde[illegible] 2 4.12 Buy feed for livestock 1-2
4.13 What 1-3(other) 4.14 Which animals 1-7
4.15 Animal fattening [illegible] 2 4.16 Which animals 1-3
4.17 Animals intended for 1-3(other)

V. Tethering

5.1 Benefit from tethering last year 1-2

5.2 if yes complete next - no response

5.2.1 kind of animal 1-7 5.2.2 Tethering duration 1-4
5.2.3 Animal origin 1-3 5.2.4 Grazed 1-2
5.2.5 Area covered 1-4
5.3 Manure compared to last year 1-3 5.4 Manure type 1-2
5.5 Manure from neighbor 1-2 5.6 Amount 1-5
5.7 Give to neighbor 1-2 5.8 Amount 1-5

5.9 Use of manure - no response

5.9.1 Crop type 1-7 5.9.2 Distance form compound 1-4
5.9.3 # cartloads 1-5 5.9.4 Used when 1-3

5.10 technique of application - no response

5.10.1 Spreading technique 1-2 5.10.2 Influ. weeding date 1-2 5.11 Manure use same as before 1-2
5.12 Changes 1-3
5.13 HH refuse & millet waste used as organic matter 1-2

SECTION C

I. Seed Survey

1.1 Crops 1-7 1.2 Source 1-5 1.3 Selection 1-4
1.5 Production (seed differ from crop) 1-2
1.6 Harvest plant selection in field 1-2
1.6.1 Criteria 1-4
1.6.2 Head/panicle selection after harvest 1-2
1.7 Storage (seed differ from crop) 1-2
1.8 Treatment 1-3
Gender breakdown for each category ??????

SECTION D

AGROFORESTRY

I. On farm tour observations.

II. Land use history.

2.1 How long (#) 2.2 Land use at beginning
2.3 Changes 2.4 Why changes
2.5 Land condition at beginning 1-3
2.6 Changes in vegetation 1-2 2.7 Changes in soil 1-3
2.8 Causes of change in vegetation 1-2
2.9 Causes of change in soil 1-6

III. Farm resources

3.1 Land - no response
3.1.1 Household area - no response
3.1.1.1 Farmed land (=ha) 3.1.1.2 fallow land (=ha) 3.1.1.3 pasture (=)

3.1.2 Land use - no response ??????%%
3.1.2.1 Grazing 3.1.2.2 Fuelwood gathering
3.1.2.3 Firewood gathering
3.1.3 Land ownership system 1-5 3.1.4 Land tenure system 1-2

3.2 Labour - no response
3.2.1 Work on the farm - no response
3.2.1.1 How many men work full time (=)
3.2.1.2 How many women work full time (#)
3.2.1.3 How many children work full time (=)
3.2.1.1 How many men work part time (#)
3.2.1.2 How many women work part time (=)
3.2.1.3 How many children work part time (#)
3.2.1.1 How many men work seasonally (#)
3.2.1.2 How many women work seasonally (#)
3.2.1.3 How many children seasonally (#)
3.2.1.1 Men which operations
3.2.1.2 Women which operations
3.2.1.3 Children which operations
3.2.2 Hire labour 1-2 3.2.2.1 What operations 1-3 open
3.2.2.2 How long (#) 3.2.2.3 What cost (#) 3.2.2.4 Pd when
3.2.2.5 Source of cash for payment

3.3 Water - no response
3.3.1 Where is the source 1-2
3.3.2 What is the water used for 1-5(other)
3.3.3 What is the distance of off farm source (#)
3.3.4 What is the onfarm quality 1-3
3.3.5 What is the off farm quality 1-3
3.3.6 Is there enough water for the nursery 1-2

3.4 Trees - no response
3.4.1 Seven most useful tree species on the farm 1-7open
3.4.2 What are they used for 1-13
3.4.3 How are the trees regenerated 1-2
3.4.4 How often are they planted 1-2
3.4.5 Who plants the trees 1-4
3.4.6 What kind of trees have been planted 1-7open
3.4.7 For what purpose 1-13 other
3.4.8 What is the seedlings' origin 1-5 other
3.4.9 How does the farmer obtain seedling 1-4 other
3.4.10 Where are the trees usually planted 1-8 other
3.4.11 What is the tree use right in the area 1-2
3.4.12 Which trees are used privately 1-2
3.4.13 Which trees are used commonly 1-2
3.4.14 What off farm tree resources used by household 1-7 other
3.4.15 How protected 1-4
3.4.16 Problems for nursery implementation 1-7 other
3.4.17 Constraints for planting 1-8

3.5 Crops - no response
3.5.1 Main food crops 1-5other 3.5.2 Main cash crops 1-4other
3.5.3 Resource constraints for HH crop production 1-8 other
3.5.4 Management constraints for crop production 1(1-3)-7 other
3.5.5 Constraints on plant growth 1-11
3.5.6 Market problems 1-3

3.6 Livestock production - no response
3.6.1 What livestock/how many 1-7 (sub numbering)other
3.6.2 What purpose 1-7 other 3.6.3.1 Main sources-grass 1-4
3.6.3.2 Main sources-fodder 1-3
3.6.4 Main tree species for fodder 1-7 in priority
3.6.5 Which trees for additional fodder 1-4 open
3.6.6 What main constraints livestock production 1-14 (other)

OFPEP BASELINE SURVEY -
DATA ENTRY NUMBERING SYSTEM

The number on the left hand side corresponds to the numbers in SPSS/PC+ databases: BLS.WK3 - village generalities (Section A) and FARMER.WK3 - Individual Farmer Records (Sections B, C, D). The numbers on the right hand side are the original numbers in the BLS survey. The reason the numbers have been changed in the SPSS/PC+ data base is to facilitate the data/report and graph generation and avoid the problem of dual numbering which lies in the original system. The database on the LOTUS is kept the same to facilitate data entry. IN the translation process the columns in the LOTUS are given the new values. The translation process is simple and explained in the SPSS/PC+ manual. Each collaborator has it's own worksheet/data base. Therefore if the staff member desires to keep the collaborators separate the translation process will need to be given a second name - ie. BLS.CCF, BLS.PC, FARMER.CCF, and FARMER.PC. It amy facilitate matters to name them in this fashion as the WV surveys (the only currently available information) is named BLS.WV and FARMER.WV.

The second set of numbers is the same but in the reverse order in order to facilitate looking up info in reference to the original survey. There are some differences between the french survey and the english survey on the hard copies but in the database they are the same.

Section A - Village Generalities.

1.1 Collaborator
1.1.1 = 1.1.1 1.1.2 = 1.1.2 1.1.3 = 1.1.3
1.1.4 = 1.1.4 1.1.5 = 1.1.5 1.1.6 = 1.1.6
1.1.7 = 1.2.1 1.1.8 = 1.2.2 1.1.9 = 1.2.3 1.1.10 = 1.2.4

1.2.1 = 1.2.5 1.2.2 = 1.2.6 1.2.3 = 1.2.7.1
1.2.4 = 1.2.7.2 1.2.5 = 1.2.7.3 1.2.6 = 1.2.8
1.2.7 = 1.2.9 1.2.8 = 1.2.10 1.2.9 = 1.3.1 1.2.10 = 1.3.2 1.2.11 = 1.3.3 1.2.12 = 1.3.4
1.2.13 = 1.3.5.1 1.2.14 = 1.3.5.2 1.2.15 = 1.3.5.3 1.2.16 = 1.3.5.4

1.3.1 = 2.1 1.3.2 = 2.2 1.3.3 = 2.3 1.4.1
= 3.1 1.4.2 = 3.2 1.4.3 = 3.3
1.5.1 = 4.1 1.5.2 = 4.2 1.5.3 = 4.3 1.5.4
= 4.4 1.5.5 = 4.5 1.5.6 = 4.6
1.5.7 = 4.7 1.5.8 = 4.8 1.5.9 = 4.9 1.5.10
= 4.10

SECTION B-Farmer Specific - Organic Matter, Seeds and Agroforestry

2.1.1 = B1.1 2.1.2 = B1.2 2.1.3 = B1.3
2.1.4 = B2.5 2.1.5 = B1.4
B1.5 & B1.6 are not entered.

2.2.1 = B2.1 2.2.2 = B2.2 2.2.3 = B2.3.1 2.2.4 =
B2.3.2 2.2.5 = B2.3.3 2.2.6 = B2.3.4
2.2.7 = B2.4

2.3.1 = B2.6 2.3.2 = B2.6.1 2.3.3 = B2.6.2 2.3.4
= B2.6.3 2.4.1 = B2.7.1 2.4.2 = B2.7.2

2.5.1 = B3.1/3.3 2.5.2 = B3.2 2.5.3 = B3.4
2.5.4 = B3.4.1 2.5.5 = B3.4.2 2.5.6 = B3.4.3

2.6.1 = D3.5.1 2.6.2 = D3.5.2 2.6.3 = D3.5.3
2.6.4 = D3.5.4 2.6.5 = D3.5.5 2.6.6 = D3.5.6

2.7.1 = B3.5 2.7.2 = B3.5.1 2.7.3 = B3.5.2
2.7.4 = B3.5.2 2.7.5 = B3.5.2 2.7.6 = B3.5.3
2.7.7 = B3.5.3 2.7.8 = B3.5.3 2.7.9 = B3.5.4
2.7.10 = B3.6 2.7.11 = B3.7

2.8.1 = B3.8.1 2.8.2 = B3.8.2 2.8.3 = B3.8.3 2.8.4
= B3.9.1 2.8.5 = B3.9.2 2.8.6 = B3.9.3
2.8.7 = B3.9.4 2.8.8 = B4.8 2.8.9 = B4.7

Livestock

3.1.1 = B4.1 3.1.2 = B4.2 3.1.3 = B4.17
3.1.4 = B4.3 3.1.5 = B4.4 3.1.6 = B4.5
3.1.7 = B4.6 3.1.8 = B4.9 3.1.9 = B4.10
3.1.10 = B4.11

3.2.1 = D3.6.1.1 3.2.2 = D3.6.3.3 3.2.3 = D3.6.4
3.2.4 = D3.6.5 3.2.5 = B4.12 3.2.6 = B4.13
3.2.7 = B4.14 3.2.8 = B4.15 3.2.9 = B4.16

3.3.1 = B5.1 3.3.2 = B5.2.1 3.3.3 = B5.2.2
3.3.4 = B5.2.3 3.3.5 = B5.2.4 3.3.6 = B5.2.5
3.3.7 = D3.6.6

3.4.1 = B5.3 3.4.2 = B5.4 3.4.3 = B5.5
3.4.4 = B5.6 3.4.5 = B5.7 3.4.6 = B5.8
3.4.7 = B5.10.1 3.4.8 = B5.10.2 3.4.9 = B5.11
3.4.10 = B5.12 3.4.11 = B5.13 3.4.12 = B5.9.1
3.4.13 = B5.9.2 3.4.14 = B5.9.3 3.4.15 = B5.9.4

3.4.16 = B5.9.5

Seed Survey

4.1.1 = C1.1
4.1.2 = C1.2
4.1.3 = C1.3
4.1.4 = C1.4
4.1.5 = C1.5
4.1.6 = C1.6
4.1.7 = C1.6.2
4.1.8 = C1.6.3
4.1.9 = C1.7
4.1.10 = C1.8

Agroforestry

5.1.1 = D2.1
5.1.2 = D2.3
5.1.3 = D2.3
5.1.4 = D2.4
5.1.5 = D2.5
5.1.6 = D2.6
5.1.7 = D2.7
5.1.8 = D2.8
5.1.9 = D2.9
5.2.1 = D3.1.1.1
5.2.2 = D3.1.1.2
5.2.3 = D3.1.1.3
5.2.4 = D3.1.2.1
5.2.5 = D3.1.2.2
5.2.6 = D3.2.2.3
5.3.1 = D3.1.3
5.3.2 = D3.1.4

5.4.1 = D3.2.1.1
5.4.2 = D3.2.1.1.1
5.4.3 = D3.2.1.1.2
5.4.4 = D3.2.1.1.3
5.4.5 = D3.2.1.2
5.4.6 = D3.2.1.2.1
547
= D3.2.1.2.2
5.4.8 = D3.2.1.2.3
5.4.9 = D3.2.1.3
5.4.10 = D3.2.1.3.1
5.4.11 = D3.2.1.3.2
5.4.12 = D3.2.1.3.3
5.4.13 = D3.2.1.4.1
5.4.14 = D3.2.1.4.2
5.4.15 = D3.2.1.4.3
5.4.16 = D3.2.2
5.4.17 = D3.2.2.1
5.4.18 = D3.2.2.2
5.4.19 = D3.2.2.3
5.4.20 = D3.2.2.4
5.4.21 = D3.2.2.5

5.5.1 = D3.3.1
5.5.2 = D3.3.2
5.5.3 = D3.3.3
5.5.4 = D3.3.4
5.5.5 = D3.3.5
5.5.6 = D3.3.6

5.6.1 = D3.4.1
5.6.2 = D3.4.2
5.6.3 = D3.4.3
5.6.4 = D3.4.4
5.6.5 = D3.4.5
5.6.6 = D3.4.6
5.6.7 = D3.4.7
5.6.8 = D3.4.8
5.6.9 = D3.4.9
5.6.10 = D3.4.10
5.6.11 = D3.4.11
5.6.12 = D3.4.12
5.6.13 = D3.4.13
5.6.14 = D3.4.14
5.6.15 = D3.4.15
5.6.16 = D3.4.16
5.6.17 = D3.4.17

Section A

1 - N/E
1.1.1 - 1.1.1.
1.1.2 - 1.1.2
1.1.3 - 1.1.3
1.1.4 - 1.1.4
1.1.5 - 1.1.5
1.1.6 - 1.1.6
1.2.1 - 1.1.7
1.2.2 -1.1.8
1.2.3 - 1.1.9
1.2.4 - 1.1.10

1.2.5 -1.2.1
1.2.6 - 1.2.2
1.2.7 - N/E
1.2.7.1 - 1.2.3
1.2.7.2 - 1.2.4
1.2.7.3 - 1.2.5
1.2.8 - 1.2.6
1.2.9. - 1.2.7
1.2.10 - 1.2.8
1.3.1 - 1.2.9
1.3.2 - 1.2.10
1.3.3 - 1.2.11
1.3.4 - 1.2.12
1.3.5 - N/E
1.3.5.1 - 1.2.13
1.3.5.2 - 1.2.14
1.3.5.3 - 1.2.15
1.3.5.4 - 1.2.16
2 - N/E
2.1 -1.3.1
2.2 - 1.3.2
2.3 - 1.3.3
2.3.1 - 1.3.4
2.3.2 - 1.3.5
3 - N/E
3.1 - 1.4.1
3.2 - 1.4.2
3.3 - 1.4.3
4 - N/E
4.1 - 1.5.1
4.2 - 1.5.2
4.3 - 1.5.3
4.4 - 1.5.4
4.5 - 1.5.5
4.6 - 1.5.6
4.7 - 1.5.7
4.8 - 1.5.8
4.9 - 1.5.9
4.10 - 1.5.10

-81

Section B

1N/E	1.1 - 2.1.1	1.2 - 2.1.2	
1.3 - 2.1.3	1.4 - 2.1.4	1.5 - N/E	
1.6 - N/E	2 - N/E	2.1 - 2.2.1	
2.2 - 2.2.2	2.3 - N/E	2.3.1 - 2.2.3	
2.3.2 - 2.2.4	2.3.3 - 2.2.5	2.3.4 - 2.2.6	
2.4 - 2.2.7	2.5 - 2.1.4	2.6 - 2.3.1	
2.6.1 - 2.3.2	2.6.2 - 2.3.3	2.6.3 - 2.3.4	
2.7 - N/E	2.7.1 - 2.4.1	2.7.2 - 2.4.2	
Solutions - N/E	Observations - N/E	3 - N/E	
3.1 - 2.5.1	3.2 - 2.5.2	3.3 - 2.5.1	
3.4 - 2.5.3	3.4.1 - 2.5.4	3.4.2 - 2.5.5	
3.4.3 - 2.5.6	3.5 - 2.7.1	3.5.1 - 2.7.2	
3.5.2/1 - 2.7.3	3.5.2/2 - 2.7.4	3.5.2/3 - 2.7.5	
3.5.3/1 - 2.7.6	3.5.3/2 - 2.7.7	3.5.3/3 - 2.7.8	
3.5.4 - 2.7.9	3.6 - 2.7.10	3.7 - 2.7.11	
3.8 - N/E	3.8.1 - 2.8.1	3.8.2 - 2.8.2	
3.8.3 - 2.8.3	3.9 - N/E	3.9.1 - 2.8.4	
3.9.2 - 2.8.5	3.9.3 - 2.8.6	3.9.4 - 2.8.7	
4 - N/E	4.1 - 3.1.1	4.2 - 3.1.2	
4.3 - 3.1.4	4.4 - 3.1.5	4.5 - 3.1.6	
4.6 - 3.1.7	4.7 - 2.8.9	4.8 - 2.8.8	
4.9 - 3.1.8	4.10 - 3.1.9	4.11 - 3.1.10	
4.12 - 3.2.5	4.13 - 3.2.6	4.14 - 3.2.7	
4.15 - 3.2.8	4.16 - 3.2.9	4.17 - 3.1.3	
5 - N/E	5.1	5.2 - N/E	
5.2.1	5.2.2	5.2.3	
5.2.4	5.2.5	5.3	
5.4	5.5	5.6	
5.7	5.8	5.9 - N/E	
5.9.1	5.9.2	5.9.3	
5.9.4	5.9.5	5.10 - N/E	
5.10.1	5.10.2	5.11	
5.12			
5.13			

Section C

1.1	1.2	1.3
1.4	1.5	1.6
1.7	1.8	1.9

Section C (french survey) Section D (english survey)

1 - N/E	2 - N/E	2.1	
2.2	2.3	2.4	
2.5	2.6	2.7	
2.8	2.9	3 - N/E	
3.1 - N/E	3.1.1 - N/E	3.1.1.1	
3.1.1.2	3.1.1.3	3.1.2 - N/E	
3.1.2.1	3.1.2.2	3.1.2.3	
3.1.3	3.1.4	3.2 - N/E	
3.2.1 - N/E	3.2.1.1	3.2.1.1.1	
3.2.1.1.2	3.2.1.1.3	3.2.1.2	
3.2.1.2.1	3.2.1.2.2	3.2.1.2.3	

3.2.1.3 3.2.1.3.1 3.2.1.3.2
3.2.1.3.3 3.2.1.4 3.2.1.4.1
3.2.1.4.2 3.2.1.4.3 3.2.2
3.2.2.1 3.2.2.2 3.2.2.3
3.2.2.4 3.2.2.5 3.3 - N/E
3.3.1 3.3.2 3.3.3
3.3.4 3.3.5 3.3.6
3.4 - N/E 3.4.1 3.4.2
3.4.3 3.4.4 3.4.5
3.4.6 3.4.7 3.4.8
3.4.9 3.4.10 3.4.11
3.4.12 3.4.13 3.4.14
3.4.15 3.4.16 3.4.17
3.5 - N/E 3.5.1 3.5.2
3.5.3 3.5.4 3.5.5
3.5.6 3.6 - N/E 3.6.1
3.6.2 3.6.3 - N/E 3.6.3.1
3.6.3 2 3.6.4 3.6.5
3.6.6

THE FOLLOWING IS THE NEW NUMBERING SYSTEM IMPOSED IN THE SPSS/PC + PROGRAM. THE NAMES OF THE CATEGORIES ARE NOT APPERAING ON THE SCREEN, ONLY THE NUMBERS. IN ORDER TO CHOSE THE VARIABLES NECESSARY, CHECK THE NUMBER AND ASK THE PROGRAM TO CALL UP THE APPROPRIATE VARIABLES.

Section A - Village Generalities.

1.1 Collaborator
1.1.1 Region 1.1.2 Department
1.1.3 Sub-Prefecture 1.1.4 Communite rurale
1.1.5 Village name 1.1.6 Established date
1.1.7 Village area 1.1.8 Has area changed
1.1.9 Are limits set 1.1.10 Why are they set
1.2.1 Population 1.2.2 Active pop
1.2.3 Men 1.2.4 Women
1.2.5 Child 1.2.6 Ethnicity
1.2.7 Seas workers 1.2.8 # of seas. wkrs.
1.2.9 Compounds 1.2.10 Households
1.2.11 Wells 1.2.12 Depth of wells
1.2.13 Where is water source 1.2.14 Distance/out of village 1.2.15 Quality/in village 1.2.16 Quality/out of village

1.3.1 Primary land tenure 1.3.2 Total cul. area
1.3.3 Total fallow area 1.3.4 Annual fallow area 1.3.5 Long fallow area

1.4.1 Type/farm equip available 1.4.2 Animals in village 1 . 4 . 3 Animal specific

1.5.1 Main crops 1.5.2 Resource limits crop
1.5.3 Constraints limit crop 1.5.4 Constraint plant growth
1.5.5 Crop rotation 1.5.6 Crops no longer cul. 1.5.7 Why no longer cultivated 1.5.8 Were those fertilized
1.5.9 What type of fertilization was used for those crops
1.5.10 How many months are food needs met by the village

1.6 Farmer specific sub-form (5 per village)

SECTION B-Farmer Specific - Organic Matter, Seeds and Agroforestry

2.1.1 Village name 2.1.2 Compound head 2.1.3 Farm head
2.1.4 Farm head age 2.1.5 Ethnic group

2.2.1 Population of farm 2.2.2 Working pop
2.2.3 Male 2.2.4 Female
2.2.5 Children 2.2.6 Seasonal residents
2.2.7 Number of households

2.3.1 Worker ID by number 2.3.2 Sex 2.3.3 Age
2.3.4 Work done by individual

2.4.1 Most difficult periods 2.4.2 Cause of difficulties
2.5.1 Types/tools & equipment 2.5.2 Means acquired
2.5.3 Field 2.5.4 Area of field
2.5.5 Fertilizers used in field 2.5.6 Crop type in field

2.6.1 Main food crops 2.6.2 Main cash crops
2.6.3 Resource constraints for HH crop production
2.6.4 Management constraints for crop production
2.6.5 Constraints on plant growth
2.6.6 Market problems

2.7.1 Field 2.7.2 Area of field
2.7.3 # of cartloads of grain 2.7.4 # of cartloads of straw
2.7.5 # of cartloads of shells 2.7.6 Quantity/grain sold
2.7.7 Quantity/straw sold 2.7.8 Quantity/shell sold 2.7.9 Use of field leftover 2.7.10 What/done w cereal straw 2.7.11 What/done with peanut leaves

2.8.1 Area/annual fallow lands 2.8.2 Animals allowed to graze 2.8.3 Quantity of grass reaped 2.8.4 Area/long fallow lands 2.8.5 Other animals dry season 2.8.6 Other animals wet season 2.8.7 Quantity of grass reaped 2.8.8 Fallow land cycle 2.8.10 Many unfarmed areas

Livestock
3.1.1 Farmer have animals 3.1.2 What type
3.1.3 Kept for what purpose 3.1.4 Looked after by 3.1.5 Grazed together 3.1.6 Guarded dry season 3.1.7 Guarded wet season 3.1.8 Night holding place dry 3.1.9 Night holding place wet 3.1.10 Migratory herders

3.2.1 Main feed sources-grass 3.2.2 Main feed sources-fodder 3.2.3 Main tree species/fodder 3.2.4 Which trees/add. fodder
3.2.5 Buy feed for livestock 3.2.6 What type
3.2.7 For which animals 3.2.8 Animal fattening 329 Which animals fattened

3.3.1 Benefit/tethering last year 3.3.2 What kind of animal 3.3.3 Tethering duration 3.3.4 Tethered ani. origin 3.3.5 Was

tethered animal grazed 3.3.6 What area covered
3.3.7 What main constraints livestock production

3.4.1 Manure compared/last year 3.4.2 Manure type
3.4.3 Manure from neighbor 3.4.4 Amount
3.4.5 Manure to neighbor 3.4.6 Amount
3.4.7 Spreading technique 3.4.8 Influ. weeding date
3.4.9 Manure use same as before 3.4.10 Changes
3.4.11 HH refuse & millet waste used as organic matter
3.4.12 Crop type manure used on 3.4.13 Distance field/compound
3.4.14 # cartloads used 3.4.15 Area covered
3.4.16 When used

I. Seed Survey
4.1.1 Crops 4.1.2 Seed source
4.1.3 Seed selection 4.1.4 Germination testing
4.1.5 Seed prod differ from crop 4.1.6 Pre hrvst select
4.1.7 Criteria 4.1.8 post hrvst select
4.1.9 Seed storage differ/crop 4.1.10 Treatment 1-3

AGROFORESTRY
5. On farm tour observations.
5.1.1 How long 5.1.2 Land use at beginning
5.1.3 Changes 5.1.4 Why changes
5.1.5 Land cond. at beginning 5.1.6 Changes in vegetation
5.1.7 Changes in soil 5.1.8 Causes/change in vege
5.1.9 Causes of change in soil

5.2.1 Farmed land 5.2.2 Fallow land 523
Pasture land 5.2.4 Land use - grazing 525
Land use - fuelwood 5.2.6 Land use - fruit
5.3.1 Land ownership system 5.3.2 Land tenure system

5.4.1 Full time workers 5.4.2 Men/work full time
5.4.3 Women/work full time 5.4.4 Child/work full time
5.4.5 Part time workers 5.4.6 Men/work part time
5.4.7 Women/work part time 5.4.8 Children/work part time
5.4.9 Seasonal workers 5.4.10 Men/work seasonally
5.4.11 Women/work seasonally 5.4.12 Children/seasonally
5.4.13 Men which operations 5.4.14 Women which operations 5.4.15 Child which operations 5.4.16 Hire labour
5.4.17 What operations 5.4.18 How long
5.4.19 What cost 5.4.20 Pd when
5.4.21 Source cash for payment

5.5.1 Water source 5.5.2 Water use
5.5.3 Distance/off-farm source 5.5.4 On-farm quality
5.5.5 Off-farm quality 5.5.6 Enough water/nursery

5.6.1 Most useful tree species on-farm
5.6.2 What are they used for 5.6.3 Trees regenerated
5.6.4 How often are they planted 5.6.5 Who plants the trees
5.6.6 What kind/trees have been planted
5.6.7 For what purpose 5.6.8 Seedlings' origin
5.6.9 How seedling obtained 5.6.10 Where trees planted

85

5.6.13 Trees used commonly
5.6.14 What off farm tree resources used by household
5.6.15 How protected 5.6.16 Problems/nursery imple 5.6.17 Constraints for planting

Set and Design of database.

The village generalities should be set up once for each village. Individual farmer information will then be available under the village file. The key cells for analysis on the village level are 1.1.5 - the village name and 1.1.3 - the sous-prefecture which will automatically be registered with the village name.

The farmer specific information will be readily available from the village table. The key cells for identification will be
2.1.3 - farm heads name.

Each section of the farmer specific information will be denoted by a number and then a sub-number for specifics within that heading. IE. all livestock information begins with 3 Number of livestock and use of livestock information will begin with 3.1 - 3.1.1 Whether the farmer has animals, 3.1.2 What type of animals does he have. Feed related questions will be under 3.2. The analysis can then be carried out by section or by question specific.

Some sections may need cross referencing. For example, feed related questions can be both livestock and agroforestry.
For example 3.2.3 Main tree species for fodder. In this instance the key word will be tree. All tree related information can be called up by requesting all questions with the word tree in it.

Are there any other category references that will be necessary ?

The database will be stored in Lotus 123 software. From this dbase reports can be generated and data analyzed with any functions of which the Lotus program is capable. The second software for analysis will be the SPSS/PC+. The data from Lotus will be transferred to SPSS as necessary. The method to translate data will recorded in a manual to facilitate this process for anyone continuing the Base Line Survey analysis on SPSS.

BLS SURVEY - FARMER SPECIFIC DBASE CODING

1.1 - 1.4 - Alpha

1.5 & 1.6 - No entry

2.1 - 2.4 - 1=>10, 2=11-20, 3=21-30, 4=31-40, 5=41+

2.5 - 1=20-35, 2=36-50, 3=51+

2.6 - 2.6.3 ??

2.7.1 - 1=harvesting - crop processing/storage, 2=storage - field clearing, 3=rainy season

96

2.7.2 - 1=lack of animal labour, 2=lack of human labour, 3=lack of inputs, 4=lack of food/money, 5=lack of rain

3.1 - 1=donkey cart, 2=ground-nut lifter, 3=horse cart, 4=hoe, 5=multipurpose tool bar, 6=ox cart, 7=ariana, 8=seeders

3.2 - 1=bought by farmer, 2=borrowed, 3=hired, 4=other

3.3 - 1=pitch fork, 2=rake, 3=wheelbarrow, 4=hilaire, 5=shovel 6=daba

3.4 - direct to number of fields

3.4.1 - 1=.5 - 3.5ha, 2=3.5-5ha, 3=5+ha

3.4.2 - 1=manure, 2=chemical

3.4.3 - 1=peanut, 2=millet, 3=maize, 4=cowpea, 5=rice, 6=sorghum

3.5 - direct to number of fields

3.5.1 - 1=.5 - 5ha, 2=5 - 10ha, 3=10+

3.5.2/1/2/3 1=1-5, 2=5-10, 3=10-20, 4=20-30, 5=30+

3.5.3/1/2/3 1=0-10%, 2=10-20%, 3=20-40%, 4=40-60%, 5=60-80%, 6=80%+

3.5.4 - 1=for animal feeding, 2=human consumption, 3=construction/fencing

3.6 & 3.7 1=left in the field, 2=kept, 3=gathered, 4=sold

3.8.1 - 1=.5-5ha, 2=5-10ha, 3=10+

3.8.2 1=yes, 2=no

3.8.3 1=1-3, 2=3-6, 3=6+

3.9.1 1=.5-5ha, 2=5-10ha, 3=10+

3.9.2 & 3.9.3 1=yes, 2=no

3.9.4 1=1-3, 2=3.6, 3=6+

4.1 1=yes, 2=no

4.2 1=cows, 2=sheep, 3=goats, 4=draught animals, 5=horses, 6=poultry, 7=donkeys

4.3 1=their owner, 2=a shepard, 3=a herd head

4.4 - 4.7 1=yes, 2=no

4.8 1=1-2yrs, 2=2-4yrs, 3=4+yrs

4.9 - 4.12 1=yes, 2=no

4.13 1=concentrated, 2=straw, 3=other

4.14 1=cows, 2=sheep, 3=goats, 4=draught animals, 5=horses, 6=poultry, 7=donkeys

4.15 1=yes, 2=no

4.16 1=cows, 2=sheep, 3=goats

4.17 1=household consumption, 2=sale, 3=other

5.1 1=yes, 2=no

5.2.1 1=cows, 2=sheep, 3=goats, 4=draught animals, 5=horses, 6=poultry, 7=donkeys

5.2.2 1=1-3 mo/yr, 2=3-6 mo/yr, 3=6-9 mo/yr, 4=9-12 mo/yr

5.2.3 1=owned by farmer, 2=tended for others, 3=other

5.2.4 1=yes, 2=no

5.2.5 1=.25-1ha, 2=1-2ha, 3=2-4ha, 4=4+ha

5.3 - 1=inferior, 2=equal, 3=superior

5.4 - 1=powdered, 2=patties

5.5 - 1=yes, 2=no

5.6 - 1=1-5, 2=5-10, 3=10-20, 4=20-30, 5=30+

5.7 - 1=yes, 2=no

5.8 - 1=1-5, 2=5-10, 3=10-20, 4=20-30, 5=30+

5.9.1 1=peanut, 2=millet, 3=maize, 4=cowpea, 5=rice, 6=sorghum, 7=other

5.9.2 1=near, 2=medium, 3=far, 4=very far

5.9.3 1=1-5, 2=5-10, 3=10-20, 4=20-30, 5=30+

5.9.4 1=before clearing, 2=after clearing, 3=during the growing season

5.10.1 1=on top of the soil, 2=integrated into soil

5.10.2 1=yes, 2=no

5.11 1=yes, 2=no

5.12 1=manure management, 2=quantity used, 3=time of application

5.13 1=yes, 2=no

SECTION B ENGLISH/SECTION C FRENCH

1.1 1=peanut, 2=millet, 3=maize, 4=cowpea, 5=rice, 6=sorghum, 7=cotton

1.2 1=self, 2=neighbour, 3=market, 4=store, 5=project/Gov/NGO

1.3 1=visual aids, 2=sieving, 3=winnowing, 4=other

1.4 & 1.5 1=yes, 1=no

1.6 1=yes, 2=no,

1.6.1 1=height, 2=maturity, 3=health/colour, 4=size of head, 5=number of tillers

1.6.2 & 1.7 1=yes, 2=no

1.8 = 1=chemical, 2=neem, 3=other

SECTION D ENGLISH/SECTION C FRENCH

2.1 1=>10, 2=11-20, 3=21-30, 4=31-40, 5=41-50, 6=51-60, 7=61+

2.2 -2.4 ALPHA

2.5 1=high fertility, 2=medium fertility, 3=low fertility

2.6 1=number of trees decreased, 2=number of trees increased

2.7 1=soil fertility decreased, 2=soil fertility increased, 3= no change in soil fertility

2.8 1=trees are cut down to facilitate mechanization
2=trees are protected by the farmer

2.9 1=lack of organic fertilizer, 2=lack of mineral fertilizer, 3=lack of both, 4=presence of organic fertilizer, 5=presence of mineral fertilizer, 6=presence of both

3.1.1.1-3 1=>5, 2=6-10, 3=11-20, 4=21-30, 5=31-40, 6=41+

3.1.2.1-3 alpha

3.1.3 1=private, 2=borrowed, 3=rented, 4=pledged, 5=other

3.1.4 1-customary law, 2=government regulations

3.2.1.1-1-3, 3.2.1.2-1-3, 3.2.1.3-1-3, 3.2.1.4-1-3 - 1=>5, 2=6-10, 3=11-20, 4=21-30, 5=31-40, 6=41+

3.2.2 1=yes, 2=no

3.2.2.1 alpha

3.2.2.2 direct relation

3.2.2.3 enter numerical amount

3.2.2.3
3.2.2.4
3.2.2.5

3.3.1 1=on farm, 2=off farm
3.3.2 1=watering plants, 2=vegetable gardening, 3=human consumption, 4=animal drink, 5=other
3.3.3
3.3.4 1=fresh, 2=salty, 3=brackish
3.3.5 1=fresh, 2=salty, 3=brackish
3.3.6 1=yes, 2=no
3.4.1
3.4.2
3.4.3 1=naturally, 2=artificially
3.4.4 1=usually, 2=occasionally
3.4.5 1=men, 2=women, 3=children, 4=all of them
3.4.6
3.4.7
3.4.8 1=development projects, 2=NGOs activities, 3=research programs, 4=farm nurseries, 5=other
3.4.9 1=gift, 2=paid with cash, 3=paid with labour, 4=other
3.4.10 1=scattered on the farm, 2=in line on farm, 3=on boundaries, 4=in the compound, 5=woodlot, 6=on grazing land, 7=on flooding line, 8=other
3.4.11 1=private, 2=common
3.4.12 1=planted, 2=naturally regenerated
3.4.13 1=planted tress, 2=naturally regenerated
3.4.14 1=forest lands, 2=other farmers' crop lands, 3=fallowed land, 4=local markets, 5=individual farmers, 6=outside markets, 7=other
3.4.15 1=live fencing

BLS SURVEY - VILLAGE GENERALITIES DBASE CODING:

1.1 -1.1.5 =Alpha

1.1.6 - 1=>1700, 2=1701 - 1800, 3=1801 - 1900
4=1901 - 1950, 5=1951+

1.1.7 - 1=1-5 ha, 2=6-10ha, 3=11-15ha, 4=16-20ha
5=21-10ha, 6=31-40ha, 7=41-50ha, 8=50ha+

1.1.8 - 1=increased, 2=decreased, 3=no change

1.1.9 - 1=yes, 2=no

90

1.1.10 - 1=allow for expansion, 2=traditional limits/heritage, 3=to avoid conflict, 4=set limits, 5=other

1.2.1 & 1.2.2 - 1=>100, 2=101-350, 3=351-500, 4=501-750, 5=751-1000 6=1001-1250, 7=1251-1500, 8=1501-1750, 9=1751-2000, 10=2000+

1.2.3-1.2.5 - 1=>50, 2=51-100, 3=101-150, 4=151-200, 5=201-250, 6=251-300, 7=301-350, 8=351-400, 9=401-450, 10=451+

1.2.6 - 1=Peulh, 2=Wolof, 3=Diola, 4=Mandink, 5=Serere, 6=other

1.2.7 - 1=yes, 2=no

1.2.8-1.2.10 - 1=>10, 2=11-20, 3=21-30, 4=31-40, 5=41-50, 6=51-60, 70, 8=71-80, 9=81-90, 10=91-100, 11=101+

1.2.11 - number corresponds to number of wells

1.2.12 - 1=>20, 2=21-30, 3=31-40, 4=41-50, 5=51-60, 6=61+

1.2.13 - 1=on farm, 2=off farm

1.2.14 - 1=<50m, 2=51m-100m, 3=101m-150m, 4=151m-200m, 5=201m+

1.2.15 & 1.2.16 - 1=fresh, 2=salty, 3=brackish

1.3.1 - 1=govt regulation, 2=allocated by land clearing, 3=granted by another village member, 4=granted by other people

1.3.2-1.3.5 - 1=>50ha, 2=51ha-100ha, 3=101ha-150ha, 4=151ha-200ha, 5=201ha-250ha, 6=251ha-300ha, 7=301ha-350ha, 8=351ha-400ha, 9=401ha-450ha, 10=451ha+

1.4.1 - 1=seeder, 2=sine hoe, 3=cart, 4=occidental hoe, 5=plough

1.4.2 - 1=yes, 2=no

1.4.3 - 1=cows, 2=sheep, 3=goats, 4=draught animals, 5=horses, 6=poultry, 7=donkeys

1.5.1 - 1=millet, 2=corn, 3=sorghum, 4=cowpea, 5=rice, 6=peanuts, 7=other

1.5.2 - 1=lack of land, 2=lack of labour, 3=lack of animal traction, 4=lack of cash for inputs, 5=poor supply of structure for inputs, 6=inadequate knowledge or skills, 7=lack of good crop varieties, 8=other

1.5.3 - 1.1=erosion by wind, 1.2=erosion by water, 1.3=erosion by both, 2=saltiness, 3=diseases, 4=weeds, 5=free grazing

1.5.4 - 1=inadequate seasonal rainfall, 2=poor distribution of rainfall, 3=low infiltration of rainfall, 4=inappropriate crop variety for rainfall in the region, 5=low soil fertility, 6=wind damage

to crops, 7=difficulty in working the land

1.5.5 - 1=0-1yr, 2=1-2yrs, 3=2+yrs

1.5.6 - 1=peanut (arachide, law, gerte), 2=manioc, 3=sanio 4=cotton, 5=maize, 6=other

1.5.7 - 1=no rain, 2=soil infertility, 3=lack H20, 4=no grain

1.5.8 - 1=yes, 2=no

1.5.9 - 1=organic, 2=mineral

1.5.10 - 1=1-3mths, 2=4-6mths, 3=7-9mths, 4=10-12mths

BASELINE SURVEY PRIORITIES.

Decision priorities - Alphonse

1. Agricultural material
2. Labour & tool availability
3. Dry matter

Analyze the use of labour, the household:

- 3.1 tools, materials, organic materials
- 2.6 population, age structure of the community
- 4.1 - 4.2 - 4.3 crop residue and manure
- 3.6 number of animals available

Analyze quality and use of agricultural material:

- 3.5 quantity of material
- 5.5 - 5.4 - 5.9 - 5.10 use of manure

Decision priorities - Sarah

3.1.1	Household area use	3.3.1	Where is the water source
3.3.6	Enough for water for the nursery		
3.4.1	Most useful tree species	3.4.2	Tree uses
3.4.3	Regeneration	3.4.5	Planters
3.4.6	Planted trees	3.4.7	Planted tree usage
3.4.8	Seedling origin	3.4.9	Obtain seedlings
3.4.17	Trees planted where	3.5.5	Constraints/plant growth
3.6	Livestock production		

SPSS/PC+ - NOTES ON GENERAL USE, USING BASELINE SURVEY AS EXAMPLE

BEGINNING SPSS SOFTWARE.

At the DOS prompt, type cd\spss. At the next prompt type spsspc.

92

This will bring you into the main menu of SPSS/PC+. At the main screen, the menu box, the help window and the scratch pad will be visible. The first step before executing any commands is to set your environment.

BUILD AND EXECUTE COMMANDS.

These instructions are valid for any commands used within the SPSS/PC+ software package. All commands within the program are capitalized. If an item in the menu window is not capitalized it signifies that there is a menu from which to chose commands. Use the arrow keys in order to select either the menu or the command that you would like. Once the cursor is highlighting the menu you want use the right arrow key to go deeper into the menu.
Three methods of building commands:

1 - Select commands from menu and paste into edit window
To paste: once you have highlighted a command, press **enter** and it will be pasted on the edit window.

2 - Type commands directly into the edit window. If using this method, remember that all commands are capitalized and need to end with a period (.) .

3 - Use review editor to create a list of commands.

To execute the command created in the edit window use, **F10** and then Enter. All commands should have a period after them

Environment settings are those which concern the software set up. For example; the printer default, the width of the page, the beep being on or off, and like information. Each time a session with spss/ps+ is started, the two most important environment settings, LISTING and LOG should be changed. Use the SHOW command to view the environment settings (default settings). All settings that appear in caps can be changed. To use the SHOW command, select the **session and control** menu from the main menu. The **session and control** menu will then appear. Cursor down to the SHOW command and press **enter** in order to paste the command into the scratch pad. To execute the command once it appears on the screen, hit **F10** and then **enter**.

LISTING file - results from session and all executed commands are stored in this file for future reference. The LISTING file name should be changed for each data file in order to avoid overwriting a file.
LOG file - contains a copy of every command used during the session. Therefore if you have problems with execution you can look into the relevant LOG file and figure out the problem (hopefully !).

To change any file in the Environment Settings, use the SET command found in the **session and control** menu. The SET command needs a sub command in order to know what to set.
Once SET has been selected the set menu will appear in the menu window. Both the LISTING file and LOG file are output files, therefore select **/OUTPUT FILE** ' ' subcommand from the menu.

A small window will open on the screen, enter the new name for the LISTING file as follows: _____.lis. For example wvbls.lis.

The SET command is now built and ready to execute.

Follow the same steps taken with the LISTING file and change the name at the prompt to _____.log. For example, wvbls.log.

TRANSLATION FROM THE LOTUS DATABASE TO THE SPSS/PC+ SOFTWARE.

In order to be able to use the SPSS/PC+ package the data needs to in information readable by SPSS. The first data sheet for the survey, Village Generalities for the World Vision survey is already on SPSS/PC+. Once the data worksheets have been filled out for the other collaborators (the blank forms are found on the Base Line Survey (BLS) disk), they will then need to be transferred to the program as well. There are a few steps to take that can make it easier to translate the data.

1. If the worksheet is saved on the hard drive it makes the translation faster.
2. If the field names at the top of the worksheet are condensed to fit within the SPSS/PC+ criteria, you can transfer those as well and save the time of renaming fields. To do so, collapse the field names into 8 letters or symbols. The BLS worksheet has already got this information done but the FARMER worksheet does not. If you remove the periods from in between the numbers, they can transfer as field names and then you have only to give them variable labels once translated. (this procedure is explained later on).
3. Remove the blank row between the field names and the data before translating. If it left in, the computer will read the row as missing information.
4. All boxes which do not contain information should have either the symbol "-" or the value "0" in order for the SPSS/PC+ package to acknowledge missing information. If they are left blank SPSS interprets that as missing cases rather than unknown information.

The translation is quite simple. From the main menu, select **read and write data** menu. Once selected the **read and write menu will appear.** From the menu select the TRANSLATE FROM command. The words TRANSLATE FROM will appear in the scratch pad and the **TRANSLATE FROM** menu will appear in the menu window. Select ' ' in order to specify which file you would like to translate. The '' will appear in the scratch pad after the TRANSLATE FROM command. A little typing box will appear on the screen, just below the menu window. Type in the name of the file. Include all relevant information concerning the file. IE. Drive name, sub-directory, file name and extension. After entering the information press enter to have the file name pasted onto the end of the command.
Then from the same menu select /FIELD NAMES. This will transfer the field names from the Lotus worksheet into SPSS variable labels. Once /FIELD NAMES has been added to the command, select /RANGE from the same menu. This allows you to chose the range from the worksheet. Select from the first row containing field names to the last row. DO NOT SELECT THE INFORMATION ON THE TOP OF THE WORKSHEET. IE. On Farm Productivity and Enhancement Program.

To translate the wvbls file to the SPSS/PC+ program the translate from command would look like this:

TRANSLATE FROM 'C:\LOTUS\WVBLS.WK1.\FIELDNAMES\RANGE A5..AS36.

The command is then ready to execute. Once it is done the computer will state

any discrepancies, and reassign any fieldnames which have duplicates. (If you are using the number system that should not happen). Then you should save this information in order not to lose it when there is a power failure in the middle of the session !!!! To do so select SAVE from the read and write data menu. When the SAVE menu appears in the menu window, select ' ', in the typing window give the data a name IE WVBLS.dat. This is now saved in the system and when you want to use the data in future sessions, you need only to select GET from the read and write data menu and specify WVBLS.dat.

DATA READING, VARIABLE LABELS AND VALUE LABELS.

Select the data file which you want to read. Data is found in data files. ie. santa.dat. When data reading it is important to understand the terms - **Variable** refers to the columns of each aspect of the data set.
Cases refer to each set of data entry.

	var1	var2	var3	var4	
ie.	Collab	Region	Dep	S.Pref	
	001	Lou	Lou	Ndian	Case 1
	002	Lou	Thi	Keur	Case 2
	003	Lou	Lou	Tiv	Case 3

The next step is to tell SPSS/PC+ what each column/variable signifies and it's exact location. ie. ID# columns 123.
To do this use the **DATA LIST** command. Since in our case the data has been entered from the Lotus database and the fieldnames have been transferred it is not necessary to state which each column is located. The variable labels however can be explained.

This is done by selecting DATA LIST from the read or write data menu. Once DATA LIST is selected the datalist menu will appear on the screen. Select file ' ' from the datalist menu to enter the necessary info: ie. data file, sub directory, drive etc. In this case use the new name given to you data. IE. WVBLS.dat.

Then select the VARIABLE LABELS choice and paste into the screen. The choice of variable will appear in the variable window. Select the one you want to label. Then press Esc in order to clear off the Variables menu. From the variable labels menu, select ' ' and enter the label you want to give the variable.

IE: VARIABLE LABEL B111 'Village Name'. In order to assign labels to all variables, use Alt E to enter the edit mode and insert a slash after the Village Name before the ".". Press Esc to exit the Edit mode. Then select another variable, the ' ' and add a slash and repeat the procedure until all variables have been assigned a label. A multiple VARIABLE LABEL command would look like this;

VARIABLE LABEL B111 ' Village Name' / BBB 'Compound chef' / B113 'Farm Head' /.

After that is completed, select VALUE LABELS. The VALUE LABELS menu will appear. You need to select variable. The variable menu will appear. Select the variable, press Esc to exit the variable window. Then select value, and the typing window will appear. In the typing window type the code.

IE 1,2, ARR etc. Then select the '__' and assign the value. The command will look like this:
VALUE LABEL 1 'YES' 2 'NO'. As with the VARIABLE LABELS it is possible to name multiple VALUE LABELS at the same time. Use Alt E to enter Edit mode insert the slash, press Esc to return to the menu and begin the process over a multiple VALUE LABEL command will look like this:

VALUE LABEL B223 1 'YES' 2 'NO' / C111 1 'POST HARVEST' 2 'PRE HARVEST' / D112 TREES 1 'MANGO' 2 'BANANA'.

Before executing the command ensure that there is a period at the end of the entire command. If there is not the computer won't know where to stop.

SAVING

Once a data file is saved there is no need to redo the **DATA LIST** command discussed above. The data file can be accessed by using the **GET** command.

SAVE. is found in the read and write data file. Saves current data and variable definitions into a system file.

Paste **SAVE** into the execution window. The SAVE menu will then appear. Use the **/Outfile** subcommand - this allows a name to be given to the file. If this is not done the data will automatically be saved under the file name spss.sys.

The typing box will appear at the bottom of the menu window. Name the data file that you intend to save: _____.sys. This saves the data as a system file. IE. WVBLS.SYS Execute the command and the file is saved for future use.

ANALYZING DATA.

To analyze data with SPSS/PC+ the process is very simple. Simply select from the menu the analysis that you want to complete. Paste the command in the scratch pad and execute. Be sure that if you use a command which requires a subcommand, that the subcommand is also pasted into the scratch pad. A period "." is needed at the end of every command.

LIST is an example of one method of analysis. It is found under the **reports and tables** menu, which in turn is found under the **analyze data menu** in the Main menu.

Paste **LIST** in the box. - If no subcommands are given it will list all data. Otherwise it will list the data for specified variables which are selected.

Another example of available analysis methods is Descriptive stats. It is one of the categories found in the **analyze data menu**. It includes the **FREQUENCIES, DESCRIPTIVE, CROSSTABS, and MEANS** commands.

FREQUENCIES - produces frequency tables, stats, bar charts and histograms
DESCRIPTIVE - produces descriptive stats not requiring frequencies tables. It can also produces Z-scores if required.
CROSSTABS - bivariate distribution, crosstabs with association

MEANS - self explanatory

REMEMBER, IF THERE IS ANY TERMINOLOGY WHICH YOU DO NOT UNDERSTAND, CALL UP THE GLOSSARY BY USING Alt. G.

Take for example the **FREQUENCIES** command. This command will give a break down of the number of responses to a particular variable. Once this command is chosen the **FREQUENCIES** menu will appear on the screen.

Some commands require subcommands. In **FREQUENCIES** menu there will be a number of choices. Choices with the emblem - preceding them are necessary to run the requested command. ie. the variable command is listed like:

-/VARIABLE. Therefore it is necessary to use this subcommand when executing **FREQUENCIES.** Paste **-/VARIABLES**, the system will then display all variables from which to choose - select the one for which you want frequencies run. To leave variables window use Esc.

Execute the command built - the following table will be displayed:

	Value	Freq	%	valid %	cum %
	1	17	56.7	56.7	56.7
	2	13	43.3	43.7	100.00
Total		30	100.00		100.00

Value - indicates the number of possible responses. In this example the two possible answers are 1 and 2.

Freq - indicates the number of times the value is given as a response. In this example 1 = 17 and 2 = 13

% - indicates what percentage each value has. In this example 1 = 56.7% and 2 = 43.3%

Valid % - indicates how valid the percentage is in regards to any unknown values. In this example, because all the questionnaires had a response to the question there are no unknown responses. Therefore, 1 = 57.7% and 2 = 43.3%

Cum % - indicates the cumulative % to date. In this example the 1 responses make up the first 57.7% and the 2 answer of 43.3% completes the full 100%.

This analysis can then be saved using the save method above. Give the file a relevant name in order to be able to recognize it.

In Main Menu mode the FUNCTION keys have the following uses:

F1 - Info: Review help/variable list/file list/glossary/menu help off

F2 - Windows: Switch/change size/zoom

F7 - Mark/unmark areas: Lines/rectangles/command

F9 - File: write whole file/delete

F10 - Run: run from cursor/exit to prompt

Alt E - Type and edit commands in edit windows

Alt M - Clears away menu & edit windows

Alt G - Calls up glossary for word definition
use Esc. to leave glossary

Alt Esc.- Returns to main menu

Home - Brings cursor to top of current menu
End - Brings cursor to bottom of current menu
Alt - scroll up/down in help windows
Rt. arrow - Moves into a deeper level of menu
ie. Main menu: orientation, read and write data
Lt. arrow - Backs-up to previous menu

LITTLE THINGS TO REMEMBER.

If there is a - before a subcommand it is necessary to include this subcommand in the command.
Make sure the environment settings are set so that you can review the work you have done.

The Base Line Survey has been/will be entered using LOTUS software. It may perhaps be something to keep in mind for future use of SPSS/PC+ that entering data using the same software package makes the process simpler and easier. The LOTUS was used in order to facilitate the transfer of information, however this information is for OFPEP use and any analysis done can be given in SPSS/PC+ output. If for any reason the database it self would need to be used by another user, using another software package, the SPSS/PC+ database can then be translated to the relevant package.

To print any analysis that is done on the software, use the SET and set the printer environment to on. Follow the same steps as to SET the listing and the log files.

The data file that has been entered for the Base Line Survey to date is the village generalities section for the World Vision surveys. There is also partial entry for the farmer specific parts for the World Vision surveys. The name of the World Vision Village Generalities file is WVBLS.DAT

In order to access this file, take the following steps:
Enter SPSS as indicated above. Once in the system, set the environment (also as above) calling the listing and Log files something distinct. IE. bls.lis. wvbls.lis and wvbls.log already exist. In order to see which files exist, In the main menu screen, type F1. Along the bottom of the screen, 4/5 choice will appear. Select file list. This will give you a list of the current files.

Once the environments have been set, select GET and enter the file name. Execute this command. Once this is done the computer know that what ever comes afterwards will be using this file. Run the commands of your choice.

Appendix 5

Consultancy Report of Danièle Heinen

ON-FARM PRODUCTIVITY ENHANCEMENT PROGRAM IN SENEGAL

SEED MARKETING SURVEY

WITHIN THE WORLD VISION INTERNATIONAL PROGRAM AREA

August 1993

Danièle Heinen, Winrock International, Dakar

100

DRAFT REPORT

LIST OF TABLES

Table 1: Production of certified seeds, 1991-1992. Source: PAS annual report 1991-1992 . . . . . -7-
Table 2: Production of certified seeds, 1992-1993. Source: PAS annual report -7-
Table 3: Certification of seeds produced through multiplication and extension -9-
Table 4: WVI program 1991-1992, Source: WVI 1991 Annual Report . . . . -10-
Table 5: WVI program 1992-1993, Source: WVI 1992 Annual Report . . . . -11-
Table 6: 1993-1994 Millet and Cowpea Extension Program. Source: Letter from WVI to DISEM, June 1993 . . . . . -12-
Table 7: 1993-1994 Seed Multiplication Program. Source: Letter from WVI to DISEM, June 1993 . . . . . -12-
Table 8: Input costs for millet seed production . . . . . -20-
Table 9: Input costs for cowpea and fodder cowpea seed production . . . . . -21-
Table 10: Estimated marketing costs for cereal seed in Sénégal. Source: PAS, Dakar . . . . . -21-

101

TABLE OF CONTENTS

I.Executive Summary . . . . . -1-

II. Background . . . . . -3-

III. Production of cereal seed . . . . . -4-
A. Production cycle and partners . . . . . -4-
B. Production statistics PAS and DISEM . . . . . -6-
C. Analysis of supply and demand of cereal seed - An example: The case of millet . . . . . -8-

IV. World Vision Production Process and Statistics . . . . . -9-
A. Program statistics . . . . . -9-
1.1990-1991 season . . . . . -9-
2.1991-1992 season . . . . . -10-
3.1992-1993 season . . . . . -11-
4.Expected program for 1993-1994 . . . . . -12-
B. Analysis of production . . . . . -13-
C. Trends in the multiplication program . . . . . -14-
D. Use of production . . . . . -14-
1. Survey conditions . . . . . -14-
2. Analysis of survey . . . . . -15-
a. Production . . . . . -15-
b. Type of uses . . . . . -16-
c. Marketing of production . . . . . -17-
d. Prices observed . . . . . -18-
e. Further marketing opportunities . . . . . -18-

V. Constraints on increased production at the village level . . . . . -19-
A. Farmers motivation . . . . . -19-
B. Seed techniques . . . . . -19-
C. Promotion . . . . . -19-
D. Input Costs and Credit . . . . . -19-
1. Input costs . . . . . -20-
2. Marketing costs . . . . . -21-

VI. Recommendations . . . . . -22-
A. General . . . . . -22-
1. Technical problems . . . . . -22-
2. Water availability . . . . . -23-
3. Credit . . . . . -23-
4. Marketing . . . . . -24-

B. Specific course of action for WVI and Winrock (OFPEP) . . . . . -25-
1. Control of production . . . . . -25-
2. Specialization of farmers . . . . . -26-
3. Production of seeds in irrigated conditions . . . . . -26-
4. Management training of farmers . . . . . -26-
5. "Local" Marketing . . . . . -26-
6. Promotion of certified seeds . . . . . -27-

I.Executive Summary

In October 1992, Winrock started the OFPEP (On-Farm Productivity Enhancement Program) an expansion of a previous project, the On-Farm Seed Project, which ran from 1987 until 1992 in Senegal and The Gambia. Its aim was to complement the on-going seed multiplication and demonstration plots activities with a soil fertility component. The program involved a number of collaborating NGOs working in the field, such as World Vision International (WVI), Save The Children Federation (STC) and the US Peace Corps (PCV).

The initial OFSP had envisaged that "some communities would support local systems of seed production and distribution either through cooperatives or by individuals who establish private firms". Although it was reported that quantitie of seed were available for sale with the farmers, the marketing system was never documented. It was felt that a seed marketing study was necessary in order to better assess OFSP impact on the production and diffusion of improved seeds seed, and to serve as a starting point for OFPEP. It also aimed at making recommendations to improve the marketing of seeds at the village level.

The study was carried out in July 1993 by a Winrock volunteer in Northern Senegal, where WVI operates, and looked at cowpea and millet seed.

Through a series of village surveys, the study shows that there are indeed sales of seeds taking place at different levels: between the farmers within the village, between villages and in the weekly markets. This complements the informal seed diffusion which had been evidenced during the previous project and takes place within the farmer's extended family and through donations and barter.

The study also shows that it was extremely difficult to quantify sales as farmers did not keep any formal record; it also evidences that, at the national level, official statistics record only the production of certified seeds through the governement controlled processing centers, leaving aside the quantities produced through multiplication and demonstration programs, part of which ends up being sold as seeds in markets and villages.

The study demonstrates, that, conversely, WVI does not record the quantities of millet and cowpea seed produced through multiplication and demonstration plots but only takes into account the quantities it purchases which gets conditioned through the processing center and is then being sold as certified seeds.

As a review of official statistics evidences a shortage of certified seeds, it appears that it is necessary to promote production and sales of "non-official" seed at the village level the to satisfy the planting requirements.

The study recommends that WVI records yields and production in the multiplication and demonstration plots as a way to: 1) ascertain the increase in improved varieties yields as opposed to traditional ones, 2) monitor the changes in production and identify the reasons for such variations (rainfall, agronomic practices, etc..), 3) determine the quantities available for sales outside those collected by WVI and other organizations for

104

processing. Such recording should be implemented in the Thies area, where multiplication activities are starting with the 1993 planting season.

The study addresses the production constraints and, in order to increase production, recommends to look at different production practices such as: 1) specialization of farmers in seed multiplication, 2) organization of farmers groups specialing in seed production, 3) selection of specific areas based on rainfall, 4) feasibility of irrigated seed production.

The study also takes into account the marketing constraints and make recommendations such as 1) use of promotional tools and techniques, 2) use of different packaging, 3) organization of marketing groups, 4) training of farmer.

Recommendations are also made regarding credit availability for inputs and marketing.

The study concludes that OFPEP (and OFSP before) is sucessful in improving the diffusion of seeds through both formal and informal channels; by including a better monitoring of outputs, OFPEP could serve as a model for similar programmes of increased seed production and marketing at the village level in more countries.

105

II. Background

In 1987 Winrock launched the OFSP (On-Farm Seed Project). A project funded through AID matching grants, its aim was to assist food crop seed related programs of PVOs and Peace Corps in Senegal and The Gambia, using a process approach that adapts technical assistance to the needs expressed by small farmers. OFSP addressed the problem of meeting farmer demands for seeds by improving their practices of seed selection, production and storage.

OFSP involved various NGOs (Non Government Organizations) and drew on the collaboration of US facilities such as:

- Center for PVO/University Collaboration in Development(The Center)
- US Peace Corps (PCV)
- various Private Voluntary Organizations (PVOs) such as World Vision International (WVI) Catholic Relief Services (CRS), Africare, Save The Children (STC), Christian Children Fund (CCF)
- Mississippi State University Seed Technology laboratory (MSU)

The project was based on the observation that national seed institutions still needed to develop ways to use traditional seed-production and distribution systems more effectively in order to convince farmers to accept improved seeds into their traditional seed production and exchange systems, rather than keep on using farmer-saved seeds. [1]

The process approach consisted in:

- identify international, national and local NGOs involved in agricultural activities that could benefit from OFSP assistance in developing/improving seed-production activities
- gather information on traditional seed production/storage systems with farmers/ extension agents
- identify appropriate or improved seed varieties and seed production practices for local conditions
- develop training programs for extension agents working with local seeds producers
- conduct demonstrations with farmers to create awareness and demand for improved seeds, thus stimulating local seed production.

All field operations were implemented through organizations that were already in the field in Senegal and The Gambia (World Vision International, Catholic Relief Services, Peace Corps, Save The Children Federation).

In 1989, OFSP started collaborating with WVI, a US Christian NGO in the regions of Louga and Thies, a drought-stricken part of Senegal, where traditional food crop varieties (millet and cowpea) were no longer adapted due to the declining rainfall. World Vision International has a multi-faceted development program, focusing on supply of safe water

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[1] OFSP Third Annual Report, August 27, 1990

106

through the drilling of boreholes and associating related activities in the fields of agriculture, health and education .

In 1990 World Vision initiated a program of demonstration plots and seed multiplication for millet and cowpea, the main food crops of the area. WVI distributed certified seeds of improved varieties developed by ISRA (the Senegalese Agronomic Research Institute) to selected villages for crop production. It also distributed registered seeds for multiplication to selected farmers (bush consultants) in some of those villages. WVI extension agents trained the bush consultants in some simple seed selection and storage practices such as: germination study, selection of plants for seed before harvest; keeping seed separate from grain; and, sieving threshed seed to remove small seeds before planting as well as agronomic practices such as spacing, thinning, and soil fertility improvement. WVI also provided subsidized fertilizers and pesticides, distributed through the bush consultants. The latter in turn trained other farmers in seed selection, co-opted other farmers for seed multiplication and became responsible to order seeds for the next planting season; they also collect payments of seeds and other inputs which were purchased on credit at the beginning of the planting season, and distribute fertilizers and pesticides to fellow villagers. At harvest time, WVI was buying multiplied seeds for processing then bagging and reselling it in the villages for planting demonstration plots.

At the close of OFSP in October 1992, WVI was collecting seeds for the third season in a row, working in 213 villages and having trained 1300 farmers through 60 bush consultants in as many villages. A random survey of 30 villages showed that 58% of farmers were using the techniques they had learnt in WVI training. Portion of the farmers' production was selected, sorted and stored in the villages to be used as seeds for the next planting season.

The OFSP project proposal envisioned that "some communities would support local systems of seed production and distribution either through cooperatives or by individuals who establish private firms". In project final evaluation report, the conclusion was that OFSP had worked primarily for the improvement of farmer-saved seed of subsistence crops and that farmer-to-farmer seed exchange was taking place almost exclusively in the form of barter and not involving cash, thus precluding the intervention of any private enterprises. Actually, WVI FY91 annual report reported that quantities of seeds were available for sale with the farmers, but the marketing system was never documented.

The success of OFSP led to the On-Farm Productivity Enhancement Program, (OFPEP), which started in October 1992. Involving the same organizations both State side and in Senegal,it complements the seed component with soil fertility, and agro-forestation activities. It was felt that a seed marketing study was necessary in order to better assess OFSP impact on the production and diffusion of improved seeds, and to serve as base and known starting point for OFPEP. This was carried out in July 1993 by a volunteer recruited by Winrock, under a contract with The PVO/University Center, with emphasis on the WVI areas in the Louga and Thies regions.

III. Production of cereal seed

A. Production cycle and partners

The production of certified seeds in Senegal involves four steps:

- ISRA screens and/or develop improved varieties and subsequently multiplies small quantities of breeders seeds (pré-base in French) at its irrigated research station, Bambey and sells the stock to Programme Autonome Semencier (PAS) an organization responsible for producing registered seeds (base) and processing certified seeds.

- PAS contracts out with individual farmers or farmers groups (GIE, or Groupement d'intérêt économique) for the production of rain-fed registered seeds.

- Seeds are then sold to various organizations (private enterprises, NGOs) for multiplication and production of certified seeds, in rain-fed conditions.

- Seeds thus produced are then collected and taken to various processing centers for conditioning, fumigation and bagging before being sold in the market place.

Another organization, the seed division of the Senegalese Ministry of Rural Development (DISEM) supervises the production of base and multiplied seeds through inspection of farmers plots, and certification of seeds at the bagging station.

Both ISRA and PAS have a much more extended role, since ISRA is also producing registered seeds at the irrigated station of Diarou as PAS may lack sufficient seed production due drought conditions; PAS is also involved in selling certified seeds through a network of recently built storage facilities throughout Senegal and is responsible for the various seed processing stations.

ISRA and PAS are concerned with groundnut, rice, millet, cowpea, fodder cowpea, maize and vegetables seeds. However the present study only covers cowpea and millet, the main food crops of the regions under review

While PAS, ISRA and DISEM are government owned or sponsored entities, they use the private sector by contracting out the actual production of registered and certified seeds to individual farmers, farmers organizations as well as various village groups (women's groups, youth groups or GIE) and a small number of commercial enterprises; the latter however, have not yet appear in the production of millet and cowpea seeds.

The private sector also includes a number of NGOs, such as World Vision, which stepped in as Government organizations previously involved in the seed sector were collapsing and withdrawing, leaving the farmers to their own demises, while no commercial enterprise was yet ready to intervene. Such NGOs are in fact acting as seed enterprises, by acting as the link between PAS, ISRA and DISEM and farmers/farmers groups to facilitate the prouction of seeds at the village level. In this role, the NGOs provide seeds inputs, training and assists processing and marketing of seedd.

They are also subsidizing the seed production by providing free, at cost or heavily subsidized inputs, purchase seeds issued from multiplication and sell certified seeds at cost or less to the farmers for further production.

A. Production statistics PAS and DISEM

Seed production statistics only look at production of registered seeds and certified seeds; this does not reflect the quantities of cereals used as seed for the following reasons:

- While the goal of PAS and DISEM is to promote certified seeds and eventually, to eliminate the use of farmer saved seeds, the latter is still the main source of seeds for production. Farmers store portion of their cereals production both for food and seeds and sell other portions on the local markets for the same purpose.

- Only seeds collected and quantities of certified seeds coming out of the processing centers are recorded by DISEM in the official seed production statistics; seeds rejected at the bagging stage are sent back to farmers who may use them as seeds for themselves or eat them; some of it find its way to the market place as seeds "tout venant", meaning that there is no guarantee of quality;

- large quantities of cereal sold as seed between villages and at weekly markets also go unrecorded.

Thus, there is a large discrepancy between quantity of certified seed available for planting and the areas actually planted.

Comparisons over several years are difficult since statistics are not presented in a consistent manner. For example, as indicated in table 1, production of certified seeds reported for 1991-92 included the surfaces seeded and the expected production and collection, while 92-93 statistics (table 2) only report actual production of certified seeds (after bagging)

Production of registered seeds is given by crop and include surfaces planted and expected production figures for 91-92, while 1992-93 statistics are broken down by region and do not report surfaces planted.

104

1. Production of certified seeds

Statistics for 1990-1991 are not available by region

1991-1992

Area	Crop	Type	Seeds	Ha seeded	Ha used	Expect MT	Collect. MT	Certif. MT
Louga	Millet	IBV 8004	260	65	63	3.5	1.309	1.284
		Souna 3	8	2	2	2.0	1.99	1.552
	Cowpea	B21	448	28	25	4.2	.795	0.672
		58-57	32	2	0	0	0.34	0.304
		CB5	32	2	2	0.4	0	0
	Fodder	66-35	280	14	8.87	1	0.229	0.172
		58-74	200	10	5	1	0.378	0.320
Thies	Millet	Souna 3	128	32	23	10.5	6.89	5.264
	Cowpea	Ndiambr	64	4	1	0.4	0	0

Table 1: Production of certified seeds, 1991-1992. Source: PAS annual report 1991-1992

1992-1993

Area	Crop	Type	Certif.T
Louga	Millet	IBV 8004	3.5
	Cowpea	B21	1.5
		58-57	1.719
		Ndimbr	0.233
		Mougne	0.782
	Fodder	66-35	3.918
		58-74	
Thies	Millet	Souna 3	28.135
	Cowpea	Ndiambr	1.224

Table 2: Production of certified seeds, 1992-1993. Source: PAS annual report

110

As rainfall decreases in the area, early varieties of millet such as IBV 8004 are more adapted to the Louga region, while the traditional Souna III becomes restricted to the Thies zone. Cowpea and fodder cowpea have increased in the Louga area, able to withstand the declining rainfall better than millet and groundnuts; at the same time, more cattle rearing calls for more fodder.

B. Analysis of supply and demand of cereal seed - An example: The case of millet

The optimum millet planting scheme of 1 000 000 ha country-wide requires 4 000 T of seeds (4 kg/ha). Based on a multiplication factor of 250 this represents 16 MT of registered seeds and 64 kg of breeder seed. This computation assumes only one level of multiplication at breeders seed level, while the optimum level is 3. With 8 kg of breeders seed produced by ISRA, and 3 levels of breeders seed multiplication, 2 MT would theoretically be available for multiplication into registered seeds (500 MT) which in turn could produce 125,000 MT of certified seeds, enough to plant 3,150,000 ha!!!!

Such coefficient, which means 1 MT/ha yield, is never reached in the fields but only on research stations. On farm optimum yields farms tend to be 700/800 kg/ha in "acceptable" rainfall conditions. In addition, DISEM estimates an 80% production rate at the bagging station.

For reference, total certified millet seed production was 56.592 T for 1992-93, and 18 T for 1991-92. 756 kg of registered seed were available for 1992-93 (a potential 189 MT of certified seeds) and 2,977 MT of registered seeds were available in 1991-92. The demand from certified seed producers was only 461 kg!!! (a 115.25 MT of potential certified seeds production).

Such analysis clearly shows both a considerable shortage in the production of certified seeds and a lack of partners in such production, as evidenced by the low demand for registered seeds. It also indicates obvious problems of adjustment between supply and demand in terms of quantity and varieties demanded. Souna III, IBV 8004 and IBV 8001 were available, but there was no demand for IBV 8001. Last, but not least, registered seeds end up being used as certified seeds in the case of acute shortage: For example, the emergency program organized between ISRA and WVI for cowpea, whereby IS 275 and IS504 varieties are being distributed for both extension and multiplication programs.

The shortage of certified seeds varies from year to year, as seed production is heavily rainfall dependent. ISRA is able to produce breeders seeds in irrigated conditions during the dry season, with some limitations due to the cool season (december-february) and to isolation requirements but, production of registered seeds under PAS supervision is under rain fed conditions. Some help is available from ISRA Darou station which can produce registered seeds under irrigated conditions. Production of certified seeds is strictly rainfall dependent.

Any attempts to increase seed production will have to take both water and farmer's availability as production partners into account.

111

IV. World Vision Production Process and Statistics

A. Program statistics

In 1990, with the assistance of the OFSP, DISEM and ISRA, WVI started a program of seed multiplication and demonstration plots with improved varieties of cowpea and millet in the Louga and Thies areas (extension only). Sixty "Bush Consultants" were selected and trained to produce certified seed on ½ ha to 1 ha plots; at the same time improved seeds were distributed for planting in demonstration plots.

WVI purchases registered seeds from PAS at wholesale and resells to the bush consultants, for multiplication, at a subsidized price. WVI also provides pesticides, fertilizers and urea for a nominal fee. Certified seeds are distributed to farmers, for extension, at cost.

Farmers pay their contribution immediately, from income derived from groundnut and trade, or may be debited at time of sale of production.

1.1990-1991 season

In order to have enough seeds for the following planting season, and as a exceptional measure, portion of the production coming from the demonstration plots was certified as seeds by DISEM, along with the seeds produced by the multiplication plots. WVI received 40 kg of millet seeds (Souna III) to plant 10 ha and 640 kg of cowpea seeds to plant 40 ha of demonstration plots from PAS. Table 3 shows surfaces and number of farmers involved and seed production.

Varieties	IBV 8004	8004 xxx	58-57 xxx	B21 xxx	B21	TVX xxx	TVX
Farmers/vill.	5/5	8/4	4/3	3/2	3/3	1/1	1/1
Surface(ha)		10,1	6	4		3	
Seeds dist.kg		44	96	64		48	
Prod.kg		1 901	560	198		270	
Yield/ha		188,22	60,33	49,5		90	
Certified kg	920	1 120	337	128	315	100	200

Table 3: Certification of seeds produced through multiplication and extension
Source: DISEM/Louga, Campagne agricole 90-91.(xx denotes multiplication of registered seeds)

112

2. 1991-1992 season

WVI organized a three-way program:

1. Multiplication for production of registered seeds, involving 60 bush consultants in 57 villages
2. Demonstration plots
3. Sales of seeds to farmers

Information collected in the field differ from information shown in WVI FY1991 annual report; production figures of certified seeds as reported by WVI does not match production figures shown in DISEM statistics. Information collected in the field is as follows:

1991-1992 (demonstration and multiplication)

Crop/	IBV 8004	Souna III	xxx IBV 8004	58-57	B21xx	B21	TVX	Ndbr	Fodder xxx
Farmers/Vil			54/50		20/20				10
Surface	163	259	58	122	20	24	20	124	
Seeds (kg)	652	1,036	232	1952	320	304	280	1,984	
Production MT			e.13.61		e 9.186				e 1.388
Yield/ha (kg)			110-847,5		350-757				274-120
Sales seeds (ha)		150		100				145	

Table 4: WVI program 1991-1992, Source: WVI 1991 Annual Report

Supposedly, seeds distributed for demonstration plots and seeds sold to farmers came from 1990-91 WVI production, with the exception of Ndiambour variety, bought from PAS. Registered seeds for multiplication were bought from PAS.

Estimates shown were made by DISEM, but greatly differ from the actual production shown in DISEM statistics for the 1991-92 season; they do not match the quantities of registered and certified seeds produced by WVI in 1990-91. For example DISEM reports only 1.309 MT of IBV 8004 collected in the Louga area and 1.284 MT of bagged certified seeds produced. (see Table 2, 1991-92 production of certified seeds). Total fodder cowpea collected is 0.607 MT (v. 1.388 MT as per WVI production figures).

Out of the seeds produced by farmers, WVI bought 1280 kg of IBV 8004, 442 kg of B21 and 436 kg of fodder cowpea to be used as seeds for demonstration plots for the following year; it did not need to buy seeds from PAS.

WVI trained 1,300 farmers in seed selection and storage techniques in 213 villages; a survey on adoption rate revealed that 58% of the farmers trained adopted the new techniques; farmers kept portion of their production in improved storage conditions to be used as seeds after selecting, sorting and treating.

3. 1992-1993 season

The WVI program had the same three components:

1. Seed multiplication
2. Demonstration plots of improved varieties using registered seeds produced during the previous season within WVI area;
3. Sales of certified seeds to farmers and outside organizations

1992-1993 (demonstration and multiplication). No production figures shown in WVI 1992-93 report for seed multiplication;

Crop/	IBV 8004	xxx IBV 8004	58-57	58-57 xxx	TVX	Ndbr xxx	Ndbr	Fodder
Farmers/Vil								
Surface	50	58	10	8	2	2	2	12
Seeds (kg)	200	232	160	128	32	32	32	192
Production MT								
Yield/ha (kg)								
Sales seeds (ha)	209		9 (all cowpea				145	

Table 5: WVI program 1992-1993, Source: WVI 1992 Annual Report

WVI cooperate with other organizations extension programs as evidenced by this sales breakdown:

Millet	farmers	143 ha	572 kg
	Sodeva	1 ha	4 kg
	PNVA	50 ha	200 kg
	Provobil	15 ha	60 kg
Cowpea	Cattle project	8 ha	128 kg
	Provobil	1 ha	16 kg
Fodder	Sodeva	2 ha	32 kg
	PNVA	10 ha	160 kg
	Provobil	3 ha	48 kg

Quantities of seeds purchased from farmers were as follows:

Fodder cowpea	406.5 kg
Cowpea 58-57	518.5 kg
B21	509 kg
Ndiambour	195 kg

In addition WVI bought 600 kg of millet seeds on behalf of PAS.

4. Expected program for 1993-1994

WVI and ISRA had agreed on an emergency program to compensate for the poor production of seeds in 1992-1993, a result of poor rain; two new cowpea varieties, IS 275 and IS 504 will be produced as registered seeds by ISRA and used for extension instead of certified seeds. 10 MT were expected; so far only 6.4T has been released by ISRA due to problems with supply of diesel fuel for the water pumps and with the pumps themselves.

Extension (with seed origin)

Zones /Var.	Souna	IBV 8004	IBV 8001	B21	Mougne	Niébé F	58-57	IS504	IS 275	Ndbr
Louga		78/isra 75 gie/wvi				18/wv	26/wv	300 isra	293 isra	9/wvi
Thies	250/pas		63/pas	26/wvi	19/pas					
Total	250	153	63	26	19	18	26	300	293	9

Table 6: 1993-1994 Millet and Cowpea Extension Program. Source: Letter from WVI to DISEM, June 1993

Seed multiplication: (still under review as to breakdown)

Varieties	IBV 8004	IBV 8001	IS 275
Surfaces (ha)	42 PAS /ISRA	28 PAS	31 ISRA
#farmers/ # villages	12/22	6/11	10/20

Table 7: 1993-1994 Seed Multiplication Program. Source: Letter from WVI to DISEN, June 1993

115

For the 1993-1994 season, WVI is expanding the seed multiplication activities to the Thies area, whereas so far only extension programs had been conducted.

B. Analysis of production

The compilation of the statistics shows a lack of monitoring of production in the WVI seed multiplication programs. Likewise, no production statistics are kept to monitor the production coming out from extension fields; it is, thus, difficult to compare yields between traditional and improved varieties. This has been compounded by a lower rainfall two years out of the three of the program, which affecred production.

However, sample yields may shed some light on the results of multiplication.

In its 1992-1993 annual report, PAS noted that in spite of declining rainfall, production of seeds had improved. Production was 1 830 MT for all food crops, an increase of 719 MT over the previous year. This could be due to increased yields and drought resistant varieties as well as better organization of seed collection.

One WVI extension agent, initially in charge of the seed program, checked on millet yields obtained by 6 of the bush consultants retained as seed multipliers in the 1990-91 season, which enjoyed "an acceptable rainfall". Results were as follows:

Previous yields Traditional	1990-91 yields New varieties
(in kg per ha for 4 kg of seeds planted)	
190	850
266	750
125	960
100	500
400	700
180	800

The last two yields were encountered in the villages of Pallene Ded and Mbedienne, where rainfall tends to be higher than the other villages located further north. The first consultant still obtained a 750 kg yield in 1991-1992 with a rainfall of only 281 mm; such results seem to trigger a renewed interest for food crops, perceived as safer crops, at the expenses of decreasing groundnut production.

Such "spot checks" are useful but cannot be used to extrapolate increased yields throughout the area. WVI, in cooperation with the official organizations, should monitor production from both extension and multiplication fields, through a sampling over the entire area, in order to account for varying rainfalls and differences in the way farmers are mastering seed practices.

116

As WVI is starting a multiplication program in the Thies area with the current season, it might be a good opportunity to implement a production monitoring system with the 8 bush consultants involved in seed multiplication and some of the farmers of the 56 villages where the new varieties are used. Suggestions for monitoring tools can be found in Appendix 3.

C. Trends in the multiplication program

Since the first season in 1990-91, bush consultants have been selected according to their demonstrated knowledge and mastering of seeds practices (weeding, isolation, sorting, application of pesticides and fertilizers, choice of site. etc...). Site visits by extension agents are no longer necessary.

The number of farmers and the size of the plots involved in seed multiplication had at first decreased, as farmer selection went on and as farmers themselves decided to use small plots in order to better control the quality of production. As interest in the program increases and new varieties become better known, the number of farmers and areas should increase. This will depend on the farmers motivation, possibilities of sales outside WVI, to GIE and newly developed PAS seed stores, which are starting to plan purchase of seeds over a four months period.

D. Use of production

1. Survey conditions

As mentioned previously, official seed production statistics only take into account certified seeds coming out of the PAS bagging stations (Diourbel for millet and cowpea). The rationale is that only that production is recognized as seeds. However, since the areas planted in millet and cowpea require much larger quantities of seed than what is available as certified seeds, a seed marketing survey must take into consideration the portion of production used as seeds by the farmers.

The survey undertaken for this study aimed at finding out what was happening to increased seed production as well as increased food production resulting from improved varieties used within the WVI program.

It attempted to ascertain the level of production reached in the seed multiplication plots, what use was made of such production and at what price. A first questionnaire was devised for the interviews. (see Appendix xxx for questionnaires). Questions on yields were later added for the second series of interviews when it appeared that no comparisons of yields with the traditional varieties had been formally established.

A survey of 10 villages was undertaken over two separate weeks in July 1993 within the Louga region by Daniele Heinen, Consultant for Winrock and Marcel Preira, WVI extension agent, in charge of the Ndande sub-zone and coordinator for the seeds multiplication program. He also acted as interpreter for Wolof. (See map in Appendix 1 for locations)

The selection of villages took into account varying rainfall, access to weekly markets, the level of success of the bush consultants in their multiplication program and the overall stage of development of villages visited. A first courtesy visit took place to let the villages know of the incoming interviews the following week and to assure farmers availability. As the rains were late, interviews did not conflict with work in the fields for the first five villages visited. After the first rains, a week later, access to farmers was more difficult for interviews in the next five villages visited. But it allowed viewing of seeding of groundnut, of fields already seeded and of some of the cowpea already coming out.

Interviews involved the bush consultant in charge of the seed multiplication program and other farmers involved in the multiplication and/or the extension program, and included "le chef de culture" (Leader in charge of crop rotation and land use in the village). In the village of Kandala, the interview involved only the President of the GIE who is also the bush consultant.

Villages visited and persons met were:

Village	People
Keur Sidy Mbengue	Mayoro Kebe,
Kandala GIE	GIE Président Khady Le
Khantiakh	Ousseynou Sarr
Palene Ded	Ablaye Gueye
Ndieye Ndiaye	Ousmane Ndiaye
Santhiou Diaraf	Mousse Ba
Par Cisse	Saer Cisse, Bara Cisse
Kaib Dia	Modou Ndong
Merina Soump	Isma Fall
Parky Khébé	Modou Kiébé

2. Analysis of survey

Samples questionnaire are in Appendix 2

a. Production

As expected from reading background material, it proved difficult to assess exact production figures, especially when trying to recall the output of the first year of the program, in 1990. Some bush consultants had kept written records; this goes along other records that they keep such as rain gage readings, orders for seeds placed by the farmers, or distribution of pesticides. Other relied strictly on their memories and compared their recollection with other farmers. Bush consultants were less aware of the production of their fellow farmers also involved in the multiplication program.

118

Sometimes it was also difficult to find information about areas planted. A list of bush consultants and surface areas allotted over the three years of the program was not available at the time; therefore interview questions also included surface areas allocated to each type of seed.

The level of knowledge also differed according the length of time the bush consultant had been involved in the program and his level of success. (Defined by the extension agent as how well the bush consultant had adopted improved seed practices and how effective his training of other farmers had been). During the discussions, farmers who were very vague in their estimates of production expressed the feeling that they should have kept better record of their activities. it was felt that it would benefit both themselves and the extension agent who would be better able to help them.

If production figures were difficult to come by, estimates on use of production were even harder to obtain. Things were a little easier for the 1992-93 season as WVI purchase figures were available. With that volume in mind, it was easier to assess where the rest of the production had gone.

The survey revealed substantial differences between villages and between sub-zones due to:

- differences in rainfall
- quality of isolation
- differences in seeding time
- differences in the village organization
- differences in what is the village primary occupation (food crops v. cattle, food crops v. trade)
- access to markets
- previous participation in extension programs

b. Type of uses

The survey revealed 7 possible uses of the seed produced, but not all uses were found in every villages.

- Self-consumption (food but also seed for next season for own plots)
- Gifts to family and poorer members of the village
- Sales to WVI
- Sales within village
- Sales to neighboring villages
- Sales in weekly markets
- Sales to organizations

Only the quantities purchased by WVI end up as certified seeds, since WVI transports the seeds to the bagging station for processing.

As production increases, a different level of sales is reached; for example, no seed was sold in case of poor harvest.

Due to Islamic custom, there is always a gift (sometimes reported included with self-consumption) of roughly 10%. Sales to WVI take precedence over sales within village or to other villages, which in turn take precedence over sales in the weekly market. Various types of sales could be conflicting with each other, depending on timing of collection and price obtained. One case was reported of sales to markets to the detriment of sales to WVI as price for the former was higher.

It also appears that a portion of the production from fields planted with improved varieties had ended up being passed as seeds through gifts to family members or relatives in other villages and sometimes sold in the markets. This was evidenced when trying to assess how the new varieties had replaced the traditional ones, especially in villages which had not been part of the extension programs.

In some instances production was reported as nil for reasons of insect infestation, lack of rain, inappropriate storage or too small to be of note (considered eaten by the farmers).

c. Marketing of production

Seeds are passed or sold in various containers:

- metal basins of varying sizes which are used for anything from laundry to cooking to carrying food and other items.
- jute bags used for potatoes
- recycled polyethylene seed bags (40 kg, 16 kg, 4 kg)
- recycled cans of powdered milk or tomato paste (400 g to 1.8 kg)

Such "packaging" raises the question of how such a product can be perceived as a quality product as opposed to what is usually sold on the market.

The answer lies in the demonstration effect that the use of the improved variety in extension fields has had on farmers from the village and from neighboring villages. Word of mouth advertising, and peer recognition for the bush consultant competence are generating sales. In some instances, bush consultants have carried out germination tests in small metal basins in their house and show those to potential buyers. Interviews evidenced that sales in the village and to neighboring villages were taking place with buyers coming directly to the bush consultant's compound to buy, cash and carry, sometimes with orders from other farmers from the same village.

Sales in the weekly markets are made from metal basins or larger bags, while customers come with their own smaller containers. Transportation to the market is by horse or donkey cart. The farmer already owns the animal used for work in the fields and may also own the cart or borrow it from a family member.

Sales to WVI are in larger bags provided by WVI. WVI comes to collect seeds with its own truck, then transport them to Diourbel for processing and bagging .Seeds rejected are returned to the farmers and payment made according to the quantities of good quality seeds accepted at Diourbel.

The marketing costs at that stage are therefore nil or negligible, limited to providing containers and feeding the draught animal.

In some instances, (Santhiou Diarat) a special order was filled for sale in Geoul and Louga markets, three years in a row; or a "commerçant" came from Louga to buy part of the production.

Only one village (Kandala) sold directly to PAS. As a GIE, it buys production from member farmers in 14 villages and has a recently built storage facility. The quantities obtained make it worthwhile for PAS to send a truck to collect seeds.

d. Prices observed

(in CFA/kg)

Crop	WVI sales	Village	Market
Millet	100	125	
Cowpea	130 -150 depending of sorting	150-200	250 (special order)
Fodder	150 sorted seeds	125	

WVI sets a price before the planting season but, does not guarantee the quantities purchased; these are decided according to the needs for the next extension program. Nevertheless, farmers tend to wait for WVI as they perceive WVI as a "guaranteed buyer". WVI extension agents reported, however, cases of refusal to sell to WVI because of a better price could be obtained on the market. It also happened that WVI did not collect, and the farmers ended up consuming the production and selling part of it on the market at a later stage.

e. Further marketing opportunities

The villages surveyed are not taking their production to be processed at Diourbel.This would require larger quantities of seeds produced, a truck and fuel to transport the seeds to the bagging station and back for sale in the villages, cash for payment of the bagging process.This is exactly what WVI provides. Only villages grouped in GIE would have enough production to make transportation and processing worthwhile but, would still need the financial means to support such operations.

Five of the ten villages visited mentioned "lost opportunities" due to demand from neighboring villages for improved seeds which could not be satisfied. Attempts to roughly quantify such demand resulted in an average potential of 300 kg of seeds within a 5 to 10 km radius. Conversely, from discussions with PAS and DISEM officials, review of official statistics and discussions with the farmers and WVI extension agents it appears that there is a global shortage of certified seeds.

121

Therefore farmers tend to rely on their own saved production as seeds rather than relying on market supply.

122

V. Constraints on increased production at the village level

There is no doubt that both seed production and marketing can be increased at the village level the demand for seeds. But there are a number of constraints.

A. Farmers motivation

Farmers will be reluctant to increase production if there is no guaranteed outlet. Since the cropping season is reduced to four months in the area under review, farmers unlike a commercial enterprise, cannot take risks and jeopardize a guaranteed income provided by groundnut to switch to seed production. On the other hand, groundnut has also suffered from reduced yields and seed production can always end as food for the farmers. The bottom line will be the generation of extra income as well as the availability of food supply to purchse with such income.

Also, commercial enterprises will not step in, without some guarantees as to the quantities of seeds available for collection and processing.

B. Seed techniques

Increase of production will require a better mastering of seed practices; rates of adoption and knowledge of seed practices vary between bush consultants and therefore between farmers that they train; bush consultants are hesitant to increase seed surfaces as they fear they cannot control the quality of production; although improved through the use of barrels, natural pesticides, ash and sand, storage is still an individual affair and subject to insects attack. Fertilizer applications are infrequent and subject to distribution by NGOs since s farmers can ill afford them. Production of seed competes with growing of millet, cowpea and groundnuts. And then, if the rain does not come or is insufficient....

C. Promotion

Increased marketing require an increased awareness on the part of potential buyers about the quality of the product. If word of mouth and demonstration effect work well within a 5 to 10 km radius, and bring buyers from neighboring villages, it becomes more difficult to differentiate the product from other cereals of unknown origin, sold as seeds and therefore, to command a higher price. And where it is available, seeds in bulk cannot compete with the certified seeds sold in small bags.

D. Input Costs and Credit

As usual, farmers have limited access to credit. Following a tradition of inputs formerly provided by the SDR (Governement Regional Development Companies, now disbanded) farmers still expect inputs to be provided free of charge, not always aware that the corresponding amount used to be debited from payment of their harvest.

The new agricultural policy spelled out by the Senegalese Governement in 1984 meant the phasing out of state development corporations (SAED, SODEVA, SODEFITEX,

SOMIVAC, SODAGRI for development corporations, BNDS as development bank). These used to provide inputs and credit to farmers (albeit not always suceessfully).

A credit organization, CNCAS (Caisse Nationale de Crédit Agricole du Sénégal) is in charge of agricultural credit; this is mostly directed to "credits de campagne", a short term loan to marketing organizations collecting and processing agricultural productions, and predominantly oriented towards groundnut, Senegal only cash crop. While commercial enterprises work in rice and groundnut, they still have not entered the millet and copwea market; the private operators collecting and processing seeds are NGOs such as WVI, Youth movements, and GIEs. These organizations may apply for a loan from CNCAS for a minimum of 100,000 CFA with a 15% own contribution; they can obtain a 60% guarantee from PAS which helps GIE fill their loan appliacations and issue a "technical opinion"; CNCAS risk is therefore limited to 25%. There is no evidence of credit granted for agricultural inputs at this time.

NGOs have played the role of agricultural credit coporations by providing free or heavily subsidized inputs and allowing farmers to pay at time of harvest; there again, the most expensive items is fertilizers. Farmers will always find money for seeds (1000 CFA/ha millet or 4,000 CFA/ha kg cowpea, but up to 35,000 CFA/ha for groundnut) tools (or barter if in dire straits) but has to forego fertilizers and sometimes pesticides and sprayers, in the absence of NGOs.

The following table details the real costs of inputs; one should add cost of labor, use of tools and animal traction [2].

1. Input costs

WVI distributed fertilizers in 1990, fertilizers and urea in 1991 and pesticides every year for millet; and only Pesticides for cowpwa and fodder cowpea.

Millet

Inputs	1990-91			1991-92		
	Qty/ha	UP (F)	Total/ha	Qty/ha	U.P.(F)	Total/ha
Seed	4 kg	187,5	750 F	4 kg	250	1 000 F
Fertilizer	100 kg	60	6 000 F	100 kg (urea)	90	9 000 F
Pesticides	1 l	1 000	1 000 F	1 l	1 000	1 000
Total			7,750			11,000

[2]See Martin, Frédéric (1991) 'Budget de culture au Sénégal', ISRA- Michigan State University, Department of Agricultural Economics.

124

Table 8: Input cost for millet seed production

Cowpea and fodder

Inputs	1990 and 1991		
	Qty/ha	U.P (F)	Total/ha
Semences	16 kg	225	3 600
Pesticides	1 l	2 000	2 000 F
Total			5 600

Table 9: Input costs for cowpea and fodder cowpea seed production

For the 1993 new cowpea varieties emergency program, the cost born by WVI is as follows:

. Seeds: 16 kg @350 F/kg= 5 600
. Pesticides: 2 l @ 2 000 F/l= 4 000
. Total: 9 600 F/ha

The farmers are asked to pay only 1 000F towards pesticides and give back the same quantity of seds at harvest time.

2. Marketing costs

The following are estimates from PAS on marketing costs for the marketing organizations and the basis on which GIE apply for credit from CNCAS (Cost are CFA/ kg collected)

Crop	Size bag	Paid to producer	Pick-up costs	Truck. cost	Bagging cost	Market costs	Total
Millet	60 kg	70	3.5	5	60	68.5	138.5
Rice	40 kg	105	4	3.1	50	57.1	162.1
Cowpea	100 kg	100	5	4	60	69	169
Shorgo	80 kg	80	3	5	60	68	148
Maize	80 kg	80	5	5	own *	10	90

* Bagging station own by the maize project; no operating cost provided.

Table 10: Estimated marketing costs for cereal seed in Sénégal. Source: PAS, Dakar

Assuming an optimum crop of 800/kg/ha for millet and 600 kg/ha for cowpea, farmers will need between 41,400 CFA and 55,200 to get their production to the bagging station and back to their village.

Price paid to the producer in this instance is lower than what WVI has paid to farmers so far, and even lower

Total production and marketing costs should be compared with an expected income of 72,000 to 100,000 CFA per ha, assuming a price range of 90 to 125 F/kg for bulk sales for millet and an expected income of assuming a price range of 150 CFA to 250 CFA/ kg for cowpea.(See village surveys for prices paid to farmers by WVI and by other buyers)

At present, farmers do not seem able to pay cash for inputs and finance marketing costs of certified seeds. They tend to rely on subsidized inputs or get inputs on credit through WVI, which effectively acts as a credit corporation. Moreover, their marketing is de facto limited to sales of bulk, non-certified products, to their fellow villagers and neighboring villages; but even at that level, there is room for more sales.

The constraints are therefore a mix of technical problems, lack of credit for inputs, competition for time and labor, water dependency, farmers motivation and marketing techniques. The following recommendations were arrived at from discussions with farmers, their suggestions, discussions with PAS and DISEM officials, with WVI extension agents and own findings in the field.

VI. Recommendations

A. General

1. Technical problems

The differences found in farmers rates of adoption and mastering of seed practices call for a specialization of farmers as seed producers. Some of the farmers interviewed found it to their advantage to sell their product as seeds then turn around to buy cereals as food.

Bush consultants tend to stick to 1 ha plots maximum of seed multiplication in order to better control the quality of production, because they also keep other fields for food production; there is a high demand for time and labor over a short period of time. The incentive to seed production lies in the extra income such culture would bring. It is suggested that a more detailed comparative budget (food production plots v. seed plots) be worked out by WVI extension agents in their area, following the method used in "Budgets de culture au Sénégal". [3]

Within a village, farmers could be specialized in seed production, provided other members of the family and of the village take care of the food production; within the village such farmer could become the seed provider, reducing the need for other farmers to set aside production for seed.
Such specialization would also eliminate the risks associated with isolation, especially in the case of millet, since only one type of seeds would be produced in any location.

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[3] Ibid note 2.

126

Similarly, climatic constraints call for specialization of areas: short cycle varieties fare better in the Louga area; cowpea and fodder cowpea fare better than millet and groundnut in reduced rainfall. From discussions with ISRA, it has been suggested however that, in order to spread the risks related to low rainfall, specialization based on climatic conditions be limited to 75% of the areas planted, and 25% kept in marginal regions.

The same scheme could apply within a farmers organization or GIE or a GIE create for the purpose of seed multiplication; such specialized GIE exist for registered seeds production under PAS supervision. This could lead to contractual agreements between farmers and GIE with marketing groups, be they other GIE or commercial enterprises.

2. Water availability

The dependance on water and the competition for time and labor during the rainy season call for production of seeds in an irrigated environment and goes hand in hand with the specialization of farmers. Garden size to 1/2 ha plots could be irrigated through the use of hand carried buckets, filled from a catchment basin which is supplied by a pipe form the wind pump or the hand pump as is the case for some of the vegetables gardens kept in the villages.

Precise water, time and labor requirements to irrigate such surfaces need to be worked out; but assuming 400 mm of water (optimal rainfall) over 1/2 ha (as higher yield is expected, surface requirements would be less) it would require 2 000 m3. Can a wind pump provide that much water over a 3 months period (assuming a 90 days variety)?. Is labor available as this dry season activity would conflict with market garden, processing of groundnut oil and meals and wood collecting for women and cattle rearing, trade and immigration to the cities for casual work for men. Could such activity retain some the labor force which is otherwise drifting to towns? Such production will also require changes in seed techniques; how well will farmers adopt those?

Irrigated production was also envisaged for registered seeds, but recent years statistics did not show a shortage of registered seeds as opposed to certified seeds.

3. Credit

As mentioned in the analysis of constraints, credit is available for marketing organizations; as villages or groups of villages organize themselves as GIE to market their production, they should be able to access the same credit facilities to buy the production from their members, finance transportation and processing of seeds. The possibility of obtaining credit to buy inputs as a GIE should be reviewed woth both PAS and CNCAS, either as a separate loan or tagged on to the marketing credit to purchase inputs for the next cropping season.

Alternatively, a "caisse" could be organized within the village or within a GIE, to purchase inputs; similar "caisse" exits in the villages where WVI operate to finance the maintenance of water hand and wind pumps, and for the garden plots, the latter operated by women. Women groups also operate other "caisse" for income-generating activites such as sewing and dyeing, soap making and milling of groundnut.

121

The idea of borrowing from those caise for purchase of agricultural inputs is opposed. Each activity is perceived as independent from the others.

WVI has already trained women groups to manage a " caisse" and produced a training manual in Wolof to that effect. It seems particularly suited to train villagers to organize a further "caisse" for inputs.

Since such purchase is more a man's affair, income derived from men's activities such as trade in towns during the dry season, sales of cattle, or sales of groundnuts should be set aside. Several cases were mentioned whereby income from groundnuts allowed to buy extra cereals for food after paying back credit. Should the villages get together as a purchasing group, there might an economy of scale and better prices obtained for fertilizers and pesticides; sprayers could also be pruchased and rented out to farmers.

The involvement of farmers in such a scheme is the best way towards breaking away from subsidized inputs and build their interest into low cost fertilizing techniques such as compost which, by buiding soil fertility, would decrease the need for high-priced fertilizers.

The progressive transfer of the full production cost to the farmer of the full production cost is the condition to "graduation" of the villages to the level of seed enterprises and of a sustainable seed production.

4. Marketing

It is not certain that it is beneficial to the farmer to control every step of the seed cycle, from production to sale of certified seeds. On the principle of "stick to your knitting" and "doing best what you know best", farmers should concentrate on the production of a high quality product, in quantities large enough to attract a marketing organization. The farmers should aim at organizing production groups, recognized as good seed producers by DISEM agents and regularly checked by them to ensure quality control, able to negotiate formal production contracts with marketing groups, who would be required to put a down payment as comittment to buy; this is in line with the 35% down payment that PAS requested from GIE buying registered seeds after it got stuck with orders for registered seeds that nobody took delivery of.

The collecting, transportation, processing and sales on the market place should be the responsability of marketing organizations, better equip in terms of labor and trucks for such an operation. Agreements can be worked out however for resale of bagged seeds by the marketing organizations to the village cereal store.[4]

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[4] The idea of local bagging stations installed in the PAS cereal stores, to avoid the transportation to Diourbel, has been discussed, when trying to establish the conditions of complete control by the farmers of the seed cycle. It was not possible to get satisfactory information as to the availability of such equipment in Senegal, through interviews with Equiplus and Matforce in Dakar. The Diourbel bagging station is currently underutilized, and in order to attract users, only variable costs are billed. As long as this is the case, the idea of local bagging stations will meet with strong opposition from agriculture officials.

However, the origin of the product should be known, hence it is necessary to launch a promotional effort to advertise for the producers: bags of certified seeds could be printed with the name of the producing village or GIE; local radio advertising, through the rural education program "Disso", printing of calendars, and tee-shirts should be used as in the case of groundnut seeds promotion. [5] There is provision within PAS lines of credit and technical assistance for financing and helping out promotion. An advertising component can be built into the credit obtained from CNCAS. This type of promotion would be in line with DISEM aim, to promote the use of certified seeds and eventually eliminate all other "seeds" ; since farmers saved seed will never be eliminated, it would also help promote the use of improved varieties at the village level, and in the neighboring villages, thus increasing the diffusion of seeds which is currently taking place. (A much better alternative to buying "seeds" of dubious origin on the market)

Generally, all recommendations assume a global extension of the GIE movement within the villages as a way to involve farmers, make them responsible for their life and as a way to find solution to lack of means. All villages visited were either in the process of creating a GIE or had just created one and had some group or another already operating (Women's group, water pump caisse, etc..). The collecting of the minimum deposit with a bank required to be registered as a GIE provides already the members with a sense of responsability.

B. Specific course of action for WVI and Winrock (OFPEP)

1. Control of production

In order to better assess the impact of their seed multiplication and extension program, and as a model for future programs of this kind, WVI should systematically monitor the quantities of seed produced in the multiplication plots, and its use and take ramdom sampling of yields in demonstration plots. It is suggested to use the same tables that were designed for the village survey. These tables can be developed in both Lotus tables or Word Processing table formats and a copy distributed to both bush consultants and extension agents. Bush consultants interviewed themselves realized that it would be useful to keep better record of their seed production and be able to compare yields between varieties, given similar rainfall.

They are already keeping records of raingauge and distribution of agricultural inputs and should be able to fill such forms with numbers. Names of crops and captions could be translated in Wolof for ease of use.

Platform scales should be made available, as in some villages the production was weighted with small market scales. Such scales could be located in the cereal store where available or in the "case de conservation" (storage huts for seeds and other inputs).

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[5] Printing for clothing material for "special occasions" is a well known practice in Africa; this could also be used as a promotion technique. It has been used successfully in other countries to promote medecines; why not seeds?

124

The production records could also be used as a promotional tool, to show interested farmers a documented account of increased production.

Winrock should use the measurement of yields as a monitoring criteria for assessment of project impact in WVI area and other areas covered by OFPEP.

2. Specialization of farmers

Both Winrock and WVI should discuss with the bush consultants, DISEM and ISRA the desirability of and the interest in specializing farmers in seed production and specializing areas in one particular seed. WVI should then identify the "best seed producers" among interest farmers and "the best plots".

3. Production of seeds in irrigated conditions

Winrock should initiate a detailed feasibility study of seed production in irrigated conditions with ISRA agronomists. Water, labor and time requirements and costs should be determined as well as soil and water availability, assuming that such production could draw on existing WVI boreholes.

4. Management training of farmers

WVI should pursue with the farmers the training provided to women for "caisse" management, in order to create a "caisse" for purchase of agricultural inputs and work alongside PAS for training in management of cereal stores, in the villages where such stores have been built (Kandala and Pallene Ded, so far; two more stores expected in the WVI area). The earlier the farmers can pay for a larger portion of the input costs, the earlier WVI can get out of the subsidizing of inputs and of acting as a credit corporation.

Winrock should draw on WVI experience to extend such training to other areas of OFPEP intervention, as a technical assistance to the creation of GIE country wide. Winrock could call on specialized credit unions to help design a training program to assist farmers and GIE in filing a credit request with CNCAS, and manage the loan obtained, organize a purchasing group and deal with suppliers of agricultural inputs.

5. "Local" Marketing

In order to give a better product image to seeds sold on the market, WVI could attempt standardize the presentation by promoting the use of one type of bag or other container, inscribed with the WVI logo and if possible the name of the village or GIE producing the seeds. Discuss with PAS availability of financing for printing of tee-shirts, calendars, even clothing material to promote the local product within the Louga and Thies regions. Promote sale from the cereals store where available to take advantage of the character of "meeting place" of such a store for the villagers. Extend the practice of conducting germination tests at the point of sales.

6. Promotion of certified seeds

WVI should discuss with PAS the possibility of indicating the origin of the seeds on the bags containing production collected by WVI.

Overall Winrock should build on WVI experience and further developments to extend the same practices and improvements to other areas covered by the OFPEP project and adapt them to the crops and local conditions. All work should be carried out in cooperation with PAS, DISEM and ISRA and, whenever possible and feasible, with other NGOs and/or youth movements or commercial enterprises willing to operate in the seed cycle. The ultimate goal is to make seed production sustainable and allow WVI and similar NGOs to withdraw from the role of seed enterprises.

31

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132

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Questionnaire for ISRA- Interview July 22,1993, Bambey

Sources of seeds in Senegal in the past five years, by crop type and varieties

Groundnuts

Niébé

Niébé diourgi

Millet

Vegetables

Potatoes

Quantities provided to WVI, farmers, GIEs, PAS, trading organizations, else.. in past 5 years

Cycle of seeds from base material to multiplication:

How much base material needed for multiplication

Yields of multiplication

Frequency of renewing seed base material for multiplication

How long (how many times)can same strain be planted (using farmers saved seeds)

Estimates of seeds needs for Senegal and current coverage

Millet

133

Niébé

Niébé fourrager

Rice

Groundnuts

Others

Sources of coverage:

ISRA (base material or multiplied seeds)

Imports from where for what seeds. Prices.

How distributed

Appendix 2

Sample questionnaires

134

Village identification

Name of village/Nom: Kandala

Area in cereals/Surface en céréales . . . . . .

Niébé/Cowpea
Niébé fourrager/Fodder cowpea
Shorghum/Shorgho
Millet/Mil

Maraichage/Garden

Area in peanuts/Surface en arachides . . . . . .

Household and seed production

Nom de la famille interviewée/Household name : GIE, Khade Le Présidente
Nombre de personnes/Household size : 200 people in 14 villages
Number of people involved in seed production: 54

Area cultivated in seed/Surface en semence
Provenance de la base/Material origin (by type of seed, par type de semences)

Season/Seed	B21	NDr	58-57	TVX	Four.	IBV 8004
90-91	1/wv					1/wv
91-92	2	3	4	3	4	9
92-93	2	1	1		3	12

Production/type (kg) or in this case purchases by GIE from members

Season/Seed	B21	NDr	58-57	TVX	Four.	IBV 8004
90-91	250					343
91-92	600	450	980	450	1500	1500
92-93	250	308	?	?	+/- 1090	267

Utilisation d'engrais pour semence/Use of fertilizers for seed prod. Yes 91-92

Usage of seed produced/Utilisation des semences produites
(in kg)

Season/Seed	B21	NDr	58-57	TVX	Four.	IBV 8004
90-91	1 50 2 100 3 ? 4 45 5					1 43 2 300
91-92	1 2 98 4 200 5 ? PAS				2 ? 3 ? 4 ?	2 ? 3 ? 4 ? PAS
92-93	1 2 182	?	?	?	1 2 105	?

Table: 1 self-consumption, 2 WVI sales, 3 sales to neighboring villages, 4 marché/market, 5 gifts/dons

Unable to give detailed use of production; for lack of a platform scale, production is weighted on small market scales...

Sales price

	B21				Niébé fourrager				IBV 8004			
Util.	1	2	3	4	1	2	3	4	1	2	3	4
90-91												
91-92		100	125								140	170
92-93												

Price varies according point of sales and customers:
Markets: Cowpea 170/kg Kebemer; 225F/kg for a trader in Louga
Sales to WVI at price agreed upon before harvest cowpea 100F/kg

126

Questionnaire :

Date of visit 7/23 Name of interviewer: Danièle Heinen

Village identification

Name of village: Parky Khebe
Area in peanuts/ arachides: 51 ha (sharp decrease in 1993)

Area in cereals:

Niébé/Cowpea: 35 ha
Niébé fourrager/Fodder cowpea: 1/4 ha (bush consultant)
Millet/Mil: 15 ha

Maraichage/Garden: +/- 800 m2

Water resources: Hand pump
Rain gage: 92-93 rainfall was 103.4 mm

Seed production

Nom interviewé/ Name: Modou Kiébé (trainer and seed multiplier)

Area cultivated in seed/Material origin (by type of seed)
Surface en semence/ provenance de la base (par type de semences)

Season/ Seed	B21	Cowpea other	Fodder	IBV 8004
90-91				1
91-92				1
92-93				1

Production/type (kg)

Season /Seed	B21	Cowpea other.	Niébé F	IBV 8004
90-91				50
91-92				100
92-93				250

137

Utilisation d'engrais pour semence/Use of fertilizers for seed prod. Yes in 1991-92;

Use of seed produced/Utilisation des semences produites

	B21					Fodder cowpea					IBV 8004				
Use	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
90-91											50				
91-92												15			
92-93											250				

Table: 1 auto-consommation, famille (self) 2 ventes WV sale 3 ventes villages voisins (sales to neighboring villages, 4 marché/market, 5 gifts/dons

Prix de vente/Sales price

	B21				Fod. cowpea				IBV 8004			
Use	1	2	3	4	1	2	3	4	1	2	3	4
90-91												
91-92											125	
92-93												

Table: 1 auto-consommation (own consumption) 2 ventes WV sale 3 villages voisins/ neighboring villages 4 marché/market

Comments on yields:

Millet: traditional variety (satialine) yielded 700 to 800 kg/ha; no longer used as longer cycle; IBV 8004 introduced in 86-87 by SODEVA; lack of rainfall led to poor yield (100-150 kg/ha)

Multiplication has not been successful first year; no reason mentioned; lack of rain the next two yeras led to poor production. Will grow 2 ha in 1993

Cowpea; two traditional varieties yield 600 kg/ha; longer cycle; good price on market (500 F/kg); still grow 3 ha; sells 1.2 MT out 1.8 MT produced.
Started 1/3 ha TVX as extension; yielded 300 kg which allowed to feed 4 sheep for two more months during dry season.
No TVX in 1993 as insects

Fodder cowpea: 1/2 ha of traditional variety (oualet) yields 500 kg/ha; small quantity planted in 91-92 as a trial; obtained 4 kg grain and some fodder.

Groundnuts situation: SONACOS buys 80K/kg; current yield 800 kg/ha, v. 1.5MT to 2 MT previously; 51 ha will bring CFA 3,264,000 for the village.
Due to poor crop in 1992-93, price of groundnut seeds reached 35,000 CFA/100 kg.

Comments on seed diffusion:
Most farmers grow IBV 8004; seeds purchased from a multiplier in neighboring village, Baroum Diop, 3 km away, at 125F/kg; such seeds were initially provided by another multiplier Dalouye Malone from the village of Tala Malone.

Interviewers comment: General lack of rainfall in 1991 and 1992 in this area; decreasing groundnut production seems an incentive to switch to cowpea and cattle raising as more drought resistant productions.

134

Questionnaire :
Date of visit 7/23 Name of interviewers: Marcel Preira/Danièle Heinen

Village identification

Name of village: Par Cisse (Mbedienne, Louga zone)
Area in peanuts/ arachides: 200 ha (10% decrease in 1993)

Area in cereals:

Niébé/Cowpea: 90 ha last two years; increase in 93 due to decreasing groundnut
Niébé fourrager/Fodder cowpea: (bush consultant)
Millet/Mil: 130 t0 140 ha

Maraichage/Garden:

Sheep and poultry

Water resources: Hand pump

Rain gage:

Seed production

Nom interviewé/ Name: Saar Cissé (trainer and seed multiplier)
2 more contractors grow seed
Area cultivated in seed/Material origin (by type of seed)
Surface en semence/ provenance de la base (par type de semences)

Season/ Seed	B21	Cowpea other	Fodder	IBV 8004
90-91	1			2
91-92	2x1/2			2
92-93				2

Expected for 93-94: 1 ha 58-57; 2 ha IBV 8004; some (?) new cowpea varieties

Production/type (kg)

Season /Seed	B21	Cowpea other.	Fodder F	IBV 8004
90-91				50
91-92				100
92-93				250

Utilisation d'engrais pour semence/Use of fertilizers for seed prod. Yes in 1991-92;

Use of seed produced/Utilisation des semences produites

	B21					Other Cowpea					Fodder cowpea					IBV 8004				
Use	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
90-91																50				
91-92																	15			
92-93																250				

Table: 1 auto-consommation, famille (self) 2 ventes WV sale 3 ventes villages voisins (sales to neighboring villages, 4 marché/market, 5 gifts/dons

Prix de vente/Sales price

	B21				Other cowpea				Fod. cowpea				IBV 8004			
Use	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
90-91																
91-92															125	
92-93																

Table: 1 auto-consommation (own consumption) 2 ventes WV sale 3 villages voisins/ neighboring villages 4 marché/market

Comments on yields:

141

Appendix 6

Consultancy Report of W. L. Hargrove

TRIP REPORT

W.L. Hargrove
Senegal and The Gambia
The OFPEP
29 May - 5 June, 1993

Trip Objectives

1. Provide consultation services on the design and function of soil conservation interventions and soil fertility amelioration; both with staff, collaborators, and in-country agronomists working with ISRA. (l'Institut Senegalaise de Recherches Agricioles)

2. Evaluate the potential of cover crop and improved fallow techniques in the work zone (ranges from culture of flooded rice, some on sulfate soils, to upland culture of cereal grains under semi-arid regimes on sandy soils)

3. Make recommendations of appropriate plant associations and rotations under limited rainfall and conditions that favor soil erosion. The risk margin for farmers is high and the environmental setting subject to severe limitations for crop production.

Trip Schedule

29 May	Arrive Dakar
30	Discuss program background, cover crop potential, work zone, soil issues
31	(Memorial Day) Travel to Kerewan, The Gambia
1 June	(Tabaski) Tour OFPEP sites with Steve Gronski, Save the Children
2-3	Nioro region - 2 ISRA stations, upland runoff, soil conservation sites; Kaolack - Babou N'Dour, agricultural station; ISRA station at Bambey; return to Dakar
4 June	Dakar, meetings
5 June	Depart Dakar

Expected Output

A report summarizing consultation, evaluation and recommendations containing information on: soil conservation techniques, cover crop potential, and plant associations considered in various areas of the work zone. The report should contain a

description of the situations examined, potential solutions, and sources of information and technical assistance.

Observations and Notes

Sunday, 30 May

We met briefly with Tom Osborne (Winrock), Chief of Party for OFPEP. He described the objectives for the trip as follows:

1) The technical aspect, i.e. they would like information on cover cropping, multiple cropping, and soil conservation techniques.

2) Networking, i.e. they want to pose questions to people outside the OFPEP Project and develop a network of contacts and information sources.

3) Lessons learned, i.e. to obtain a better idea of what they are doing and learn from their experiences.

4) They are interested in ways that they can access SANREM.

Monday, 31 May

We met briefly with Alphonse Faye, the OFPEP agronomist. We discussed general cropping practices for rice farming in the Gambia and southern Senegal. He identified the limiting factors for rice production as: 1) the rainfall pattern, 2) soil toxicities (Fe, salt), and delay in return of the water table.

Women are the primary rice farmers, although in some ethnic groups, men and women are working together. The men have animal traction, but women do not. He explained that a woman's "worth", or social esteem, is determined by the amount of rice she can produce.

After harvesting, the rice straw is usually burned, and vegetables are grown in the lowlands where there is a water table. Where the water table is not close to the soil surface during the dry season, the rice straw is generally grazed, the remainder left in the field, and the field fallowed until the next rainy season. Where the water table remains near the soil surface, vegetables (tomatoes, okra, eggplant, cabbage, and lettuce) are grown, perhaps more than one crop in sequence. Animal manure is hauled to the fields to maintain soil fertility. The source of this manure is household sheep and goats that they own. Sometimes the rice residues and other residues are left in the field, but more often they are burned.

In summary, animal manure seems to be used reasonably well for maintaining soil fertility, but burning residues is a major constraint. Alphonse and Sarah are very interested in developing

144

compost as a means for improving and maintaining soil fertility. With respect to soil erosion control, there is some limited use of stone diguettes, but not much use of mulch or hedgerows.

Tuesday, 1 June

We visited fields near Kerewan with the OFPEP Coordinator, Steve Gronski (Save the Children). Millet is being grown in the uplands. The fields were clean (residues collected and burned). Women were hand-broadcasting what we thought were millet seeds and raking them in. Soil erosion is a problem in this area.

We also visited some rice fields in the area toward the Njawara river which would be rainfed, not irrigated. Steve explained the problem in these fields was lack of organic matter and lack of N. The fields were demarcated by small earthen bunds planted to grasses (Andropogon sp. or Panicum sp.). There was some rice residue remaining on the fields. The soil was very hard. Rainfall in this area is about 700 mm.

In general, the management on these rice fields seems pretty good. They are fallowed over the dry season, and at least some residues are left in the field. The constraint seemed to be management of the uplands, where millet is grown and the soil erosion hazard seems great.

We went by car to the rice fields near the river which have been abandoned because of acid soil and salt problems. Save the Children is leading a project designed by The Gambia Soil & Water Division to lime this area and channel water from the uplands to this area to leach the salts. Soil analyses were not available, and Sarah nor Steve were sure of the mineralogy of the soil. Sarah suggested that phosphogypsum might be effective; however, phosphogypsum could exacerbate the problem if the mineralogy of the soil is 2:1 clays. Steve had ordered some lime for the area. The water diversion consists of a series of earthen bunds in the uplands and channels to bring the water to the lowlands. One large dike and one smaller dike had been constructed near the rice fields to contain the water to try to leach the production fields. This seems like a good scheme.

We drove also to the uplands. Millet and groundnuts are the main crops being produced on these fields. This seems to be a critical area for soil erosion control measures. The water harvesting scheme depends on the long-term functioning of the earthen bunds. However, if the channels fill with soil from erosion from the production fields, water will flow over the bunds or will break through the bunds. The fields were clean and had been burned. Protection of this area is critical to the functioning of the bunds and to the long-term productivity of the uplands and the lowlands. Another motivation for the water diversion scheme was the problem of flooding of the village. The berms built by Save the Children

145

divert the water around the village. The water diversion scheme was designed and implemented as a result of a PRA activity done by Save the Children.

We drove to a village just across the border in Senegal, Karonko, where rice is being grown, but the women are complaining about soil erosion from the sandy uplands moving onto their rice fields. The fields appeared to have good organic matter content; there were many earthworm casts evident. The rice fields had some residues remaining and cattle were grazing in the fields at the time we were there. Dean Donaghue, a Peace Corps Agriculture Volunteer, has been working with women in these rice fields. He was to meet us, but we had arrived early. He had previously pointed out the women's concerns to Sarah Workman.

We walked to the uplands where the soil is very sandy. Corn and groundnuts are the principal crops. The land is more sloping (5-10%), and is in need of more treatment than just residue management or cover crops. Practices such as diguettes, terraces, or hedgerows will be necessary to control erosion.

In summary, sustainable rice production, in my opinion, will depend on protection of the uplands. Many possibilities for improved techniques to control erosion exist, such as mulch, improved crop residue management, and/or cover crops. On steeper slopes, practices such as diguettes or hedgerows will be required.

Wednesday, 2 June

We left The Gambia through Farafenni and drove to Nioro and Kaymor. The region had been selected ro site visits based on recommendations by Kristin Sage, PCV in natural resources management. In Kaymor, we met Gretchen Hopley, a Peace Corps Agriculture Volunteer. ISRA (Thysse) is doing several things here to control erosion. They are building stone diguettes to control gully erosion (not continuous lines but short lines). Also, they are building small stone cuvettes around planted trees. The farmers are growing primarily millet and groundnuts. Gretchen said there is considerable interest in sorghum. Gretchen explained that the crop residue management for millet was that the stalks were left in the field until the end of the dry season when they are burned. Groundnut residues are harvested for animal feed.

We drove to the village of Senkoran where we saw severe gully erosion. The soil appears to be a sandy surface soil over a more clayey subsoil. There is more slope in the terroir villagois, and the erosion is severe. There is a dispute in the village as to who is the chief; thus, the village is doing little or nothing about the erosion problem. ORSTOM and ISRA are collaborating on building cuvettes, planting trees, working on hedgerows, and evaluating cropping systems. The hedgerow work was very interesting as woody species and grasses were combined in the hedgerow. The cropping

systems work involved intercropping of millet and niebe.

Steve Gronski departed for the Gambia after lunch. He indicated that he was interested in evaluating some tropical legumes as cover crops. He requested seeds of Jackbean (Canavalia sp.), African Yam Bean (Sphenostylis stenocarpa), and Rice Bean (Vigna umbellata).

After lunch we visited the ISRA station in Nioro where several alley cropping trials were being conducted by Babou N'Dour. There were several introduced tree species that were being evaluated including: Leucaena leucocephala, Cassia siamea, Glyricidia sepium, and Neem. Several native and introduced species were also being evaluated as live fences. Sarah likes native species (Acacia, Bombax, Pterocarpus, etc.), in general, rather than introduced species.

Thursday, 3 June

We visited the ISRA station at Kaolack. We met Modou Sene, soil scientist (Address: ISRA SCS, BP 199, Kaolack, Senegal. Tel. (221) 41 29 16). He described an interdisciplinary program in natural resource managment being conducted by ISRA-Kaolack. Some of the work is being done in the vicinity of Senkoran. He showed us a poster paper with some preliminary results (Note: The paper was given at the ISCO meetings in Addis Ababa. George Langdale from Watkinsville, GA went to this meeting; he has the proceedings.). The approach is a watershed or landscape approach. The rainfall is in the range of 600-700 mm. They are cooperating with Rodale and Africare in some of these activities. Some of the practices being evaluated included hegerows, contour plowing, stone cuvettes, etc.

He also told us of a French scientist, Chopart, who worked at the ISRA station in Bambey and conducted research on no-tillage, mulching, and cover crops for several years. He said that we could find publications on his work in the ISRA-Bambey library.

We visited Babou N'Dour, the agroforester with ISRA. He is working on two big projects, FIDA, an agroforestry development project, and with ICRAF on on-farm research on alley cropping, live fences, wind breaks, and animal feeding. For hedgerows and windbreaks, they are sometimes combining grasses with woody species. They have a source of vetiver grass in Sonkoro (Msr. Diatta).

They are also working on improved fallow, where they plant trees and grow no crops for four years and then plant crops between the alleys for four years. They are evaluating Cassia siamea, Tephrosia bractiolata, Guiera selegalensis, Prosopsis cineraria, and Acacia sclerosperma. Cassia siamea is the fastest growing. They are also using natural regeneration as one treatment.

In alley cropping work, they are evaluating Gliricidia, Cassia, Neem, and Leucaena. I asked about species for use on contours as

a hedgerow or on earthen bunds. He suggested Hardwikia binnata, a species similar to Piliostigma, and Zizyphus mauritiana. He also suggested that it would be possible to plant grasses with them, like Andropogon, Panicum, or vetiver grass.

We went to the Bambey-ISRA library. We found several publications by Chopart, the French scientist, but they focused on minimum tillage and not green manure or cover crops. He and Nicou have a paper in the 1979 book on soil tillage and crop production. Also, Limamoulaye Cissé (Millet Network Coordinator for ICRISAT, Niamey, Zana's neighbor) worked at Bambey on cropping systems. (I need to contact him.)

Friday, 4 June

We met with Phil Jones, Ag Project Officer, US/AID. I briefly described SANREM and the objectives for my visit to Senegal with OFPEP. Phil told us of a new mission-funded project being developed which will be a follow-up to the reforestation project. The focus of the new project will be community-centered natural resource management. The project should be ready to begin in 1994. The focus of the mission is natural resources and human health. Mike MacGahuey was on the design team for the project. Phil will speak to Jim Bonner and Mike about SANREM.

We had a meeting with Tom Osborne and Alphonse to brief them on our trip. I prepared my report.

Analysis, Potential Solutions, and Recommendations

Lowland Rice Soils

In general, the rice soils seemed to be the better-managed soils. Soil fertility is maintained by leaving at least some residues in the fields and by adding animal manures and some fertilizer. Soil erosion does not seem to be a big problem, as slopes are very small and fields are diked to pond water and demarcate the fields. Native grasses were growing on the earthen bunds.

The primary problem seems to be soil acidity and salt toxicity. Soils data provided by Alphonse (Brusq, et al, 1987) show that lowland soils in the Bao-Bolon valley have pyrite, are around pH 6, and have a high salt content. Soils near the lowland contain jarosite, a potassium-iron-aluminum-sulfate-hydroxide mineral, and soils in the uplands contain gypsum. Since the source of acidity and iron is pyrite, the best management for these soils is to keep them flooded. Oxidation of the pyrite while not flooded produces acidity (sulfuric acid). These soils will not respond to phospho-gypsum, and in fact application of phospho-gypsum would exacerbate the problem.

The scheme to channel water from the uplands to the lowlands seems a good one and seems, along with lime applications, the best management practice for restoring rice production on these soils.

Upland Soils

At every site that we visited, the critical issue seemed to be the management of the uplands. It is soil erosion from the uplands that will threaten the durability of the water diversion scheme in Njawara, it is soil erosion that threatens rice production in Karonko, and it is soil erosion that threatens the village of Senkoran. Thus, it is soil erosion control and maintenance of productivity on the uplands that seems to be the challenge to sustaining agriculture in this landscape.

Maintaining Soil Productivity

In general, animal manure is widely used for maintaining soil fertility. Manure is both hauled to fields, and animals are bedded overnight on fields. Alphonse also said that there is limited fertilizer use. The biggest opportunities for improving practices to maintain soil fertility seem to be: 1) improved crop residue management, 2) compost, and/or 3) cover crops or green manure crops.

Many fields had residue remaining in them, but the majority seems to be burned. One practice that would both help maintain soil productivity and control soil erosion would be not to burn. Some farmers in similar rainfall belts in Burkina Faso are not only refraining from burning but also are bringing additional mulch or "paillage" to the fields in the form of cut native grasses. Their motivation is increased yields due to water conservation from the mulch. A demonstration or farmer-participatory research trial on this would seem appropriate, especially in Njawara.

Another practice that holds promise is composting. The limitation is the effort and labor required to deliver household garbage, manure, crop residues, etc., to a compost pit and then to deliver the compost to the fields. But again, if yield increases can be shown it is more likely to be adopted. It is more likely to be successful for fields near compounds.

There are many opportunities for use of cover crops or green manure crops, but there are also many limitations. Cover crops cannot be used in these areas as they have been in more humid climates, due to limited rainfall. But, there are several ways in which cover crops might be used to provide soil erosion control and maintain soil fertility. One would be interplanting with a cereal and cutting the green manure for mulch, or forage, if needed. Species that could be used in this way include Mucuna, Lablab, and niebe (prostrate type). These are all viny tropical legumes that accumulate a lot of biomass. The Lablab can be cut during the

rainy season and it will continue to resprout. This makes it a good condidate for use in interplanting because it will produce enough biomass for forage and mulch. Niebe is particularly interesting because it produces seeds that are consumed and it is a familiar plant to farmers in the area. The so-called "dual purpose" cowpeas should be considered, as they will produce both biomass for mulch or forage and an edible seed crop.

A second approach would be either interseeding the cover crop just before the main crop matures or seeding it after the main crop is harvested. It would use residual soil moisture and eventually desiccate or be eaten in the field. Niebe (non-photoperiod sensitive) is a particularly good candidate for this use.

Other practices that offer potential include improved fallow in agroforestry systems, where woody species can provide green manure or mulch to the fallowed fields. Another practice that is being used in Burkina Faso is the zai system, where holes approximately 10 cm in diameter and 10 cm deep are made in fields on a 1 meter spacing and filled with compost or manure. Crops are then planted directly in the hole or around the hole. This system improves both soil fertility and increases water infiltration, but is rather labor intensive. It is best introduced for high value crops.

Maintaining soil fertility in groundnut fields poses a particular challenge, as groundnut residues are valued for forage and are never left in the field. Data from the plant nutrient survey done in the Gambia by John Peters and Emmett Schulte show that soil organic matter is least in groundnut fields (0.6%). Thus, it seems that a cover crop or some sort of intercropping scheme with a crop that would leave some residues would be valuable. Results from the Gambia Department of Agriculture show that groundnut performed poorly when intercropped with millet (probably due to shading). Perhaps niebe could be planted after groundnut harvest? Or perhaps groundnut fields should be the special target of compost?

Soil Erosion Control

There seems to be some use of stone diguettes and cuvettes already. The opportunity for stone diguettes is not so great since there are not so many stones readily available. There seems to be bigger opportunity for paillage, cover crops, and hedgerows.

Paillage would be very helpful in controlling erosion in fields. Native grasses can serve as a source for paillage. The limitation is the labor required to cut and carry. However, as discussed above, farmers in Burkina Faso do it because of the yield increases. A demonstration or farmer-participatory trial would be helpful here. There are particular opportunities in Jawara since the water diversion scheme was designed as a result of a PRA activity. A follow-up PRA could focus on how to maintain and sustain this system. The system will fail if soil erosion

150

continues. In addition to mulching fields, grass strips are needed upslope from the earthen bunds in Njawara to filter out soil before the water enters the channel. Some sort of hedgerow is also needed to stabilize and protect the bunds. A woody species or the combination of a woody species with grasses would be appropriate here.

Cover crops also offer potential in alleviating the soil erosion problems. In particular, crops like niebe or lablab that could be planted at the end of the rainy season and left to provide some mulch for the beginning of the next rainy season would be valuable. The constraint here is the liklihood of the residues being removed by animals.

For areas with more slope, such as in Njawara, Karonko, and Senkoran, hedgerows, diguettes, or a combination thereof will be necessary. As already stated, a hedgerow is particularly needed on the earthen bunds in Njawara to protect the bunds themselves. Many woody species could be used for hedgerows on the contour. Sarah Workman is best able to recommend some species here, but it is desirable to use native species that are multipurpose.

In the Senkoran area, there is a need for gully treatment. This might include stabilizing the gullies with stones and/or plantings of woody species, grasses, or a combination thereof. Land treatment to prevent erosion above the gullies is critical.

As already stated the zai system also holds promise for soil erosion control, primarily because it increases water infiltration. It is particularly suited to maize and other high value crops.

In summary, the greatest challenge is protection of the uplands and, in my opinion, the greatest potential for improved management lies in a combination of mulching, vegetative cover, and hedgerows.

Sources of Information and Technical Assistance

Contacts for Information and Technical Assistance

Dr. Rhonda Janke, Director
Rodale Research Center
611 Siegfriedale Road
Kutztown, Pennsylvania 19530
Tel 215 683 6383
Fax 215 683 8548
E-mail: Dialcom GCD0129 EIES 213
(Rodale has done a lot of work on cover crops and has worked in Senegal.)

Dr. Walter Bowen
IFDC

PO Box 2040
Muscle Shoals, Alabama 35662
Tel 205 381 6600
Fax 205 381 7408
(Walter worked on cover crops in Brazil; he is now interested in modelling nutrient cycling from cover crops)

Dr. Jess Reed
Meat & Animal Science Department
1576 Observatory Drive
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Madison, Wisconsin 53706
Tel 608 263 4310
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Bitnet: NANCY.FOX@MAIL.ADMIN.WISC.EDU
(Jess is very knowledgeable about West African ecosystems and is interested in integration of animals in agroforestry systems and role of animals in nutrient cycling)

Dr. Josh Posner
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Tel 608 262 1390
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(Josh has experience with cover crops and agroforestry systems in The Gambia, Senegal, Bolivia, and perhaps others)

Dr. Mark Powell
ILCA/ICRISAT Sahelian Center
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Niamey, Niger
Tel (227) 72 25 29
Fax (227) 73 43 29
(Mark has a lot of experience in West Africa; his interests are in nutrient cycling; did Peace Corps in Burkina)

Dr. Bob Hart
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611 Siegfriedale Road
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Tel 215 683 6383
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(INFORUM is a computer network that provides information on sustainable agriculture; the idea is good, but so far there are not many subscribers and it's expensive)

Martha Rosemeyer
Agroecology Program
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Tel 408 429 4367
(Lot of experience in Central America with cover crops)

Dr. Tony Juo
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Texas A&M University
College Station, Texas 77843
Tel 409 845 3041
(Much experience in West Africa; TROPSOILS PI in Niger; Jordan's major professor)

Dr. Hector Barreto
CIMMYT
Apartado Postal 6-641
06600 Mexico D.F.
Tel (595) 421 00
Fax (595) 410 69
E-mail DIALCOM 157:CG1201
(Much experience with cover crops in Central America, esp. Guatemala)

Dr. Rolf Derpsch
Casilla de Correo 1859
Asuncion, Paraguay
Tel (042) 305
(The most knowledgeable man alive concerning cover crops; many years experience in Brazil)

Ademir Calegari
IAPAR
Caixa Postal 1331
86001 Londrina Parana
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Tel (0432) 26 1525
Fax (0432) 26 7868
E-mail CELSO BRFUEL.BITNET
(Several years expereince with cover crops in southern Brazil)

Dr. Dennis Garrity
ICRAF
Forest Research and Development Center
Jalan Gunung Batu No. 5
PO Box 382 Bogor 16001 Indonesia
Tel & Fax (62 251) 323 063
(Many years expereince in the Philippines with cover crops, alley cropping systems, and contour hedgerows)

Dr. David Leonard
Land Use and Productivity Enhancement Project (LUPE)
Dept. 236
PO Box 25320

Miami, Florida 33102
Tel in Honduras 33 3674
Fax in Honduras 31 0137
(Highly recommend that you contact Dave; LUPE is AID-funded project much like OFPEP; they have good experience with cover crops, vetiver grass, and alley cropping; they are working in subhumid, semi-arid areas of Honduras)

Dr. Christian Roth
Institut fur Okologie
FG Bodenkunde
Salzufer 11 - 12
1000 Berlin 10
Germany
Tel 030 31 47 35 29
(Worked with Derpsch in Brazil; he's mine and Sumner's drinking buddy)

Other Information

Soil-Improving Legumes, Marianne Sarrantonio, Rodale Institute.

Managing Cover Crops Profitably, Cover Crops Handbook, Sustainable Agriculture Publications, USDA, 342 Aerospace Center, Washington, DC 20250

Sustainable Agriculture and the Environment in the Humid Tropics, 1993, National Research Council, National Academy Press, Washington, DC.

Legume Green Manures, Soil Management CRSP Bulletin 92-04.

Cover Crops for Clean Water, ed. by W.L. Hargrove, pub. by Soil and Water Conservation Society.

For Sources of Seed:

Write Gil Lovell, USDA-ARS Plant Introduction Station, Georgia Station, 1109 Experiment Street, Griffin, Georgia 30223

For More Information on Tropical Legumes and their Use in the Tropics:

Write CIDICCO, P.O. Box 3385 Tegucigalpa MDC, Honduras. (They have a newsletter.)

Appendix 7

Data Base Survey Developed by

I.S.R.A. and OFPEP, Senegal

WINROCK INTERNATIONAL
On Farm Productivity Enhancement Program.
O . F . P . E . P

INSTITUT SENEGALAIS DE RECHERCHES AGRICOLES
D .R .C .S .P
C N R A /Bambey

DATA BASE SURVEY

SECTION A. GENERAL INFORMATION ON THE VILLAGE

1.1 Population

1.1.1 Province _____

1.1.2 Department _____

1.1.3 Sub-Perfecture _____

1.1.4 Rural Community _____

1.1.5 Name of village _____

1.1.6 Foundation date of village _____

1.2.1 Initial area occupied by the village in hectares?
_____

1.2.2 Has that area 1) increased 2) decreased 3) no change

1.2.3 Are its boundaries specified? 1) yes 2) no

1.2.4 For what reason(s) _____

1.2.5 Total population _____

1.2.6 Working population _____

1.2.7 Number of 1) males: +21yrs _____
2) females: +18yrs _____
3) children: _____

1.2.8 Predominant ethnic groups1) Peulh 4) Wolof
3) Diola 4) Mandink 5) Serère 6) Others_____

1.2.9 Are there seasonal workers? 1) yes 2) no

1.2.10 If yes how many? _____

1.3.1 Number of compounds? _____

1.3.2 Number of households? _____

1.3.5 Water availability in the village

1) where is the water source?
   1. on farm
   2. off farm

2) what is the distance of the off farm water source _____ (meters)

3) what is the quality of the on farm water source?
   1. fresh 2. salty 3. brackish

4) what is the quality of the off farm water source?
   1. fresh 2. salty 3. brackish

2. LAND

2.1 What was the primary land tenure system in the village ?
   1) government regulation
   2) allocated land by clearing/developing
   3) granted by another village member
   4) granted by other people, specify _____

2.2 Total cultivated area _____(ha)

2.3 Total fallow area _____(ha)
   1) annually _____(ha)
   2) long _____(ha)

3. EQUIPMENT

3.1 Types of farm equipment available in the village
   1) seeder 4) occidental hoe
   2) sine hoe 5) plough
   3) cart

3.2 Are there any animals in the village? 1) yes 2) no

3.3 If yes, specify.
   1)cows 4)draught animals 7)donkeys
   2)sheep 5)horses
   3)goats 6)poultry

4. TYPE OF CROPS

4.1 What are the main crops of the village?
   1) millet 4) cowpea 6) peanuts
   2) corn 5) rice
   3) sorghum 7) others_____

4.2 What are the principle resources limiting production?
   1) lack of land
   2) lack of labor
   3) lack of animal traction
   4) lack of cash for inputs
   5) poor supply structure for inputs
   6) inadequate knowledge or skills
   7) lack of good crop varieties
   8) others (specify) _____

151

4.3 What are the principle constraints which limit production?

1) erosion
   1. by wind
   2. by water
   3. by both
2) saltiness
3) diseases
4) weeds
5) free grazing

4.4 What are the principle constraints on plant growth?

1) inadequate seasonal rainfall
2) poor distribution of rainfall
3) low infiltration of rainfall
4) inappropriate crop variety for rainfall in the region
5) low soil fertility
6) wind damage to crops
7) difficulty in working the land

4.5 How long is the rotation? 1) 0-1 yr 2) 1-2 yr 3) 2+ yrs

4.6 What are the main crops in the past which are no longer cultivated?_____

4.7 For what reasons? _____

4.8 Were those crops fertilized? 1) yes 2) no

4.9 If yes, what type of fertilization:

1) organic (manure, compost)
2) mineral (chemical fertilizer)

4.10 For how many months of the year does village food production meet consumption needs?

1) 1-3 months
2) 4-6 months
3) 7-9 months
4) 10-12 months

SECTION B: ORGANIC MATERIAL SURVEY

1. CHARACTERIZATION OF THE AGRICULTURAL FARMS

1.1 Village name _____

1.2 Compound head's name _____

1.3 Farm head's name _____

1.4 Ethnic group _____

1.5 Date of visit _____ (day,mo,yr)

1.6 Interviewer's name _____

2. POPULATION

2.1 Total resident population _____

2.2 Number of working residents _____

2.3 Number of
1) males _____
2) females _____
3) children _____
4) seasonal residents _____

2.4 Number of households _____

2.5 Farm head's age 1) 20-35 2) 36-50 3) 51+

2.6 Farm members and their activities:
(use the codes following the table)

Listing of members	2.6.1 Sex	2.6.2 Age	2.6.3 Work performed
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

CODES: 2.6.1 Sex: 1) male
2) female

2.6.2 Age: 1) 0-18 yrs
2) 18-30
3) 31-40

4) 41-55
5) 55+

2.6.3 Work performed:
-1) household labor
2) field labor
2.1) clearing
2.2) plowing
2.3) seeding
2.4) weeding
2.5) harvesting

3) off-farm activities
3.1) cottage industry
3.2) wage labor
3.3) marketing
3.4) schooling

2.7 What are the most difficult periods on the farm? How do they overcome them? (use codes for specified categories)

2.7.1 Periods	2.7.2 Causes of the difficulties	Solutions	Comments

CODES: 2.7.1 Period:
1) harvesting - crop processing/storage
2) storage - field clearing
3) rainy season

2.7.2 Causes of the difficulties:
1) lack of animal labor
2) lack of human labor
3) lack of inputs
4) lack of food/money
5) lack of rain

3. MEANS OF PRODUCTION

3.1 Types of agricultural equipment used on the farm:
1) donkey cart
2) groundnut-lifter
3) horse cart
4) hoe
5) multi-purpose tool bar
6) ox cart
7) ariana
8) seeders

3.2 How were these acquired?
1) bought by farmer
2) borrowed
3) hired
4) other _____

3.3 Types of agricultural tools used on the farm:
1) pitch fork
2) rake
3) wheelbarrow
4) hilaire
5) shovel
6) daba

3.4 Agricultural inputs used on the farm:
(complete the table using the codes given below)

160

Field #	3.4.1 Area	3.4.2 Fertilizers	3.4.3 Type of crop

CODES:

3.4.1 Area:
1) .5 - 3.5 ha
2) 3.5 - 5 ha
3) 5 + ha

3.4.2 Fertilizer:
1) manure
2) chemical

3.4.3 Type of crop:
1) peanut
2) millet
3) maize
4) cowpea
5) rice
6) sorghum

3.5 Agricultural production on the farm:

Field #	3.5.1 Area	3.5.2 Number of cartloads			3.5.3 Quantity sold			3.5.4 Use of the left over quantity
		1/	2/	3/	1/	2/	3/	

1=grain / 2=straw / 3=shells

CODES:

3.5.1 Area:
1) .5 - 5 ha
2) 5 - 10 ha
3) 10+ ha

3.5.2 Number of cartloads:
1) 1-5
2) 5-10
3) 10-20
4) 20-30
5) 30+

3.5.3 Quantity sold:
1) 0-10%
2) 10-20%
3) 20-40%
4) 40-60%
5) 60-80%
6) 80% +

3.5.4 Use of left over quantity:
1) for animal feeding
2) human consumption
3) construction/fencing

3.6 What is done with the cereal straw:
1) left in the field
2) kept
3) gathered
4) sold

3.7 What is done with the peanut leaves:
1) left in the field
2) kept
3) gathered
4) sold

16

3.8 Annual fallow lands:

3.8.1 Area: 1) .5-5 ha 2) 5-10 ha 3) 10+ ha

3.8.2 Are other villager's animals allowed to graze there? 1) yes 2) no

3.8.3 Quantity of grass harvested or reaped (number of cartloads)
1) 1-3 2) 3-6 3) 6+

3.9 Long fallow lands:

3.9.1 Area: 1) .5-5 ha 2) 5-10 ha 3) 10+ ha

3.9.2 Are other villages' animals allowed to graze there during the dry season? 1) yes 2) no

3.9.3 Are other villages' animals allowed to graze there during the rainy season? 1) yes 2) no

3.9.4 Quantity of grass harvested or reaped (number of cartloads) 1) 1-3 2) 3-6 3) 6+

4. CATTLE-RAISING CONDITIONS WITHIN THE PROJECT AREA

4.1 Does the farmer have any animals? 1) yes 2) no

4.2 If yes, what species?
1)cows 4)draught animals 7)donkeys
2)sheep 5)horses
3)goats 6)poultry

4.3 Who looks after the animals?
1) their owner 2) a shepherd 3) a herd head

4.4 Do several owners group their animals for grazing purposes? 1) yes 2) no

4.5 Are the animals guarded during the dry season?
1) yes 2) no

4.6 Are the animals guarded during the rainy season?
1) yes 2) no

4.7 Are there many unfarmed areas? 1) yes 2) no

4.8 What is the cycle of fallow lands?
1) 1-2 yrs 2) 2-4 yrs 3) 4+ yrs

4.9 Is there a holding place for the cattle at night during the dry season? 1) yes 2) no

4.10 Is there a holding place for the cattle at night during the rainy season? 1) yes 2) no

4.11 Are there migratory herders in the village?
1) yes 2) no

112

4.12 Does the farmer buy feed for the livestock? 1) yes 2) no

4.13 If yes, what feed? 1) concentrated 2) straw
3) other _____

4.14 For what animal?
1)cows 4)draught animals 7)donkeys
2)sheep 5)horses
3)goats 6)poultry

4.15 Does the farmer practice animal fattening? 1) yes 2) no

4.16 For which animals?
1)cows 2)sheep 3)goats

4.17 What are the animals intended for?
1) household consumption 2) sale
3) other _____

5. TETHERING

5.1 Did the farm benefit from tethering animals in the last year? 1) yes 2) no

5.2 If yes, fill in the following table:

5.2.1 Kind of animal	5.2.2 Tethering duration	5.2.3 Animal(s) origin	5.2.4 Grazed	5.2.5 area covered by manure

CODES:

5.2.1 Kind of animal:
1)cows 4)draught
2)sheep 5)horses
3)goats 6)poultry
7) donkeys

5.2.2 Tethering duration:
1) 1-3 mo/yr
2) 3-6 mo/yr
3) 6-9 mo/yr
4) 9-12 mo/yr

5.2.3 Animal origin:
1) owned by farmer
2) tended for others
3) other

5.2.4 Grazed: 1) yes 2)no

5.2.5 Area covered:
1) .25-1 ha
2) 1 - 2 ha
3) 2 - 4 ha
4) 4 + ha

5.3 If manure was used, on which quality area was it applied as compared to the year before?
1) inferior 2) equal 3) superior

16

5.4 Type of manure used: 1) powdered 2) patties

5.5 Does the farmer get the manure from his neighbor?
1) yes 2) no

5.6 If yes, number of cartloads?
1) 1-5 3) 10-20 5) 30+
2) 5-10 4) 20-30

5.7 Does the farmer give manure to his neighbors?
1) yes 2) no

5.8 If yes, number of cartloads? 1) 1-5 2) 5-10
3) 10-20 4) 20-30 5) 30+

5.9 Use of manure: (complete the table using the codes given)

5.9.1 Crops used on over last 3 years	5.9.2 distance between field and compound	5.9.3 # of cartloads	5.9.4 area covered	5.9.5 time of use

(1) specify type of cart

CODES: 5.9.1 Types of Crops:
1) peanut 3) maize 5) rice 7) other
2) millet 4) cowpea 6) sorghum

5.9.2 Distance:
1) near
2) medium
3) far
4) very far

5.9.3 # if cartloads:
1) 1-5 4) 20-30
2) 5-10 5) 30+
3) 10-20

5.9.4 Time of use:
1) before clearing
2) after clearing
3) during the growing season

5.10 Technique of application
5.10.1 Spreading technique:
1) on top of soil 2) integrated into soil

5.10.2 Does the application technique influence the weeding date? 1) yes 2) no

5.11 Does the farmer continue using manure as he always has?
1) yes 2) no

5.12 In what areas are there noted changes?
1) manure management 3) time of application
2) quantity used

5.13 Is household refuse and the waste from millet thrashing used as organic manure in the fields?
1) yes 2) no

SECTION C: SEED SURVEY

1.1 Crop	1.2 Source	1.3 Selection	1.4 Test/Tr.	1.5 Product	1.6 Harvest	1.7 Storage

CODES: (use the underlined letter to indicate answers)

1.1 Crops:
1) Peanuts
2) Millet
3) Maize
4) Cowpeas
5) Rice
6) Sorghum
7) Cotton

1.2 Source:
1) Self
2) Neighbor
3) Market
4) Store
5) Project/ Gov/NGO

1.4 Germination Test-
1) Yes 2) No

Seed Treatment at Planting-
1) Yes 2) No

1.3 Selection:
1) Visual selection
2) Sieving
3) Winnowing
4) Other

1.5 Production:
Seed production different from crop production-
1) Yes
2) No

1.6 Harvesting:
Plant selection in the field - 1) Yes 2) No

If yes, criteria: Height, Maturity, HEalth/Color, Size of Head, Number of Tillers/Panicles

Head/panicle selection after harvest - 1) Yes 2) No

1.7 Storage:
Seed stored different from crop-
1) Yes 2) No

1.8 Treatment:
1) Chemical
2) Neem
3) Other

** Use a symbol by each operation to denote gender responsibility:
+ (women), - (men)

SECTION D: AGROFORESTRY SURVEY

1. ON FARM TOUR Observations:

2. LAND USE HISTORY

2.1 How long the farmer has been farming this particular land?_____

2.2 What form of land use was practiced at the beginning of the period?_____

2.3 What changes in land use have occurred?

2.4 Why did these changes occur?

2.5 What was the condition of the land at the beginning of this period?
1. high fertility
2. medium fertility
3. low fertility

2.6 What changes have occurred so far in vegetation?
1. number of trees decreased
2. number of trees increased

2.7 What changes have occurred so far in the soil?
1. soil fertility decreased
2. soil fertility increased
3. no change in soil fertility

2.8 What are the causes of these changes in vegetation?
1. trees are cut down to facilitate mechanization
2. tress are protected by the farmer

2.9 What are the causes of these changes in the soil?
1. lack of organic fertilizer
2. lack of mineral fertilizer
3. lack of both
4. presence of organic fertilizer
5. presence of mineral fertilizer
6. presence of both

166

3. FARM RESOURCES

3.1 Land

3.1.1 What is the household area (ha) of:
1) farmed land _____
2) fallow land _____
pasture_____

3.1.2 What is the land use right for?
1) grazing_____
2) fuelwood gathering_____
3) fruit gathering_____

3.1.3 What is the land ownership system?
1) private
2) borrowed
3) rented
4) pledged
5) others (explain)

3.1.4 What is the land tenure system?
1) customary law 2) government regulation

3.2. Labor

3.2.1 How many people work on the farm?
1) full time _____
1. men _____
2. women _____
3. children_____
2) part time _____
1. men _____
2. women _____
3. children_____
3) seasonally
1. men _____
2. women _____
3. children_____
4) For what operation(s)?
1. men _____
2. women _____
3. children _____

3.2.2 Does the farmer hire labor?
1) yes 2) no

3.2.2.1 If yes, for what operation(s)?
1) _____
2) _____
3) _____
3.2.2.2 for how long? _____
3.2.2.3 at what cost? _____
3.2.2.4 when is it paid? _____
3.2.2.5 what is the source of cash to pay labor?
_____

167

3.3 WATER

3.3.1 Where is the water source?
1) on farm 2) off farm

3.3.2 What is the water used for?
1) watering plants
2) vegetable gardening
3) human consumption
4) animal drink
5) other (explain)

3.3.3 What is the distance of the off farm water source?
_____

3.3.4 What is the on-farm water quality?
1) fresh 2) salty 3) brackish

3.3.5 What is the water quality off-farm?
1) fresh 2) salty 3) brackish

3.3.6 Is there enough water for the nursery?
1) yes 2) no

3.4. TREES

3.4.1 What are the (7) most useful tree species on-farm? (list in order of priority)
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

3.4.2 What are they used for? (give species ordering number in front of each kind of usage)
____ 1. fertilization
____ 2. animal feeding
____ 3. human consumption
____ 4. dead fencing
____ 5. live fencing
____ 6. medicine
____ 7. fuelwood
____ 8. fencing poles
____ 9. windbreaks
____ 10. shade
____ 11. building materials
____ 12. charcoal
____ 13. other (be precise)_____

3.4.3 How are the trees regenerated?
1) naturally
2) artificially/plantation

3.4.4 How often are trees planted on the farm?
1) usually 2) occasionally

3.4.5 Who plants the trees?
1) men
2) women
3) children
4) all of them

3.4.6 What kind of trees have already been planted?
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

3.4.7 For what purpose(s)? (give the species ordering number in front of each purpose)
____ 1. fertilization
____ 2. animal feeding
____ 3. human consumption
____ 4. dead fencing
____ 5. live fencing
____ 6. medicine
____ 7. fuelwood
____ 8. fencing poles
____ 9. windbreaks
____ 10. shade
____ 11. building materials
____ 12. charcoal
____ 13. other (be precise)_____

3.4.8 What is the seedlings' origin(s)?
1) development projects
2) NGOs' activities
3) research programs
4) farm nurseries
5) other (be precise)_____

3.4.9 How does the farmer obtain seedlings?
1) gift
2) paid with cash
3) paid with labor
4) other (be precise)_____

3.4.10 Where are trees usually planted?
1) scattered on the farm
2) in line on farm
3) on boundaries
4) in the compound
5) woodlot
6) on grazing land
7) on flooding line
8) other (be precise)_____

169

3.4.11 What is the tree use right in the area?
1) private 2) common

3.4.12 Which trees are used privately
1) planted trees 2) naturally regenerated trees

3.4.13 Which trees are commonly?
1) planted trees 2) naturally regenerated trees

3.4.14 What off-farm tree resources are used by the household?
1) forest lands
2) other farmers' crop lands
3) fallowed lands
4) local markets
5) individual farmers
6) outside markets
7) others (be precise)_____

3.4.15 How are young plantation protected?
1) live fencing
2) dead fencing
3) barbed wire
4) watching

3.4.16 What are the problems for nursery implementation?
1) lack of fresh water
2) fresh source far from the household
3) lack of technology
4) lack of input
5) lack of local organization
6) don't feel necessary
7) other (be precise) _____

3.4.17 What are the constraints for tree planting?
1) free grazing
2) lack of technology
3) lack of seedlings
4) severe drought
5) lack of water
6) land tenure system
7) government forest regulations
8) lack of labor

3.5. Crops

3.5.1 What are the main farm food crops
1) millet
2) corn
3) sorghum
4) rice
5) other (be precise) _____

3.5.2 What is the main cash crop
1) peanut
2) bean
3) casaba
4) other (be precise) _____

176

3.5.3 What are the resource constraints for the household crop production?

1) lack of land
2) lack of labor
3) lack of drought power
4) lack of cash for input
5) poor supply infrastructure for inputs
6) inadequate knowledge or skills
7) lack of good crop varieties
8) other (be precise) _____

3.5.4 What are the management constraints for crop production?

1) erosion
   1. by wind
   2. by water
   3. by both
2) flooding/waterlogging
3) saltiness
4) weeds
5) diseases
6) free grazing
7) other (be precise) _____

3.5.5 Constraints on plant growth

1) inadequate seasonal rainfall
2) poor distribution of rainfall
3) low infiltration of rainfall
4) inappropriate crop variety for the local rainfall regime
5) low soil fertility
6) physical damage by wind
7) wind desiccation of crop
8) heavy rainfall
9) shallow soils
10) poor soil structure
11) poor workability

3.5.6 Marketing problems

1) lack of markets
2) low prices
3) transport availability and cost

3.6 Livestock production

3.6.1 What livestock does the farm have (precise the number for each species)

1) cows _____
2) horse(s) _____
3) goats _____
4) sheep _____
5) camels _____
6) donkey _____
7) other (be precise) _____

3.6.2 For what purpose(s) these animals are raised (indicate the type of animal for each purpose)

1) milk _____
2) meat _____
3) manure _____
4) drought _____
5) sale for cash _____
6) inheritance asset _____
7) other (be precise) _____

3.6.3 What are the main sources for animal feeding

1) grass from:
   1. crop land
   2. forest land
   3. pasture
   4. market
2) fodder from:
   1. wild trees
   2. planted trees
   3. market

3.6.4 What are the seven (7) main tree species used for fodder (list per priority order)

1) _____
2) _____
3) _____
4) _____
5) _____
6) _____
7) _____

3.6.5 Which trees can be suggested for additional fodder

1) _____
2) _____
3) _____
4) _____

3.6.6 What are the main constraints for livestock production?

1) high mortality
2) lack of grazing land
3) lack of land for growing fodder (cut-and-carry)
4) poor nutrient quality of feed
5) free grazing
6) lack of shade
7) degradation of grazing land
8) low capacity of charge
9) lack of market
10) low prices
11) transport availability and cost
12) inheritance (explain)
13) robbery
14) others (explain)

112

Appendix 8

Soil Conservation Survey

Senegal

SOIL CONSERVATION SURVEY

SECTION A: CHARACTERIZATION OF THE AGRICULTURAL FARMS

1: CHARACTERIZATION

1.1 Volunteer name _____

1.2 Arrondissement _____

1.3 Village name _____

1.4 Compound head's name _____

1.5 Size of family Male _____ Female _____ Child (<14) _____

Any of these seasonally absent: Male _____ Female _____

1.6 Farm head's name _____

1.7 Ethnic group _____

1.8 Other NGO's in the area _____

SECTION B: AGROFORESTRY

1. ON-FARM TOUR Observations (Specify physical characteristics -- valleys, ravines, % slope, etc.):

2. LAND USE HISTORY

2.1 How long the farmer has been farming this particular land? _____

2.2 What form of land use was practiced when the farmer began farming this land? _____

2.3 What changes in land use have occurred?

2.4 Why did these changes occur?

2.5 What changes have occurred so far in vegetation?

2.6 What are the causes of these changes?

2.7 What changes have occurred so far in the soil?

3. FARM RESOURCES

3.1 LAND

3.1.1 What is the household area (ha) of:

1) farmed land_____
2) fallow land_____
3) pasture_____

3.2 TREES

3.2.1 What are the (7) most useful tree species on-farm and what are their uses? (list in order of priority)

	Species	Uses
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____
6.	_____	_____
7.	_____	_____

CODES:

1.	Fertilization	6.	medicine	11.	building materials
2.	fodder	7.	fuelwood	12.	charcoal
3.	human consumption	8.	fencing poles	13.	other (be precise)
4.	dead fencing	9.	windbreaks		
5.	live fencing	10.	shade		

3.2.2 Has farmer ever planted trees? If no. why?

1) yes 2) no_____

3.2.3 How often are trees planted on the farm?

1) usually 2) occasionally

3.2.4 Who plants the trees?

1) men
2) women
3) children
4) all of them

3.2.5 What kind of trees have already been planted, where are they located (field, compound, garden, etc.), and for what purpose?

	Species	Location	Uses
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____

CODES:

1.	fertilization	6.	medicine	11.	building materials
2.	animal feeding	7.	fuelwood	12.	charcoal
3.	human consumption	8.	fencing poles	13.	other (be precise)
4.	dead fencing	9.	windbreaks		
5.	live fencing	10.	shade		

3.2.6 What off-farm tree resources are used by the household?
1) forest lands
2) other farmers' crop lands
3) uncultivated lands
4) local markets
5) outside markets
6) others (be precise)_____

3.2.7 What are the constraints for tree planting?
1) free grazing
2) lack of technical skills
3) lack of seedlings
4) lack of rain
5) lack of water for watering
6) land tenure system
7) lack of labor
8) termites
9) others (be precise) _____

3.2.8 Does the farmer have any strategy/technology implemented to tackle these constraints? If yes, describe in detail.

1) no 2) yes:

3.3 Crops

3.3.1 What crops are grown by the farmer?

3.3.2 What are the management constraints for crop production? (please describe)

1) erosion
   1. by wind_____
   2. by water (gully, rill, sheet, etc.)_____
   3. by both_____
2) flooding/waterlogging_____
3) saltiness_____
4) weeds_____
5) diseases_____
6) free grazing_____
7) other (be precise)_____

3.3.3 Does the farmer have any strategy/technology implemented to tackle these constraints? If yes, describe in detail.
1) no 2) yes:

3.3.4 Constraints on plant growth
1) inadequate seasonal rainfall
2) poor distribution of rainfall
3) low infiltration of rainfall
4) inappropriate crop variety for the local rainfall region
5) low soil fertility
6) physical damage by wind
7) wind desiccation of crop
8) heavy rainfall
9) shallow soils
10) poor soil structure (erosion--water? wind?)
11) poor workability

3.3.5 How long has it been a problem?

3.3.6 Does the farmer have any strategy/technology implemented to tackle these constraints? If yes, describe in detail.
1) no 2) yes:

3.4 Livestock Production

3.4.1 What are the main sources for animal feeding

1) grass form:
   1. crop land
   2. forest land
   3. pasture
   4. market
   5. other (be precise)_____

2) fodder from:
   1. wild trees
   2. planted trees
   3. market
   4. other (be precise)_____

3.4.2 What are the seven (7) main tree species used for fodder (list per priority order)

	Species	Pods	Leaves
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____

3.4.3 What are the main constraints for livestock production?

1) high mortality
2) lack of grazing land
3) lack of growing fodder (cut-and-carry)
4) poor nutrient quality of feed
5) free grazing
6) lack of shade
7) degradation of grazing land
8) low carrying capacity
9) lack of market
10) low prices
11) transport availability and cost
12) robbery
13) other

3.4.4 Does the farmer have any strategy/technology implemented to tackle these constraints? If yes, describe in detail.

1) no 2) yes:

SECTION C: ORGANIC MATERIAL

1. FALLOW LANDS

1.1 Are there many unfarmed areas?
1) yes 2) no

2.1.2 If yes, why?
1) fertility
2) lack of seed
3) lack of labor
4) other

1.2 What is the time period of fallow lands?
1) 1-2 yrs 2) 2-4 yrs 3) 4 + yrs

1.3 Annual fallow lands:

1.3.1 Area: 1) 0.5-5 ha 2) 5-10 ha 3) 10+ ha

1.3.2 Are other villager's animals allowed to graze there?
1) yes 2) no

1.3.3 Quantity of grass harvested or reaped (number of cartloads)
1) 1-3 2) 3-6 3) 6+

1.4 Long fallow lands:

1.4.1 Area: 1) 0.5-5 ha 2) 5-10 ha 3) 10+ ha

1.4.2 Are other villages' animals allowed to graze there during the dry season? 1) yes 2) no

1.4.3 Are other villages' animals allowed to graze there during the rainy season? 1) yes 2) no

1.4.4 Quantity of grass harvested or reaped (number of cartloads)

2. TETHERING

2.1 Did the farm benefit from tethering animals in the last year? If no, why?
1) yes 2) no

2.2 Kind of animal tethered and how many of each
1) cows_____ 4) horses_____
2) sheep_____ 5) donkeys_____
3) goats_____

2.3 Tethering duration:
1) 1-3 mo/yr
2) 3-6 mo/yr
3) 6-9 mo/yr
4) 9-12 mo/yr

2.4 Area covered:
1) 0.25-1 ha 2) 1-2 ha 3) 2-4 ha 4) 4+ ha

2.5 Type of manure used: 1) powdered 2) patties

2.6 Use of manure: (complete the table using the codes given)

2.7.1 Crops used on over last 3 years	2.7.2 distance between field and compound	2.7.3(1) # of cartloads	2.7.4 area covered	2.7.5 time of use

(1) specify type of cart

CODES: 2.7.1 Types of Crops:
1) peanut 3) maize 5) rice 7) other
2) millet 4) cowpea 6) sorghum

2.7.2 Distance:
1) near
2) medium
3) far
4) very far

2.7.3 # of cartloads:
1) 1-5 4) 20-30
2) 5-10 5) 30+
3) 10-20

2.7.4 Time of use:
1) before clearing
2) after clearing
3) during the growing season

2.8 Technique of application

2.8.1 Spreading technique:
1) on top of soil 2) integrated into soil

2.8.2 Does the application technique influence the weeding date?
1) yes 2) no

2.9 Is household refuse and the waste from millet threshing used as organic manure in the fields?

1) yes 2) no

Appendix 9

Steps Used in the Development of Collaborative Program Plans

Senegal

Steps Used in the Development of Collaborative Program Plans

The step by step process used with each collaborator for the development of field activities is outlined as the OFPEP COLLABORATIVE PROGRAM PLAN for each organization. It includes a description of the OFPEP program framework goals, objectives, activities, and indicators, along with baseline/benchmarks information at the time of the program debut. This document includes information used to define roles and responsibilities of the collaborator and OFPEP staffs for the duration of the program.

There are two different, interrelated, themes for the field activities: seeds and soil fertility. Since activities with seeds have already been undertaken with some collaborators, the path for continuing seed activities is somewhat simpler than for initiating new activities.

Previous Collaborative Seed Activities With OFSP

A. Review Activities of Previous Year(s): It is important to conduct a joint review of past activities undertaken by the collaborator and OFPEP. Based on the review, collaborative seed activities will be developed for the upcoming season. Previous activities can be evaluated and future activities can be planned. The review will involve feedback from the farmers, field staff, program managers, and OFPEP staff. It will be organized around the following framework of questions:

Goal: what has been the overall aim of the agricultural sector?

Objectives: What were the more specific objectives of collaborative seed activities with the OFSP that were defined to achieve the goal(s)?

Activities: What activities have been undertaken to accomplish the objectives; i.e. demonstrations, seed production, and farmer training?

Indicators: What information is being used to monitor and evaluate the seed production, farmers trained, adoption rates, yield increase, and farmer feedback?

Assumptions: What assumptions were made about the organization, the farmers, and the environment in the planning of the activities? Were the assumptions valid?

Results: What did the indicators say about the activities that were undertaken last season?

Lessons Learned: What can be learned from the results; i.e. successes, problems, etc. that should be considered in revising the program for next season?

182

Development of New Activities in Seed and Soil Fertility

A. The OFPEP staff will discuss priority themes and zones of activity of a new program with collaborators. This will include ideas on general strategy of how the program may develop over the next 3-5 years.

B. Information Gathering: To develop appropriate activities and to establish benchmarks for measuring progress towards objectives an information gathering exercise is necessary for new activities. The information gathering will take two forms:

1. Review of secondary sources of information: A wealth of information exists from national sources such as the government statistics, ISRA and international sources such a projects and USAID. Every effort will be made to use existing socio-economic and environmental/agricultural data.

2. Surveys: A simple, low cost, and rapid survey has been carried out in selected villages of proposed zones of activity with randomly selected farmers. The survey focused on understanding the knowledge, attitudes, and practices of farmers (women and men) as well as the physical environmental/agricultural domain.

   In order to carry out the survey:

   a. As a starting point the OFPEP staff used surveys developed by ISRA researchers as the basis for a draft survey. It was presented to the collaborators for their review and comment.
   b. Training was provided for collaborator staff/field staff in carrying out survey interviews. Interviewing techniques, phrasing questions, clarifying questions in local languages, and recording data were examined.
   c. The survey interviews will be carried during March or April.
   d. OFPEP will undertake the analysis of the survey and provide the results of the survey to the collaborator. The results will also be discussed with technical sources. From a technical/physical perspective, mapping (zonage) will be proposed that matches appropriate activities to the zones where they are most feasible. Secondly the activities will complement the current activities and problems identified by the farmers. Findings of the surveys will be incorporated into the trainings with collaborator who conducted the surveys.

C. Based on the information gathering objectives, activities, indicators, and assumptions will be developed with the collaborator.

D. An OFPEP Collaborative Program Plan will be developed by OFPEP staff with each collaborator that outlines what and where activities will occur (zones, villages, numbers of farmers), the responsibilities of the organization, and the assistance needed from the OFPEP.

Outline for OFPEP Collaborative Program Plan

I. Information Gathering

A. Essential Points of Information Gathering
1. Region and villages represented in the survey
2. Farmers interviewed
3. Gender Analysis

B. Baseline/Benchmarks

C. Strategy of the Collaborative Activity
How what is described in the program will be carried out.
1. Region
2. Villages

II. Program Framework

A. Goals
B. Objectives
C. Activities
D. Indicators
E. Assumptions

III. Inputs by Collaborator

A. Number of Staff Involved M/F
B. Training Responsibilities
C. Monitoring/Evaluation Responsibilities

IV. Inputs by OFPEP

A. Training
1. Topics
2. Tentative Dates

B. Training Materials and Documents Needed

C. Technical Assistance
1. Planning and strategy meetings
2. Farmer visits

D. Monitoring/Evaluation responsibilities

184

Appendix 10

OFPEP Collaborative Program Plan

Peace Corps, 1993

Senegal

OFPEP Collaborative Program Plan
Peace Corps, 1993

I. Information Gathering

A. Essential Points of Information Gathering

Region and villages represented in the survey.

Soil conservation/compost survey pilot zone in Nioro du Rip (@15 villages) to be extended to three, possibly four, other zones in year two.

Region	Activity
Diourbel	agroforestry
Fatick	rice; agroforestry
Louga	agroforestry
Kaolack	rice; compost, agroforestry, soil conservation
Kolda	rice; agroforestry
Tambacounda	rice; agroforestry

Number of farmers interviewed: Women/Men
To be determined

Gender Analysis
Household composition; Existing division of labor e.g. watering, tree nursery management, field activities

B. Baseline/Benchmarks

The selection of the technologies to be promoted could be evaluated regarding:

- the feasibility of a given technology to solve a targeted problem and identification of the constraints related to soil fertility management and the needs of target groups
- economic viability of the proposed technology relative to the particular local situation
- acceptability of the proposed technology by the local population

C. Strategy of the Collaborative Activity: How what is described in the program will be carried out

OFPEP is serving to bridge the gap between the PC, their farm families, and local sources of technical assistance and training, such as ISRA.At the village/farmer level, low input technologies are demonstrated and put into the hands of farmers. Farmers in selected villages will be trained and will have experience with low input approaches to seed production and soil fertility management. The low input technologies require limited

external support and use locally available equipment or materials, once introduced at the village/farmer level they become self sustaining. These technologies include:

- Improved crop varieties: adapted crop varieties that can be multiplied at the farmer level.
- Seed practices: seed screening, germination testing, and plant selection at harvest.
- Improved production practices: time of planting, weeding, and thinning.
- Soil improvement: incorporation of organic matter, composting, live fencing, and windbreaks or other soil enrichment plantings.

II. Program Framework

A. Goal(s)

To contribute to increased well-being of farm families by improving soil and seed related agricultural practices.

B. Objectives

Increase technical knowledge of participating farmers
Improve management of community and individual resources
Promote conservation and wise use of natural resources
Link field extension agents with national research and service organizations.

C. Activities

Seed production of improved rice varieties

After surveys/observations by Peace Corps volunteers, appropriate improved rice varieties and modified production practices are introduced to women farmers in training workshops. The women farmers then carry out demonstrations of the new varieties and practices on small plots. Based on the results, the new varieties and practices are then diffused to other women in the village and surrounding villages.

Soil fertility demonstrations

Coupled with soil conservation surveys, pilot soil fertility demonstrations of compost are being conducted in 3 villages. This phase will be followed by farmer training in compost production, assisted by ISRA staff, and expanding the demonstration of compost to more villages and farmers next year.

Agroforestry

Projects designed from survey results will integrate woody species into crop systems in reference to farmer preferences and needs. Nitrogen fixing trees and multipurpose species will be introduced into agricultural landscapes as hedgerows or windbreaks, soil erosion barriers, fruit or fodder sources, and soil building components. OFPEP will work with volunteers to establish village windbreaks, live fencing, and fodder species. The potential for institutionalizing a joint PC - OFPEP soil conservation program, incorporating composting and tree planting, is being tested in one pilot zone (Nioro du Rip).

Pigeon Pea trials

Peace Corps Senegal obtained eight varieties of Cajanus cajan, a drought resistant multi-use legume from ICRISAT/Hyderabad. OFPEP worked with the PC to design and implement adaptability trials at twenty sites ranging through five bio-climatic zones of Senegal and the Gambia. The results of the trials, to be evaluated by ISRA collaborators, will indicate which varieties are best suited to which zones.

D. Indicators

Number of farmers exposed to new technologies
Number of farmers continuing to use or adopting new technologies
Extent of yield increases
Land surface Area covered by new technology
Cost/benefit ratios of input/output
Improvement of soil properties (Soil and plant tissue analysis)
Level of farmer satisfaction
Quantity of product produced, planted, geographic diffusion
Number of volunteers and number of farmers trained in techniques

E. Assumptions

That national government will support seed and soil fertility management initiatives.

That PCVs will be available in sufficient numbers to be trained, and, subsequently have time, cooperation and resources to train farmers and others.

III. Inputs by Collaborator

A. Number of Staff, Male/Female

Agriculture	42 total
	20 Rice; 11 f 9 m
	22 gardens, manioc, soils
Natural Resources	35 total
	17 forestry; 16 Environmental Ed.
	3 National Parks; 3 f 1 m

B. Training Responsibilities

Peace Corps conducts extensive Pre-Service technical and language training and to volunteers. Periodic In-Service Training sessions are held for specific work related topics.

C. Monitoring/Evaluation Responsibilities

Rice volunteers maintain written records of all field activities with farmers. Farm head of household and a map of location are listed in a permanent file book for continued reference.

All PCVs are required to maintain files of their activities at each Zone House. Written records are kept for agroforestry and soil management activities. A central computerized database of activities is compiled from annual reports submitted by PCVs.

IV. Inputs by OFPEP

A. Training

1. Topics: Survey Techniques/Information Gathering

Rice production:	seed selection and storage
	cultivation techniques
	habitat/varietal selection
Composting:	Preparation and utilization
	AF field trials: design
	species selection/utilization
	data collection, evaluation
	soil conservation: techniques and management

2. Tentative Dates

Jan-Mar	Evaluation of 1992 Activities; Planning 1993
April	Rice In-service training, current PCVs
April-May	Design AF-Pigeon Pea Trials
May	Initial Baseline Survey training
June-Oct	Monitoring Field Activities
July	Rice and Agroforestry PST, new PCVs
July-Aug	Rework Soil Survey - Pilot Compost Trials
Nov	Soil Conservation Survey
Nov-Dec	Establish Compost Demonstrations
Dec-Jan	Survey Analysis, Activities Evaluation

B. Training Materials and Documents Needed

Printed surveys and workshop
Technical outlines for compost and soil management activities
Rice Technical literature provided by Peace Corps

C. Technical Assistance

1. Planning and strategy meetings
   Advisory Council Meetings are held twice yearly. PCVs have monthly Zone meetings OFPEP staff can attend. Village Meetings and Technical Field Visits are made with PCVs when necessary.

2. Farmer visits
   With volunteers during cultivation and harvest (June to November) and during periods specific to technical activities (e.g. composting).

Appendix 11

Example of Survey Conducted in Southeastern Uganda

OF FARM PRODUCTIVITY ENHANCEMENT PROGRAMME (OFPEP)

SURVEY CONDUCTED BETWEEN: AUGUST, 16-20,1993:

(C) ANALYSIS OF THE DATA

1. Data compiled for all the 20 farm families:-

(a) CROPS:

i. Food Crops	Variety	No. of farm families	
1. Millet	Local	18	
	P.224	2	
2. Maize	Kawanda Comp.	0	
	Hybrid	10	One family twice.
	Local	4	
3. Sorghum	Serena	0	
	Seredo	0	
	Local	17	
4. Rice		8	
5. G. Nuts	Roxo	0	
	Red beauty	7	Two families twice.
6. Beans	Local	8	
		7	
7. Soya Bean		5	
8. Cow Peas		15	
9. Pegion Peas		0	
10. Sim sim		5	
11. Cassava	EAO	0	
	Local	20	
12. Sweet Potatoes		17	
13. Bananas		4	
14 Vegetables		19	

(ii) Horticultural Crops

Vegetables	Variety	No. of farm families	
(1.) Tomatoes	Money Maker	2	
	Maglobe		
	Local	4	
(2) Cabbage	Drum head		
	Other	1	
(3) Egg-plant		2	
(4) Onions		3	
(5) Local Veges	Amaranthus	5	Two families ap[illegible] twice.
	Nakati	2	
	Pumpkin leaves	8	

APOLLO SOCIAL SERVICE GULUPAGWE DATE 23/Aug/

Committee soon for assessment in relation to further funding for BNF/OFPEP activities in the country.

Participants were then asked to introduce themselves.

MIN 2/93 BRIEF INTRODUCTION OF THE OFPEP PROGRAM:

Pierre Antoine, OFPEP Director for Africa and East Asia explained to the participants that this Project is funded by United Stated Agency for International Development (USAID). He indicated that this project is being implemented in Indonesia, Nepal, Senegal, Gambia and Uganda.

He informed the participants that in 1992, USAID renewed the funding for OFPEP. In Uganda, the decision that OFPEP builds on the on-going BNF activities was made, so OFPEP is an extension of BNF with ACDI as the lead agency for Uganda and Save the Children Fund is the lead agency for Gambia.

MIN 3/93 EXPLANATION OF AGRICULTURAL ACTIVITIES BY EACH ORGANIZATION:

Charles Nkwiine of Makerere University informed the participants that Makerere is the sole producer of Rhizobia Inoculants for the country. Makerere also trains farmers on how to use the Inoculants and so far three (3) workshops have been organized in conjunction with the Heifer Project and ActionAid. Research is done at Namulonge.

Gary Bayer, the Chief Agricultural Development Officer at USAID/U informed the participants that AID has offered financial assistance to Makerere University. It has also offered technical assistance in areas of research, and marketing of non-traditional cash crops.

Peter Owor, Programs Officer of Multi-Purpose Training and Employment Association (MTEA) stated that the association trains farmers at grassroot level for better agricultural production. It also encourages the youth to appreciate the need to engage in farming. It trains Women in Development (WID) and teaches them management skills.

Stanley Dunn, CARE's Country Representative informed the participants that although CARE has mainly been identified with Agro-forestry, CARE has also engaged itself in agricultural extension activities in Bushenyi

and West Nile. He further stated that his organization offers technical assistance in the storage and post harvest crop handling. CARE has also assisted some areas in water supply and sanitation.

The Senior Manager of Christian Children's Fund informed the participants that to-date CCF has 52 Projects in the country and that they are just starting to focus on the Agricultural Sector. CCF was ready to include BNF/OFPEP activities in its Agricultural Sector programs.

Country Representative for Heifer Project International informed the meeting that at the moment the project is engaged in creating awareness among farmers in livestock farming and the use of inoculants for improving their pastures. The farmers covered so far have expressed deep interest in BNF.

MIN 4/93 **OVERVIEW OF THE OFPEP PROGRAM OR ACTIVITIES IN W. AFRICA AND THE ROLE OF P.V.O/UNIVERSITY CENTRE.**

The Director of OFPEP told the participants that 90% of the population in West Africa were producing low quality seed, so OFPEP came in and started using knowledgeable people like the Peace Corps to train the farmers on basic seed technology and seed multiplication practices. OFPEP set up workshops for the NGOs who in turn trained the farmers in soil management and also supervised the establishment of demonstration plots and research on how to improve crop yields.

OFPEP, through surveys and conversations with the farmers managed to identify the farmers' constraints and offered solutions for them for instance women associations which were formed in the growing of rice and all the production was to be done by women. To improve on rice production, animal weeding was suggested but this had to be done by men naturally. OFPEP convinced the men to do the ploughing which they accepted and the production eventually increased.

He was happy to announce that after 5 years they had 65,000 farmers dealing with the NGOs and who continued to work with OFPEP. He stated that their ultimate goal in W. Africa was to help the Government to generate surplus seed for every farmer to improve his production.

He stated that the evaluation of the program showed that OFPEP should first focus on soil management due to general lack of soil nutrients combined with lack of seeds should be addressed. The use of Agro-forestry as well as use of animal manure and chemical fertilizers should be encouraged along with the introduction of soil conservation measures.

He noted that OFPEP is not a research program but is a product of research. It is a linkage between research and implementation which require funding from USAID and support from the Research Stations and Makerere in order to implement it. He again stated that OFPEP's goal is to put the technology into the farmers hands through demonstrations.

He explained to the participants that P.V.O is a centre for collaboration. OFPEP is supported by P.V.O/University and Winrock is the main contractor for OFPEP and ACDI is a sub-contractor. He further explained that OFPEP is supported by P.V.O/University which essentially is a centre for collaboration. P.V.O/Centre tries to bring Universities and NGOs together. There are 57 institutions, one-half being Universities and one-half being NGOs. It is a link between people who do research and those who carry out demonstrations.

MIN 5/93 **THE EAST AFRICAN OFPEP**

Francis Oching, the BNF Project Country Coordinator briefed the meeting on BNF activities in the country by pointing out:

i) that BNF was introduced into the country in November 1989 by a Niftal Team.

ii) that the first training workshop was held in Mityana during Nov - Dec 1990. The workshop was co-sponsored by SCF, ACDI, UCCU and the CAAS Project. Participants were drawn from Mityana, Mpigi, Luwero, Mubende and Kiboga Districts.

iii) that the second training workshop was held in Jinja in June/July 1992 with funds from SCF.

iv) that a third training workshop was held in Lira in October 1992 with the assistance of PL-480/one-year-budget of the CAAS Project.

v) that although previous training workshop was for training trainers, there is now need to involve farmers directly.

v) that Makerere University had been instrumental in directing the affairs of BNF through inoculant production.

vi) that some NGOs present in the meeting had already exposed BNF Technology to farmers in their areas of operation. Cases in point were ActionAid, CARE and Heifer Project International.

vii) that Management Training and Employment Associations could be very instrumental in Eastern Uganda.

viii) that the idea of merging BNF with OFPEP became more clear by December, 1992.

ix) that OFPEP has to proceed on the foundation laid by BNF.

The OFPEP East Africa Coordinator Dr. Moses Onim said it would be logical for OFPEP to build on the experiences of BNF in Uganda since figures from BNF demonstrations revealed a lot of success for BNF. He was quoting figures from the Lira training workshop demonstrations. He hoped that Uganda would be a stepping stone for spreading OFPEP throughout East Africa. A look at the figures from Lira Demonstrations strongly suggested that rhizobial inoculation be routinely used on legume crops whose yields were substantially increased by inoculation at this site and that more effective rhizobial strains be screened for groundnuts, phaseolus beans, siratro and crotolaria.

MIN 6/93 ACDI AS THE LEAD INSTITUTION IN UGANDA.

The Chairman informed the meeting that the Budget for BNF/OFPEP has already been put forward. So far BNF has been using funds from Save the Children and PL-480 Monetization Program. ACDI will also get a grant from AID/Winrock to fund the activities in the country.

An evaluation of the Biological Nitrogen Fixation/Legume Management Outreach Pilot Project and the assessment of the proposed On-Farm Productivity Enhancement Program is to be presented to the CAAS Core Committee.

An agreement was signed between ACDI and Winrock and as soon as the budget presented to the CAAS Project is approved then an office will be set up and an Administrator and Secretary will be recruited immediately.

MIN 7/93 BRAINSTORMING SESSION

Participants were asked to mark on the charts, the areas that their organizations cover and what agricultural activities they engage in. The results showed that the NGOs together covered much of the country but few were using BNF.

195

Gary Bayer reported that Makerere started the BNF activity and UCCU expressed interest in the production and marketing. He therefore, questioned UCCU's current stand. The Chairman explained to him that UCCU is inactive at present it has both financial and management problems.

Pierre Antoine asked Charles Nkwiine the current inoculant demand and the packaging of the inoculant. Charles reported that a lot of the inoculant was bought upto last season but did not have the exact figures. He said that the inoculant was being bought by NGOs on behalf of the farmers in some cases. Farmers have not yet really started buying the inoculant directly from Makerere due to lack of transport and distance from Makerere. He said that with the equipment they have now and the demand generated there is likely to be an increase in the production of the inoculant by the beginning of next season. He said that the price per packet of 250g was UShs. 1200.

Pierre expressed his desire that every farmer in Uganda should be able to obtain the inoculant when and where required and hence more production is needed.

Mr. Owor suggested that there are two solutions to increased use of the inoculant in the country. The awareness raising campaign and production should be stepped up.

Duane Eriksmoen indicated that BNF activities should not be carried out in isolation. The use of chemical fertilizers should also be encouraged.

The Director of Christian Children's Fund wanted to know the process of ordering the inoculant. Charles Nkwiine indicated that it is from the awareness raising point that orders are made but proposed that retailers need to be identified and trained in BNF technology as well as inoculant handling because it was not reasonable for an uninformed salesperson to distribute the inoculant without after sales service. He also indicated that Church of Uganda has offered to train the stockists asked the NGOs to send in names of the stockists for training.

The Chairman asked Charles Nkwiine whether they are ready to give the inoculant directly to supply shops. Charles indicated that this was a possibility as long as the stockists were trained.

The BNF Coordinator noted that the Crop Husbandry Improvement Program (CHIP) has been giving out soy seeds freely to the farmers as well as innoculants and felt that such seeds as well as innoculants should be paid

196

for. The Research Officer from Namulonge indicated that they have started selling the seed to the farmers but the main problem was that the farmers are complaining about lack of marketing for their soybeans.

He also indicated that the farmers are eager to use the rhizobia inoculant but the problem is buying it from Makerere. Dr. Onim asked why the NGOs do not buy it and sell it to the farmers and asked whether it is really worth it, in terms of profit making for the NGOs?

Country Representative for the Heifer Project also indicated that the farmers really appreciate the use of the inoculant especially with the tree and forage legumes.

Mr. Owor suggested that Makerere be used only as a centre for production and that distribution centers be set up in various areas. This could enable the farmers to easily buy the inoculant from nearby distribution centers without having to travel to Makerere.

He also indicated that the Kawanda seeds should be supplied together with the inoculant. He further noted that unless there is an increase in the production and marketing of the inoculant, BNF will flop. Charles Mkwiine pointed out that there is need to improve on forage and crop production using innoculant. Finally Mr. Pierre concluded by saying that for OFPEP to be successful, the marketing problem has to be addressed because no farmer would really be interested in growing crops that don't fetch him money.

The Chairman asked whether the NGOs were evaluating and monitoring their activities. Namulonge Research Officer indicated that evaluation was done annually and monitoring was done quarterly at the Research Station. Heifer Project Country Representative reported that his project is monitored mid-yearly and evaluation is done at the end of the contracted period before an extension is made by USAID. For instance they changed to livestock rearing from what they were doing before, after an evaluation. The Chairman indicated that evaluation helps to redesign a project.

MIN 8/93 **WORK PLAN FOR THE FUTURE**

The Country Coordinator reported that they intend to continue with the training workshops using the funds that are available and to follow up on the training exercises already conducted in the country. They also would like to establish demo plots in the East of the country to cover Soroti, Moroto, Kotido, Mbale and Tororo.

191

The Chairman inquired whether they are going to restrict their activities on legumes only. The Coordinator said that BNF is trying to use all legumes useful to Uganda. Mr. Pierre said that they don't need to use all legumes, but to concentrate on those which responded to BNF technology. The Chairman further asked how seeds are sold at Namulonge Research Station. The Research Officer reported that seeds are bought directly by the farmers or some farmers buy from fellow farmers. Farmers also save the seed from the harvest for the next season. Mr. Pierre supported the idea of farmers producing and saving seed for future use.

Mr. Pierre promised the participants that Winrock is ready to fund the NGOs/Makerere for the demonstration plots. He further stated that there is funding for the workshops but indicated that Winrock will only pay for the priority areas but not for everything. It was up to BNF project to build a plan in conjunction with the NGOs and collectively inform Winrock what they really need and funding will be availed.

The Research Officer indicated that they are willing to provide seed for the workshops but have a problem of transporting the seed. Mr. Nkwiine urged the participants to combine forces when a workshop is earmarked, each organization should contribute towards the workshops and thanked the Research Officer for his offer. Such gestures would lead to low expenditures in organizing a workshop.

The Chairman pointed out that there is no seed production company in Uganda at the moment and that is one of the CAAS projects' objectives. He further urged the Country Coordinator to work out a program of activities with clear-cut objectives, appropriate agencies should then be asked to increase their activities accordingly. Mr. Nkwiine emphasized the need to train the inoculant sellers because they sell the inoculant directly to the farmers and hence need the technology. The Chairman inquired as to whether Makerere could supply the Farm Supply shops with the inoculant, but Mr. Nkwiine did not support the idea, he just said that at the moment they are just ready to supply the NGOs.

The Research Officer also stated that there is important need to continue creating awareness in the BNF technology as well as OFPEP to the farmers.

Finally the participants agreed that immediate concern was the need to increase seed and inoculant production. Mr. Pierre informed the participants that actions discussed now are not immediate but future plans say 6 - 8 months away because there is need for seed supply to the demo plots which will be used for demonstrations.

Dr. Onim pointed out that Makerere is facing a serious constraint of lack of a Hammer Mill. The production unit depends on Namulonge to grind the peat and this hampers the production progress. The participants agreed and the Chairman promised to look into it.

MIN 9/91 **A.O.B**

The Chairman asked the participants how they could keep in touch with each other regularly because it is really necessary. Dr. Onim suggested that ACDI Offices should be the headquarters and it was generally agreed upon.

Dr. Onim urged the Country Coordinator to work out a program and contact the NGOs. He further reminded the Chairman that Makerere University's problem of the Hammer Mill should be addressed. Mr. Pierre urged the NGOs to keep in touch with the Country Coordinator.

The Chairman asked the Heifer Project's Country Representative whether they have met any problems while carrying out their activities. The Country Representative said that the only problem they have met is the rebel activities in the east especially Soroti, where they lost alot of animals and yet it is a very ideal place for animal traction.

The meeting ended peacefully at 1:00 P.M

Recorded by

Grace Ekodeu
Secretary

199

Appendix 12

Minutes of OFPEP Brainstorming Meeting

Uganda

February 2, 1993

MINUTES OF OFPEP BRAINSTORMING MEETING
ON FEBRUARY 2, 1993.

PRESENT:

Victor Amann	- ACDI	- ConRep - Chairman
Pierre Antoine	- WINROCK INT.	- Director
Moses Onim	- WINROCK INT.	- E.A. Rep
Stanley Dunn	- CARE ✓	- Director
Gary Bayer	- USAID/U	- ADO
Duane Eriksmoen	- USAID/U	- Project Officer
Charles Nkwiine	- BNF/Makerere ✓	- Lecturer
Peter Owor	- MTEA/Iganga	- Programme Officer
Bernard Muyeya	- Heifer Project ✓	- Country Rep.
L. Wandera	- Christian Children's Fund	- Manager
Oching Francis	- BNF/OFPEP	- Country Coordinato
P. Tukamuhabwa	- Namulonge Research Station	- Research Officer

AGENDA:

1. Introduction of participants and welcome by Chairman.
2. Brief introduction of the OFPEP Program by Antoine Pierre.
3. Explanation of Agricultural Activities of each organization.
4. Overview of the OFPEP Program or Activities in W. Africa and the role of P.V.O/University Centre by Antoine Pierre.
5. The East African OFPEP by Onim/Oching.
6. ACDI as the OFPEP Lead Institution in Uganda.
7. Brainstorming session.
8. Work Plan for the Future.

MIN 1/93 OPENING REMARKS AND INTRODUCTION OF PARTICIPANTS:

The Chairman welcomed everybody to the meeting and briefly explained the On-Farm Productivity Enhancement Program (OFPEP). He informed the members that:-

- ACDI was the lead agency for BNF/OFPEP in the Country.
- The draft of an evaluation report on BNF/OFPEP was out and would be presented to the CAAS Core

100

(iii) Fruits

	Variety	No. of farm families	
1. Pineapple	Smooth Cayenne	2	One farmer appears twice.
	Other	9	
2. Passion fruits	Purple	7	One farmer appears twice
	Yellow	6	
	Local (hard shell	5	
3. Pawpaws	Big	5	
	Small	11	
4. Mangoes	Dodo		
	Small	16	
5. Oranges	Budgeted		
	Local	9	
6. Bananas		1	
7. Guava		16	
8. Jack fruit		8	
9. Flowers		3	

(iv) Cash Crops:-

Crop	Variety	No. of farm families
1. Coffee	Arabica	0
	Robusta	0
	Colonal	0
2. Cotton	Satu	8
	Era	0
3. Tea	Assian	0
	China	0
4. Tobacco	Flue-cured	0
	Fire-cured	0
5. Cashew Nuts		0

(v) Crop Diversification:-

Crop:-	No. of farm families	Order of Popularity
1. Soya beans	6	2
2. Sim-sim	5	4
3. Sisal	2	6
4. Vegetables	6	2
5. Flowers	3	5
6. Sun flower	0	

202

(b) SEED SELECTION, CROP YIELDS, CROP PROCESSING AND STORAGE

(i) (Seed Selection)

Indicator	Size	Colour	Yield Potential	Popularity	Growth Period	Market Value	Good Storage qualities
No. of families	12	9	20	19	18	15	9

(ii) Crop Yields

Cause of poor Yield	Poor skills	Drought	Pests	Disease	Weeds	Low soil fertility	Poor seed	Lack of protection inputs
No. of families	17	18	19	19	18	18	16	15

(iii) Crop Processing Methods:-

Method	Threshing by hand	Winnowing by hand	Threshing by Machine	Grinding by hand	Grinding by machine
No. of families	20	20	0	20	0

(iv) Storage Methods:-

Storage	Granaries	Special Stores	In houses	In Stores
No. of families	19	0	2	0

(v) Storage Problems:-

Problem	Rats	Insect pests	Diseases	Poor facilities	Food thefts
No. of families	17	4	0	3	6

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(c) AVAILABILITY OF IMPROVED SEED, FARM LABOUR, LAND, EXTENSION SERVICES AND OTHER FACTORS OF PRODUCTION:-

(i) Improved Seed and Other inputs

Available input	Improved seed	Hand hoes	Tractor	Ferti-lisers	Pesticides
No. of families	12	20	0	0	0

(ii) Household land availability:-

Acreage (No. of acres)	0	1-3	3-6	6-9	10 - Over	
No. of families	-	5	6	5	4	

(iii) Land tenure System:-

System	Customary	Leasehold	Communal	Bought	Rented
No. of families	19	-	-	5	-

(iv) Farm Labour:-

(1) Time spent daily by women (hours)	1-2	2-3	3-4	5 - Over
No. of families	0	2	13	5

(2) Time spent daily by men (hours)	1	1-3	3-6	6-9	10- Over
No. of families	0	0	14	3	0

(3) Time spent daily by children(hrs)	Less 1	1-2	2-3	3-4	5- Over
No. of families		8	9	3	0

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204

(4)

% time annually	10-20	30-50	50-70	70 - 100
No. of families		10	10	0

(v) All the 20 farm families lack Capital (financial)

(Small Credit is extended to project families by the Project for small scale cultivation of food crops).

Suggestions on Methods of Improving of Capital(financial) Credit Supply to families:-

Method	Personal Savings	Agricultural Bank	Revolving Fund	Coop Savings	Use Land Title
No. of families.	0	8	7	4	1

(vi) Extension Services:-

No. of visit to households by Agric, Vet, or Forestry extension dorkers Annually.

No of visits	None	Once	Twice	Thrice	Four	More than 4
No. of families	8	8	1	3	0	0

(vii) Methods of Spreading improved Agric Skills:-

Method	Farmer to farmer	Ext. dorker to farmer	Visits to other areas	Through School Children	Method and result demo.
No. of families	18	10	6	-	6

(viii) No. of families that have deliberately looked for agric extension worker = 11.

.../6.

205

(d) LIVESTOCK FARMING PRACTICES

(i) Types of livestock reared by families.

Type	Cattle	Goats	Sheep	Pigs	Poultry			
					Chicken	Turkey	Ducks	Pigeons
No. of families.	16	14	4	5	19	4	9	1

(ii) Methods of livestock management practiced

(a) Ruminants

Method	Tethering	Communial grazing	Rotational grazing
No. of families	14	3	1

(b) Pigs , Poultry

Method	Intensive	Extensive	Back Yard Management (Poultry)
No. of Families	0	4	18

(iii) Average no. of livestock per household

	Type of Livestock	Number of households with			
		0	1-3	3-5	Over 5
1.	Cattle	4	12	3	1
2.	Goats	6	6	8	0
3.	Sheep	16	3	0	1
4.	Pigs	15	2	1	2
5.	Poultry				
	(a) Chicken	1	2	3	14
	(b) Turkey	16	0	2	2
	(c) Ducks	11	2	4	3
	(d) Pigeons	19	0	1	0

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206

(iv) Livestock Management Practices

Practice	No. of families
1. Fencing	0
2. Herd/Flock health	0
3. Water Supply	17
4. Pasture - Natural	14
Improved	0
Established	0
5. Supplementary feeding	0
6. Stocking rate	0
7. Farm lay out	0
8. Environmental protection	0
9. Housing	0
10. Equipment	0
11. Productivity	0

(e) SOIL/WATER/LAND/TREE MANAGEMENT

(i) Opinions on causes of environmental degradation

Cause	Over Cultivation	Overgrazing	Poor methods of Agric.	Too much rain	Vegetation destruction
No. of families	20	13	20	-	20

(ii) Soil Conservation Methods Practised

Method	No. of families	Order of Popularity
1. Countour Cultiva.	15	2
2. Mulching	3	7
3. Grass Stripping	17	1
4. Row Cropping	14	3
5. Crop Rotation	14	3
6. Fallowing	10	5
7. Agroforestry	6	6
8. Organic fertilisers:-	0	-
Farm Yard Manure	1	8
Compost	0	-
Green Manure	0	-

...../8.

(iii) Tree Planting

Type	Fruits	Fuel wood	Wind breaks	Shade trees	Mz firing	Fencing trees
No. of families	20	-	20	20	-	-

(iv) Local Species Planted:-

(a) Fruits - Refer to Section C 1 (a) iii above.

(b) Building/Fuel Wood

Tree	Eucalyptus	Cassia	Markhamia	"Lira"
No. of families	16	16	18	9

2. **Report based on the data collected**

"A" (a) The major food crops grown in the area in order of importance are:- Cassava, Millet, Sorghum and Sweet-potatoes. Vegetables and Cow-peas are used for source.

(b) Hortoultural crops are not popularly grown.

(c) Popular fruit trees are Mangoes, Guavas, and Paupaws. Jack fruit trees is becoming popular also.

(d) the only traditional Cash-crop is Cotton (satu variety). This is grown by only a cross-section of the population. Over 50% of the population in the area no longer grow cotton.

(e) In crop diversification, rice and soya bean are becoming popular as both food and cash crops.

"B". (a) Farmers know the indicators for the selection of good quality seeds.

(b) The majority of the farmers are knowledgeable about causes poor crop yield.

(c) In crop processing practically all families have no access to the use of machines. They use hands - a tidious and slow process.

(d) Farm produce - mostly millet and sorghum - is stored in granaries. Rats are the biggest menace to this kind of storage.

"C" (a) Improved seeds are not readily available to the farmer. Some farmers can now get access to improved maize and millet seeds.

Cultivation is 100% done using hand hoe.

(b) Some families have small acreage of land to cultivate because of the high population density in the area. This gives rise to only small harvests.

(c)

For practically all families the land tenure system is customary.

This syctem has given and continuse to give rise to land fragmentation and over cultivation of small plots. This has led to degradation of the soils and hence poor crop yields.

(d) Farm labour - The survey indicates that while men and women spend almost equal time on farm activities, a few men are not involved in farm work at all.

Children spend less time than adults on farm activities.

Between 30 - 70% of the family time is spent on farm activities annually.

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(e) All families depend on family labour for agricultural production because they have no access to capital(financial). Productivity is therefore low because the activity is at small scale.

(f) Services by agriculture, vet or forestry extension staff to farmers is not efficient neither effective.

"D" LIVESTOCK FARMING PRACTICES

(a) Every farm family rears at least two different types of livestocks but in small numbers.

(b) The majority of the families only manage the cattle, goat and sheep by tethering. This method is popular for two main reasons:- (i) the herd is very often too small, and

(ii) there is little free space available to encourage communial grazing.

Only natural pasture is available and animals are driven to streams for watering.

"E" SOIL/WATER/LAND/TREE MANAGEMENT

(a) All farmers are aware of the causes of environmental degradation.

(b) Soil conservation methods are practised, the most popular being grass stripping.

(c) Some tree-planting is carried out but is notably still minimal.

3. Recommendations for the improvement of the agricultural production in the region:-

(a) Making farm inputs available and affordable to the farmer:-

(i) Improved seeds - millet(F.224), maize(hybrid 622), beans, serghum etc.

(ii) Pesticides, fertilizers,

(iii) Extending loan/credit facilities to farmers i.e. Capital(financial). This will enable farmers to afford necessary inputs, increase labour force, till more acreage of land and practice crop protection so as to get increased production.

(b) Intensifying Extension Services:-

There is need for the agriculture, vet and forestry extension wee workers to interact with farmers to give technical education in the field.

Demonstration plot should be set up in every village and meetings should be organised during which method/result demonstrations are carried out once a month in the villages.

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210

Improved methods of livestock management should be introduced to farmers because there is acute shortage of land in this area.

(c) Agroforestry is minimal, limited to planting of a few trees around homesteads and along land boundaries. Yet a lot of deforestation has taken place in the area in the process of people clearing land for cultivation and tree felling for firewood, charcoal burning and for firing bricks.

There is therefore need to sensitise and educate the community on the importance of trees and vegetation cover in soil conservation. This requires the combined effort of enlightened people in the community and technical staff.

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211