

2725
PROJECT PAPER

UPPER VOLTA

FOUNDATION SEED PRODUCTION

(686-0245)

Authorized In The Field, May 7, 1981

AGENCY FOR INTERNATIONAL DEVELOPMENT

UNCLASSIFIED

ACTION MEMORANDUM FOR THE MISSION DIRECTOR, USAID/UPPER VOLTA

FROM: R. C. Coulter, ^{see} Program Officer

- I. Problem: Your approval is required to execute a grant of one million six hundred thousand dollars (\$1,600,000) from the Sahel Development Program appropriation (SH) to the Government of Upper Volta (GOUV) for Foundation Seed Production (686-0245). It is planned that \$1,600,000 will be obligated in FY 1981.
- II. Discussion: The project is a follow-on effort to the Seed Multiplication Project which will end April 30, 1981. The goal of the project is to increase domestic food production and improve the quality of life of rural families in Upper Volta. The purpose of the project is to further develop with the GOUV a national seed multiplication, marketing and quality control program which will increase the quantity of seed of genetically superior varieties of the target crops produced in Upper Volta and assure widespread availability and use of such seed. The specific objectives of this project will be achieved when:
- (a) the NSS* demonstrates improved capacity to plan for and provide leadership in the implementation of a national seed production program from which Voltaic farmers will purchase approximately 2% of their annual seed requirements of the target crops;
 - (b) the NSS demonstrates its ability to provide sufficient quantities of foundation seed of approved varieties to meet the needs of those organizations involved in seed multiplication and distribution activities;
 - (c) the NSS personnel have the capability and are implementing a complete quality control program for seed produced in the ORD of Hauts-Bassins;
 - (d) the NSS, in cooperation with the ORD of Hauts-Bassins, has established a marketing program including demonstration activities, a realistic seed pricing policy and an annual seed survey which will make additional planning information available on Voltaic farmer seed use patterns;
 - (e) the NSS has assumed leadership in training both seed program technicians and farmer advisory personnel in those factors relevant to their responsibilities in production, processing, quality evaluation, marketing and farmer utilization of good seed of improved varieties.

By developing the capacity of an organization providing a key link in the seed production cycle, the project directly responds to the number one CILSS, GOUV and AID priority --- increased food production. The immediate beneficiaries of the project will be the approximately 22,000 farming families in southwestern Upper Volta who will be able to increase their agricultural production and incomes through use of improved seed. Ultimately, the entire nation should benefit as the NSS certification program spreads to other ORDs and national food production is increased.

*NSS: National Seed Service, an office within the GOUV's Ministry of Rural Development.

It is anticipated that full life-of-project funding, \$1,600,000, will be obligated in the first year (FY 81). The breakdown by input is as follows:

<u>Project Inputs</u>	<u>AID</u>	<u>GOUV</u>	<u>TOTAL</u>
Technical Assistance	368	--	368
Commodities	404	--	404
Training	290	--	290
Other Costs	145	249	394
Inflation & Contingency	<u>393</u>	<u>101</u>	<u>494</u>
TOTAL	<u>1,600</u>	<u>350</u>	<u>1,950</u>

The local currency component financed by A.I.D. is \$611,000. There are no other donor contributions to the project.

The project has been analyzed from the social, economic, administrative and technical points of view, all of which have concluded that the project is sound. The IEE recommendation for a Negative Determination was approved by AA/AFR June 20, 1980 (80 State 162260), contingent upon completion of a risk/benefit analysis on pesticide use. That analysis was completed during project design and the recommendations incorporated into the plans for the project.

The project agreement will contain a condition precedent to first disbursement (except for technical assistance and training) to the effect that the GOUV will establish a revised seed pricing policy based on the costs of production. This CP is considered necessary as the long-term viability of the seed production program depends on the ability of seed producers to cover production costs. In addition, the project agreement will include a covenant requiring the GOUV to submit a plan for meeting recurrent costs following the PACD. Additional covenants will require the GOUV to provide all necessary project staff, to create a National Variety Release Committee, and to participate fully in the evaluation process.

One procurement source/origin waiver is requested for the purchase of ten mopeds (\$5,000). Justification is included in Annex F to the project paper.

The project implementation plan has been reviewed by the project committee which finds it to be reasonable. The implementing agency for the project will be the National Seed Service in the Ministry of Rural Development.

The project review committee, chaired by you, met and reviewed the project on March 30, 1981. The committee recommended approval of the project contingent upon certain modifications and additional analysis which have now been completed.

A Congressional Notification was forwarded to AID/W on April 24, 1981. Congressional clearance is anticipated by May 15, 1981.

The requirements of Section 611(a) of the FAA have been satisfactorily met (See Supplementary Annex B of the Project Paper).

Project implementation will be the responsibility of Larry Dominessy, Acting Chief, Office of Rural Development. The AFR/DR backstop officer will be David Dawson.

- III. Recommendation: That you sign the attached Project Authorization and thereby approve life-of-project funding of \$1,600,000 and the requested waiver.

Drafted by: OPR: G. Bertolin GB

Clearances: OPR: R.C. Coulter draft
OFM: G. Byllesby draft
ORD: L. Dominessy (GM) draft
A/DIR: E. Melaven EM

PROJECT AUTHORIZATION

Country: Upper Volta
PROJECT: Foundation Seed Production
PROJECT NO. 686-0245

Pursuant to Part 1, Chapter 1, Section 121 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Foundation Seed Production Project for the Republic of Upper Volta ("Cooperating Country") involving planned obligations of not to exceed one million six hundred thousand dollars (U.S. \$1,600,000) in grant funds over a three-year period, from the date of obligation subject to the availability of funds in accordance with the A.I.D. OYB allotment process, to help in financing foreign exchange and local currency costs for the project.

The project consists of the provision of technical assistance, training, and commodities, construction of a cold storage room and financing of certain local operating costs for the National Seed Service in the Ministry of Rural Development in order to further develop a national seed multiplication, marketing and control program.

A. Source and Origin of Goods and Services

Except for ocean shipping, goods and services financed by A.I.D. under the project shall have their source and origin in the Cooperating Country or in countries included in A.I.D. Geographic Code 941, except as A.I.D. may otherwise agree in writing. Ocean shipping financed under the grant shall be procured in the United States or in the Cooperating Country, except as A.I.D. may otherwise agree in writing.

B. Conditions Precedent

The Project Agreement shall contain two conditions precedent providing in substance that prior to the first disbursement of funds under the Project (except disbursements of funds for contractor services (\$100,000) and short-term training (\$18,000)), or to the issuance of any commitment documents with respect thereto, the Cooperating Country shall furnish in form and substance satisfactory to A.I.D.:

- 1) A Ministerial Decree establishing a new price policy for foundation and certified seed;
- 2) The name and specimen signatures of an official of the Ministry of Rural Development who will be assigned to act as the GOUV Project Manager and who will be the counterpart and primary contact for the USAID Project Manager.

Prior to the disbursement of funds for each building construction activity financed under the Grant (except disbursement of funds for the preparation of plans and specifications), or to the issuance of any commitment documents with respect thereto, the Grantee shall furnish to A.I.D., in form and substance satisfactory to A.I.D. the following:

- 1) Detailed plans, specifications, and construction schedules with respect to such activities;
- 2) A description of the arrangements made for providing construction services for such activities;
- 3) A description of the arrangements made for providing engineering supervisory services for such construction activities.

C. Covenants

The Project Agreement shall contain covenants providing in substance that:

- 1) The parties agree to establish an evaluation program as part of the Project. Except as the Parties otherwise agree in writing, the program will include, during the implementation of the Project and at one or more points thereafter:
 - a) evaluation of the progress toward attainment of the objectives of the Project;
 - b) identification and evaluation of the problem areas of constraints which may inhibit such attainment;
 - c) assessment of how such information may be used to help overcome such problems; and
 - d) evaluation, to the degree feasible, of the overall development impact of the Project.
- 2) The Grantee agrees to provide in a timely manner all necessary Upper Volta personnel for Project Implementation, including four agents/technicians to be assigned to the NSS, as well as all necessary support personnel (secretaries, janitor, guardian, driver, workman) beginning January 1, 1982.
- 3) The GOUV will constitute a National Variety Release Committee which will create an official variety catalog which officially authorizes multiplication and distribution of certified seed.
- 4) The Grantee agrees to furnish no later than nine (9) months from the date of this Agreement, in form and substance satisfactory to A.I.D., a plan detailing how the recurrent costs of the Project will be assured after the PACD.

D. Waivers

Based upon the justification in Annex F to the Project Paper and notwithstanding the provisions in paragraph A, I hereby:

- a) Approve a procurement source waiver from A.I.D. Geographic Code 941 (Selected Free World) to A.I.D. Geographic Code 935 (The Free World) for mopeds in an amount not to exceed \$5,000;
- b) Certify that the exclusion of procurement of the above described commodities from Free World Countries other than the Cooperating Country and countries included in A.I.D. Geographic Code 941 would seriously impede the attainment of U.S. foreign policy objectives and objectives of the foreign assistance program; and
- c) Find that special circumstances exist to waive, and do hereby waive, the requirements of section 636(i) of the Act.

Date: May 7, 1981 Richard C. Meyer
 Mission Director

Drafted by: OPR: G. Bertolin GB
 Clearances: OPR: R. Coulter draft
 OFM: G. Byllesby draft
 ORD: L. Dominessy (GM) draft
 A/DIR: E. Melaven EM

AGENCY FOR

PROGRAM

ACTION CODE

Amendment Number

AMENDMENT

PROJECT

Add
Change
Delete

5

2. COUNTRY/ENTITY

UPPER VOLTA

PROJECT NUMBER

686-0245

4. BUREAU/OFFICE

AFRICA

PROJECT TITLE (maximum 40 characters)

FOUNDATION SEED PRODUCTION

6. PROJECT ASSISTANCE COMPLETION DATE (PACD)

MM DD YY
0 5 3 1 8 4

7. ESTIMATED DATE OF OBLIGATION
(Under 'B.' below, enter 1, 2, 3, or 4)

A. Initial FY 81 B. Quarter 3 C. Final FY 82

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

A. FUNDING SOURCE	FIRST FY 81			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
AID Appropriated Total	989	611	1,600	989	611	1,600
(Grant)	(989)	(611)	(1,600)	(989)	(611)	(1,600)
(Loan)	()	()	()	()	()	()
Other U.S.	1.					
	2.					
Host Country		39	39		350	350
Other Donor(s)						
TOTALS	989	650	1,639	989	961	1,950

9. SCHEDULE OF AID FUNDING (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) SH	133E	003				1,600		1,600	
(2)									
(3)									
(4)									
TOTALS						1,600		1,600	

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)

011 012

11. SECONDARY PURPOSE CODE

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

A. Code TNG
B. Amount 290

13. PROJECT PURPOSE (maximum 400 characters)

To develop with the GOUV a national seed multiplication, quality control program which will increase the quantity of seed of genetically superior varieties of the target crops produced in Upper Volta and assure widespread availability and use of such seed.

14. SCHEDULED EVALUATION

Interim MM YY 0 3 8 2 0 3 8 3 Final MM YY 0 9 8 4

15. SOURCE/ORIGIN OF GOODS AND SERVICES

000 941 Local Other (Specify)

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

17. APPROVED BY

Signature
RICHARD C. MEYER
Title
USAID MISSION DIRECTOR

Date Signed
MM DD YY
0 5 0 7 8 1 1

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

MM DD YY

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II. DETAILED DESCRIPTION

A. Introduction

The Foundation Seed Production Project (686-0245) 1/ is a follow-on effort to the \$1.62 million Seed Multiplication Project (686-0202) 2/ which will end April 30, 1981. The major accomplishment of Phase I has been to establish the institutions and infrastructure necessary for a national seed program. Evaluations of Phase I activities conducted in April 1978, and December 1979, have identified several elements of the National Seed Service (NSS) program which need to be strengthened before high quality seed of improved varieties will be available to Voltaic farmers on a regular basis. Phase II will, therefore, assist the GOUV to restructure and reinforce the national seed program in accordance with evaluation recommendations.

B. Project Strategy

The goal of the project is to increase domestic food production and improve the quality of life of rural families in Upper Volta. The purpose of the project is to further develop with the GOUV a national seed multiplication, marketing and quality control program which will increase the quantity of seed of genetically superior varieties of the target crops produced in Upper Volta and assure widespread availability and use of such seed. The specific objectives of this project will be achieved when: (a) the NSS demonstrates improved capacity to plan for and provide leadership in the implementation of a national seed production program from which Voltaic farmers will purchase approximately 2% of their annual seed requirements of the target crops (see Supplementary Annex E: Technical Analysis); (b) the NSS demonstrates its ability to provide sufficient quantities of seed of approved varieties to meet the needs of organizations involved in seed multiplication and distribution activities; (c) the NSS personnel have the capability and are implementing a complete quality control program for seed produced in the ORD 3/ of Hauts-Bassins;

1/ Hereinafter referred to as Phase II

2/ Hereinafter referred to as Phase I

3/ Regional Organization for Development. Upper Volta is divided into eleven ORDs which are administered by the Ministry of Rural Development and are responsible for the supervision and coordination of development activities within their assigned area. The acronym "ORD" can mean either the governmental agency or the geographical region encompassed by that agency.

(d) the NSS, in cooperation with the ORD of Haute-Bassins, has established a marketing program including demonstration activities, a realistic seed pricing policy and an annual seed survey which will make additional planning information available on Voltaic farmer seed use patterns; (e) the NSS has assumed leadership in training both seed program technicians and farmer advisory personnel in those factors relevant to their responsibilities in production, processing, quality evaluation, marketing and farmer utilization of good seed of improved varieties.

C. Relationship to Agricultural Sector Strategy

The project directly addresses the rural development priorities of the Government of Upper Volta of which the highest is food self-sufficiency. Through its emphasis on making seed of superior quality available to farmers, the project will have its greatest impact on the well-being and nutrition of the rural population. Introduction and utilization of improved food grain varieties will increase production for self-consumption and will provide additional income for farmers from the sale of surplus grain. The project is also in accordance with the CILSS strategy and the FY 1982 Upper Volta CDSS which states: "First priority is food production and related activities". ^{1/}

While Upper Volta has the potential not only to reach its goal of food self-sufficiency, but also to become an exporter of food grains, thereby contributing to regional food self-sufficiency, this potential has not yet been realized. Since the severe drought in the late 1960's and early 1970's progress has been made towards increasing crop production. Nevertheless sufficient food production in any given year is still dependent on timely and adequate rainfall. Upper Volta does not yet produce enough food on a regular basis to cover shortfalls in bad years or to export to neighboring countries. Efforts to increase food production include increasing land area under cultivation, introducing new technologies to intensify agriculture on existing land, and encouraging the use of improved seed to increase crop production.

^{1/} 1982 CDSS. p. 37

The quality and orientation of Upper Volta's agriculture are closely related to the availability and use of good seed. Seed is the mechanism through which plant populations are distributed over time and space. Seed, therefore, provides the only practical means of transmitting and multiplying into succeeding generations the improvements bred into new varieties by plant breeders. Recognition and understanding of seed's primal role are crucial to the establishment of an effective agricultural strategy. It must not be forgotten that seeds are unique among agricultural inputs: they are alive, can be rapidly multiplied, and are required in relatively small quantities.

To develop improved seed varieties, basic agricultural research is being done by scientists working for various research institutes at selected stations throughout the country. USAID is a major contributor to this international seed research effort through its \$13.9 million Semi-Arid Food Grain Research and Development (SAFGRAD) project (698-0393). The SAFGRAD project has contributed to the infrastructure and equipment of the Kamboinse research station and is financing seed researchers from the International Institute for Tropical Agriculture (IITA) and from the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). Farming systems research is being conducted by Purdue University and the project's testing component puts promising lines through a two-year field test in 25 countries throughout semi-arid Africa. Other seed research efforts in Upper Volta are carried out by the Institut de Recherches Agronomiques Tropicales et des Cultures Vivrières (IRAT) with stations at Farako-Ba and Saria, and the Institut de Recherches sur les Huiles et les Oleagineux (IRHO) with stations at Kiangoloko and Saria.

These groups carry out long-term, basic agricultural research such as plant breeding, crop agronomy, pest management, and soil management. In Upper Volta, scientists are looking for new varieties of food crops that give higher yields, resist diseases and drought and are acceptable to the African palate. New lines are constantly undergoing advanced testing in the hope of releasing new varieties. The development of improved seed varieties is a long-term process which is more advanced for some crops than others. While significantly improved varieties are now available for rice, groundnuts, maize, soybeans and cowpeas, progress has been less dramatic for millet and sorghum - the staple crops in Upper Volta. Some promising lines have been developed for these crops, but substantial testing remains to be done before varieties become available which will make significant impact on national production levels.

Development and testing of improved seed varieties is, however, only one part of an effective national seed program. To realize fully their potential impact on agricultural production, these new varieties must be multiplied up to commercial volumes under strict quality control, and they must be sown by farmers. To bridge this gap between the research station and the farmer is the primary function of the National Seed Service.

A well-organized, effective seed program has two important advantages over more ad-hoc multiplication systems. First, an organized system is rapid. In traditional agriculture, as practiced in Upper Volta, the farmer sets aside a part of each season's production to plant the succeeding crop. Selection and multiplication of improved varieties take place over time. An organized seed program can compress the process and thereby accelerate agricultural development.

The second advantage of an organized seed program is that it can ensure maintenance of improved seed quality. While rapid short-term production increases can be achieved through introduction of high yielding varieties via several multiplication systems, yields will get progressively poorer unless the variety remains pure. An organized seed program which enforces quality control during the multiplication process is the key to long-term maintenance of genetic purity of improved varieties.

The justification and purpose of a seed program, therefore, are the dissemination of superior varieties developed, field tested and proven by breeders at agricultural research stations to crop lands for which the variety is adapted. This is best accomplished through an organized seed program. Because of the long lead times involved in the development and dissemination of new seed varieties, the establishment of an effective seed program is necessarily a long-term commitment. USAID's Phase I project began the development of such a system.

D. Links to Phase I

1. Accomplishments of Phase I: In 1974, AID funded a \$1.62 million Seed Multiplication project (686-0202) aimed at increasing domestic food production in Upper Volta. The project called for the creation of a National Seed Service (NSS) which was to evaluate the seed varieties being developed by research stations in Upper Volta, and ascertain those varieties which should be selected for multiplication and distribution to farmers. Improved varieties of rice, maize, groundnuts, and cowpeas have been developed, selected, and multiplied under this project. Some sorghum and millet has also been multiplied even though improvement in these crops has not been substantial enough to effect widespread changeover to improved varieties.

The NSS was also charged with establishing the program necessary to maintain seed quality, and with overseeing support provided to five foundation seed production centers and four certified seed production centers. This support consisted of AID-funded seed processing and agricultural equipment, ^{1/} warehousing, training and direct financial subsidies. It enabled the five research stations and four ORDs ^{2/} to produce 1,900 MT of foundation and certified seed over six years.

Technical assistance and training were also provided under the Seed Multiplication project. A USAID-contracted extension advisor/general agriculturalist, primarily concerned with field operations, has worked for two years on the project. Short-term technical assistance was provided for installation of seed processing and laboratory equipment. Training was provided to the Chief of the NSS who received three months of U.S. training through USDA at Mississippi State University (MSU) in seed improvement. Training was also provided to 10 extension agents at the Matourkou agricultural training center and to 11 ORD Seed Production Officers at IITA in seed production and processing.

After six years of implementation the core of a functioning national seed program has been firmly established. The National Seed Service has its own headquarters facilities including administrative offices, seed testing laboratory, seed storage/processing warehouse and varietal demonstration field in Ouagadougou. The NSS is headed by Mr. Koumassi Yago, a trained agronomist with five years administrative experience. His staff includes an Assistant Chief in charge of technical activities, i.e. production and quality control; two mid-level agricultural technicians; a laboratory technician; and two field agents. In addition, there are now agricultural agents in all 11 ORDs who have had seed production and processing training and who are beginning to develop ORD seed programs.

The NSS has programmed and supported the production of over 1,900 MT of improved food crops/seed crops during the past six years (see Supplementary Annex L). According to estimates (See Supplementary Annex M), the use of this seed has resulted in approximately 16,000 tons of additional production.

^{1/} See equipment list Supplementary Annex K.

^{2/} Hauts Bassins, East, Comoe and Centre.

over the life of the project. Foundation and certified seed are presently produced with NSS support at five research stations and in one ORD (See Supplementary Annex N, Map). All of these centers utilize AID-provided farm equipment, seed processing equipment and have AID-financed seed storage warehouses. Through crop year 1979 each research station and participating ORD (Haut-Bassin only in 1979) received a production subsidy to help it to meet production costs not covered by the artificially low seed sale prices (Supplementary Annex O gives production subsidy details).

2. Phase I Problems and Evaluation Recommendations: 2/
Several key problem areas must still be addressed if the National Seed Service program is to accomplish its original aims. Experience has shown that the capacity to produce up to 500 MT of seed per year is easily available. The problem, however, is producing seed of recognized and consistent high quality. An effective quality control system has not been established. Phase I produced adequate, and in some cases more than adequate, quantities of seed, but due to a less than adequate number of trained NSS personnel to implement a quality control system, the quality of seed produced was lower than desired. A natural result has been lower acceptance level by the farmer than would otherwise be expected. To correct this deficiency a concerted effort to recruit and train low-level agricultural agents in seed inspection techniques is essential.

The marketing effort also needs improvement. There is an absence of valid baseline data on utilization of improved versus local seed, which makes accurate determination of improved seed demand virtually impossible. As a result certain varieties have been produced in excess of what could be marketed while there has been a greater demand than supply for others. The evaluations recommended that a survey of present seed used by farmers be developed and administered to provide this missing information. Such a survey will give a clearer readout on future seed demand.

Also insufficient in Phase I was field demonstration of promising new varieties. Demonstration can be an effective method of publicizing the value of a new variety, potentially increasing the demand for improved seed. In addition it can make

1/ Neither NSS nor USAID/UV has great confidence in the figures cited in Supplementary Annex M - the data base to generate accurate farm-level production estimates simply does not exist. Nevertheless these figures represent the best estimate which can be made given the information available, and do give an indication of the order of magnitude of the impact of the Phase I effort.

2/ Evaluations were conducted in April 1978 and December 1979.

the farmer and of NSS activities. A lack of other forms of organized publicity was also noted. The evaluations recommended that increased efforts be made to expand field demonstration and publicity activities.

Perhaps the most crucial problem for Phase I operations was the national seed pricing policy. It sets seed prices (not differentiating between foundation and certified) at 15-30 percent above the official grain price. This mark-up margin does not allow a seed producer to cover his production costs. It therefore serves as a negative incentive for the commercial production of improved seed. What is more, when market grain prices exceed the official price by more than 30 percent, seed is less expensive than grain and may be used as food. A more flexible and realistic pricing is a prerequisite for the long-term viability of the Upper Volta seed program.

A final impediment to Phase I success was AID's inability to provide needed French-speaking technical assistance in a timely fashion. In fact, the principal project advisor did not arrive at post until February 1979, more than four years after project start-up. (See Supplementary Annex P for summary evaluation of Phase I).

The NSS has already taken many of the steps recommended by the evaluations to improve the performance of the seed program. Production levels for 1980 were 22 tons of foundation seed and approximately 160 tons of certified seed - a major reduction from the 400 tons a year produced during the rest of Phase I. The GOUV has created four new seed inspector positions at the NSS and three agents have been permanently assigned to the NSS. The fourth is expected to be assigned in June 1981. On the marketing side, the NSS conducted a seed demand survey in the Haut-Bassin during the 1980 planting season to help determine production levels (Questionnaire is in Supplementary Annex Q). Field demonstration of NSS seed also began in the ORD des Hauts-bassins during 1980. The GOUV has agreed to the price policy changes recommended in the evaluations, and the 1981 foundation seed and 1981-82 certified seed will be produced and marketed under a more realistic price structure.

In summary then, the NSS has reacted positively to the recommendations made by the evaluations, and has initiated a number of actions to increase the effectiveness of its program. There remain, however, the necessary tasks of training the new seed inspectors, of demonstrating that the new pricing policies can work, and demonstrating to farmers that NSS seed is a superior product which will bring them increased yields. Phase II will provide the technical expertise and financial resources to perform these tasks.

On AID's side, the current project advisor is willing to return to post under Phase II which will not only provide continuity with the current effort but also assure that competent French-speaking expertise is available to the NSS from day one of the project.

3. Impact on Phase II Design: In an effort to overcome the present problems within the Voltaic seed program as pointed out in the evaluations, Phase II will continue to support a modest, high-quality foundation seed production and marketing program. The project will also improve the existing quality control program for production and marketing of seed of all classes.

Phase II will specifically address the shortcomings in Upper Volta's seed program identified by the evaluations. It will upgrade the quality control system through more and better trained NSS inspectors, through more effective and inclusive seed testing, and through a reduction in scope of the present seed production to include foundation seed production only. NSS certification of multiplied seed will also be reduced at the beginning of the project, but will surpass pre-project levels when NSS inspectors are fully trained. It will also improve the seed marketing effort through establishment of a regular and systematic seed market survey, expansion of improved seed demonstration activities and publicity efforts, and implementation of the revised national seed pricing policy so that seed can be produced without subsidy and used effectively at the farm level.

It is important to note that as a result of the evaluations a project design of realistic nature was established. The accuracy of those evaluations enabled the design team to concentrate on solving problems rather than identifying them.

E. Major Components of the Revised NSS Program

As stated in Section II.B the purpose of the project is to further develop with the GOUV a workable national seed program. Therefore, the discussion of project components has been divided into two parts: the major components of the modified national seed program; and in section II.F the major elements of AID assistance to this program.

Following the evaluations of the Phase I effort, the NSS took a number of steps to re-organize and upgrade the national seed program. The efforts will be continued and expanded under Phase II. The major components of this revised program are five: 1) greater coordination of national seed

research and demonstration activities; 2) production of foundation seed only; 3) better quality control over the production of both foundation and certified seed; 4) improved marketing arrangements; 5) and sensitization through training of government officials and farmers as to (a) the role improved seed can play in agricultural development and (b) environmentally sound techniques for producing and using that seed.

1. Coordination of National Seed activities: Under Phase I a high level National Seed Committee was established to coordinate policy decisions on production, marketing and pricing. This committee never met. A similar Technical Advisory Committee to select varieties, estimate demands and establish quality standards was never formally constituted since it soon became apparent that such a committee would be too large and unwieldy to be effective. Under the revised program, the policy decisions will be made by the Director of Agriculture Services (DSA) on the advice of the Director of the NSS. The technical release decisions will be made by a National Variety Release Committee to be formed by the GOUV. This committee will be composed of the Director of the DSA, the Chief of the NSS, an ORD Director, two agronomic research representatives and two ORD extension agents. Since this committee will be considerably smaller than the originally conceived Technical Advisory Committee, it stands a much better chance of becoming a functional and effective organization. Plant breeders will submit applications to the National Variety Release Committee for official registration of varieties which will then be entered into an official variety catalog. Only those varieties in the catalog may be sold to consumers as certified seed. Results of their meeting will be announced at the annual seed production meeting in March each year.

Other coordinating activities that the NSS will continue under Phase II include holding an annual seed production meeting, establishing seed pricing, production, and distribution levels, coordination of seed information flows, and feedback to research institutions on varietal needs and successes.

2. Seed Production: Under Phase I grants were made to research stations and ORDs for production of both foundation and certified seed. This system left the NSS little leverage with which to ensure quality. Under Phase II, the NSS will finance production of foundation seed only and that will be under contract with the research stations. Not only will this method reduce the production quantities to be supervised by the NSS, but it will also put the NSS in a much stronger position

vis-a-vis the research stations. If quality does not meet the standards specified in the contract, the NSS will not take delivery. The procedure will work as follows:

A revolving fund for foundation seed production will be deposited in the NSS bank account which is reserved for NSS purchase of contracted foundation seed from the research institutes. The quantity will be based upon projected demand as determined by seed surveys and estimated needs for certified seed provided by the ORDs and other seed growers at the annual seed meeting. These contracts will carefully detail both the quality and quantity of foundation seed which the NSS will purchase. Production will be monitored by NSS inspectors and only that seed meeting the specified quality level will be purchased. Receipts from foundation seed delivered under contract to the NSS will be deposited in the NSS's foundation seed account for future year production contracts.

Primary responsibility for certified seed production will move from the NSS to the ORDs, or other seed producers, but under the supervision of the NSS quality control inspectors. The ORDs will purchase their foundation seed from the NSS and multiply it up to commercial volumes for sale to farmers. Only seed produced from NSS purchased foundation seed and grown under the supervision of NSS inspectors will be eligible for NSS certification - the only guarantee the farmer will have of a quality product.

It should be pointed out in this context that initially certified seed will be produced only by the ORD of Hauts-Bassins. This ORD has been singled out because of its location, the capability of its production officials, its seed multiplication infrastructure, and the priority it gives to seed production activities. In addition, this ORD has set up an independent seed production account into which all seed sale revenues are deposited. It is anticipated that by the end of Phase I this account will have sufficient capital to undertake expanded certified seed production under the new pricing system without financial support from the NSS. This is the only ORD in which this capability exists at the present time. Before the end of the project, it is anticipated that other ORDs will begin to produce certified seed under NSS auspices, as a spread effect of the project.

Although certified seed production levels will be lower at the beginning of Phase II than they were through most of Phase I, the quality of the product will be improved. As the seed inspectors gain experience in their jobs and as the reputation of certified seed becomes established, certified seed production levels will

gradually increase until, by the end of the project, they will surpass the levels of Phase I. Anticipated seed production levels by year three of the project are approximately as follows:

	<u>1983</u>
Foundation Seed	29 Tons
Certified Seed	<u>578 "</u>
Total Seed Production	<u>607 Tons</u>

3. Quality Control: The 1,900 MT of foundation and certified seed produced during Phase I was not properly supervised and inspected by NSS personnel. The production levels were over-ambitious given the number and training of personnel available. As a result, seed produced in Phase I, while improved, was not of the consistent high quality desired. Without this recognized and consistent quality, the NSS will never be able to convince farmers that the use of NSS seed will produce superior results.

The NSS has initially attacked this problem by drastically cutting production levels from 425 tons of foundation and certified seed in 1978 to 94 tons in 1979. In this way the NSS hopes to get a grip on the quality of seed being produced. Once quality control has been established at this low level, the NSS will gradually build up production and certification levels to the point where, by the end of Phase II, seed certified by the NSS will exceed the levels of 1978.

Under Phase II the quality control section of the NSS will be upgraded to perform its functions better. This section will include a national seed testing laboratory technician, four seed inspectors and the Chief of the Technical Services section.

Quality control efforts of this section will have two principal functions: field and seed lot inspections by NSS personnel and laboratory testing of seed produced.

a) Seed inspection: At present there are no trained seed inspectors. Yet the role of seed inspectors is a crucial factor in ensuring quality control in a seed program. The GOUV has recognized the important role seed inspectors have to play and has created four positions at the NSS for this purpose. It is anticipated that all positions will be filled prior to project start-up.

Inspectors' duties will include seed field inspections, post harvest inspections, seed-lot

labeling and sampling. They will verify that NSS foundation seed is used for the first multiplication and is multiplied according to NSS standards.

During the initial year of the project their certification activities will be confined to foundation seed production and a limited quantity of certified seed production. During years two and three of the project, when the inspectors have gained experience, their responsibilities for certified seed inspection will increase until they can cover the entire 607 tons of annual production planned by the end of the project.

b) Seed testing: In addition to inspection visits by agricultural agents, seeds must be tested on a regular basis to ensure quality, and evidence of that testing must be presented to consumers. The National Seed Testing Laboratory will conduct seed quality tests on samples collected by NSS inspectors for germination, physical purity and moisture content. The laboratory buildings and equipment necessary for this testing were provided under Phase I, as was training for an agricultural agent to perform simple lab tests. Seed inspectors will be rotated into the lab to assist in the seed testing. Tests will be conducted on a fee basis to the seed producers, with results then transferred to seed-bag tickets according to seed-lot identity. Prior to distribution for sale, seed inspectors will verify the quality level indicated on the seed-bag tickets, assuring that the contents and quality of the seed in the bag are as described. All NSS-verified foundation and certified seed will be bagged in official NSS bags with official NSS tickets. In this way consumers will be assured that they are purchasing a quality product.

4. Marketing: The first step in a good marketing program is clearly to have a good product. The coordination activities, reduced production levels and quality control interventions described above will help ensure the availability of a quality product. At least three other elements are necessary: the product must be one that people want, they must know about the product, and its price must be one consumers are willing to pay.

a) Seed Market Survey: In order to gain a better understanding of seed demand, and thereby to more accurately gear production to demand, the NSS instituted a seed demand survey in 1980. Such a survey will be conducted annually by the NSS

during Phase II.

These seed surveys will be conducted in an attempt to generate valid base-line data on seed utilization by both male and female farmers. Surveys will be used to gather information on both local and improved varieties grown, quality of seed actually being planted, and to provide a data base for estimating the real demand for improved seed varieties, as well as information helpful in determining educational program and seed demonstration needs. These surveys will enable a greater degree of accuracy in planning seed production.

The survey will entail the administration of a questionnaire and collection of seed samples from the farmers contacted during the survey. The questionnaire and answer sheet used in 1980 Seed Survey are attached in Supplementary Annex Q. Each year, NSS staff will meet with the ORD director and pertinent staff prior to implementation of the survey to make initial arrangements for materials and future training sessions.

ORD surveyers will conduct the survey employing certain ORD extension agents to contact farmers and collect seed samples. The NSS will pay the operating costs of the survey and will direct ORD personnel on the selection of samples and procedures, and furnish to each surveyor survey forms, sample bags, pencils and transportation. When the samples have been collected at the ORD level, they will be sent to the NSS laboratory for purity and germination testing. The questionnaires will be collected and analyzed by computer. Results will be made available to the public. A permanent computer program now exists in Ouagadougou to specifically treat seed survey data.

b) Demonstration activities: To encourage farmer awareness and demand for the increased volume of seed, the NSS will package and distribute, through the extension system, demonstration packets of seed of each newly released variety sufficient to plant 20 m² to approximately 5 percent of the farmers living in the area of adaptation of the variety. Demonstration packets will be made available to both men and women. Distribution of demonstration packets represents a major shift in emphasis from the previous project. This primarily promotional

program is now practical because of the extensive varietal trial and demonstration programs being conducted by SAFGRAD (300 farms), UNDP Cereal Demonstration Project (2,400 farms) and the AVV (200 farms) and those planned by the multi-donor Eastern Region Food Production Project. None of these demonstration activities existed when the original project was designed.

Specifically, any variety that is officially registered with the National Variety Release Committee can be chosen for demonstration. Once chosen, treated foundation seed of that variety will be packaged in 100 gram clear plastic bags. They will be labeled and have the NSS emblem on them. The packets will then be distributed and will be followed-up with late season inspections. The feedback from the activity will help to better program production levels and verify adaptability of the variety to the region chosen.

c) Seed Pricing Policy: In order for the marketing efforts and revised production system to work, revision of the seed pricing system is crucial. Demand cannot be determined if prices are set according to an artificial low fixed-margin mark-up over official food grain prices. If seed prices are not set significantly higher than the official food grain price, seed risks being eaten instead of planted when free market grain prices exceed official prices. The GOUV's seed pricing policy moved away from a subsidy toward a profit ^{1/} motivating price in 1979 as a result of the project evaluation report. Realistic pricing will be utilized as the incentive to encourage both government organizations and private farmers to produce and market seed. The "profit" incentive is currently being used successfully by several ORDs and the AVV to increase utilization of other production inputs such as planters and plows.

^{1/} Profit only in the sense that the direct costs and a small percentage of fixed costs are recovered from the sale of seed. There will be no attempt to recover GOUV employees' salaries and benefits, quality control, promotional or educational expenses at this stage of the program's development. For further discussion of this point see Supplementary Annex C: Economic Analysis.

5. Training: A most important factor in the long-term success of the NSS and related programs is a widespread understanding of the role that high quality seed of improved varieties can play in increasing agricultural productivity. Indeed, if those persons working with and advising the farmers are not fully aware of the importance and availability of superior varieties of seeds, farmer acceptance and utilization risk being so low that varietal development research and seed multiplication programs will have minimal impact at the farmer's level. Therefore training in seed technology awareness will become part of the revised NSS program.

Another important educational role that the NSS will play during Phase II concerns the safe collection, use and disposal of chemical products needed for seed production. While all activities directly administered by the NSS use EPA-approved pesticides according to prescribed practices, many organizations operating under NSS supervision do not. A list of appropriate chemical products and appropriate usage procedures were developed during project design. It will be one task of the NSS both during the seed awareness courses and throughout the seed program to educate seed producers and consumers as to what chemical products can be used, how they should be applied and how they are to be disposed of.

F. Major Components of Project Assistance

Project assistance in support of the NSS program described above will be made up of long and short-term technical assistance, equipment and supplies for quality control and marketing activities, construction of a cold room at NSS headquarters, training of seed production officers and related personnel, and operating cost support for foundation seed production, quality control, demonstrations and the seed surveys. A summary of major inputs in each area is provided below.

1. Technical Assistance: The project will provide a long-term seed technology advisor for the life of the project. He will advise the NSS on all aspects of the program described in Section II.E above. The seed technology advisor will be particularly involved in the on-the-job training of newly assigned seed inspectors and lab technicians. He will also be responsible for the preparation and execution of the in-country training programs. An additional duty of the seed technology advisor will be to handle project administrative matters as requested by the NSS and USAID's agricultural development office. The Scope of Work for this position is included in Supplementary Annex T.

Four person months of short-term technical assistance will provide additional expertise in seed certification, testing, marketing, and training. The short-term assistance of an

agricultural economist will assist in the interpretation and refinement of the seed demand survey each year. A short-term agricultural economist will also conduct the necessary analyses to set seed prices each year. Finally, short-term assistance will be provided for a project evaluation in May 1983.

2. Commodities. The bulk of the equipment needed for seed production activities was provided during Phase I. Commodities to be procured under Phase II, therefore, will be primarily spare parts for equipment purchased under Phase I, supplies for seed demonstrations, inspection and training activities, and vehicles and POL for the quality control program. The importance of readily available transportation for a quality control program based on site visits cannot be overstated. Detailed equipment lists for Phase I and Phase II are provided in Supplementary Annexes K and A respectively.

3. Construction: Since the basic infrastructure of the seed program was created under Phase I, construction under Phase II is minimal. The only construction will be a 60 m² air-conditioned cold storage room, which will be constructed within the 160 m² NSS warehouse in Ouagadougou. This room will be used to store foundation seed stocks for up to two years without significant deterioration. See Supplementary Annex V for cost estimates and construction plan.

4. Training: Given the current quantity and quality of NSS personnel, a comprehensive training effort is needed under Phase II to ensure that the NSS has manpower necessary to implement the national seed program described in Section II.E. above.

The project will provide training to seed inspectors and lab technicians utilizing a learn-by-doing on-the-job methodology. The agents will undergo training designed to give them practical experience in seed production, site selection, varietal identification during vegetative growth, roguing, proper use of toxic chemicals, post-harvest seed processing procedures, sampling, seed testing procedures, labeling seed bags, and accurate record keeping. Technical written materials from Mississippi State University (translated under Phase I) will enhance the agents' training. In addition to on-the-job training as NSS employees are assigned, in-country training courses will be conducted to develop the necessary technical skills of those NSS, ORD and AVV personnel directly involved in seed production, processing and quality control activities. A total of 71 NSS, ORD and AVV seed technicians will receive from two weeks to four months technical training in the various aspects of seed technology pertinent to Upper Volta.

Six seed personnel with sufficient English capability will participate in the IITA Tropical Agriculture Production Course.

Two NSS officers will be trained to the B.S. or M.A. (Master of Agriculture) level in seed technology in the U.S. to provide a small but essential core of individuals with the in-depth education necessary for continued development of the national seed program after completion of this project. See Supplementary Annex R for course listings at Mississippi State University. Specifics of the various in-country training efforts are provided in Supplementary Annex S.

To implement the seed technology awareness program, a minimum of four, one-week "seed awareness" courses will be conducted by the NSS with support from consultant personnel. The 120 participants in these courses will be selected from the educational (extension) leaders of ORD, AVV and similar organizations without regard to the level of development of the seed activities within their organizations. Through these sensitization efforts, the role of improved seed in agricultural development will be enhanced in the minds and in the actions of those responsible for grass-roots administration and execution of development programs.

5. Other Costs: Unlike Phase I, the direct costs of foundation and certified seed production will henceforth be recovered from the sale of seed. No operating subsidies will be provided. The project will provide start-up funds for foundation seed production by establishing a revolving fund for this purpose. Start-up funds for certified seed production are already available to the Bobo ORD from activities under Phase I. Start-up funds for other certified seed producers will depend on either the GOUV or other donors. 1/

Although seed production costs will not be financed by the project, the coordination, quality control, marketing and educational activities of the NSS will be supported as a public service. Project support to these activities includes local salaries, funds for demonstration activities, the seed survey, utilities, and travel expenses of inspection personnel.

1/ The Caisse Central de Cooperation Economique (CCCE) has already provided funds for a seed farm in the Eastern ORD, the World Bank for the Bourguiriba ORD. Similarly, other donors are interested in the Sahel and Yatenga ORDs.

The rationale for this approach is discussed in the Elementary Annex C: Economic Analysis.

G. Project Costs

The estimated cost of the project is \$1,950,000 of which \$1,600,000 is to be funded by AID. The GOUV contribution of \$350,000 will pay local salaries 1/ and utilities. The budget summary is as follows:

<u>SUMMARY BUDGET</u>	<u>(\$000)</u>		
<u>INPUT</u>	<u>GOUV</u>	<u>AID</u>	<u>TOTAL</u>
<u>Technical Assistance:</u>		368	368
Long Term (36 PM)			
Short Term (4 PM)			
<u>Commodities:</u>		404	404
Spare parts for equipment, vehicles, POL, Seed survey supplies, promotional supplies, laboratory equipment, bags, storage supplies.			
<u>Other Costs:</u>	249	145	394
Cold room construction, seed survey demonstration, foundation seed production, revolving fund, salaries, utilities, seed inspector travel expenses.			
<u>Training:</u>		290	290
Seed technology training, and appreciation courses, long-term and short-term U.S. training.			
Sub-Total	249	1,207	1,456
Contingency(15% except T.A.)	37	127	164
Inflation (15% compounded annually)	64	266	330

TOTAL	<u>350</u>	<u>1,600</u>	<u>1,950</u>

A more detailed budget is given in Section V.I
Financial Analysis.

1/ Except contract personnel during 1981, Phase I is currently paying the salaries of these individuals and Phase II will continue this support through the end of 1981 at which time the GOUV will pick up the cost. The project will also pay the salary of a part-time accountant/bookkeeper to handle project financial reporting. Travel expenses of inspection personnel will also be paid by AID.

H. Beneficiaries

The primary beneficiaries of this project will be those rural family units whose head makes a decision to purchase seed of one of the genetically superior varieties which will be made available as a result of project activities. Estimates of the number of families benefitting from the use of the 63 MT of seed of improved varieties purchased in the Hauts-Bassins ORD in 1980 range from 1,171 (Social Soundness Analysis: Supplementary Annex D), to 1,470 (Technical Analysis: Supplementary Annex E). Using similar ratios of seed produced to families benefitted, the two analyses estimated that from 10,500 - 15,000 families would benefit from seed purchased in 1983. At the same time, those farmers who purchased seed in 1980, 1981 and 1982 will still be receiving benefits from the seed they purchased. This is true because, unlike fertilizers, herbicides and insecticides, the benefits from genetically superior varieties (except hybrids) continue from three to five years after the seed is first purchased and used. Thus, the total number of beneficiaries resulting from the project in a given year will be considerably greater than the above figures suggest.

Increased production will allow farmers not only to meet their own needs, but to market surpluses. In the long run by establishing an entity capable of planning and controlling the production of a superior quality food crop seed and demonstrating the improved production potential to the farmer to create a demand for improved seed, benefits from this project could accrue to all Voltaics. Increased supply of food should improve nutritional levels. Income from the sale of surplus production would potentially allow for the obtaining of additional health/education needs for rural families. Primary beneficiaries would be the rural poor. A more detailed discussion of the number of beneficiaries and how they will benefit from the project is included in the Social Soundness Analysis, Supplementary Annex D.

III. IMPLEMENTATION PLANNING

A. Implementation Plan

As the project is a second phase effort, the bulk of the equipment, infrastructure, and personnel necessary for start-up on project activities are already in place. Since Phase I has been extended until April 30, 1981, there will be a smooth transition from Phase I to Phase II. The NSS program will operate without a break, with Phase II inputs reinforcing the program as they become available.

To the extent that new equipment, construction, training and technical assistance are involved, the appropriate documentation will be prepared during the first six months of the project. Such documentation includes PIO/Ps for training, PIO/Cs for new equipment and PIO/Ts for needed technical assistance. The technical advisor from Phase I will continue under Phase II thereby providing continuity in technical assistance. A detailed implementation plan is included in Supplementary Annex E.

B. Implementation Arrangements

Arrangements for procurement, contracting, construction, training, and disbursements for local operating costs are detailed below.

1. Procurement: Project commodities will be procured both locally and in the U.S. Local procurement, which will consist largely of spare parts, POL, molybdenes, and demonstration and seed survey materials, will be carried out directly by the NSS. U.S. procurement, consisting largely of four-wheel drive vehicles, some spare parts, lab equipment, and drying and cold room supplies, will be undertaken through PIO/Cs, with AAPC or similarly suitable U.S. companies as procurement agents.

One waiver will be required for project implementation. This is a source/origin waiver for the purchase of ten 50cc mopeds. Detailed justification for the waiver can be found in Annex F.

2. Contracting: A contract to continue the services of the present seed technology agriculturalist through January, 1983 was signed but not fully funded in January 1981. Following project obligation, a PIO/T based on the scope of work in Supplementary Annex T will be prepared to provide funds for the contract beginning June 1, 1981.

Other PIO/Ts will be drawn up for the services of several specialists who will provide short-term consultation. These will include specialists in seed certification, seed testing, seed marketing and seed technology training. Short-term consultants will also assist in analyzing the annual seed demand survey and in conducting the necessary cost analysis to set seed prices each year. To the maximum extent possible, these services will be provided by the Cooperative Agreement No. AID/DSAN-CA-0148 between AID/W and Mississippi State University. This cooperative agreement was successfully used for evaluation and design work during the Phase I project.

An evaluation team, scheduled for May 1983, will be made up of a seed technologist, agricultural economist and social analyst. At least one of these should be AID direct-hire, the other two will be funded by contracts.

3. Construction Arrangements: The re-modeling of the NSS warehouse in Ouagadougou to accommodate an air-conditioned, cold storage room will be contracted for locally. Due to the small scope of work, informal bids will be solicited and construction will be monitored by AID/Ouagadougou. Plans are to be submitted by the GOUV no later than June 1, 1981 with construction to begin as soon as possible after approval of plans by AID/Ouagadougou. Insulating material will be ordered from the USA as well as three H.D. 24,000 BTU air-conditioners.

4. Training Arrangements: The following arrangements will be made concerning the different types of training.

a) U.S. Training: Short-term - each year two seed technology agents from NSS and/or other organizations will go to U.S. to participate in USDA Summer Course TC-130 Seed Improvement (run for the USDA by MSU). A PIO/P will be prepared in the first quarter of each year for \$8,500/participant. The course is for 9 weeks (Mid-May/Mid-July). Long-term - two NSS agents will be sent to Mississippi State University for study at the B.S. or M.S. level for two years. If both candidates can be nominated at once, both could enroll during 1982 after sufficient English training. Once

these two agents return, they will assume control of Quality Control and Technical Services at the NSS. A total of \$104,000 is planned for 48 PM. A copy of the educational program at MSU is included in Supplementary Annex R.

b) Third Country: IITA Tropical Crop Production Course - each year two participants will be trained at IITA in Ibadan, Nigeria for a 10-week course which occurs in December, January and February each year. The candidates will be chosen before September of each year.

c) In-Country: In-country training for both seed technology and seed awareness will be achieved through short (1-2 week) courses to be organized and administered entirely by the NSS with the assistance of the seed technology advisor.

5. Local Operating Costs: Local operating costs will be handled as they were under Phase I. That is to say, after execution of a project implementation letter (PIL) detailing authorized expenditures, the NSS will present a quarterly budget with a request for an advance to be deposited at the project account. At the end of each quarter the NSS will provide justification for expenditures and, as needed, request a further advance of funds. Travel expenses of NSS personnel will also be handled as they currently are.

6. GOUV Logistical Support: The GOUV-provided logistical support for project activities will include maintenance of project buildings and equipment, utilities and salaries of GOUV civil servants, and auxiliary staff (secretaries, janitors, guard, except in FY 81). Office space will be provided for NSS agents and staff at the NSS or the newly opened center at FARAKU-DA.

7. AID Logistical Support: AID will provide office space and secretarial services for the seed technology advisor within its agricultural development office. AID will also provide logistical support for the contractor as per his recently signed contract.

C. Implementation Roles

Responsibility for direct project implementation at the level of project outputs falls almost entirely on the NSS, with USAID/Ouagadougou and AID/W playing limiting supporting

roles chiefly in training and contracting. However, for the project to achieve its purpose of increasing the supply of well-adapted varieties to farmers, a number of other organizations have important roles to play. A brief summary of the role to be played by each follows:

1. Research Institutions: Undertake the basic agricultural research needed to develop breeder seed for improved varieties. The research stations will also produce, under contract to and quality control by NSS, the foundation seed which will subsequently be sold by NSS to certified seed producers.

2. National Variety Release Committee: Is responsible for registering new varieties developed by the research institutions. Only registered varieties will be multiplied and certified under NSS auspices.

3. ORD's: Are responsible for managing the production of certified seed whether directly or through contract to independent growers. In addition, the ORDs are responsible for direct contact with the consumer, i.e., they act as sales agents.

Finally, if the project goal of increased food production is to be reached, then the intended beneficiaries, rural farmers, must participate actively. It is they, after all, who will translate the improved seed into increased agricultural production. The project will encourage this participation in three ways. First, the seed provided will, to the maximum extent possible, respond to the needs of farmers as expressed in the annual seed survey. Secondly, a superior product will be made available through the quality control program. Finally, the superiority of this product will be demonstrated through the distribution of packets of sample seed to farmers working with ORD agents. Adoption of improved seed by other farmers then depends on physical evidence and word-of-mouth. A final important role of the farmer is feedback to the researchers (via the seed survey) as to what seeds are preferred and why.

D. Organizational Capacity

1. GOUV capacity: As noted above, the primary implementing agency for the project will be the National Seed Service. In terms of buildings, equipment, and trained personnel, the NSS is well suited to the tasks to be undertaken during the project. Indeed, it was precisely to perform those tasks that the NSS was created.

While numerous difficulties were encountered during Phase I, two actions taken near the end of that project have brought the scope of NSS activities and administrative capacity of the organization more closely into line. The first of these was a dramatic reduction in NSS seed production responsibilities accomplished by reducing the level of foundation seed production and eliminating certified seed production from direct NSS responsibility. The second action was the filling of four technical staff positions which will allow the NSS for the first time to play a meaningful field inspection role. Therefore, the NSS now has the capacity to manage the planned program.

There remain, however, two areas of weakness. The first of these is financial management. None of the present NSS staff has adequate accounting or even bookkeeping background to manage effectively the financial reporting requirements of AID. Therefore, the project will provide funds over LOP for a mid-level accountant/bookkeeper to be contracted by the NSS. This accountant will work closely with the USAID financial management personnel to establish and maintain an adequate accounting system.

The second weakness is the support staff (drivers, secretaries, janitor) for which no funds were provided in the calendar year 1981 NSS budget. Since these personnel are clearly essential to the operations of the NSS, the Phase I project has agreed to fund these positions through April 30, 1981. In the interest of continuity, Phase II will continue this support through the end of CY 1981, after which time the GOUV will pick up these costs. A detailed analysis of the administrative structure of the NSS is in Supplementary Annex G.

As noted above, other organizations, although they have no direct project management role, are crucial to the success of the overall program. In general, the research stations are well-managed and staffed by competent professionals. No problems are foreseen in the performance of their dual roles of development of improved breeder seed or production of foundation seed.

Among the ORDs, however, the only one currently in a good position to manage a certified seed production program is the Hauts-Bassins ORD. Certification activities, therefore, have begun with that ORD. Through the project's training program, and through the efforts of other donors, seed production capability will be developed in other ORDs during the life of the project. As this happens, the NSS will begin to certify production in other ORDs as well as in the Hauts-Bassins.

.. AID capacity: As the AID role in project implementation is a relatively limited one, no major problems are foreseen in implementation. The key AID input is the provision of a competent, French-speaking seed technology advisor. Since the Phase I technician will continue in Phase II, this input is assured. Technical backstopping and training assistance are readily available from Mississippi State University under Cooperative Agreement No. DSAN-CA-0148. Finally, with USAID/Upper Volta moving to standardize on American Motors vehicles, procurement of project vehicles (the major commodity input) should be expeditious.

E. Legal/Administrative Issues

The NSS was officially created by Ministerial decree, Arrete No. 23/DR, of July 19, 1976. The role and function of the NSS outlined by that decree are consistent with the activities proposed under the project.

There are then, only two legal/administrative prerequisites for project success. The first of these is the creation of the National Variety Release Committee to register new seed varieties developed by researchers. This committee will be established by Ministerial decree.

The second administrative/legal issue is that of the revised pricing policy. In fact, the new pricing policy is already being implemented based on financial and economic analyses performed during project design. Administratively and legally the mechanism for setting seed prices has not changed and will not change under Phase II. Prices will still be set by the Director of Agricultural Services (DSA). What has changed is the process by which the prices are determined. In the past an artificial fixed mark-up over food grain prices was used. This year, and in subsequent years, analysis of production levels, costs, and sales will be performed in order to set prices which will allow the ORDs to cover their direct production costs.

F. Monitoring Responsibility

Primary responsibility for project monitoring will lie with USAID/Upper Volta's agricultural development office which will be responsible for monitoring all major aspects of project implementation. USAID's Office of Financial Management will be responsible for monitoring the financial progress of the project.

The AID/W monitoring role will consist primarily of monitoring the progress of participant trainees in U.S. institutions and the monitoring of a limited number of PIO/Cs. The Development Services Bureau will monitor the Mississippi State University inputs into the project.

IV. EVALUATION ARRANGEMENTS

Two major types of evaluation efforts are planned for the project: (1) annual internal evaluation of the seed program by the NSS; and (2) an external evaluation in the third year of the project.

The first of these, the internal evaluation effort, will be centered around the annual seed use survey. The first such survey was conducted in May 1980 (see questionnaire, Supplementary Annex Q), and is now being analyzed. By means of this survey, the NSS will, each year, obtain valuable information directly from farmers as to the acceptability and effectiveness of seed previously purchased and needs for future years. With this information the NSS will be better able to guide seed research and make decisions regarding the type and quantity of seed to be programmed in the future. The seed survey, then, provides an ongoing mechanism for the NSS to evaluate the effectiveness of its program and to change course as necessary. Short-term technical assistance is planned each year to help interpret the results of the most recent survey and to modify the questionnaire in order to obtain better results in the next effort.

The external evaluation is planned for the spring of 1983, roughly two years after project start-up. This timing will allow observation of the results of two full growing seasons, while still leaving time for a change in project course if it should be needed. The evaluation team will consist of a seed technologist, an agricultural economist, and a sociologist/anthropologist, at least one of whom should be an AID employee. The evaluation plan is in Supplementary Annex I.

V. SUMMARIES OF PROJECT ANALYSES

All major analyses conducted by the design team have concluded that the project is a feasible one. Summaries of the economic, social, technical, financial and environmental analyses are provided below and detailed analyses appear as annexes to this PP. The major conclusions of the administrative analysis were provided in Section III, D "Organizational Capacity."

A. Economic Analysis (See Supplementary Annex C)

The two questions normally asked in an economic analysis - "what is the economic value of the system's output?" and "are there more cost effective ways of carrying out these same functions?" - could not be answered in quantifiable terms for this project. Because of the paucity of agricultural data and the past pricing policies of the NSS, it was impossible to obtain more than a "seat-of-the-pants" estimate of what demand for improved seed may be. Therefore, judgments on both questions have had to be made on a qualitative basis.

In the case of the second question - an alternative - the economic analysis clearly supports public sector seed production and distribution as the only viable alternative at present, given the almost total lack of private seed producers. The inspection role should remain a public sector function given the possibility for conflict of interest and corruption in a private inspection system.

For the first question - economic value - while the economic analysis was unable to measure the probable economic worth of the project, it was able to describe the seed pricing conditions under which seed production operations would earn a 15 percent rate of return. The methodology used was in a sense "backwards". It began with roughly known costs of production, target production levels and an assumed 15 percent rate of return. Given these elements, the only missing factor in the IRR equation is price which could then be calculated. Using a range of rates of return (choice dependent on policy goals) a pricing band was established for each of the major crops produced under NSS auspices. It is these prices which the DSA will use as guides in establishing its seed prices.

Given the rough nature of the cost estimates and the uncertainty surrounding final demand, these price estimates cannot be considered final. Rather the same analysis should be undertaken each year as more cost information becomes available and experience is gained concerning accurate estimation of market demand.

The economic analysis also addressed the question of how the more than \$1 million of recurrent costs resulting from the project in years 1984-87 should be met. It is clear that actual production costs can and should be met by seed consumers, i.e. farmers, through a realistic seed pricing policy. For the inspection and quality control related costs, however, the economic analysis takes the position that the public sector should be responsible (as is the case everywhere else) because the benefits from these programs are in general, public benefits and because charging farmers for the full cost would probably greatly reduce improved seed use to the detriment of the general public.

The economic analysis points out that, to date, the GOUV has been forthcoming in its support for the NSS. To ensure that the government will continue to support an expanded NSS program, the project agreement will require that the GOUV provide UNRWA with a realistic plan for meeting the project's recurrent costs.

B. Social Analysis (See also Supplementary Annex D)

The social analysis contained in Supplementary Annex D and summarized below concentrates on the social characteristics of the peoples of the ORD des Hauts-Bassins. This approach was taken because the bulk of certified seed production to be undertaken during the life of the project will take place in this ORD. Therefore, a study of the Hauts-Bassins ORD is the most relevant to the project's immediate success and impact. What is more, the success or failure of the seed program in the Hauts-Bassins ORD will certainly have an important influence on the decisions of other ORD's to undertake seed programs under NSS auspices. While for these reasons the social analysis concentrates on the Hauts-Bassins ORD, the reader should bear in mind that the long-term impact of the project is expected to cover the entire country.

The social analysis has three principal elements: a profile of the target population, the likely impact of the project on the population, and the socio-cultural feasibility of the project. A summary of the findings in each of these areas is provided below.

1. Profile: The approximately 317,000 people of the Hauts-Bassins ORD belong to at least 10 distinct ethnic groups. They are primarily subsistence farmers concentrating on production of millet, sorghum and maize as staple crops. In 1979 almost three-fourths of cultivated land was devoted to cereals production. Principal cash crops in the area are rice, groundnuts and cotton.

Most cultivation tasks are shared by men and women on the family's principal fields on which are grown the staple crops. Processing (milling) is a women's task throughout the area. In addition (with the exception of the Bobo-Dioula), women have their own fields which they cultivate for their own purposes. Husbands usually only assist in the initial land clearing and preparation of these fields. The most common crops grown by women in their fields are groundnuts and okra - cash crops.

The extension service through which seed distribution will take place operates on a system of contact producers. Each extension agent is responsible for working directly with 18 to 20 farmers. Each of these is in turn in contact with five or more other farmers in the same area. By this means, extension information is directly or indirectly provided to approximately 50 percent of the region's farmers. Extension information reaches other farmers only through observation or word of mouth. Extension advice is provided to women either through their husbands or by one of eighteen women extension agents in the ORD (vs. 132 male extension positions). In addition to agricultural advice, these women agents are responsible for dissemination of a whole range of domestic economics themes.

2. Impact: Primary project impact will be on the estimated 22,100 farming families who will use improved seed made available with the help of this project. It has been estimated that the use of improved seed alone can increase yields from 10 to 50 percent. Even greater increases can be achieved if other improved practices (e.g. fertilizer, cropping patterns) are employed as well.

The long-term beneficiary impact of the project should be much greater than those who will benefit during the life of the project since improved seed, once purchased, can be used for many years with only partial replacement each year. Also, once the value of improved seed is demonstrated by the project's direct beneficiaries, word of mouth will spread its use. Finally, once the Hauts-Bassins ORD demonstrates the viability of the new pricing system and once the NSS quality control capability is increased, other ORDs throughout the country will begin producing and distributing improved seed. The potential spread effect is therefore very great.

Three principal impact issues were discussed in the social analysis: the potential orientation of production towards cash crops; the potential for increased processing work; and the impact on women. The cash crop concern is that since the project (at least initially) will produce relatively large amounts of groundnut and rice seed, it will encourage a re-orientation of production away from staple crops to cash crops. First of all, the NSS plans to promote seed for

cereals crops when significantly improved varieties become available. At the present time, however, the most significant production increases can be achieved with the seed currently being produced. To date this concern has proved unjustified as most farmers invest time, money and effort in cash crops only after cereal crop production is assured. In any case, the project is simply providing subsistence farmers with another option for production and a means (through increased production of either staple or cash crops) of increasing the family's margin of safety during a bad year.

Concerning the second point, if production gains are made, there will, of course, be more processing work. This is a particular concern since processing is primarily a women's task. However, the Hauts-Bassins ORD also has a credit program for the purchase of mills. This program should provide a solution to the processing problem should it become a burden.

Finally the question of the project's impact on women was discussed. Will improved seed be available to women as well as men? In the case of the principal family fields the answer is clearly yes. Increased production on those fields will benefit the entire family. Concerning the women's own fields, the evidence suggests that they will also be able to obtain improved seed if they want it, either through their husbands, directly from the ORD, or through the women extension agents. It should also be noted that groundnuts, one of the seeds emphasized by the project, is one of the crops most often chosen by women for their own fields. More information on women's seed demand and use will become available after the next seed demand survey which will include questions specifically designed to gain a greater appreciation of their needs.

3. Feasibility: In general it can be said that of all the improved cultural practices being disseminated in Upper Volta improved seed is probably the most likely to be adopted and used successfully by Voltaic farmers. Promoting seed does not involve introducing a new concept or product, simply an improved version of an old and well-known commodity. In fact, Voltaic farmers are already relatively sophisticated selectors of improved seed varieties as witnessed by the fact that international seed research institutions are having a relatively difficult time improving on Upper Volta's principal crops - millet and sorghum.

The only feasibility questions that remain then are whether farmers will be willing and able to pay a premium price for improved seed and whether the extension service will be able to demonstrate its effectiveness and distribute the seed.

The social analysis provides a cautiously affirmative answer to both questions. On the question of price it is believed that farmers will recognize in improved seed an opportunity to increase their production and will be willing to invest in it. Since farmers are unlikely to convert their entire fields at once, the fact that credit is not available for some seeds should not block their purchase even by basically subsistence farmers. As for the effectiveness of the extension service in the Hauts-Bassins ORD, the contact producer - follower producer system seems reasonably well adapted to social context of the area as well as to government resources available to support it.

C. Technical Analysis: (For complete text, see Supplementary Annex E)

The project provides for an extension of those successful activities implemented under the current Seed Multiplication Project 686-0202. Those non-fruitful and/or unnecessary activities are either modified and/or eliminated to more clearly focus upon the goal of providing the necessary infusion of good seed of improved varieties of the major food crops into the seed supply used by Upper Volta's farmers. Significant progress has been made toward meeting the project goals since the 1978 evaluation (ref MSU Technical Report TA78-5).

The proposed project places emphasis upon developing the NSS into a national planning, quality control and training agency. The actual seed production and distribution activities will be accomplished at capable research stations, the available ORD seed production farms and through ORD supervised contract production with individual farmers. Resupply of mechanical equipment for seed production is not recommended. Most other seed facilities, i.e., processing and storage warehouses and quality control, supplied during the current project should satisfactorily service the needs of the proposed three-year project. The seed delivery system is functioning adequately.

Funds are recommended to continue and refine the farmer seed use survey for a period of three years. The results, believed unique in concept and to West Africa, should vastly improve the NSS's capability to determine the real demand for improved varieties. The survey will also provide regional organizations with data that will improve their capacity to estimate actual seed use and determine real demand.

Construction of an air-conditioned cold storage room (60 m²) within the NSS seed storage warehouse will provide for the conservation of foundation seed stocks from 18-24 months. This will allow the NSS to more carefully store foundation seed under very strictly controlled conditions.

A detailed discussion of the technical activities required to establish a quality control program suitable for implementation by the NSS is also provided in Supplementary Annex E. This includes a discussion of quality control techniques applicable to varietal development, multiplication, harvesting, drying, processing, storage and marketing.

These techniques include such activities as:

- a. rigorous roguing program during varietal development,
- b. determination of source of seed for each year's multiplication to insure pure seed,
- c. site selection and determination of proper isolation distances,
- d. inspection during growing season for off-types, weeds and diseases,
- e. inspection at harvest to prevent mechanical mixing of seed in the field,
- f. inspection and sampling after processing,
- g. inspection of storage conditions for cleanliness, proper use of pesticides, and
- h. seed testing and feedback to growers concerning physical quality of the seed.

An inspector's handbook concerning his role, training and duties is also found in Supplementary Annex E. Included with the handbook are a set of forms to be used during implementation of the quality control program. They include field inspection reports, seed sample report forms, laboratory forms for purity, germination and moisture content tests.

An outline of the project's implementation plan is found in Section IV, MSU report TA 80-10 found in Supplementary Annex E.

In summary, the technology required for the implementation and success of this project does not go beyond that currently utilized in the seed program.

D. Financial Analysis (See Supplementary Annex F)

The principal financial objectives of the project are to:

- establish a self-sustaining foundation seed production revolving fund at the national level;
- develop the capacity of the NSS to determine pricing levels of seed that will cover costs and replacement of capital;

- establish a self-sustaining certified seed revolving fund at the Hauts-Bassins ORD;
- establish reporting formats for financial data;
- establish capital reserve funds at the ORD for replacement of warehouse and equipment.

A cash flow analysis of the seed program in the Hauts-Bassins ORD is given. Based upon an input of \$75,000 from project 686-0202 as their revolving fund, the fund could be self-supporting if properly managed and monitored. For monitoring purposes, three financial documents will be required: quarterly billing to the ORD Seed Production Office by the ORD accounting office; cash situation of revolving fund bi-annually; financial position of revolving fund. Copies of these reports are included in Supplementary Annex F. AID will continue to have the right to audit ORD accounts.

It is recommended that more accurate cost of production studies be undertaken if annual seed price determinations are to be valid and realistic.

A revolving fund of \$45,000 will be established for production and marketing of Foundation Seed to be administered by the NSS for the production of 80 tons of foundation seed over the next three years.

The following tables present:

Table 1: Source and Application of Funds FY 1981 and FY 1982 (Obligation Schedule)

Table 2: Projection of Expenditures by Fiscal Year

Table 3: Costing of Project Outputs/Inputs

AID's contribution will be \$1,500,000 including contingency and inflation factors. GOW contribution will be \$350,000 over the life of the project. Of this total contribution of \$1,950,000, 36 percent will be used to produce foundation seed, 55 percent will be used directly to improve the overall national seed program effort (such as quality control, training of personnel, marketing) and 9 percent will be used for the seed use survey. See Supplementary Annex F for cash flow analysis on the seed program in ORD - Hauts-Bassins.

FOUNDATION SEED PRODUCTION PROJECT (686-0245)

TABLE 1

SOURCE AND APPLICATION OF FUNDS (U.S. \$ THOUSAND)

(Amount for an Incrementally Funded Project)

	FY 81			Life of Project	
	AID	GOV		AID	GOV
	(LC)	(LC)		(LC)	(LC)
PROJECT INPUTS					
I. TECHNICAL ASSISTANCE					
Long-Term	---	---	300	---	---
Short-Term	---	---	69	---	---
II. SUPPLIES					
Spare Parts-Equipment	25	20	---	25	20
Vehicles: 6 Vehicles	120	---	---	120	---
5 Mobylettes	---	5	---	---	5
PCL	---	105	---	---	105
Seed Survey Supplies	---	12	---	---	12
Demonstration Supplies	---	12	---	---	12
Promotional Material	10	15	---	10	15
Laboratory Equipment	15	---	---	15	---
Drying and Storage Supplies	30	20	---	30	20
Cold Room Supplies	7	---	---	7	---
Inspector Supplies	---	8	---	---	8
III. OTHER COSTS					
Local Salaries and Travel Expenses	---	24	22	---	24
Construction, Cold Room	---	24	---	---	24
Seed Survey	---	52	---	---	52
Demonstration Package	---	18	---	---	18
Foundation Seed Revolving Fund	---	27	---	---	27
Utilities	---	---	12	---	---
					90
IV. IN-COUNTRY TRAINING					
Seed Appreciation Courses	---	60	---	---	60
Seed Technology Courses	---	45	---	---	45
THIRD-COUNTRY TRAINING					
IIIA Tropical Production Courses	30	---	---	30	---
U.S. TRAINING					
Long-Term	104	---	---	104	---
Short-Term	51	---	---	51	---
SUB-TOTAL	760	447	34	760	447
Contingency @ 15% except T.A.	60	67	5	60	67
SUB-TOTAL	820	514	39	820	514
Inflation (15%)	169	97	---	169	97
TOTAL	989	611	39	989	350

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PROJECTION OF EXPENDITURES BY FISCAL YEAR

TABLE 2

FOUNDATION SEED PRODUCTION PROJECT (686-0245)

START: 1 May, 1981

PACD: 30 April, 1984

(\$ 000)

	FY 81			FY 82			FY 83			FY 84			TOTAL		
	AID (FX)	AID (LC)	GOUV (LC)	AID (FX)	AID (LC)	GOUV (LC)	AID (FX)	AID (LC)	GOUV (LC)	AID (FX)	AID (LC)	GOUV (LC)	AID (FX)	AID (LC)	GOUV (LC)
I. TECHNICAL ASSISTANCE															
Long-Term (36 pm)	40	---	---	100	---	---	100	---	---	60	---	---	300	---	---
Short-Term (4 pm)	20	---	---	24	---	---	24	---	---	---	---	---	68	---	---
II. COMMODITIES/EQUIPMENT															
Spare parts Agr. Equip.	---	5	---	25	5	---	---	10	---	---	---	---	25	20	---
Vehicles:	---	---	---	120	---	---	---	---	---	---	---	---	120	---	---
6 Jeeps	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5 Mobylettes & Replacements	---	2	---	---	2	---	---	1	---	---	---	---	---	5	---
POL	---	10	---	---	30	---	---	35	---	---	30	---	---	105	---
Seed Survey Supplies	---	3	---	---	4	---	---	8	---	---	---	---	---	12	---
Demonstration Supplies	---	4	---	---	4	---	---	4	---	---	---	---	---	12	---
Promotional Materials	---	5	---	10	5	---	---	5	---	---	---	---	10	15	---
Laboratory Equipment	---	---	---	15	---	---	---	---	---	---	---	---	15	---	---
Dry & Storage Material	---	15	---	30	5	---	---	---	---	---	---	---	30	20	---
Cold Room Supplies	---	---	---	7	---	---	---	---	---	---	---	---	7	---	---
Inspector Supplies	---	4	---	---	4	---	---	---	---	---	---	---	---	8	---
III. OTHER COSTS															
Construction, Cold Room	---	10	---	---	14	---	---	---	---	---	---	---	---	24	---
Seed Survey	---	10	---	---	17	---	---	25	---	---	---	---	---	52	---
Demonstration	---	5	---	---	6	---	---	7	---	---	---	---	---	18	---
Foundation Seed Revolving Fund	---	27	---	---	---	---	---	---	---	---	---	---	---	27	---
Utilities	---	---	12	---	---	25	---	---	---	---	23	---	---	---	90
Local Salaries & Travel Expenses	---	10	22	---	6	45	---	6	55	---	2	37	---	24	159
IV. PARTICIPANT TRAINING															
Seed Awareness Courses (60 pm)	---	---	---	---	30	---	---	30	---	---	---	---	---	60	---
Seed Technology Courses (30 pm)	---	---	---	---	15	---	---	15	---	---	15	---	---	45	---
IITA Tropical Crop Course (12 pm)	---	---	---	10	---	---	10	---	---	10	---	---	30	---	---
U.S.: Long-Term (48 pm)	---	---	---	36	---	---	48	---	---	20	---	---	104	---	---
Short-Term (12pm)	17	---	---	17	---	---	17	---	---	---	---	---	51	---	---
SUB-TOTAL	77	110	34	394	147	70	199	143	85	90	47	60	760	447	249
Contingency @ 15% except T.A.	3	17	5	41	22	10	11	21	13	5	7	9	60	67	37
SUB-TOTAL	80	127	39	435	169	80	210	164	98	95	54	69	820	514	286
Inflation (15% Compounded)	---	---	---	65	25	13	59	49	26	45	23	25	169	97	64
T O T A L	80	127	39	500	194	93	269	213	124	140	77	94	989	611	350

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TABLE 3

COSTING OF PROJECT OUTPUTS/INPUTS

FOUNDATION SEED PRODUCTION PROJECT 686-0245

(\$ 000)

<u>Project Inputs</u>	P R O J E C T O U T P U T S			<u>Total</u>
	<u>Foundation Seed Production</u>	<u>Development of Seed Program</u>	<u>Seed Survey</u>	
<u>AID APPROPRIATED:</u>				
Technical Assistance	105	218	45	368
Commodities	200	192	12	404
Training	75	210	5	290
Other Costs	51	42	52	145
Inflation and Contingency*	<u>146</u>	<u>211</u>	<u>36</u>	<u>393</u>
SUB-TOTAL	577	873	150	1,600
<u>HOST COUNTRY</u>				
Salaries, Local	48	95	16	159
Utilities	30	56	4	90
Inflation and Contingency	<u>35</u>	<u>58</u>	<u>8</u>	<u>101</u>
SUB-TOTAL	113	209	28	350
<u>T O T A L</u>	<u>690</u>	<u>1,082</u>	<u>178</u>	<u>1,950</u>

*Inflation 15%
Contingency 15% except T.A.

The recurrent costs associated with expansion of the NSS are the increases in its operating costs and the salaries of its new personnel. In fact, the NSS was created with the assistance of USAID in 1975 and, therefore, all of its operating costs can be considered recurrent costs of the first and second phases taken together. The incremental recurrent costs due to the second phase are significantly lower than the recurrent costs associated with the establishment of the NSS in Phase I.

.....The ORD seed production efforts will be run on a self-financing basis except for salaries of any personnel. Additional costs to be borne by the NSS for 1984-1987 are as follows:

ESTIMATION OF REQUIREMENT COSTS FOR NATIONAL SEED SERVICE, 1980-87

BASED ON 1980 ACTIVITY LEVEL

240 CFA = \$1	(\$ 000)					1984-87
	<u>1980</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>Total</u>
<u>EXPENSES</u>						
1. Personnel (Salaries, ⁰ Travel, Per Diem)	12.4	61.0	67.1	73.8	81.2	283.1
2. Production Material and Supplies	15.4	18.8	20.6	22.7	25.0	87.1
3. POL and Vehicle Main- tenance	25.4	38.6	36.1	42.1	37.0	153.8
4. Operating Expenses/ NSS (Util., Supplies)	32.0	39.4	43.3	47.7	52.4	182.8
5. Marketing Activities	16.7	24.4	26.9	29.6	32.5	113.4
6. Foundation Seed Produc- tion Costs ⁺	29.2	20.4	22.0	24.7	27.3	94.4
7. Training	<u>7.9</u>	<u>30.0</u>	<u>30.0</u>	<u>30.0</u>	<u>30.0</u>	<u>120.0</u>
	139.0	232.6	246.0	270.6	285.4	1,034.6
<u>REVENUE</u>						
1. Sale of Foundation Seeds [#]	31.3	31.3	34.4	38.5	42.7	146.9

⁰ Two new agents added each year.

+ Foundation Seed Production Costs = 160 FCFA/Kg

Sale of Foundation Seed at 250 FCFA/Kg

E. Environmental Analysis:(See Supplementary Annex N)

The negative determination of the Initial Environmental Examination was approved at the time of the PID review, contingent upon completion of a risk-benefit analysis concerning the use of pesticides in the project. That analysis was performed by a crop protection specialist during PP design (see Supplementary Annex N) and specific guidelines were set forth for the procurement and use of pesticides by the project.

For activities under the direct control of the NSS (principally Foundation Seed storage) the only pesticide used will be the EPA-approved Thiram. This product will be applied according to the directives set forth in Supplementary Annex N.

In addition, NSS personnel will have as one of their principal training tasks the promotion of approved pesticides applied using approved procedures. This effort will be directed at the other partners in the seed program -- the research institutions and participating ORD(s). The basis for their training efforts will be the risk-benefit analysis which provides lists of approved products and cites safe procedures for their use. NSS personnel will also promote alternatives to chemical pest control such as biological control and improved cultural practices.

By using the guidance set forth in the risk-benefit analysis, the project will not only assure that pesticide use in the project is conducted in an environmentally sound manner, but the project will also begin the long education process vis-a-vis other pesticide users in Upper Volta.

VI. CONDITIONS, COVENANTS AND NEGOTIATING STATUS

As should be clear from the text, project success depends to a large extent on the implementation of the revised pricing policy for improved seed. Therefore, the project agreement will contain a condition precedent to first disbursement that the GOUV promulgate a ministerial decree establishing a seed price policy based on the cost of producing improved seed. This policy will be in conformance with the recommendations included in the economic analysis, Supplementary Annex C. In order to continue the services of the current contractor, and to allow commencement of the training program in a timely fashion, long-term technical assistance and short-term U.S. training will be exempted from this condition.

As for covenants, the project agreement will require that within nine months of the signing of the Agreement the GOUV provide AID with a realistic plan for meeting project-related recurrent costs after the completion of the project. The project agreement will also contain the standard condition precedent relating to disbursement of funds for construction purposes.

The GOUV will also agree in the project agreement to provide all necessary project implementation personnel, including four technical agents to be assigned to the NSS. The GOUV will also agree to establish a National Variety Release Committee to authorize multiplication and distribution of certified seed. A final covenant will establish guidelines for project evaluation.

The PID review cable suggested that a covenant be included in the project agreement requiring the GOUV to implement a seed quality control program. Since establishment of such a program is already NSS policy and since implementation of that program is underway, it is unnecessary to include a covenant to that effect.

Each of the conditions and covenants described above has been discussed with the Director of Agricultural Services who is in agreement with their content. No problems, therefore, are foreseen in the negotiations of the project agreement.

ANNEX A

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TAGS:

SUBJECT: FOUNDATION SEED PRODUCTION (636-0245) PID

1. THE SUBJECT PID WAS REVIEWED BY THE PROJECT COMMITTEE ON MAY 28 AND RECOMMENDED FOR APPROVAL. THE AA/AFR HAS SUBSEQUENTLY AUTHORIZED USAID/OUAGA TO PROCEED WITH DEVELOPMENT OF THE PP. THE FOLLOWING ISSUES SHOULD BE ADDRESSED DURING PROJECT DESIGN.

(A) PRICING POLICY. SINCE THE SEED PRICING SYSTEM IS CRUCIAL TO THE SUCCESS OF THE PROJECT, THE MISSION SHOULD DETERMINE WHAT MECHANISM IS FELT TO INSURE THAT THE GOV WILL PROMULGATE THE REVISED PRICING POLICY. ADVISE AID/W BY CABLE ASAP ON HOW THIS ISSUE WILL BE HANDLED IN THE PP AND THE PROJECT AGREEMENT.

(B) FINAL PROJECT PHASE. AS STATED ON PAGE 11 OF PID, BY THE END OF THE PHASE II PROJECT, THE NATIONAL SEED UNIT WILL BE A SELF-SUFFICIENT AGENCY WHICH WILL GENERATE THE REVENUE NEEDED TO MEET ITS OPERATIONAL COSTS OF PRODUCTION. CONSEQUENTLY, NO FURTHER AID ASSISTANCE TO THE NATIONAL SEED SERVICE (NSS) IS CONTEMPLATED.

(C) RISK-BENEFIT DECISION. THE PP SHOULD FOCUS ON THE USES OF NSS AND ADDRESS IN GREATER DETAIL THE PROPOSED MEANS OF DEMONSTRATING TO FARMERS THAT THE RELATIVELY HIGHER COST OF NSS SEED IS WARRANTED BY THE POTENTIAL GREATER EARNINGS. PARTICULAR ATTENTION SHOULD BE GIVEN TO THE RISK-BENEFIT DECISION THE FARMER WILL HAVE TO MAKE WHEN DECIDING WHETHER OR NOT TO PURCHASE NSS SEED.

(D) ROLE OF WOMEN. THE PROJECTED ROLE OF WOMEN IN THE MARKETING OF THE PRODUCT OF IMPROVED SEED SHOULD BE MORE FULLY INTEGRATED INTO THE MAIN PROJECT TEXT. MORE ANALYSIS NEEDS TO BE GIVEN TO THE POSSIBILITIES WOMEN WILL HAVE TO PURCHASE SEED FOR THEIR OWN PLOTS AND TO THE POSSIBILITY THAT SOME CROPS MAY BE MORE FREQUENTLY CULTIVATED BY WOMEN THAN BY MEN. IN ADDITION, THE USE OF SEED BY WOMEN SHOULD BE INCORPORATED INTO THE NEXT SEED DEMAND SURVEY THAT IS SCHEDULED IN THE POBC OFFICE. THE NEXT PLANNING

OF QUALITY CONTROL TO THE SUCCESS OF THE PROJECT.
GOV'S COMMITMENT TO ESTABLISH A SEED QUALITY CONTROL PRO-
GRAM IS COMMENDABLE AND WILL BE AN INTEGRAL COMPONENT OF THE
PROJECT. THE MISSION SHOULD CONSIDER THE CAPABILITY OF
INCLUDING THE INITIATION OF SUCH PROGRAMS A COVENANT
IN THE PROJECT AGREEMENT.

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(F) THE PRIVATE SECTOR PARTICIPATION. THE PID INDICATES THAT COMMERCIAL GROWERS WILL BE CONTRACTED TO PRODUCE SEEDS. A THOROUGH PRE PP ANALYSIS SHOULD BE UNDERTAKEN OF THIS ASPECT OF THE PROJECT SINCE THE FINANCIAL VIABILITY OF THE PROJECT IN LARGE MEASURE REVOLVES AROUND THE PARTICIPATION OF THESE COMMERCIAL SEED PRODUCERS.

(G) TRAINING. THE TRAINING AND EXPERIENCE OF CURRENT NSS PERSONNEL SHOULD BE EVALUATED IN GREATER DETAIL TO DETERMINE IF ADDITIONAL LONG-TERM TRAINING SHOULD BE INCLUDED IN THE PROJECT. THE CAPABILITY OF NSS PERSONNEL TO TRAIN ADDITIONAL SEED QUALITY CONTROL PERSONNEL DURING AND AFTER PROJECT COMPLETION IS OF PARTICULAR CONCERN, SINCE (AS STATED ON PAGE 10 OF PID) CURRENTLY THERE ARE NO TRAINED SEED INSPECTORS IN THE NSS.

(H) RISK-BENEFIT ANALYSIS. THE PP ENVIRONMENTAL ANALYSIS WILL INCLUDE A RISK-BENEFIT ANALYSIS FOR PESTICIDE USE ON RESEARCH STATIONS AS RECOMMENDED IN THE IEE. EVEN THOUGH THIS PROJECT WILL NOT PROCURE OR USE ANY PESTICIDE, AID WILL BE CONCERNED WITH ANY POSSIBLE ADVERSE IMPACT OF PESTICIDE USE STIMULATED BY THIS PROJECT.

(I) USAID'S RIGHT TO AUDIT. THE PP SHOULD INDICATE THAT USAID RESERVES THE RIGHT TO AUDIT THE ORD SEED PRODUCTION ACCOUNT THROUGHOUT PHASE II EVEN THOUGH THE USAID PROJECT CONTRIBUTION FOR THAT ACCOUNT ENDS IN DECEMBER 1980.

(J) TYPE OF SEED PRODUCED. THE PP SHOULD CLARIFY WHETHER GROUNDNUTS ARE CHIEFLY FOR LOCAL CONSUMPTION OR FOR EXPORT. IF THE LATTER, THE PROJECT PURPOSE SHOULD BE MODIFIED TO REFLECT THE FACT THAT SEEDS FOR BOTH FOOD AND CASH CROPS WILL BE PRODUCED.

(K) SEED DELIVERY SYSTEM. THE PP SHOULD EVALUATE THE SEED DISTRIBUTION SYSTEM USED DURING PHASE I AND DETERMINE THE IMPROVEMENTS, IF ANY, REQUIRED IN THE SYSTEM TO INSURE THAT SEED IS AVAILABLE PRIOR TO THE PLANTING SEASON.

(L) COLLABORATION WITH OTHER SEED PRODUCTION STATIONS/ EFFORTS IN NEIGHBORING COUNTRIES: THE PP SHOULD OUTLINE THESE EFFORTS AND SHOW HOW THE PROPOSED PROJECT RELATES TO THEM AND WHAT STEPS ARE PLANNED TO EXCHANGE INFORMATION BETWEEN INSTITUTIONS DOING SIMILAR KINDS OF RESEARCH IN THE SAHEL.

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2. AAI/FF HAS AGREED TO NEGATIVE DETERMINATION ON IEE
WHICH CONTEMPLATES THE RISK-BENEFIT ANALYSIS CITED IN
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ANNEX B
PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

List of Project
 From FY 81 to FY 84
 Total US Funding 1,600,000
 Date Prepared 4/21/81

Project Title & Number: **FOUNDATION SEED PRODUCTION 686-0245**

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS																		
<p>Sector Goal: The broader objective to which this project contributes:</p> <p>to increase domestic food production and improve the quality of life of rural families in Upper Volta.</p>	<p>Measures of Goal Achievement:</p> <p>A 6,000 ton net annual increase in food production. Reduction in imported food grains.</p>	<p>GOUV food crop production statistics Import/Donor assistance statistics</p>	<p>Assumptions for achieving goal targets:</p> <ol style="list-style-type: none"> 1. The GOUV will continue to place the highest priority on projects which lead to increased production of grain and legume food crops. 2. Rainfall distribution will not adversely affect total crop production. 3. Insect or disease pests will not adversely affect total crop production. 4. GOUV continues fertilizer import subsidies. 																		
<p>One of the project is to further develop with the GOUV a workable national seed multiplication, marketing and quality control program which will increase the quantity of seed of genetically superior varieties of the target crops produced in Upper Volta and assure widespread availability and use of such seed.</p>	<p>Conditions that will indicate purpose has been achieved. End of project status.</p> <ol style="list-style-type: none"> 1. The NSS will be recognized as the only official source of foundation cereal seeds in U.V. 2. Foundation Seed produced under NSS auspices will meet norms of international standards. 3. NSS will operate a quality control program for 80 MT foundation seed and 1,300 MT of certified seed during the life of the project. 4. 1,300 MT of seed certified by the NSS will be sold to farmers in Upper Volta 	<ol style="list-style-type: none"> 1. NSS seed testing lab records. 2. NSS seed inspectors trip reports. 3. ORD certified seed sales records. 4. NSS foundation seed sales records. 	<p>Assumptions for achieving purpose:</p> <ol style="list-style-type: none"> 1. The GOUV will rest sole responsibility for foundation seed production in the NSS, and provide qualified personnel for the NSS. 2. The ORD administration has the capability to multiply seed. 3. Farmers will pay a premium for superior quality seed, and will respond to promotional and educational programs. 4. Research organizations will provide a continuous supply of genetically pure breeders seed of the approved varieties. 5. The GOUV seed pricing policy will permit the NSS, ORD and AVV to recover all direct costs of production, processing and marketing of seeds. 																		
<p>Supply of high quality foundation seeds. 2. Seed production officers trained in-country. 3. Extension agents in target ORDs and AVV trained in production of seed as a production input as well as safe use; storage & disposal of pesticides. 4. NSS technical services and ORD seed project leaders trained in seed program implementation. 5. Seed survey completed and results published.</p>	<p>Magnitude of Outputs:</p> <ol style="list-style-type: none"> 1. 80 tons for all years 2. 45 3. 120 4. 12 short-term 2 U.S. degree 5. Seed use survey completed and results published. 	<p>Volta during the life of the project.</p> <ol style="list-style-type: none"> 1. NSS sales records. 2. Site visits and inspectors reports. 3. Site visits and ORD sales records. 4. Records of in-country technical training. 5. Records of seed awareness courses. 6. AID training records. 7. Survey report. 	<p>ASSUMPTIONS FOR ACHIEVING OUTPUTS:</p> <ol style="list-style-type: none"> 1. NSS and ORD personnel permanently assigned to seed projects and released for training as necessary. 2. Qualified candidates can be located and trained in English for US training. 3. ORD Directors place a high priority on development of seed production and supply capacity. 																		
<p>Technical Assistance (USAID) Foundation (USAID) (USAID) (USAID) (USAID)</p>	<p>Implementation Target (Type and Quantity)/BUDGET SCHEDULE:</p> <table border="0"> <tr><td>1. Technical Assistance</td><td>\$ 368,000</td></tr> <tr><td>2. Revolving Fund</td><td>27,000</td></tr> <tr><td>3. Commodities</td><td>404,000</td></tr> <tr><td>4. Training</td><td>250,000</td></tr> <tr><td>5. Construction</td><td>24,000</td></tr> <tr><td>6. Seed survey</td><td>52,000</td></tr> <tr><td>7. Demonstrations</td><td>18,000</td></tr> <tr><td>8. Salaries & utilities</td><td>273,000</td></tr> <tr><td>TOTAL BASE COST</td><td>\$1,456,000</td></tr> </table>	1. Technical Assistance	\$ 368,000	2. Revolving Fund	27,000	3. Commodities	404,000	4. Training	250,000	5. Construction	24,000	6. Seed survey	52,000	7. Demonstrations	18,000	8. Salaries & utilities	273,000	TOTAL BASE COST	\$1,456,000	<p>Project Reports PIO/C PIO/T</p>	<p>Assumptions for providing inputs:</p> <p>PP approval.</p>
1. Technical Assistance	\$ 368,000																				
2. Revolving Fund	27,000																				
3. Commodities	404,000																				
4. Training	250,000																				
5. Construction	24,000																				
6. Seed survey	52,000																				
7. Demonstrations	18,000																				
8. Salaries & utilities	273,000																				
TOTAL BASE COST	\$1,456,000																				

-See Table 1, 2, Financial Analysis Summary, Section IV.D-

5C(1) - COUNTRY CHECKLIST

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

A. GENERAL CRITERIA FOR COUNTRY ELIGIBILITY

1. FAA Sec. 116. Can it be demonstrated that contemplated assistance will directly benefit the needy? If not, has the Department of State determined that this government has engaged in a consistent pattern of gross violations of internationally recognized human rights? Yes

2. FAA Sec. 4B1. Has it been determined that the government of recipient country has failed to take adequate steps to prevent narcotics drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. Government personnel or their dependents, or from entering the United States unlawfully? No

3. FAA Sec. 620(b). If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement? Yes

4. FAA Sec. 620(c). If assistance is to government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) debt is not denied or contested by such government? No

5. FAA Sec. 620(e)(1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities? No

6. FAA Sec. 620(a), 620(f); FY 79 App. Act, Sec. 108, 114 and 606. Is recipient country a Communist country? Will assistance be provided to the Socialist Republic of Vietnam, Cambodia, Laos, Cuba, Uganda, Mozambique, or Angola? No
7. FAA Sec. 620(i). Is recipient country in any way involved in (a) subversion of, or military aggression against, the United States or any country receiving U.S. assistance, or (b) the planning of such subversion or aggression? No
8. FAA Sec. 620 (j). Has the country permitted or failed to take adequate measures to prevent, the damage or destruction, by mob action, of U.S. property? No
9. FAA Sec. 620(l). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, inconvertibility or confiscation, has the AID Administrator within the past year considered denying assistance to such government for this reason? N/A
10. FAA Sec. 620(o); Fishermen's Protective Act of 1967, as amended, Sec. 5. If country has seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters:
 a. has any deduction required by the Fishermen's Protective Act been made?
 b. has complete denial of assistance been considered by AID Administrator? N/A
11. FAA Sec. 620; FY 79 App. Act, Sec. 603.
 (a) Is the government of the recipient country in default for more than 6 months on interest or principal of any AID loan to the country?
 (b) Is country in default exceeding one year on interest or principal on U.S. loan under program for which App. Act appropriates funds? N/A
12. FAA Sec. 620(s). If contemplated assistance is development loan or from Economic Support Fund, has the Administrator taken into account the percentage of the country's budget which is for military expenditures, the amount of foreign exchange spent on military equipment and the N/A

amount spent for the purchase of sophisticated weapons systems? (An affirmative answer may refer to the record of the annual "Taking Into Consideration" memo: "Yes, as reported in annual report on implementation of Sec. 620(s). This report is prepared at time of approval by the Administrator of the Operational Year Budget and can be the basis for an affirmative answer during the fiscal year unless significant changes in circumstances occur.)

13. FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption? **No**

14. FAA Sec. 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget? **Not in arrears**

15. FAA Sec. 620A, FY 79 App. Act, Sec. 607. Has the country granted sanctuary from prosecution to any individual or group which has committed an act of international terrorism? **No**

16. FAA Sec. 666. Does the country object, on basis of race, religion, national origin, or sex, to the presence of any officer or employee of the U.S. there to carry out economic development program under FAA? **No**

17. FAA Sec. 669, 670. Has the country, after August 3, 1977, delivered or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements or safeguards? Has it detonated a nuclear device after August 3, 1977, although not a "nuclear-weapon State" under the nonproliferation treaty? **No**

6. FUNDING CRITERIA FOR COUNTRY ELIGIBILITY

1. Development Assistance Country Criteria:

a. FAA Sec. 102(b)(4). Have criteria been established and taken into account to assess commitment progress of country in effectively involving the poor in development, on such indexes as: (1) increase in agricultural productivity through small-farm labor intensive agriculture, (2) reduced infant mortality, (3) control of population growth, (4) equality of income distribution, (5) reduction of unemployment, and (6) increased literacy?

Yes, see FY 1982 and FY 1983 Country Development Strategy Statements.

b. FAF Sec. 104(c)(1). If appropriate, is this development (including Sahel) activity designed to build motivation for smaller families through modification of economic and social conditions supportive of the desire for large families in programs such as education in and out of school, nutrition, disease control, maternal and child health services, agricultural production, rural development, and assistance to urban poor?

N/A

2. Economic Support Fund Country Criteria

a. FAF Sec. 502B. Has the country engaged in a consistent pattern of gross violations of internationally recognized human rights?

N/A

b. FAF Sec. 533(b). Will assistance under the Southern Africa program be provided to Mozambique, Angola, Tanzania, or Zambia? If so, has President determined (and reported to the Congress) that such assistance will further U.S. foreign policy interests?

N/A

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

N/A

d. FY 79 App. Act, Sec. 113. Will assistance be provided for the purpose of aiding directly the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights?

N/A

e. FAF Sec. 620B. Will security supporting assistance be furnished to Argentina after September 30, 1978?

N/A

5C(2) - PROJECT CHECKLIST

Listed below are statutory criteria applicable generally to projects with FAA funds and project criteria applicable to individual fund sources: Development Assistance (with a subcategory for criteria applicable only to loans); and Economic Support Fund.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE?
HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PRODUCT?

A. GENERAL CRITERIA FOR PROJECT

1. FY 79 App. Act Unnumbered; FAA Sec. 653 (b); Sec. 634A. (a) Describe how Committees on Appropriations of Senate and House have been or will be notified concerning the project; (b) Is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than \$1 million over that figure)?

a) Congressional notification forwarded on April 1981
b) Yes

2. FAA Sec. 611(a)(1). Prior to obligation in excess of \$100,000, will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?

a) Yes. See Supplementary Annex B.
b) Yes. See Supplementary Annex B.

3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?

No further legislative action required.

4. FAA Sec. 611(b); FY 79 App. Act Sec. 101. If for water or water-related land resource construction, has project met the standards and criteria as per the Principles and Standards for Planning Water and Related Land Resources dated October 25, 1973?

N/A

5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed \$1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project?

Yes, See Annex E.

6. FAA Sec. 209. Is project susceptible of execution as part of regional or multilateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs.

No

A.

7. FAA Sec. 601(a). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.

- a) Yes. Through increased agricultural exports.
- b) N/A
- c) N/A
- d) N/A
- e) Yes. Through improved seed technology.
- f) N/A

8. FAA Sec. 601(b). Information and conclusion on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).

N/A

9. FAA Sec. 612(b); Sec. 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services.

Upper Volta is acknowledged as one of the world's poorest countries and has difficulty meeting its recurrent budget. It nevertheless will fund additional staff positions for this project.

10. FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?

The U.S. has no excess foreign currency in Upper Volta.

11. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?

Yes

12. FY 79 App. Act Sec. 602. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar, or competing commodity?

Groundnuts, the production for export of which will be a partial result of the project, may be in surplus during a cyclical high in world production. No substantial injury to U.S. producers is anticipated.

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FAA Sec. 102(b); 111; 113; 281a. Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained

a) The project will directly assist the rural producers by giving them access to appropriate and productive seed.

basis, using the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries?

b. FAA Sec. 103, 103A, 104, 105, 106, 107.

Is assistance being made available: (include only applicable paragraph which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source.)

(1) [103] for agriculture, rural development or nutrition; if so, extent to which activity is specifically designed to increase productivity and income of rural poor; [103A] if for agricultural research, is full account taken of needs of small farmers;

(2) [104] for population planning under sec. 104(b) or health under sec. 104(c); if so, extent to which activity emphasizes low-cost, integrated delivery systems for health, nutrition and family planning for the poorest people, with particular attention to the needs of mothers and young children, using paramedical and auxiliary medical personnel, clinics and health posts, commercial distribution systems and other modes of community research.

(3) [105] for education, public administration, or human resources development; if so, extent to which activity strengthens nonformal education, makes formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in development;

(4) [106] for technical assistance, research, reconstruction, and selected development problems; if so, extent activity is:

(i) technical cooperation and development, especially with U.S. private and voluntary, or regional and international development, organizations;

(ii) to help alleviate energy problems;

(iii) research into, and evaluation of, economic development processes and techniques;

(iv) reconstruction after natural or manmade disaster;

b), c) access to improved seed will provide a self-help opportunity to farmers.

d) women as well as men will have access to improved seed. Also as a major marketing force in the region women will benefit from increased marketing activity.

e) N/A

Project is funded under the Sahel Development Account, FAA Section 121. The project falls within the food production sector of the multi-donor Sahel Development Program.

B.1.b.(4).

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(v) for special development problem, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance;

(vi) for programs of urban development, especially small labor-intensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development.

c. [107] Is appropriate effort placed on use of appropriate technology?

Yes

d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)?

N/A for SDP project... Nevertheless, the GOUV is contributing (in-kind) \$350,000.

e. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to the Congress been made, and efforts for other financing, or is the recipient country "relatively least developed"?

Upper Volta is a "relatively least developed" country.

f. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental and political processes essential to self-government.

The project contains a major training component in order to develop the institutional capacity to Voltaic management of the seed program.

g. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?

Yes

2. Development Assistance Project Criteria

a. FAA Sec. 122(b). Information and conclusion on capacity of the country to repay the loan, including reasonableness of repayment prospects.

N/A

b. FAA Sec. 620(d). If assistance is for any product or enterprise which will compete in the U.S. with U.S. enterprise, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?

N/A

a. FAA Sec. 531(a). Will this assistance support, promote economic or political stability? To the extent possible, does it reflect the policy directions of section 102?

N/A

b. FAA Sec. 533. Will assistance under this chapter be used for military, or paramilitary activities?

N/A

4. Additional Criteria for Sahel
Development Program

How will assistance contribute to the long-term development of the Sahel region in accordance with a long-term multi-donor development plan?

By developing the Voltaic capacity to produce improved seed the project will strengthen a key link in the production cycle contributing to the major regional goal of food self-sufficiency.



5C(3) - STANDARD ITEM CHECKLIST

Listed below are statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by imposing limits on certain uses of funds.

These items are arranged under the general headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A. Procurement

1. FAA Sec. 602. Are there arrangements to permit U.S. small business to participate equitably in the furnishing of goods and services financed? **Yes**
2. FAA Sec. 604(a). Will all commodity procurement financed be from the U.S. except as otherwise determined by the President or under delegation from him? **Yes**
3. FAA Sec. 604(d). If the cooperating country discriminates against U.S. marine insurance companies, will agreement require that marine insurance be placed in the United States on commodities financed? **N/A**
4. FAA Sec. 604(e). If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? **N/A**
5. FAA Sec. 608(a). Will U.S. Government excess personal property be utilized wherever practicable in lieu of the procurement of new items? **Yes**
6. FAA Sec. 603. (a) Compliance with requirement in section 901(b) of the Merchant Marine Act of 1938, as amended, that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S.-flag commercial vessels to the extent that such vessels are available at fair and reasonable rates. **Yes**
7. FAA Sec. 621. If technical assistance is financed, will such assistance be furnished to the fullest extent practicable as goods and professional and other services from private enterprise on a contract basis? If the **Yes**

facilities of other Federal agencies will be utilized, are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs?

N/A

B. International Air Transport. Fair Competitive Practices Act, 1974. If air transportation of persons or property is financed on grant basis, will provision be made that U.S.-flag carriers will be utilized to the extent such service is available?

Yes

9. FY 79 App. Act Sec. 105. Does the contract for procurement contain a provision authorizing the termination of such contract for the convenience of the United States?

Yes

B. Construction

1. FAA Sec. 601(d). If a capital (e.g., construction) project, are engineering and professional services of U.S. firms and their affiliates to be used to the maximum extent consistent with the national interest?

N/A

2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable?

Yes

3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the United States not exceed \$100 million?

Yes

C. Other Restrictions

1. FAA Sec. 122 (e). If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter?

N/A

2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights?

N/A

3. FAA Sec. 620(h). Do arrangements preclude promoting or assisting the foreign aid projects or activities of Communist-bloc countries, contrary to the best interests of the United States?

Yes

4. FAA Sec. 636(i). Is financing not permitted to be used, without waiver, for purchase, long-term lease, or exchange of motor vehicle manufactured outside the United States, or guaranty of such transaction?

Yes

C.

5. Will arrangements preclude use of financing:

- | | |
|--|-----|
| a. <u>FAA Sec. 104(f)</u> . To pay for performance of abortions or to motivate or coerce persons to practice abortions, to pay for performance of involuntary sterilization, or to coerce or provide financial incentive to any person to undergo sterilization? | Yes |
| b. <u>FAA Sec. 620(g)</u> . To compensate owners for expropriated nationalized property? | Yes |
| c. <u>FAA Sec. 660</u> . To finance police training or other law enforcement assistance, except for narcotics programs? | Yes |
| d. <u>FAA Sec. 662</u> . For CIA activities? | Yes |
| e. <u>FY 79 App. Act Sec. 104</u> . To pay pensions, etc., for military personnel? | Yes |
| f. <u>FY 79 App. Act Sec. 106</u> . To pay U.N. assessments? | Yes |
| g. <u>FY 75 App. Act Sec. 107</u> . To carry out provisions of <u>FAA sections 209(d) and 251(h)</u> ? (Transfer of FAA funds to multilateral organizations for lending.) | Yes |
| h. <u>FY 79 App. Act Sec. 112</u> . To finance the export of nuclear equipment, fuel, or technology or to train foreign nations in nuclear fields? | Yes |
| i. <u>FY 75 App. Act Sec. 601</u> . To be used for publicity on propaganda purposes within United States not authorized by the Congress? | Yes |

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Ouagadougou, le

1040 DR/CAB/DSA

15 DEC. 1980

Le Ministre du Développement Rural

à Monsieur le Chargé d'Affaires de l'Ambassade
des Etats-Unis d'Amérique à OUAGADOUGOU

US AID/OUAGADOUGOU
<u>ACTION - OPR</u>
INFO: OPR, OFM
DATE ACTION REQUIERE:
NAN: DIR
DISTRIBUTION: B/DIR
REMARKS:

Monsieur le Chargé d'Affaires,

J'ai l'honneur, dans le cadre de la préparation de la phase II du Projet Semencier Haute-Volta-US-AID N°686 0245 intitulé "Projet de Production de Semences de Base" pour une durée de trois ans à compter de Janvier 1981, de solliciter une fois encore de votre haute bienveillance, le concours financier de l'US AID pour un montant global de 1 500 000 dollars US, soit environ 327 000 000 FRANCS CFA.

En effet grâce déjà au projet semencier Haute-Volta-US AID N° 686 0245 financé dès Décembre 1974 par l'US AID, plus de 1 900 000 de semences sélectionnées ont été injectées dans le milieu rural, provoquant une amélioration de la production végétale de notre pays de l'ordre de 3% en dépit des divers déficits vivriers enregistrés ces dernières années.

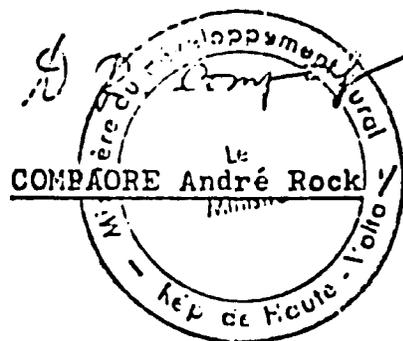
Ce taux d'accroissement apparemment faible s'explique notamment par la méconnaissance des variétés améliorées au niveau du monde rural et par aussi la qualité peu appréciée des variétés, notamment de céréales qui ont été jusqu'ici proposées à la vulgarisation par les Instituts de Recherche.

C'est dans le souci de mettre à la disposition du paysan un matériel végétal de meilleure qualité, afin d'accroître plus substantiellement la production, et partant d'atteindre l'autosuffisance alimentaire qui demeure l'objectif prioritaire du Gouvernement de la Haute-Volta, que la phase II du programme semencier Voltaïque s'avère indispensable.

../.

Confiant quant à votre sensibilisation à nos problèmes de développement, que ma requête trouvera sa solution auprès de votre aimable compréhension, je vous prie d'agréer, Monsieur le Chargé d'Affaires, l'expression de ma très haute considération ./~

Le Cnef d'Escadron



611(e) Certification

FOUNDATION SEED PRODUCTION (686-0245)

Certification pursuant to Section 611(e) of the Foreign Assistance Act of 1961, as amended.

I, Richard C. Meyer, USAID Mission Director for Upper Volta, having taken into account, among other things:

- A. The continuing need for self-sufficiency in food crop production;
- B. The importance the Government of Upper Volta (GOUV) places on agricultural development;
- C. The requirement for a national seed program in order to produce and distribute seed of improved, superior, food crop varieties to farmers throughout Upper Volta;
- D. The requirement for additional, better-trained, practical seed production agents and field inspectors to insure quality control;
- E. The existence of qualified GOUV personnel (1) to manage the project, and (2) to manage the national seed program of foundation seed production and quality control;
- F. The construction/equipment elements of the project which will develop necessary seed program infrastructure;
- G. The important role that U.S. technicians can play in developing an operational, effective national seed

program;

do hereby certify that in my judgment, the GOUV will have with help of this project, the financial and human resource capacity to maintain and utilize effectively the seed program infrastructure developed by the Project.

Richard C. Meyer

Mission Director

Ouagadougou, Upper Volta

ANNEX F

PROCUREMENT SOURCE/ORIGIN WAIVER

DATE:

NUMBER:

A waiver of AID source and origin requirements is requested for procurement of \$5,000 for small motorcycle/mopeds.

- A. Cooperating Country: Upper Volta
- B. Authorizing Document: Action Memorandum and PA dated
- C. Project: Foundation Seed Production 686-0245
- D. Nature of Funding: Grant
- E. Description of Goods: Ten 50cc mopeds
- F. Approximate Value: \$5,000
- G. Probable Origin: France
- H. Probable Source: Upper Volta
- I. Total Waivers to Date to this Project:

Discussion

The project paper calls for the purchase of five mopeds in order to allow project personnel (inspectors at the National Seed Service) to carry out daily business in Ouagadougou (5 kilometers from the project site) during office hours. During field inspections, these mopeds will be used to transport agents to seed production fields that are not accessible by car; this is particularly true during the rainy season from June to October.

There is a complete availability of spare parts and a plethora of qualified mechanics in Ouagadougou for French Peugeot and Motobacane mopeds. American-made mopeds would pose undo logistical problems for the agents who will be responsible for the maintenance of the mopeds. There is no source of American spare parts in Upper Volta and a breakdown would certainly put the moped out of use while waiting for parts to arrive from the U.S. Another problem would arise in trying to mix American standard tools with metric tools. Because there exists no American-made moped which can be readily maintained and repaired in Upper Volta, a Procurement Source/Origin Waiver from Code 941 to Code 935 is requested for the purchased of five mopeds.

SUPPLEMENTARY ANNEX A

Equipment List

1. Six four-wheel drive jeeps, and spare parts.
2. Five mobylettes and their replacements.
3. Heavy Ag equipment spare parts such as belts, wheels bearings, discs, screens, filters, pulleys, hose.
4. Laboratory equipment and supplies - moisture testers, scales, dividers, sample containers, crisper, germinator, germinatory towels, counter-boards, purity boards.
5. Drying tarps 10m x 10 m.
6. Sand snakes and grain pallots.
7. Heavy duty air conditioners for cold storage.
8. Insulation for cold room.
9. Foundation and certified seed sacks and tags.
10. Plastic bags for demonstrations and survey.
11. Audio visual equipment - instamatic cameras, projectors, overhead projectors.
12. Tools for vehicles and warehouse.

DATE: February 9, 1981

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memorandum

REPLY TO
ATTN OF:

Allan W. Strom, General Engineering Officer, ORD

SUBJECT:

611 (a) Certification for Foundation Seed Production, Project 686-0245

TO: Mr. Samir M. Zoghby, Chief, Office of Rural Development *SME*

I visited the site about two miles from Ouagadougou on February 4, 1981, together with Dale Rachmeler, the project advisor. The planned construction is at the National Seed Service Headquarters at La Bois de Boulougne and consists of a 6mx10m conditioned storage room for seeds. The construction is to be inside a new 10mx16m warehouse which is well built and has concrete block walls plastered both inside and out and has a galvanized steel roof with steel trusses.

Preliminary planning of the storeroom is of sufficient detail on which to base a cost estimate and the estimated cost of \$24,000 is adequate to allow for contingencies and inflation until planned time for construction. The final design will be prepared by the owner and construction services are planned to be procured through proposals from three local contractors. Only insulation material and possibly the air conditioners will be procured from the U.S. under a PIO/C funded purchase order. The construction is simple enough that the owner will provide the necessary construction supervisory services.

I have reviewed the planning and the estimated costs and find them adequate. Therefore, requirements of FAA Section 611 (a) (1), as amended, are deemed to have been satisfied for the conditioned storage room.

cc: Dale Rachmeler



Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

OPTIONAL FORM NO. 10
(REV. 7-78)
GSA FPMR (41 CFR) 101-11.6
5010-112

SUPPLEMENTARY AREA CEconomic AnalysisA. Introduction

The Foundation Seed Project will reinforce the public seed selection, inspection, and distribution system. The economic analysis will first address two questions:

- (1) What is the economic value of this system's output? and
- (2) Are there more cost-effective ways to carry out these same functions?

The available data do not permit definitive answers to these two questions, but there are sufficiently strong indications to permit us to conclude that reinforcement of a public seed inspection and distribution system appears to be appropriate in the current situation.

The analysis will then move on to an examination of the factors affecting the price of seed and it will provide guidance as to an appropriate price structure for improved seed. Finally, the analysis will evaluate the probable recurrent costs resulting from the project as well as means of meeting these costs.

B. Economic Value

The project itself will strengthen the capacity of the NSS to carry out its assigned functions. The project cannot claim to be the source of all improvements in yield attributable to selected seeds, since the NSS functions as a screening device, not as breeder, seed producer or vendor. The additional value attributable to this project will, therefore, be due to improved stringency of selection among available varieties for multiplication and inspections of certified seed.

The NSS must first select those varieties which are to be multiplied from breeder seed to foundation seed. The criteria for this selection are both technical and economic. The variety must perform better than locally available varieties and it must be possible to multiply it and sell it at a cost which makes it attractive to farmers. Since the production and distribution of seeds will no longer be subsidized, the NSS must purchase foundation seed varieties which it can resell to ORDs which multiply seeds. Since the ORDs multiplication and distribution activities will also be on a self-

supporting basis, they will not be willing to purchase varieties from NSS which are not proven performers with a promising market. Thus, the economic and technical criteria will increase the stringency of NSS' varietal selection and eliminate doubtful varieties before a lot of resources are spent multiplying them.

Once the NSS has chosen the varieties to be multiplied in consultation with ORDs which will be purchasing the foundation seed, the NSS must carry out inspections of the multiplied seed. Thus, when the ORDs have completed the process of seed multiplication, the NSS inspectors will take samples and perform germination and other tests on this seed before it is allowed to be sold as certified. This quality control function will eliminate seed which does not have the requisite qualities of certified seed and will clearly identify technical characteristics of the certified seed to be sold under the NSS label. This process will ensure that the quality standards are respected and thus increase the farmer's confidence in the project.

The economic value of improving these functions is difficult to measure. In the case of varietal selection, the elimination of technically acceptable but economically unattractive varieties will save the resources that would have been used to multiply and store unwanted or marginally acceptable products. If the ORDs are allowed to set prices which vary with the expected returns to different seeds, the better performing varieties will be multiplied more extensively than varieties with lower expected returns. To the extent that pricing does not differentiate between performance levels for varieties of the same species, this effect will be less important and the rejection of uneconomic varieties will be the only positive savings to emerge from the more rigorous selection and sales process.

With respect to inspections for the maintenance of quality standards, the value of the inspections depends upon how much the performance of different ORDs is improved by the inspections relative to their own quality control procedures. By enforcing a given standard, the NSS can increase the probability of achieving good results from every lot of certified seed which is sold. The benefit to be obtained in the short-run accrues to the farmer who can be confident of the potential performance of the selected seeds he buys with the NSS label. In the long-run, good quality control is essential to the maintenance of demand for the product. If too many bad seed lots are sold, farmers will lose confidence

in the NSS and be unwilling to buy what may be excellent new varieties for fear of wasting their money on bad seed.

It is not possible to estimate by how much the quality control of ORDs may be improved by independent NSS inspections because there are not now any statistics on the proportion of certified seed sold which failed to meet current quality standards. In fact, the NSS may or may not be able to improve upon the performance of the excellent program in the ORD des Hauts-Bassins in this respect. However, the seed programs in other ORDs are not yet well established, and the NSS can play an important role in seeing to it that seed quality is maintained in the early years of their programs.

C. Alternatives

While the direct economic value of this project cannot be measured, it is possible to make a judgment on the choice of public versus private seed production and distribution.

There are not now any private seed companies in Upper Volta. In addition, the traditional markets have no regular trade in seed varieties. Instead, farmers apparently acquire new varieties through their social networks. Richard Swanson^{1/} has reported that Gourmantche farmers travelled to Niger to obtain varieties with shorter growing seasons after the droughts and the apparent shortening of the rainy season.

The absence of a market for seed, either in the private sector or as a well organized traditional activity is not surprising given the limited extent of agricultural markets in Upper Volta. It has also been pointed out that seed production and marketing is generally not a very attractive commercial activity until farmers begin demanding hybrids so as to obtain plant uniformity. The use of hybrids for plant uniformity establishes a regular annual demand which a company can build a business upon. For non-hybrid improved varieties, the farmer who buys it this year can wait several years before the variety degenerates sufficiently to require replacement. This reduces

^{1/} Richard Swanson: Gourmantche Agriculture, Part II Cultivated Plant Resources and Management Document No. 8, Eastern ORD, BAEP, Upper Volta, April 1979.

the size of the annual market and requires seed companies to constantly come up with new varieties to replace the ones which farmers have already bought. Thus, given the absence of commercial activity and the exclusive development of non-hybrid varieties thus far in Upper Volta, it appears appropriate at this time to pursue development of a predominantly public seed production and distribution system. However, in order not to discourage the eventual development of private seed producers and marketers, it is also critical that the public sector adopt a pricing policy which involves no subsidies and a reasonable return to capital.

As for inspection, it is generally considered to be impractical to attempt to do inspections on a private basis. The possibilities for corruption are considered to be high and the public sector is everywhere entrusted with and held to be accountable for the inspection and certification of seed.

D. Pricing

The institution of a price-setting mechanism which will take into account the maintenance of the national seed program without subsidization of operation expenses is the sine-qua-non of this project. The analysis of the seed program of the ORD des Hauts-Bassins which follows is an attempt to contribute to the discussion of the criteria which should be taken into consideration in setting seed prices.

The financial analysis section sets forth the ORD's operating costs at different levels of seed output and determines the minimum prices for cereals, rice and peanuts which will allow the ORD to cover all its costs including equipment amortization but excluding the salaries of civil service employees. The cost-benefit analyses presented below determine the prices which should prevail for the ORD to realize a 15% rate-of-return on its investment at market prices.

The Bobo ORD handles two broad categories of seed: food grains and peanuts. The data available on production costs are provided in three groups: cereals (corn and sorghum), rice, and peanuts. As in the financial analysis, the appropriate prices are calculated for these three groups.

Sufficiently detailed data are not available to distinguish between different varieties within these groups. Neither are data available for on-farm use of certified seed to permit derivation of the demand for such seed. So this analysis is limited to the derivation of appropriate prices for the three groups of seed to obtain a 15% internate rate-of-return.

The calculations assume an initial investment in buildings and equipment with replacement of equipment every thirty years and no salvage value for the buildings at the end of the thirty-year period. The rolling fund is built up over time as the program expands and is intact at the end of thirty years.

Operating costs were estimated from ORD records and refined in discussions with the Director of the seed program. Targets for expansion of the seed program were also set during these discussions.

ORD DES HAUTS-BASSINS
NET SEED PRODUCTION TARGETS (METRIC TONS)

<u>Season</u>	<u>Cereal</u>	<u>Rice</u>	<u>Peanuts</u>
1980/81	50	69	38
1981/82	75	100	50
1982/83	100	140	75
1983/84	145	200	105
1984/85	200	225	140
1985/86	250	225	180
1986/87	300	225	180
1987/88	300	225	180

The calculations on the following three pages are in thousands of CFA francs. They represent the results of an iterative process to establish the margin between the production cost and the sales price to the final user of certified seed. Figures in parentheses are negative entries.

CEREALS

	<u>INVESTMENT</u>	<u>INCREASE IN ROLLING FUND</u>	<u>OPERATING COSTS</u>	<u>GROSS COSTS</u>	<u>GROSS BENEFITS</u>	<u>NET CASH FLOW</u>	<u>TONS OF SEED</u>
	13,020	5,500	1,564	7,064	2,681	(4,381)	50
	0	2,750	2,201	4,951	4,024	(927)	75
3	0	4,950	2,770	5,520	5,365	(155)	100
4	0	6,050	3,973	8,923	7,779	(1,144)	145
5	0	5,500	5,440	11,490	10,730	(760)	200
6	0	5,500	6,725	12,225	13,413	1,188	250
7	0	0	8,010	13,510	16,095	2,585	300
8	0	0	8,010	8,010	16,095	8,085	300
9	0	0	8,010	8,010	16,095	8,085	300
0	5,670	0	8,010	13,680	16,095	2,415	300
19	0	0	8,010	8,010	16,095	8,085	300
0	5,670	0	8,010	13,680	16,095	2,415	300
28	0	0	8,010	8,010	16,095	8,085	300
9	0	(33,000)	8,010	(24,990)	16,095	41,085	300

Production Cost: 110 CFA/Kg.

Margin: 53.65 CFA/Kg.

Sales Price: 163.65 CFA/Kg.

RICE

<u>YEAR</u>	<u>INVESTMENT</u>	<u>INCREASE IN ROLLING FUND</u>	<u>OPERATING COSTS</u>	<u>GROSS COSTS</u>	<u>GROSS BENEFITS</u>	<u>NET CASH FLOW</u>	<u>TONS OF SEED</u>
1	10,815	6,460	1,159	7,619	2,493	(5,126)	69
.	0	2,890	1,450	4,340	3,613	(727)	100
.	0	3,740	1,946	5,686	5,058	(628)	140
.	0	5,610	2,700	8,310	7,226	(1,084)	200
.	0	2,338	2,993	5,333	8,129	2,798	225
8-9	0	0	2,993	2,993	8,129	5,136	225
10	3,465	0	2,992	6,458	8,129	1,671	225
11-19	0	0	2,993	2,993	8,129	5,136	225
20	3,465	0	2,993	6,458	8,129	1,671	225
21-28	0	0	2,993	2,993	8,129	5,136	225
29	0	(21,038)	2,993	(18,045)	8,129	26,174	225

Production Cost: 93.5 CFA/Kg.

Margin: 36.0 CFA/Kg.

Sales Price: 129.5 CFA/Kg.

PEANUTS

<u>YEAR</u>	<u>INVESTMENT</u>	<u>INCREASE IN ROLLING FUND</u>	<u>OPERATING COSTS</u>	<u>GROSS COSTS</u>	<u>GROSS BENEFITS</u>	<u>NET CASH FLOW</u>	<u>TONS OF SEED</u>
1	8,820	2,888	874	3,762	1,492	(2,270)	38
2	0	912	1,045	1,957	1,964	7	50
3	0	1,900	1,463	3,363	2,945	(418)	75
4	0	2,280	1,890	4,170	4,124	(46)	105
5	0	2,660	2,506	5,166	5,498	332	140
6	0	3,040	3,204	6,244	7,069	825	180
7	0	0	3,204	3,204	7,069	3,865	180
8	1,470	0	3,204	4,674	7,069	2,395	180
9	0	0	3,204	3,204	7,069	3,365	180
10	1,470	0	3,204	4,674	7,069	2,395	180
11-28	0	0	3,204	3,204	7,069	3,865	180
29	0	(13,680)	3,204	(10,476)	7,069	17,545	180

Production Cost: 76 CFA/Kg.

Margin: 39.27 CFA/Kg.

Sales Price: 115.27 CFA/Kg.

The same analyses were conducted with shadow prices in place of market prices to determine the economic value of the ORD's seed multiplication activity. ^{1/}

SHADOW PRICES

CONVERSATION RATES

Capital Goods	.8928
Construction	.851
Transport (Truck 3T)	.729
Light Vehicle	.690
Sacks	.8352
Treatment	.8352
Maintenance/Labor	.5000
Cleaning	.8573

In general, the shadow price analysis shows that the ORD's margin should be on the order of 84 to 86% of the margin calculated at market prices. (The calculations are displayed on the following three pages). This is so because the opportunity costs of both capital goods and inputs are lower than the market prices which includes taxes. The table following the calculations summarizes the margins between the production cost and the sales price for the different crops under alternative criteria.

^{1/} World Bank

CEREALS

	<u>INVESTMENT</u>	<u>INCREASE IN ROLLING FUND</u>	<u>OPERATING COSTS</u>	<u>GROSS COSTS</u>	<u>GROSS BENEFITS</u>	<u>NET CASH FLOW</u>	<u>TONS OF SEED</u>
1	11,317	5,500	1,205	6,705	2,300	(4,405)	50
2	0	2,750	1,733	4,483	3,450	(1,033)	75
3	0	2,750	2,220	4,970	4,600	(370)	100
4	0	4,950	3,190	8,140	6,670	(1,470)	145
5	0	6,050	4,360	10,410	9,200	(1,210)	200
6	0	5,500	5,425	10,925	11,500	575	250
7	0	5,500	6,480	11,980	13,800	1,820	300
8	0	0	6,480	6,480	13,800	7,320	300
	0	0	6,480	6,480	13,800	7,320	300
	5,062	0	6,480	11,542	13,800	2,258	300
11-	0	0	6,480	6,480	13,800	7,320	300
20	5,062	0	6,480	11,542	13,800	2,258	300
21-	0	0	6,480	6,480	13,800	7,320	300
	0	(33,000)	6,480	(26,520)	13,800	40,320	300

Production Cost: 110 CFA/Kg.

Margin: 46 CFA/Kg.

Sales Price: 156 CFA/Kg.

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RICE

<u>YEAR</u>	<u>INVESTMENT</u>	<u>INCREASE IN ROLLING FUND</u>	<u>OPERATING COSTS</u>	<u>GROSS COSTS</u>	<u>GROSS BENEFITS</u>	<u>NET CASH FLOW</u>	<u>TONS OF SEED</u>
1	9,349	6,460	821	7,281	2,139	(5,142)	69
2	0	2,890	1,060	3,950	3,100	(850)	100
3	0	3,740	1,428	5,168	4,340	(828)	140
4	0	5,610	1,980	7,590	6,200	(1,390)	200
	0	2,338	2,205	4,543	6,975	2,432	225
5-7	0	0	2,205	2,205	6,975	4,770	225
10	3,094	0	2,205	5,299	6,975	1,676	225
11-19	0	0	2,205	2,205	6,975	4,770	225
20	3,094	0	2,205	5,299	6,975	1,676	225
21-28	0	0	2,205	2,205	6,975	4,770	225
29	0	(21,038)	2,205	(18,833)	6,975	25,808	225

Production Cost: 93.5 CFA/Kg.

Margin: 31 CFA/Kg.

Sales Price: 124.5 CFA/Kg.

PEANUTS

<u>YEAR</u>	<u>INVESTMENT</u>	<u>INCREASE IN ROLLING FUND</u>	<u>OPERATING COSTS</u>	<u>GROSS COSTS</u>	<u>GROSS BENEFITS</u>	<u>NET CASH FLOW</u>	<u>TONS OF SEED</u>
1	7,567	2,888	619	3,507	1,273	(2,234)	38
2	0	912	755	1,667	1,675	8	50
3	0	1,900	1,080	2,980	2,513	(467)	75
4	0	2,280	1,418	3,698	3,518	(180)	105
5	0	2,660	1,890	4,550	4,690	140	140
6	0	3,040	2,412	3,452	6,030	578	180
7-9	0	0	2,412	2,412	6,030	3,618	180
10	1,312	0	2,412	3,724	6,030	2,306	180
11-19	0	0	2,412	2,412	6,030	3,618	180
20	1,312	0	2,412	3,724	6,030	12,306	180
	0	0	2,412	2,412	6,030	3,618	180
	0	(13,680)	2,412	(11,268)	6,030	17,298	180

Production Cost: 76 CFA/Kg.
 Margin: 33.5 CFA/Kg.
 Sales Price: 109.5 CFA/Kg.

ORD MARGIN

(CFA/KG.)

	<u>Cereals</u>	<u>Rice</u>	<u>Peanuts</u>
Break-even pricing at maximum output	30	16	20
15% I.R.R. at shadow prices	46	31	33
15% I.R.R. at market prices	54	36	39

In order to achieve financial self-sufficiency at the ORD level, the prices set by the DSA for the ORDs should be at least as great as the break-even prices determined by financial analysis. They may be set at any level equal to or greater than these break-even prices. However, if the program is to be considered an economically rational use of resources, it should be possible to set prices high enough to achieve at least a 15% internal rate-of-return at shadow prices. If farmers' willingness to pay is to be employed as a criterion for choice of varieties to multiply, then prices should be set at least at this latter level for all varieties. The ORD's profits from the seed program can then be employed in other services to the farmer for which it is not customary or not practical to request payment.

If prices are set at a level below the 15% internal rate-of-return level (at shadow prices) then the ORD has a less rigorous test of the value of the different strains of certified seed. If there is unsatisfied demand for both sorghum and corn, for example, the ORD has no good way to judge by how much to expand production of corn and sorghum. However, at higher prices it may be possible to tell that the demand for corn is not fully satisfied, but that the sorghum output is about right. In addition, if prices are set as low as the break-even prices, the ORD will not be generating its own resources to expand a potentially profitable program and so will depend upon the vagaries of public finance and/or external funding.

Should the ORD sell its seed at the highest prices the market will bear? If there were already a significant traditional trade in sorghum seed,

competing with the ORD, the answer would probably be yes. However, as a monopsonist (sole supplier of a productive input) the ORD could discourage the widespread adoption of improved varieties by earning too great a return on its capital. Thus, like public utilities in the U.S., the ORD should earn no more than a "fair" return on its capital and so encourage the widest possible use of certified seed consistent with economic use of its resources.

The analysis of pricing at a 15% I.R.R. using market prices for capital goods and inputs gives a good indication of the maximum prices which the DSA may set to allow ORDs to earn no more than a "fair" return on capital. At this level, the private sector would presumably find processing of certified seed a financially attractive endeavor. At lower price levels, participation of the private sector is more likely to be discouraged by the lower return on investment.

Table 1 thus defines a range of margins which can be taken into consideration by the DSA in setting prices for certified seed. The lowest margin permits the ORD to operate its seed program without drawing on the national budget, but the low price may discourage the development of private seed companies and there will be no internally generated funds for expansion of the program. The shadow price margin is appropriate for an economically rational allocation of the input (certified seed).

There is a wide range of choice in price setting because there is no hard and fast rule about how the benefits from the seed program should be shared among the processor (ORD) and the users (farmers). The ideal price is the one established by the shadow price analysis since this price will theoretically lead to the economic use of the certified seed under the assumptions which have been made about the scale of the seed program. However, the ORD may decide that it wishes to encourage more widespread adoption of seed and increase farmers' knowledge of the benefits of certified seed use. In order to accomplish this, a lower price may be justified. On the other hand, the ORD may wish to maximize its own profits by exploiting its market position and charge the highest possible prices for seed in order to finance other valuable ORD activities. Either of these positions can be justified on economic grounds, so there remains a wide range of choice in price setting for certified seed.

The governmental unit responsible for setting prices should carry out the type of analysis set forth above on an annual basis in order to take into account changes in relative prices (inflation) and changes in the scale of programs. It should also specify the criteria adopted in coming to a conclusion about the proper margins to set for each type of crop. This unit must have access to production cost data and should institute accounting procedures which will permit refinement of the analyses carried out in this paper.

In summary, since the certified seed market is not yet a competitive one, the ORD should adopt prices for certified seed which do not exceed a "fair" return on capital and which are not less than the break-even prices determined by financial analysis.

E. On the Appropriateness of "Backward" Analysis

The experienced reader of project economic analyses will note that the cost-benefit analysis was performed in a backward fashion. The costs were determined and the desired internal rate of return was fixed in order to derive the level of benefits necessary to achieve that I.R.R. This is an appropriate procedure in the current situation for two reasons: (1) there is no parallel market or black market to provide approximations to free market for certified seed, and (2) prices have not yet been set at sufficiently high levels to test the demand for any particular seed variety. Thus, there is no reliable indicator for the level of benefits which can be expected on the basis of experience to date. Instead, by adopting a pricing policy which will test the market for certified seeds, the project itself will begin to determine the level of benefits which might be derived from the use of certified seed. The background analysis provides a starting point by providing the DSA and the ORDS with a rational method for setting prices and beginning the process of determining effective demand, expanding production of profitable lines and abandoning unprofitable ones, thus letting the market play a role in deciding the proper allocation of resources in the seed program.

F. Recurrent Costs

The recurrent costs associated with expansion of the NSS are the increases in its operating costs and the salaries of its new personnel. The ORD seed programs will be run on a self-financing basis except for the salaries of any additional necessary ORD personnel.

The additional costs to be borne by the NSS are estimated to be approximately \$1,000,000 for the four years immediately following completion of the project (1984-87). Details are provided in Section VI.D of the main text, Financial Analysis. Will the GOUV be able and willing to bear these costs?

The GOUV has demonstrated a growing awareness of the importance of making improved varieties available to farmers through a seed program. It has also committed larger number of personnel and other resources to the NSS, increasing from 3 to 9 the number of employees on the GOUV payroll at NSS and gradually raising its budgetary contribution for utilities, supplies and other operating expenses over the period 1975 to 1980. Over the same period the GOUV contributed the services of 4 ORD personnel for work on the seed program. This growing commitment and the stated intention of the GOUV to further expand the NSS augurs well for a continuation of NSS activities with GOUV resources at the level of output reached by the end of this project in 1984.

Furthermore, if the capacity of the NSS for expanding production is fully utilized, the estimates of revenue from the sale of foundation seed could prove to be too conservative. The current estimates are based on a gradual expansion from a small base of output (22 MT/year). In the past, with poorer quality control than is being practiced now, the NSS handled 150 MT of foundation seed in one year. As better varieties are developed, the potential clearly exists to rapidly expand production and sales, thereby raising revenues and reducing unit costs of production at the same time. This desirable outcome would tend to reduce the portion of recurrent costs which have to be covered through GOUV budgetary contributions. However, it is not possible to predict precisely either the timing for the development of better varieties or the level of demand for such varieties. In the meantime, the NSS continues to function on a small-scale promoting the best varieties available and concentrating on maintenance of high quality products.

The PID review cable suggests that the NSS must be totally self-financing by the end of the project. It is the case in every country in the world that seed inspection, testing and certification are financed in large part through general tax revenues. The PID (and this PP) make the case that all production aspects of the multiplication process will be self-financing due to the new pricing mechanism and the contractual arrangements now being adopted. However, funds for

the public-service aspects of the NSS activities (i.e. inspection, testing, and certification) will be provided for from the GOUV budget or possibly other donors or even USAID if an appropriate policy on recurrent costs financing is adopted in the next few years.

It is not reasonable to expect that Upper Volta will develop a system unlike any existing system which would require the farmer through the price he pays for NSS seed, to pay the cost of all NSS inspection, testing, and certification activities beyond direct production, marketing and distribution costs. First everywhere it is acknowledged that there are potentially substantial benefits which accrue to consumers whose food prices are reduced to the extent that better varieties increase available supplies on the market. Thus, seed inspection services in the U.S. and elsewhere are financed through general tax revenues and not through higher seed prices because the seeds produce benefits which are not all captured by the producers. Second, attempting to capture all the benefits through higher seed prices to the farmer would reduce the use of this seed by farmers and thus reduce the benefit to consumers of the seed program. Thus, the assertion that the NSS should be self-financing ignores the classic public good argument which is found to be valid everywhere else in the world, and if adhered to, would reduce the benefits to be derived from the seed program.

Whatever the source of funds to support the NSS operations (i.e. farmers through seed purchases, consumers through general taxes, or external donors through grants or loans), the GOUV will be required to provide to USAID a realistic, achievable plan for financing the recurrent operating costs of the NSS at the end of current USAID financing.

The Project Agreement will contain a covenant requiring that the GOUV submit a report to USAID/Upper Volta outlining how the GOUV plans to meet the recurrent operating costs of the NSS at the end of the project. The report must be submitted within nine months of the signing of the agreement and be satisfactory in form and substance to USAID. This means that USAID/Upper Volta must be satisfied that the GOUV has developed a realistic plan to meet the recurrent operating costs of the NSS beginning in 1984 and that there is reasonable assurance that such a plan will, in fact, be carried out.

SUPPLEMENTARY ANNEX DSOCIAL ANALYSIS

I. SOCIO-CULTURAL OVERVIEW OF THE ORD DES HAUTS-BASSINS

A. Target Population Profile

The target area of this project is the ORD des Hauts-Bassins in southwest Upper Volta. In 1979, this ORD had an estimated population of 317,000 inhabitants.

There are at least 10 ethnic groups in the Hauts-Bassins, among whom are the Babwa in the northeast, the Bobo-Dioula in the north and center, and the Senoufo in the west.

B. Land and Livelihood

The people in this zone are generally organized in village communities. All family groups in a village have equal access to resources.

The residents of the ORD des Hauts-Bassins are primarily subsistence cultivators. Their main crops are millet and sorghum. In the northern zones, peanuts are an important cash crop. In the middle zone, cotton plays that role. Rice is cultivated on bottom land throughout the areas but more so in the south where rainfall is heavier and river networks more dense. Rice, however, even in the areas where it is the primary crop, must be looked at as a cash crop. People tend to market two-thirds or more of their rice production and buy millet and sorghum with the proceeds.

In 1979, the areas under cultivation and production in the ORD des Hauts-Bassins were as follows;

	<u>Hectares</u>	
Fonio	7,562	3,208
Sorghum	66,362	75,817
Millet	18,413	13,979
Maize	22,152	26,000
Rice	3,453	4,111
Peanuts	12,314	9,040
Cotton	<u>25,391</u>	<u>29,952</u>
	155,647	162,758

The share of each crop as a percent of the total land under cultivation in the ORD des Hauts-Bassins in 1979 was as follows both including and excluding acreage under cotton production:

	<u>Including Cotton</u>	<u>Excluding Cotton</u>
Fonio	4.9	5.8
Sorghum	42.6	50.9
Millet	11.8	14.1
Maize	14.2	17.0
Rice	2.2	2.7
Peanuts	7.9	9.5
Cotton	<u>16.4</u>	<u>---</u>
	100.0	100.0

C. Organization of Production

In 1979 the ORD des Hauts-Bassins estimated a rural population of 317,000 inhabitants, of whom about 175,000 were able-bodied adults. There were slightly under 25,000 family farming units, each consisting of about 13 members of whom 7.2 were able-bodied adults.

The 25,000 families cultivated an aggregate of 155,650 hectares in 1979. This means that the average family cultivated about 6.2 hectares or .86 hectare per able-bodied adult family member. This relatively low average area under cultivation per able-bodied adult may be due to the greater intensity with which land under peanuts, rice and cotton are cultivated as opposed to land under subsistence crops. Overall, 26.4 percent of the land cultivated in the ORD in 1979 was under the three cash crops.

Households cultivate several different plots in several locations. Throughout the area, households cultivate around two-thirds to three-fourths of their fields collectively under the direction of the household head. The balance is cultivated as private undertakings by different members of the household. Over the production of these fields, each adult family member has complete control.

D. Women

Women play a crucial role in the agricultural system in southwest Upper Volta. All women contribute a significant amount of labor time to their husband's fields. Among many ethnic groups, moreover, women cultivate their own fields.

The husband's fields, providing the family's staple crops of millet, maize, sorghum and fonio, are the family's top priority. These fields are planted first and they are the ones to receive fertilizer and insecticides when the family can afford them. At the first opportunity women turn to the fields given to them by their husbands for seasonal use.

In most areas, women participate in all agricultural tasks. There is little rigidity in sex specificity of labor tasks and women plow, seed, weed and harvest fields in addition to men. Although a woman will contribute her labor to all these tasks on the family field, her husband

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will usually help her only in the initial land clearing and preparation of her field.

The kinds of crops grown by women vary regionally, but peanuts intercropped with okra seems to be the most popular. The list also includes condiments, peppers, beans, sorghum and millet.

E. The Extension Service

The extension service in the ORD des Hauts-Bassins was essentially set up under the Project for Agricultural Development of West Volta funded by the World Bank. The main objective of that program was to promote cotton production in the area. The extension service, however, can be and is utilized as well for the promotion of improved crop seeds.

The ORD des Hauts-Bassins is organized into five sectors and each sector is in turn divided into five sub-sectors and each sub-sector into several centers. Each center is staffed by one extension agent. In all there are 132 centers in the ORD des Hauts-Bassins.

Each extension agent is in direct communication with 18 to 20 "contact producers". Demonstration plots are established on the "contact producers" fields and are cultivated by them under the supervision of the extension agents. Then each "contact producer" recruits five or more followers, who are called "follower producers". The "contact producer" is the conduit through whom information passes to a group of "follower producers". These are integrated into the extension through the "contact producer". The other farmers in the zone are known as the "others". Their contact with the extension system depends on their personal initiative.

There are also women extension agents in the ORD des Hauts-Bassins. The Domestic Economics Division of the ORD is responsible for women's affairs. This division trains its own monitrices in a wide range of areas including health, nutrition, and agricultural extension techniques. At present, there are 18 monitrices. Each January, they participate in a 2-4 week refresher course which serves to improve communication between the ORD's officials in Bobo and the field workers, and provides an important forum for dissemination of information. The women agents are the counterparts of the male extension agents. Materials and supplies are distributed to the women cultivators through the women extension agents.

The Domestic Economics Division has organized women into village groups and supports many village activities. The Division has various labor-saving devices at its disposal, e.g. millet mills. These await distribution to villages which have an organized committee with a plan to amortize the equipment.

II. SOCIO-CULTURAL FEASIBILITY

A. Motivation

Producers, including women with whom the PP team spoke, who have certified seed, see an advantage in continued use. They cite the greater vigor of the new varieties compared with their customary varieties of peanuts, maize, sorghum and rice. They also cite higher yields per hectare with the new varieties. People appear to be disposed to embrace certified seed.

B. Who Will Benefit from the Foundation Seed Project?

The group that will benefit most from the project are the "contact producer" families who are in direct communication with the extension agents. Next in line are the five or more "follower producer" families in touch with each of the "contact producer" families.

In 1980, the ORD des Hauts-Bassins sold certified seeds to 1,470 families. Since the average family unit in this ORD includes 13 men, women and children, over 19,100 benefitted from the increase in food or gain production. If a similar ratio is maintained as this project progresses, about 137,579 Voltaics (10,583 families) will receive similar benefits during 1983. At the same time, those farmers who purchased seed in 1980, 1981 and 1982 will still be receiving benefits from the seed they purchased. This is true because unlike fertilizers, herbicides and insecticides, the benefits from genetically superior varieties, except hybrids, continue for three to five years after seeds are first purchased and used. If the benefits from seed purchased in years 80, 81 and 82 are counted, the number of beneficiaries in 1983 will be 22,100 families or over 280,000 Voltaics (see attached table).

Although the male extension agents normally communicate with male farmers, the wives of these farmers benefit at least indirectly from the information and certified seeds disseminated by the male extension agents. In addition, a number of farming women receive direct assistance including certified seeds from the extension monitrices mentioned above. The other farmer families who are not "contact farmers" or "follower farmers" linked up in the extension service can benefit from observing or hearing about the more abundant harvests due to certified seeds. They can take the initiative of contacting directly the extension agents for information and certified seeds.

C. Procurement of Certified Seeds

Through the extension service, small packages of every new variety of certified seed will be disseminated free to the "contact" and "follower" farmer families together with instructions. The purpose

of this free seed program is to familiarize farmers with new certified seeds and to learn from them the results of these new seeds sown under a variety of circumstances. More importantly, proven certified seeds will be readily available to the farmers. At the present, certified seeds for certain crops are available on credit in certain areas. Rice seed is available on credit in centers where rice production is heavily promoted and likewise peanut seed in centers promoting peanut production. All other certified seed is available on a cash-only basis as the amounts of seed bought is very small.

Under Phase I of this project, certified seed could be purchased at a low subsidized price. For sound reasons explained in the Economic Analysis, Supplementary Annex C, a new price policy will be initiated in Phase II whereby the sale of certified seed will cover production costs. The results of calculations detailed in the financial analysis are as follows:

Sale Price of Certified Seeds (CFA/kg)

	80/81	81/82	82/83	83/84
Cereals	156.7	149.8	145.5	142.8
Rice	115.6	111.7	110.0	108.8
Peanuts	108.7	104.0	100.3	97.6

As mentioned earlier, the average family farm in the project area measures 6.2 ha. and consists of several plots.

According to the Mississippi State University team, the planting rate (Kg/ha) is as follows: millet - 6; sorghum - 12; maize - 40; paddy rice - 100; ground - 80. Assuming but not granting that a farmer wanted to change over to certified seed 100 percent in one year, an illustrative example of the quantity required and cost would be as follows:

1/3 of his field or 3 hectares of millet would require 6 Kg of seed per hectare or 18 Kg at 156.7 CFA or 2,820 CFA, and the other 2/3 of his field (6 ha.) would require 12 X 6 or 72 Kg of sorghum at 156.7 CFA or 11,282 CFA: a total of 14,102 CFA.

That price is steep for a subsistent farmer especially during the seed purchasing season of April and May when family funds are at a low level. However, there is no need for the cultivator to convert his entire farm to new varieties at one time. In fact, even if he could afford the price, he would not be inclined to discard all at once his proven farming practices or varieties. No matter what he

he has heard or seen elsewhere, he would be more inclined to convert his farm to new crop varieties only gradually. He could do this at the rate he can afford the cost of new certified seeds. This gradual conversion is facilitated by having several separated plots which can be converted one at a time.

Once a plot or the entire farm has been sown in certified seed, however, the annual cost of renewal is minimum. He need only replace 2 percent of his seed to maintain 90 percent genetic purity. That cost any farmer can absorb. Thus, even without credit for the purchase of certified seed, it is possible for a convinced farmer to convert his farm to new improved varieties at the pace he chooses and can afford. As experience shows him the greater production and profit of certified seed, he will be disposed to save more money to convert his farm more rapidly to new varieties.

What has been said for the family fields is equally true for the personal fields of the women. In fact, it will be easier for them to convert to certified seed because the quantity needed is much less. To obtain money for this purchase, women have various income-generating activities. One lucrative source of funds is making and selling sorghum beer or just the sprouts at a 200 percent profit. Sprouting two batches of red sorghum (12 days of work) can earn a woman 8,000 CFA net profit. With this revenue, she can purchase all the certified seed required for her field.

Even without fertilizer, the use of certified seed can increase productivity from 10 percent to 50 percent over current yields. The actual production increase depends on the technical sophistication of the peasant, his geographic location and the seed variety he is using. A recent study in Niger, conducted under average farm conditions showed a 20 percent increase in production solely from use of certified seed.

According to the PP team anthropologist, "the production increases due solely to the adoption of certified seed are not great enough to have an important qualitative impact on social relationships.... Similarly, there should be little change in the current marketing system."

D. Fertilizer

This project is concerned exclusively with the production and dissemination of certified seed. It does not include as an integral or necessary element the sale and utilization of fertilizers.

However, for maximum yield increases (up to 75 percent) the extension services encourage the use of fertilizers available at government subsidized prices. For the purchase of fertilizer, a farmer can obtain credit if he joins a village group or association that ensures the repayment of the loan. This is also true for women.

They can also obtain fertilizers from or through their husbands.

E. Planting Patterns

It is predictable that the planting pattern will change as a result of the availability and utilization of certified seed. More cash crops may be planted on plots no longer needed to maintain the same level of sorghum or millet production. On the other hand, the farmer may decide to produce more cereal for commercialization of the surplus. Before making his decision, however, the individual farmer will take into consideration every factor: size of farmland, soil, available funds, family manpower resources for weeding, harvesting, and food processing, etc. So many factors intervene in the decision besides the farmer's own character and ambition and desires, that it is difficult to make meaningful predictions of the changes of the planting pattern and the social consequences. In this entire process, however, the farmers are free to decide whether or not to purchase this or that kind of certified seed with or without fertilizers and to convert their farms to improved varieties of crops at the pace of their choice. This project is simply providing the subsistence farmers with another option: the opportunity to obtain improved certified seed and achieve increased production.

F. Harvesting and Processing

In his decision to utilize certified seeds and increase crop production, the farmer will have to consider the possible increase of work at harvest time. Fortunately, harvesting is a family affair. Both men and women harvest and thresh the grain. The pounding of grain into flour, however, is exclusively a woman's task. It is time consuming, e.g. to feed a family of 8, one meal, a woman must pound millet or flour about 2 hours. Fortunately, the ORD des Hauts-Bassins has been especially well endowed with both privately and collectively owned millet mills, so that in many villages throughout the ORD, women have access to labor-saving devices. As mentioned earlier, the ORD in Bobo has various labor-saving devices such as millet mills available on credit to organized village committees which have outlined a plan to amortize the equipment. In short, the possible increase of work at harvest time as a result of the utilization of certified seed enters into the decision of the farmer. He will have a choice thanks to this project, which will provide him with various alternatives.

G. Risk-Benefit Decision

The risk-benefit decision of farmers deciding whether or not to purchase and use improved seed is not susceptible to rigorous analysis at this time for the simple reason that so little data exists on farmers' decision-making process. There does, however, exist a strong prima facie case that farmers will be willing to invest in improved seed. The following facts support that conclusion:

- 1) seed is a known input. Unlike fertilizer, pesticides, or animal traction equipment, Voltaic farmers are well versed in seed selection and use;
- 2) the project plans extensive demonstration activities which will allow farmers to gain first-hand information on the merits of various seeds;
- 3) relative to other improved inputs, seed is inexpensive; and
- 4) the farmer can invest in a small amount of improved seed in the first year to determine how well it works. Unlike animal traction equipment, the threshold cost and therefore risk of trying improved seed is very low.

Although the data base on farmer behavior is now weak, the project include funding for a seed demand survey each year which should substantially improve information on farmers' decision-making vis-a-vis improved seed. This improved data base will permit a more refined analysis of the risk-benefit decision during project implementation.

H. Impact on Women

In accordance with current guidance, this paper has integrated discussion of the role of women in the project throughout the text. Therefore, this section is confined to a summary of the major points noted in the rest of the analysis.

In terms of women's role in agriculture, the most salient point is that most agricultural tasks are shared by men and women. The only areas diverging from this general rule are processing and small-scale marketing in which women predominate. Women also have personal fields for which they are solely responsible. There is a potential for an increased processing workload, but the design team concluded that sufficient credit is available in the Hauts-Bassins ORD to enable those with the greatest processing needs to purchase mills.

In terms of access to the new seed, and to fertilizer and to extension advice needed to profit fully from this seed, seed for family fields will normally be obtained by the husband for the whole family's use. As for the women's own fields, they can either approach a male

extension agent directly, get the seed through their husbands, or buy it through one of the ORD's 18 female agents. The design team concluded that women do have access to sufficient funds to permit them to purchase improved seed if they so desire.

The benefits of increased family production will accrue to female as well as male members of the family in that more food will be available for family meals. In addition, any increased income generated on the women's field is kept by the women and used for their own purposes.

I. Spread Effect

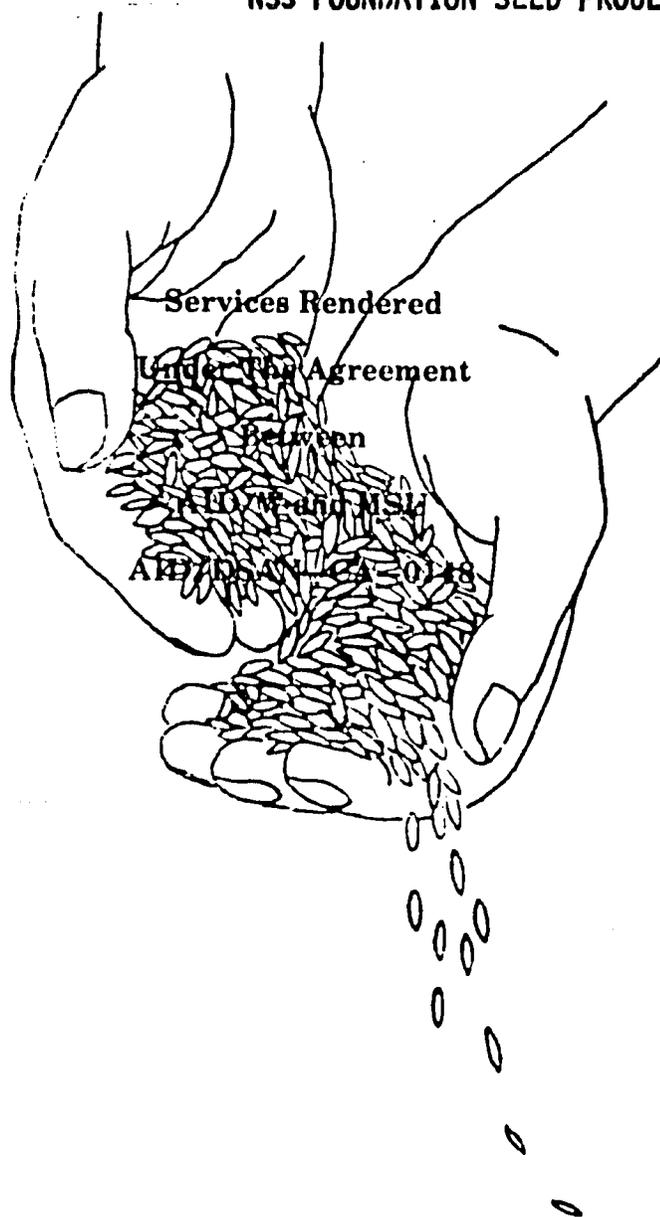
The extension system in the ORD des Hauts-Bassins is in direct or indirect contact with approximately one-half of the family farming units in the ORD. The structure of the extension service is such that there is good reason to believe benefits from using certified seeds will reach almost all those families. The other half of the farming units in the ORD who are not now being reached by the extension system will only slowly be won over to certified seed. Word-of-mouth will be an important conduit of information about the certified seed program. Interest will be piqued by informal exchanges of information on the local level.

Diffusion of the innovation, however, will not be hampered by the lack of foundation and certified seed. Through the project, the production of these can easily be expanded to meet the demand of the entire country. The spread of the program will be achieved principally through the structure of the extension service. As this service is expanded to reach more farming families, not only in the ORD des Hauts-Bassins but in the other ORDs as well, the beneficial effects of this program will spread throughout the country. As said earlier, the ORD des Hauts-Bassins sold certified seed to 1,470 families (representing 19,000 persons) in 1980. If a similar ratio is maintained during phase II of this project, 22,000 members will receive similar benefits during 1983. This prediction, based on the present rate of acceptance of certified seed, augurs well for the spread effect of the project.

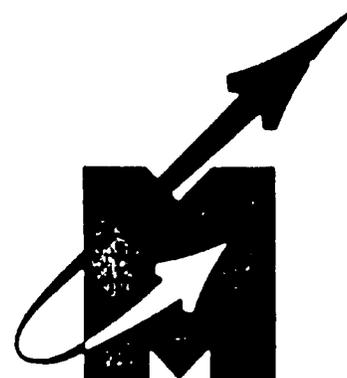
SupplementalTechnical Analysis

This technical analysis combines three documents prepared by Mississippi State University. The principal technical recommendations, including the implementation plan; 2) the outline for a quality control program; and 3) a model seed inspectors handbook.

TECHNICAL RECOMMENDATIONS FOR A PROJECT PAPER
TO ESTABLISH THE
NSS FOUNDATION SEED PROJECT



SEED TECHNOLOGY LABORATORY
MISSISSIPPI STATE UNIVERSITY
MISSISSIPPI STATE, MISSISSIPPI



**Report to USAID/Upper Volta, AID/W
and Ministry of Rural Development/GOUV
on
TECHNICAL RECOMMENDATIONS FOR A PROJECT PAPER
TO ESTABLISH THE NSS FOUNDATION SEED PROJECT**

**Services Rendered Under the
Cooperative Agreement
between
AID/W and MSU
(AID/DSAN-CA-0148)**

**SEED TECHNOLOGY LABORATORY
Mississippi Agricultural and Forestry Experiment Station
Mississippi State University
Mississippi State, MS
July, 1980**

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A special acknowledgement is given to Mr. Cristophe Traore, Seed Production Officer, ORD-Bobo who so freely gave of his valuable time and suggestions in the interest of providing better seed for his people. His common sense knowledge of the goals and purpose of a comprehensive seed program are well beyond his formal educational background.

Finally, we appreciated the efforts and interest of Jay Smith, USAID/Program Officer, who served as the PP economist. In our combined 34 years of experience in working with USAID Missions, he was the first program officer we have "followed" to the field, a most refreshing indicator of unity between technicians and bureaucrats.

Howard C. Potts
C. Hunter Andrews
July, 1980
Mississippi State, MS

REPORT SUMMARY

Title: Technical Recommendations for a Project Paper to establish the NSS Foundation Seed Project

Contract: AID/DSAN-CA-0148 with Mississippi State University

Consultants: Drs. C. Hunter Andrews and Howard C. Potts, Seed Technology Laboratory, MAFES, Mississippi State, MS.

Period of Consultation: June 16 - July 4, 1980

Summary

The USAID/UV Mission requested and the AID/W contract Project Manager approved the services of two senior consultants under cooperative agreement AID/DSAN-CA-0148 for the purpose of assisting Mission personnel in the preparation of the technical aspects of a project paper to establish the, "Foundation Seed Production Project (686-0245). Dr. C. Hunter Andrews and Dr. Howard C. Potts, Senior Seed Technologists of MSU's Seed Technology Laboratory were in Upper Volta June 18-July 3, 1980 and worked with Mission and GOUV. personnel in the technical design of the project.

The project proposed provides for an extension of those successful activities implemented under the current Seed Multiplication Project (683-202). Those non-fruitful and/or unnecessary activities are either modified and/or eliminated to more clearly focus upon the goal of providing the necessary infusion of good seed of improved varieties of the major food crops into the seed supply used by Upper Volta's farmers.

Significant progress has been made toward meeting the goals of the Seed Multiplication Project (686-202) since the review made in 1978 (Ref MSU Technical Report TA 78-5).

The proposed project places greater emphasis upon developing the NSS into a national planning, quality control and training agency. The actual seed production and distribution activities will be accomplished at capable research stations, the available ORD seed production farms and through ORD supervised contract production with individual farmers. Resupply of mechanical equipment for seed production is not recommended. Most other seed facilities ie processing, storage warehouses, and quality control, supplied during the current project should satisfactorily service the needs of the proposed three year project.

Funds are recommended to continue and refine the "farmer seed use survey" for a period of three years. The results of this survey, believed unique in concept and to West Africa, should vastly improve the NSS's capability to determine the real demand for seed of improved varieties. Additionally, the results will provide a basis for determining seed use patterns throughout Sahelian Africa, data not currently available to any Mission.

This report includes the recommended: (a) Project Description/Strategy, (b) Technical Feasibility, (c) Implementation Plan and (d) supporting tables for the project paper. The consultants also provided the Mission with drafts of the PP logical framework matrix, budget, and lists of needed equipment.

Consultant Andrews utilized nearly one-third of his time in the development of a detailed outline of the technical activities required

to establish a quality control program suitable for implementation by the NSS. This outline, not included in the report, is to be review by NSS and USAID/UV technical personnel prior to a recommended visit of the US technician to the S.T.L. in September, 1980.

I. Background and Scope of Work

Personnel of the Seed Technology Laboratory, Mississippi State University have maintained continuous contact with the developing seed program in Upper Volta since its initiation in 1974. The initial design of the USAID assistance project was accomplished during the "Sahelian crisis" of the early 1970's and as a result was based on very limited, often inaccurate base information and projections.

The Mission requested project evaluation of the original project (686-202) in 1978 was very critical both of Mission and GOUV actions, or lack there of, toward implementation of the original design. ^{1/} Fortunately, considerable progress has been made toward attaining several of the specific objectives set forth in this project during the past two years. On the basis of this progress, USAID/UV has prepared and received approval of a PID which more clearly defines the roles and objectives of the USAID and the National Seed Service (NSS) in the development of a comprehensive seed program for Upper Volta.

The PID for the proposed "Foundation Seed Production Project" (686-0245) clearly identifies the major constraints to an orderly, progressive development of Upper Volta's seed program. These are: (a) the seed pricing policy, (b) lack of trained personnel and (c) the assignment of responsibility for the production and marketing of seed to organizations

^{1/} The evaluation team's report is reprinted as Appendix I in MSU Technical Assistance report TA 78-5, Short Term Implementation of the NSS Technical Program.

not having the personnel or facilities to properly fulfill the assigned responsibilities.

To assist in the evaluation and design of the "new" project, the USAID/UV Mission requested and the MSU/AID/DSAN-CA-0148 Contract Manager approved the services of two senior consultants from MSU's Seed Technology Laboratory for a period of approximately two weeks. One of the requested consultants was to have expertise in AID documentation and Seed Program Development and the other in establishment of quality control programs. Dr. Howard C. Potts and Dr. C. Hunter Andrews were nominated and approved to work with Mission and GOUV personnel in the preparation of the technical sections of the project paper and provide the requested technical assistance. The consultants departed Miss. State 16 June and returned 4 July, 1980.

II. Project Description/Strategy

The goal of this project is to increase crop productivity and food supply for the rural poor of Upper Volta by making available high quality seed of improved varieties of cereal grains and food legumes. More specifically, the purpose of this project is to assist the GOUV to establish a workable national seed multiplication, marketing and quality control program capable of increasing the quantity of seed of genetically superior varieties of the target food crops into quantities sufficient to assure widespread availability and use of such seed.

The specific objectives of this project will be achieved when: (a) the NSS demonstrates its continuing capacity to plan for and provide

leadership in the implementation of a national seed production and marketing program from which Voltaic farmers will purchase approximately 2% of their annual seed requirements of the targets crops (Table 1), (b) the NSS personnel have the capability and are implementing a complete quality control program for seed produced in the ORD's of Bobo-Dioulasso, Centre, and Est and the AVV, (c) the NSS, in cooperation with the ORD's of Bobo-Dioulasso, Centre and Est, have established and tested the survey criteria necessary to make significant improvements in determining Voltaic farmer seed use patterns, (d) the NSS demonstrates its ability to provide sufficient quantities of foundation seed of approved varieties to meet the needs of those organizations involved in seed multiplication and distribution activities and (e) the NSS has assumed leadership in training both seed program technicians and farmer advisory personnel in those factors relevant to their responsibilities in production, processing, quality evaluation, marketing and farmer utilization of good seed of improved varieties.

Essentially all of the facilities required for successful implementation of this project are in-country as a result of the activities completed under Phase I (Project No. 686-0202). Thus, a major responsibility of the US technician and GOUV counterpart personnel will be to improve the utilization efficiency of these facilities. In addition to the Bobo ORD, currently the only ORD which has an effective seed multiplication/ distribution program, the ORD's of Est, Centre and the AVV will have the capacity to produce process and market 600 MT of seed which have the desired physical and genetic qualities. This in contrast

Table 1. Estimate of real demand for certified seed of improved varieties by 1983

Crop	Total acreage (000ha) 1)	Seeding Rate (kg/ha)	National Seed Requirement (MT)	Technical Replacement Rate 2) (%/yr)	Expected Farmer 3) Replacement Rate(%/yr)	Estimated Farmer Demand 4) (MT)	Foundation Seed Requirements (MT)
Sorghum	1,150	12	13,800	25.0	1.0	34.5	0.50
Millet	780	6	4,680	33.0	1.0	15.5	0.25
Maize	130	25	3,250	33.0	10.0	107.0	1.60
Rice	50	75	3,750	20.0	25.0	187.5	7.02
Cow peas	25	30	750	20.0	1.0	1.5	0.10
Peanuts	145	80	11,600	20.0	10.0	232.0	18.56
TOTALS	2,280		37,830			578.0	27.94

- 1) Weighted average from 1974-76, base data from MRD.
- 2) Frequency of replacement required to maintain 90 % genetic purity
- 3) Base upon the case with which traditional farmers can save seed or obtain them from a neighbor, availability of varieties superior in performance under farmer technology, intended use of the crop produced.
- 4) Real demand: (national seed requirement (MT) X technical replacement rate (Z)) X (farmer replacement rate (Z)). It is assumed that the retail price of certified seed will be twice (2X) that of the official price of grain.

to the 89 MT of seed of the desired quality sold to farmers in 1980.

The primary beneficiaries of this project will be those rural family units whose head makes a conscientious decision to purchase seed of one of the genetically superior varieties which will be made available as a result of project activities. Approximately 1470 family units living in the Bobo ORD purchased 63 MT of seed of improved varieties in 1980. (See Section V., "Base line Data for Determining Numbers of Beneficiaries"). The average family unit in this ORD includes 15 men, women and children. If each family unit purchased seed sufficient to plant one hectare then a maximum of 22,050 persons will benefit from the increase in food or grain production, estimated to be a minimum of 150 kg/ha, in 1980. If a similar ratio is maintained as this project progresses, over 200,000 rural Voltaics will receive similar benefits during 1983. At the same time, those farmers who purchased seed in 1980, 1981 and 1982 will still be receiving benefits from the seed they purchased. This is true because unlike fertilizers, herbicides and insecticides, the benefits from genetically superior varieties, except hybrids, continue for three to five years after seed are first purchased and used.

The NSS and cooperating organizations will benefit from an enhanced capability to collect and analyze demand data necessary to make rational decisions concerning the conduct of their production, distribution and educational activities as well as an increase in technical capabilities, therefore, efficiency of their personnel. The GOUV will benefit through either a decrease in the ORD's requests for financial support from

scarce tax revenues or increased services from the same level of expenditures.

All seed marketed under the auspices of the NSS program will be inspected both during its production and after processing to assure the using farmers that the seed are of the variety indicated. Further, each bag of seed delivered to the approximately 400 ORD encadreur and AVV input-supply warehouses will be labeled to indicate the kind, variety, physical purity and germination of the seed contained therein. Thus, minimum standards for producing and processing genetically pure, high quality seed will be established, through a ministerial decree, consistent with internationally recognized seed certification standards, but starting at a level consistent with the technical and climatic restrictions existant in Upper Volta.

To encourage farmer awareness and demand for the increased volume of seed, the project will package and distribute, through the already organized system of farmer advisors, "demonstration packets" of seed of each newly released variety sufficient to plant 20 m² to approximately 5% of the farmers living in the area of adaptation of the variety as established by the trials conducted by the research organization which releases the variety. This represents a major shift in emphasis from the previous project. This primarily promotional program is now practical because of the extensive varietal trial and demonstration programs being conducted by the SAFGRAD (300), UNDP Cereal Demonstration Project (2,400) and the AVV (200) and those planned by the Eastern Region Food Production Project (686-0244). None of these demonstration activities existed when the original project was designed.

The volume of seed to be produced and marketed by the end of the project will be based upon the results obtained from the farmer "seed use" survey, initiated in the Bobo ORD during 1980. This survey, believed to be unique in Sahelian Africa, will provide over the three year project life a vastly more accurate data base for measuring the buying intentions, the rate of spread of new varieties and permit a more specific identification of those marketing factors which influence the traditional African farmer to either purchase or not purchase seed of superior varieties. The availability of this demand estimate data should significantly reduce the problems encountered from both over- and under-production of seed which characterizes most developing seed programs.

As the basic organization concerned with the availability, quality and increased utilization of seed of superior varieties, the NSS will have assumed responsibility for the production and marketing of foundation seed of all improved varieties authorized for multiplication and distribution by government agencies. An approved varieties list will be established and then changed as necessary each year by a five member Variety Release Committee to be established by ministerial decree. Actual production and processing of the estimated 25 MT of foundation seed required will be accomplished through contracts with those organizations or individuals which best demonstrate the capability to efficiently meet the standards established. A \$45,000 revolving fund to support the NSS foundation seed production and marketing effort will be established, as a separate account, to permit more accurate audit and control of this fund. No other direct seed production subsidies will be provided through this project.

In concert with the NSS Chief, his staff and the few trained technicians available, the US technical advisor will cooperate in an intensive in-country, third country and U.S. training program. In addition to on-the-job training as NSS employees are assigned, in-country training courses will be conducted to develop the necessary technical skills of those NSS, ORD and AVV personnel directly involved in seed production, processing and quality control activities. A total of 51 NSS, ORD and AVV seed technicians will receive from two weeks to four months technical training in the various aspects of seed technology pertinent to Upper Volta. Six of these will participate in the IITA Seed Production and Technology Training course.

Two NSS officers will be trained to the BS or MA (Master of Agriculture) level in seed technology in the US to provide a small but essential core of individuals with the in-depth education necessary for continued development of the national seed program after completion of this project.

A most important key to the long term success of this and related programs is a widespread understanding of the role that high quality seed of improved varieties can play in increasing agricultural productivity. Indeed, if those persons working with and advising the farmers are not fully aware of the importance and availability of good seed of superior varieties, farmer acceptance and utilization will be so low that varietal development research and seed multiplication programs will have minimal impact at the farmers level. To circumvent this potential problem, a minimum of four, one-week, "seed awareness" courses will be conducted by project personnel with support from consultant personnel.

The 120 participants in these courses will be selected from the educational (extension) leaders of ORD, AVV and similar organizations without regard to the level of development of the seed activities within their organizations. This type "grass-roots" information flow is critical to the success of this and future seed projects.

Only three months of short-term consultant services are provided, since it is anticipated that a portion of the necessary consultant services will be provided through the centrally funded Seed Program/ Development Cooperative Agreement (AID/DSAN-CA-0148) with Mississippi State University. Preliminary contacts have been made for the services of two contract consultants for one month during the first quarter of 1982.

The vehicles, equipment and materials to be supplied are minimal and primarily reflect new needs created by growth of project activities, the "demonstration packet" program, and the "seed use" survey. The only construction necessary is that of a small, conditioned seed storage room inside the NSS warehouse in Ouagadougou for storage of foundation seed reserves.

Commodity and financial assistance to support government seed production activities, a major portion of the financial expenditures in Phase I, are not supported by this project. Rather, restructuring the GOUV's seed pricing policy from a subsidy to a "profit" 2/ motivating

2/ Profit only in the sense that the direct costs and a small percentage of fixed costs are recovered from the sale of seed. There will be no attempt to recover GOUV employees salaries and benefits; quality control, promotional or educational expenses; etc. at this stage of the programs's development.

price, initiated in 1979 as a result of the project evaluation report, will be utilized as the incentive to encourage both government organizations and private farmers to produce and market seed. The "profit" incentive is currently being used successfully by several ORD's and the AVV to increase utilization of other production inputs such as planters and plows.

III. Technical Feasibility

The technology required for the implementation and success of this project does not go beyond that currently utilized in the seed program. The only new facility planned is an air-conditioned room to be used for storage of reserve stocks of foundation seed for period of 18 to 30 months. The atmospheric conditions to be maintained are a temperature of 22-24°C and a 60% RH. These conditions can be attained by the use of three 24,000 BTU heavy duty, room air conditioners. The room itself is to be constructed inside the existing seed storage warehouse at the NSS headquarters site.

Although not required technically, operational costs will be reduced if the inside walls and ceiling of the room are first covered with a vaporproof material (10 mil polyethelyene or asphalt paint) and then 5 to 10 cm of sheet insulation (styraform or expanded polystyrene). Except when sesame, peanuts and soybeans are in storage, only the ventilation fans will need to be operated when the ambient RH is less than 50%.

IV. Implementation Plan

<u>Date</u>	<u>Activity</u>	<u>Agency(s) Responsible</u>
7/80	PP Prepared	
8/80	PP Approved	
12/80	Pro Ag Signed	
1/81	<ul style="list-style-type: none">- Project Start Date.- Prepare PIO/C for vehicles and commodities.- Approval of design of conditioned storage room.- Ministerial Decree establishing prices of "foundation" and "certified" seed.	
2/81	<ul style="list-style-type: none">- First release to foundation seed revolving fund.- Purchase of foundation seed produced in 1980.- Initiate preparations for 1981 Seed Use Survey.	
3/81	<ul style="list-style-type: none">- Annual seed planning and coordination meeting.- Determination of demand for foundation seed.- Preparation of demonstration packets and promotional materials.- Selection of 2 short term participants for U.S. training.	
4/81	<ul style="list-style-type: none">- DSA approval of authorization for Variety Approval Committee.- Annual research coordination meeting.- Initiate contracts for foundation seed production.- Train Seed Use Survey interviewers.- Distribution of demonstration packets to ORD level.- Field inspector refresher training.- Assignment of first new Engineer Agronome to NSS (Director of Qual. Control).	
5/81	<ul style="list-style-type: none">- Request for Seed Certification consultant.- Distribution of foundation seed.- Initiate Seed Use Survey.- Demonstrate packet distribution to farmers.- Site selection and planning for 1st technical training course.- U.S. short term participants depart.	

- 6/81
 - Complete Seed Use Survey interviews.
 - Complete distribution of demonstration packets.
 - Select participants for 1st technical training course.

- 7/81
 - Open bids for construction of seed storage room.
 - Ministerial decree establishing Variety Approval Committee.
 - Initiate field inspections for foundation and ORD seed production.

- 8/81
 - Seed Certification consultant arrives.
 - Internal evaluation of seed pricing policy.
 - Analysis of data from Seed Use survey.
 - Presentation part I of 1st technical training course.
 - Short term U.S. participants return.

- 9/81
 - Certification consultant departs.
 - Assignment of second Engineer agronome to NSS (Chief Seed Analyst).
 - Finalization of recommendations for certification regulations.
 - Start inspections of processing plants.
 - Selection of three participants for IITA course.

- 10/81
 - Request of Training consultants (MSU).
 - DSA approval of certification regulations.
 - Pro Ag. Amendment signed (FY 82 funds).

- 11/81
 - Conduct opinion survey of recipients of demonstration packets.
 - Site selection and arrangements for 2nd Technical Training course and 1st Seed Awareness course.
 - Complete field inspections.

- 12/81
 - Ministerial Decree issued establishing certification regulations.
 - Issue report of Seed Use survey.
 - Complete farmer opinion survey of demonstration packets.
 - Participant selection for 2nd Technical Training course.
 - Departure of three participants to IITA Course.

- 1/82
 - Fourth inspector assigned to NSS (if warranted).
 - Arrival of U.S. vehicles and commodities.
 - Begin construction of seed storage room.
 - Variety Approval committee meeting.
 - Planning for demonstration packet program.
 - Seed sampling and testing by NSS.
 - Participant selection 1st Seed awareness course.

- 2/82
 - Training consultants arrive.
 - Justification for 1st release and 2nd release to Foundation Seed Revolving fund.
 - Purchase of foundation seed.
 - Presentation 2nd technical training course and 1st seed awareness course.
 - Selection of 1st participant for degree training in U.S.

- 3/82
 - Training consultants depart.
 - Annual seed coordination and planning meeting.
 - Demand determination for foundation seed.
 - Preparation of demonstration packets.
 - Completion of sampling and labeling FS and ORD seed.
 - Participant selection 2nd Seed Awareness Course.

- 3/82
 - Selection of two participants for U.S. short term training.
 - Return of IITA Participants.

- 4/82
 - Selection of Seed Testing Consultant.
 - Completion of seed storage room.
 - Annual Research Coordination meeting.
 - Contracts for foundation seed production.
 - Distribution of foundation seed.
 - Training of Seed Use Survey interviewers.
 - Distribution of demonstration packets to ORD level.
 - Inspector refresher training workshop.
 - Initial marketing control inspections.
 - Presentation of 2nd Seed Awareness Course.
 - Departure of 1st U.S. degree participant.

- 5/82
 - Complete production contracts and distribution of foundation seed.
 - Start Seed Use Survey.
 - Start demonstration packet distribution to farmers.
 - Departure of 2 U.S. short term participants.

- 6/82
 - Complete Seed Use Survey.
 - Complete demonstration packet distribution.

- 7/82
 - Seed Testing Consultant arrives.
 - Start field inspections.

- 8/82
 - Seed Testing Consultant departs.
 - Evaluation and revision of seed price.
 - Evaluation of Seed Use Survey.
 - Return of U.S. short term participants.

- 9/82
 - Start processing plant inspections.
 - Selection of 3 participants for IITA course.
- 10/82
 - Pro Ag amendment signed (FY 83 funds).
- 11/82
 - Farmer opinion survey of demonstration packets.
 - Select sites for 3rd and 4th Seed Awareness short courses.
- 12/82
 - Report of Seed Use Survey.
 - Complete Farmer opinion survey.
 - Complete field inspections.
 - Complete processing plant inspections.
 - Site selection 3rd Technical Training course.
 - Participant selection 3rd and 4th Seed Awareness courses.
 - Departure of IITA participants.
- 1/83
 - Annual meeting Variety Approval committee.
 - Sampling and testing foundation and ORD seed.
 - Participant selection 3rd Technical Training course.
- 2/83
 - Justification of 3rd release of Foundation Seed Revolving Fund.
 - Purchase of foundation seed.
 - Selection of 2nd U.S. degree participant.
- 3/83
 - Annual Seed Coordination and Planning meeting.
 - Preparation of demonstration packets.
 - Complete processing plant inspections.
 - Start Marketing control inspections.
 - Presentation of 3rd & 4th Seed Awareness courses.
 - Selection of 2 U.S. short term participants.
 - Return of IITA participants.
- 4/83
 - Selection of Marketing consultant.
 - Finalize recommendations for Seed Marketing Regulations.
 - Annual Research Coordination meeting.
 - Contract for production and distribution of foundation seed.
 - Train Seed Use Survey interviewers.
 - Inspector refresher workshop.
 - Complete market control inspections.
 - Departure 2nd U.S. degree participant.
 - Presentation 3rd Technical Training course

- 5/83
 - Complete contracts and distribution for foundation seed.
 - Start Seed Use Survey.
 - Start demonstration packet distribution to farmers.
 - Departure 2 U.S. short term trainees.
 - Project evaluation.

- 6/83
 - Complete Seed Use Survey.
 - Complete demonstration packet distribution.

- 7/83
 - Seed Marketing consultant arrives.
 - DSA approval of Seed Marketing regulations.
 - Start field inspections.

- 8/83
 - Seed Marketing consultant departs.
 - Evaluation and revision of seed price policy.
 - Data evaluation Seed Use Survey.
 - Return of 2 U.S. short term participants.

- 9/83
 - Start processing plant inspection.

- 10/83
 - Ministerial Decree establishing Seed Marketing Regulations.

- 11/83
 - Opinion survey of demonstration packet program.

- 12/83
 - Final report of Seed Use Survey.
 - U.S. technical advisor departs.
 - Project ends.

V. Other Activities and Comments Related to the Project Paper

Draft copies of the budget, logistical framework matrix, an implementation network tracking chart and equipment lists were prepared. These documents were left with Mission personnel for refinement, verification and typing.

Table 2 presented on the following pages, "Baseline Data for Determining Numbers of Beneficiaries", is included in this report because it is believed that the tabular data, I.A. Seed Sales, are accurate since they were accumulated from sales invoices. The column, Percentage of Total Area Planted with "Improved" Seed in 1980 is believed to be rather indicative of current farmer acceptance rates of seed in Upper Volta. The combined influences of credit availability, a rewarding cash grain market and a source of genetically pure seed are the probable reasons for the high farmer acceptance rate of rice seed. There were no newly released varieties of sorghum, millet or maize sold in 1980, although, the seed sold were of improved varieties. Except for peanuts, the supply of seed exceeded the demand within this ORD, however, the excess was all sold to other organizations.

Table 2. Baseline Data for Determining Numbers of Beneficiaries.

IA. Seed sales, Bobo ORD, 1980 1/

Crop	Total Area Planted (1980 estimated ha)	Improved Seed Sold to farmers (kgs)	Planting Rate (kg/ha)	Area Planted (ha)	Percentage of Total Area Planted with "Improved Seed" in 1980 (%)
Sorghum	66,362	3,128	12	261	0.3
Millet	18,413	2,150	6	358	2.0
Maize	22,152	13,111	40	327	2.9
Rice	3,453	36,910	100	369	17.8
Peanuts	NA	7,700	80	96	NA
Sesame	NA	290	5	58	NA
Soybeans	NA	20	40	1	NA

1/ Source: official records, Seed Section, ORD - Bobo, June 1980.

B. Assumptions:

- (a) The average family unit only purchased enough seed to plant one hectare of one species.
- (b) The average family unit (1) is composed of 15 members (men or children), (2) cultivates 5 ha of crops, (3) has 3 field workers.

II. Calculations of Beneficiary Numbers

Bobo ORD 1470 family units purchased seed
 x 15 members/family unit
 22050 beneficiaries in 1980

III. Project Area Beneficiaries by 1983 (estimates extrapolated on the basis of Bobo-ORD data from 1980).

Crop	Estimated Sales (kg)	Purchasing Families
Sorghum	34,500	2875
Millet	15,500	2583
Maize	107,000	4280
Rice	187,500	2500
Cowpeas	1,500	50
Peanuts	<u>232,000</u>	<u>2900</u>
	578,000	15198

15,198 family units purchase seed
 x 15 members/family unit
227,970 beneficiaries in 1983

VI. Technical Assistance to the Current Project

A significant portion of one consultant's time was utilized in the evaluation of the current capabilities and future needs of the NSS quality control program. A detailed outline of a complete quality control program was prepared and left with the technical advisor for subsequent discussion with NSS personnel. A recommendation was made to the Mission Director that the technical advisor be permitted to serve two-week TDY at MSU during his August home leave. If the TDY is approved, MSU personnel will work with the technical advisor to further refine and then "formalize" the recommendations.

APPENDIX

Itinerary and Official Contacts

- June 16 Depart: MSU 0950
- June 17 In route to Upper Volta
- June 18 Arrive: Ouagadougou, Upper Volta 0430
Preliminary briefings at Mission headquarters.
- Mr. Dale Rachmeler, Technical Advisor, Seed Mult. Proj./USAID
Mr. Samir Zoghby, Chief, Rural Dev. Div., USAID/Ouaga
Mr. B.Loc Eckersley, A/Dir. USAID/Ouaga
Mr. J. Smith, Program Economist, USAID/Ouaga
- June 19 Detailed review of PID and discussions with Mission officials.
- June 20 Initial discussions with GOUV technical personnel.
Mr. Koumass, Yago, Chief, National Seed Service/GOUV
- June 21&22 Free Time
- June 23 Travel to Bobo-Dioulasso
In depth discussions of Bobo ORD seed production, processing and marketing activities.
- Mr. Christophe Traore, Seed Prod. Officer, ORD-Bobo
Mr. Kuku Zongo, Inspector, National Seed Service/GOUV
- June 24 Continuation of discussions of Bobo ORD seed program.
Visit IRAT Research Station and NSS seed farm at Farako-BA.
- Mr. Marcel Tatiata, Dir. ORD-Bobo-Dioulasso
Mr. M. D'Arondel De Hayes, Dir., Farako-BA Research Station
- June 25 Discussions of and initial preparation of project description.
- June 26 Review and agreement of draft project description with GOUV officials.
- June 27-30 Preparation of project description, technical feasibility, equipment lists implementation plan, budget.
- July 1 Preparation of draft log frame matrix, network tracking chart and supporting tables.
- July 2 Detailed review and approval of technical aspects of PP with Chief of NSS.
- July 3 Depart Ouagadougou 1230
- July 4 Arrive: Miss. State 1920

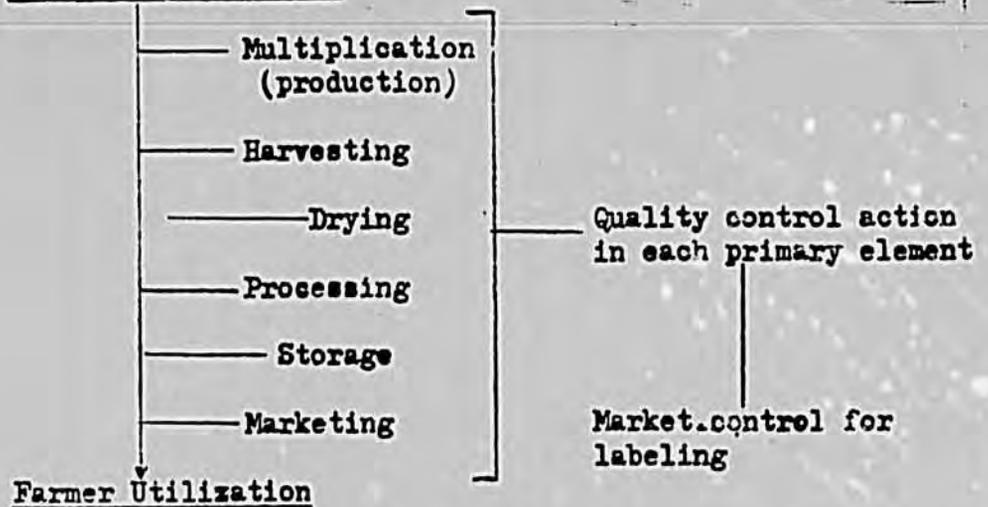
Note:

The consultants attempted to contact many other individuals, working both for the GOUV and other technical assistance organizations, but were unable to make these desired contacts. However, because of previous contact with this project and the awareness of Mission personnel concerning GOUV, SAFGRAD, IRAT, FAO programs which will inter-relate with the proposed project this lack of personal contact was not deemed detrimental.

A QUALITY CONTROL PROGRAM
FOR
NATIONAL SEED SERVICE

To develop an effective seed program, rigid quality control measures must be integrated throughout all components of the program. These components (or elements), as they have routinely been described, include the following:

Varietal development



Within each of these primary components, specific quality control procedures must be utilized to insure that high quality seed is always maintained and made available to the farmer. Thus, each separate component must be closely analyzed in order to determine which quality control techniques are applicable to it.

I. Varietal Development

The continuous flow of new varieties (hybrids) into a well organized seed program is absolutely essential for continued growth and stability of the program. Initially, traditional varieties must be replaced by improved genetic stocks which have been proven to be superior to the traditional ones, and a continuous flow of improved seeds must replace those which become obsolete. The responsibility for varietal development usually rests with some research institution (organization), either private, national or public, or international in scope of operation. In any event quality control procedures are initiated in this beginning phase to insure that seed resulting from the breeding program, the improved varieties, possess characteristics which represent the fundamental breeding techniques for specific goals of the program.

At this early phase the plant breeders have utilized the necessary techniques in developing the variety, hybrid, pure line, selection, composite, etc. which insure its genetic identity and quality level. Some breeding programs, in their urgency to stress genetic engineering, may neglect to emphasize desirable aspects of a seed program such as minimizing off-types, maintaining mechanical purity etc. When this occurs it becomes necessary for the seed program to initiate its own varietal purification system such as a rigid roguing program which will result in more favorable

characteristics. Once the variety has been developed and recommended, this breeder seed is made available for the next component of the program, i.e. multiplication (production).

II. Multiplication-Production

Seed of a newly introduced improved variety must be multiplied to a quantity sufficient to meet the demand of the farmers occupying the region served by the seed program. To accomplish this several generations of seed multiplication are necessary during which varietal purity and quality are strictly maintained. This yearly increase must be continually repeated until such time that the variety becomes obsolete and is discontinued from production.

Rigid quality control practices must be utilized during the basic seed production programs to insure maintenance of varietal purity as nearly as possible to that of the originally introduced seed of the improved variety.

Essential quality control techniques utilized in the multiplication/production component include the following:

(1) Source of seed

It is assumed that the source of seed for multiplication is varietally pure and of known origin. This of course, depends upon the resourcefulness of the breeding program, but the seed program must be organized upon the assumption that varietally pure seed will be available.

(2) Land

Selection: Whenever possible the best, most fertile land available should be selected for optimum production of high quality seed. DO NOT use land for seed production that was planted to another variety of the same or similar crop the preceding season; this prevents varietal mixtures resulting from volunteer plants.

Isolation: Seed fields must be physically isolated greater distances from other fields planted to other varieties of the same crop to prevent out-crossing (cross pollination) and lesser distances to prevent mechanical mixtures at harvest, etc. The isolation distance is determined by the mode of pollination of the species and the prevailing environmental conditions.

(3) Roguing

Seed fields must be rogued one or more times to remove:

- (a) off-types
- (b) other varietal contaminants
- (c) diseased plants
- (d) other crop plants
- (e) troublesome weeds

(4) Inspections-

Seed fields are inspected at least once to check for:

- (a) Isolation distance
- (b) Incidence of off-type
- (c) Incidence of other varieties of crops
- (d) Troublesome weeds
- (e) Diseases

Note: Initially, NSS inspections will be more frequent to verify proper production techniques and provide advice and assistance to producers who are

not fully aware of production requirements for certified seed.

A SUGGESTED NSL INSPECTION SCHEDULE:

- (1) First inspection to verify land selection
- (2) Second inspection at mid-production cycle-during flowering
- (3) Third inspection just prior to harvest

As producers become more familiar with production techniques, the number of inspections may be reduced.

III. Harvesting-Threshing

Harvesting and threshing operations are very critical in the seed program, and the basic quality level of the seed is established when they are removed from the field. Thus seed quality is never higher than it was at harvest, but it can be quite low. Harvesting and threshing must be performed in a careful and timely manner.

Generally, seeds are harvested at a relatively high seed moisture contents (15-25%) to minimize field deterioration, i.e., damage by adverse weather, diseases, insects, birds, rodents, etc. If seeds remain in the field deterioration causes serious losses in seed quality. Additionally, threshing can cause further deterioration of seeds which have been exposed to unfavorable field conditions.

Remember, always use extreme caution in both harvesting and threshing operations to prevent mechanical mixing of varieties. Inspect equipment for cleanliness prior to use and always equip properly to minimum mechanical damage.

If seeds are hand harvested, a further selection of proper plants to harvest will eliminate undesirable plants. Also undesirable seeds can be eliminated during threshing.

IV. Conditioning-Drying

As mentioned in the harvesting section, preferably seeds are harvested at relatively high seed moisture contents, 15-25%. Although this enhances the production of high quality seed, it also creates the problem of drying. Since seed with high moisture contents (above 13%) rapidly lose viability in warm environments, it is necessary to reduce seed moisture to below 13% to preserve their quality.

Drying can be accomplished by shocking the plants in the field, or preferably threshing the seed and spreading them in the sun to dry. Extreme care must be exercised in preventing mechanical mixtures at this point, and also care must be utilized to prevent the seed from getting wet either in the field or on the drying floor in case of rain.

V. Processing

After seeds have been adequately dried, they are cleaned, sized, treated and packaged for distribution and marketing. During each of these processing steps, careful attention is necessary to insure continued maintenance of seed quality.

Cleaning: Seeds normally contain undesirable contaminants such as broken, disease weathered, insect damaged seeds, chaff and straw, weed-seeds, soil particles, stones, etc. It is necessary to remove (or minimize) these contaminants for maintaining quality standards. Seed cleaning machines are available which, when adjusted properly, will remove (clean) much of the undesirable contaminants. The air screen cleaner performs the basic cleaning; however, additional machines such as the gravity table, roll mill, aspirator, spiral etc. supplement the cleaning process when necessary.

Sizing : To some extent the cleaning operation may actually result in sizing the seed for more uniformity by removing both the extremely small and large seeds. This in itself improves the quality, for these small and large seeds are often of low quality. It may be desirable, however, to further size-grade certain kinds of seed to improve both plantability and/or seed quality. Some size grading is usually advisable in peanuts and corn. As planting practices become mechanized, then size grading seed is more advantageous. Seed sizing is accomplished with the length separator (disc, cylinder) and with width and thickness separators (precision graders). As always use these machines carefully to achieve the best results in improving seed quality.

Treating: Seed are treated with various fungicides and insecticides to protect them from storage and soil borne fungi and insects. Thus, seed quality is enhanced in this manner. Since the dosage and uniformity of coverage with the proper chemicals are important, treatment is best accomplished with a seed treater which can be calibrated properly. Otherwise, treatments can be applied by hand as the seeds pass from the cleaning machine(s) into the bag (often seeds are treated by the farmer during the actual planting operation).

Note : Do not use treated seed for food, feed, or industrial purposes. Safeguard the health of workers when using treatment materials.

Materials: The actellic now used is giving ideal results in controlling insects and should be continued. In addition Phostoxin should be used as a fumigant in the warehouses.

Packaging: Weighed quantities of seed are placed into attractive, properly sized bags as the final step in processing. Bag sizes should be made to conform in size to the quantity of seed required to plant the field of the average farmer. This prevents selling seed from open bags that may be too large for the farmers needs. ALWAYS use new, clean, bags. Never re-use bags. Bags should be securely closed in a prominent position.

VI. Storage:

After the seed have been packaged, they must be stored until they are delivered to the farmer (consumer). This storage period varies from a few months to possibly a few years, and during this storage interval precautions must be taken to maintain seed quality. Basically, this is accomplished by storing the seed in a dry and cool environment. High seed moisture (above 13%) combined with warm temperatures greatly accelerate the biological processes in seeds and thus cause rapid deterioration. In addition storage molds and insects are more active in warm, moist environments and quickly attack seeds lowering their quality. Therefore to exercise the best quality control measures in seed storage, first be sure that the seed going into storage are adequately dry. Then, keep the storage environment as cool and dry as possible to reduce both physiological deterioration and effects of molds and insects. Also, be sure to enforce stringent and continuous sanitation procedures. Both inside and immediately surrounding the storage building must be kept clean and free of trash, weeds, straw, spilled seed, etc. Spray the interior of the warehouse periodically with insecticide to control insects, and periodic fumigation of the entire building may be advisable. Elevate the floor of the warehouse approximately 1 meter and install tight fitting doors to minimize rodent and water problems.

l. Marketing-Distribution

As the seed move into the distribution and marketing channels, continued surveillance is necessary to assure that the high quality level of the seed is maintained until the consumer (farmer) purchases the seed. All seed offered for sale should be labeled (tagged) properly indicating the quality status, i.e. , kind, variety, purity and germination. The inspectors of the NSS should visit marketing outlets and take samples of the seeds being sold. These samples together with the labeling information should be sent to the central testing laboratory for verification. If quality tests indicate that the seed are mis-labeled, action should be taken to either re-label the seed or remove it from the market.

B.3 NSS Seed Inspector's Handbook

ROLE - TRAINING - DUTIES

I. Role

The seed inspector plays a vital role in the seed production - certification program. In many instances he may be the sole contact between the certification/production agency and the seed producer (farmer). He can serve in an important educational capacity as he explains to the producer (farmer) the necessity of strict regulations governing the production of high quality certified seed. Seed inspectors should be well informed in acceptable agronomic practices, possess a friendly and understanding personality and be willing to work closely with seed producers to see that they completely understand the need for producing high quality seed.

II. Duties

Seed inspectors' duties vary considerably according to the scope of the production/certification program. Basically, however, their duties can be divided into four main categories:

1. Field inspection
2. Equipment and facility inspection
3. Sampling
4. Tagging

(1) Field inspection: These are personal visits by the inspector to the actual seed production field(s). The number of inspections may vary, but in a beginning program, three inspections should suffice.

- the first should be made at planting time to insure proper land selection and isolation;
- the second inspection should be made at mid-season (bloom) to check for off-types, other crops, varieties, weeds, etc. The inspector should advise the grower to rogue the production field if necessary.
- the third inspection should be made just prior to harvest for a final check on weeds, off-types, other crops or varieties.

NOTE: It may be advisable to visit the production field during harvest to see that proper techniques are utilized and to advise about the possibility of chanical mixing. The inspector may also wish to check the drying area to insure that it is clean and adequate. As producers become more familiar with production techniques, fewer inspections are necessary.

(2) Equipment and facility inspections: These are personal observations of all equipment and facilities used in producing, and handling seed. Planting, harvesting, and threshing equipment must be inspected for cleanliness.

(3) Sampling: Small quantities of seeds are taken from each bag or seed lot in the prescribed manner by the inspectors. After the seeds have been cleaned, put into new bags and stored, the inspector should take a representative sample to send to the central quality control laboratory for quality analysis. In addition to sampling seeds at the producers warehouse, the inspector should sample seeds after they have entered into various marketing channels to insure maintenance of quality standards and to check on labeling requirements.

NOTE: Seeds should be identified according to lot numbers to facilitate accurate accountability and record keeping. Lot numbers identify specific quantities of seed such as that produced by each individual grower or seed produced in separate fields. All seed in a specific lot should be as uniform as possible which makes quality control much easier. Until the grower (producer) fully understands the significance of assigning lot numbers, the inspector may desire to do this task, particularly if he has kept up with the production practices.

(4) Tagging: In some seed programs the responsibility of putting the quality control tag on each bag of seed is placed upon the producer; however, in beginning programs, it

is best that the inspector assumes this responsibility. By doing this task the inspector can be sure that the proper seed is tagged (labelled) and that the seeds are separated into proper lots. At this time the inspector can also observe the storage building to see that proper storage conditions exist.

III. Training

It is certainly desirable for seed inspectors to have background training in basic agronomic principles. This enables them to provide fundamental guidance and advice to seed producers concerning preferred cultural practices for improved seed production. In addition, inspectors must receive special training in varietal identification and in techniques of certification, i.e., inspection, sampling, labeling, etc.

NOTE: Inspectors should frequently visit research programs to become completely familiar with characteristics of crops and varieties which will be included in the Seed Program. A good working relation with local plant breeders is advisable.

INSPECTOR'S REPORT
FIELD INSPECTION

DATE _____

PRODUCER _____

LOCATION _____

CROP _____

VARIETY _____

NO. HECTARES _____

ESTIMATED YIELD _____

FIELD CONDITIONS (OBSERVATIONS)

LAND SELECTION _____

ISOLATION _____

OFF-TYPES _____

OTHER VARIETIES _____

OTHER CROPS _____

WEEDS _____

REMARKS _____

ACCEPT FOR CERTIFICATION _____

NOT ACCEPTED FOR CERTIFICATION _____

REASON: _____

INSPECTOR'S SIGNATURE _____

NSS
INSPECTOR'S REPORT
SEED SAMPLE

DATE _____

PRODUCER _____

LOCATION _____

CROP _____ VARIETY _____

YEAR PRODUCED _____ NO. BAGS _____

MARKET OUTLET _____

INSPECTOR'S SIGNATURE

PURITY WORK CARD

Initial Sample Wt. _____ gm.
 Pure Seed _____ gm. %
 Other Crop Seed _____ gm. %
 Weed Seed _____ gm. %
 Inert Matter _____ gm. %
 Final Weight _____ gm. %

Weed Seed: Name No./kg.

Total Weed Seed/kg. _____

Other Crop Seed: Name No./Kg.

Total other crop seed/kg. _____

Other Varieties: Name No./Kg.

Total other variety seed/kg. _____

GERMINATION WORK CARD

Number Seeds Tested _____ No. Reps. _____

Substrate _____ Temperature _____

Treatment _____

Germination:	I	II	III	IV
Date _____ 1st Count				
Date _____ Final Count				
Total Normal Seedlings				
Dormant Seeds				
Total Germination				
Average Germ				
Abnormal Seedlings				
Dead Seeds				

LABORATORY REPORTING FORM
NATIONAL SEED SERVICE (NSS)

Laboratory No. _____

DATE _____

CROP _____

VARIETY _____

LOT NO. _____

NO. BAGS _____ DATE SAMPLED _____

PRODUCER _____

LOCATION _____

OBSERVATIONS _____

PURITY TEST

Pure Seed _____ %

Other Crop Seed _____ %

Weed Seed _____ %

Inert Matter _____ %

GERMINATION TEST

Normal Seedlings _____ %

Dormant Seeds _____ %

Total Germination _____ %

SUPPLEMENTARY ANNEX F

FINANCIAL ANALYSIS

The funding for this project consists of support to the National Seed Service (NSS) in the form of commodities, local salaries, training, seed surveying, and the establishment of a foundation seed revolving fund. The project also funds long-term and short-term technical assistance. The total AID contribution will amount to \$1,600,000. Project budget tables are included in Section V.D of the main text.

The principal financial objectives of the project are to:

- implement a self-sustaining certified seed revolving fund at the Bobo-Dioulasso ORD which will be used as a model for seed programs in other ORDs;
- establish a self-sustaining foundation seed revolving fund at the national level;
- develop the capacity of the NSS to determine pricing levels of seed that will cover costs of seed production and replacement of capital;
- establish reporting formats that will improve the transmission of all aspects of seed financial data from the ORD level to the NSS; and
- establish a capital reserve fund at the ORD for replacement of warehouses and equipment.

Although funding for this project is earmarked to strengthen the administrative capability of the NSS, the following analysis will focus primarily on the financial operations of certified seed production in the Bobo ORD. The analysis will determine the financial viability of the revolving fund, instituted at the ORD under Phase I, based on projected production levels and a suggested pricing structure for certified seed. The PP design team has worked closely with the Bobo ORD and NSS officials to determine fair cost estimates of seed production and processing. Unfortunately, there is a lack of concrete seed cost data and the estimates used in this analysis, although reasonable, should not be considered totally accurate.

Table 1 depicts the projected certified seed production levels at the Bobo ORD through 1984, and the minimum sales price that should be offered to farmers for the seed operation to become self-sustaining. The following prices for foundation and certified seed were used:

<u>Purchase of Foundation Seed from NSS</u>		<u>CFA/Kg.</u>
Sorghum		392
Corn		312
Rice		312
Peanuts		376
<u>Sale of Foundation Seed to Contract Farmers</u>		<u>CFA/Kg.</u>
Rice		312
Peanuts		276
<u>Purchase of Certified Seed from Contract Farmers</u>		
Rice		85
Peanuts		76

The following is the projected foundation seed needs of the Bobo ORD through 1984:

	<u>1980/81</u>	<u>1981/82</u>	<u>1982/83</u>	<u>1983/84</u>
		(0.00 MT)		
Cereals	.75	1.10	1.48	2.13
Rice	2.60	3.75	5.25	7.50
Peanuts	3.00	4.00	6.00	8.40
Total	<u>6.35</u>	<u>8.85</u>	<u>12.73</u>	<u>18.03</u>

Table 2 reflects the cash-flow of funds in Bobo ORD revolving fund using the costs and prices for seeds established in Table 1. The revolving fund was established in April, 1981 under Project No. 686-0202 with an AID contribution of CFA 15,000,000. The Bobo ORD will make initial deposits into the fund from collections of 1979/80 seed sales, and the ORD will subsidize the 1980/81 production costs. Thereafter, the ORD will pay all seed production and processing costs out of its general funds and bill the ORD's Seed Service on a quarterly basis. The ORD Seed Service will then reimburse the ORD general fund during January following the production year. Therefore, the production and processing costs for the 1980/81 seed production will be reimbursed to the ORD in January, 1982. As can be seen in Table 2, the revolving fund should be self-sustaining. In some instances the ORD Seed Service may have to defer reimbursement to the ORD for several months. This is especially true when the Seed Service's cash will be invested in certified seed inventory in periods of increasing seed production levels.

At the national level, the project will fund the establishment of a foundation seed revolving fund. The AID contribution to this fund will amount to \$27,000 over the life of the project, in addition to \$15,000 contributed under Project No. 686-0202.

Included in the price of certified seeds to farmers is provision for amortization of warehouses and equipment. During the course of the project, calculations should be made of the portion of seed sales that are to be reserved for replacement of warehousing and equipment. Based on projected production levels, by the end of the 1982/83 production season approximately CFA 3,000,000 should be deposited with a separate Capital Assets Reserve Fund. These funds can then be used in future years for needed replacement of capital assets.

It will be the responsibility of the NSS to monitor all aspects of seed production in the ORDs. This monitoring will include determining demand for seeds, pricing structure, and the costs of seed production. In order to determine the costs of certified seed production and the movement of certified seed inventory at the ORD level, the transmission of financial information from the ORD to the NSS needs to be improved. The financial reports shown in Exhibits 1-3, together with the annual seed production schedules that are now prepared, should give the NSS the necessary information to monitor the financial operations of the ORD's seed services.

The required reports are as follows:

Exhibit 1 - Quarterly Billing to ORD Seed Service

This report will be prepared on a quarterly basis with copies going to NSS and USAID. The report should reflect seed production and processing costs incurred by the ORD during a particular quarter, and will be the basis for payment of reimbursement by the ORD Seed Service.

Exhibit 2 - Cash Situation of Seed Revolving Fund

This report will be issued on a bi-annual basis (June 30, Dec. 31) by the ORD Seed Service with copies to NSS and USAID. The principal purpose of the report is to show the status of cash in the revolving fund. The report will also reflect the percentage of cash sales to credit sales, the timing of credit collections, and the amount of interest earned on credit sales.

Exhibit 3 - Financial Position of Revolving Fund

This report will be issued on a bi-annual basis (June 30, Dec. 31) by the ORD Seed Service with copies to NSS and USAID. The report will reflect the movement of seed inventory and the status of receivables from credit seed sales.

It is extremely important that the above reports be prepared and issued on a timely basis. The ORD should have the capability of producing the reports, but USAID should be prepared to offer financial technical assistance in this area if problems should be encountered. USAID will retain the right to audit ORD accounts which will continue to use funds generated by Phase I activities.

1. The actual quantity sold, price of certified
and actual production products, and...

1962

	61/62			61/62			62/63			63/64		
	CEREALS 50 T	RICE 60 T	PEANUTS 30 T	CEREALS 75 T	RICE 100 T	PEANUTS 50 T	CEREALS 100 T	RICE 140 T	PEANUTS 75 T	CEREALS 145 T	RICE 180 T	PEANUTS 90 T
1. <u>REVENUE</u>												
INSPECTED	2.1	2.5	1.0	1.5	2.0	1.0	1.1	1.4	.8	.7	1.0	.5
TRUCKS	2.4	2.7	1.3	0.4	4.0	0.3	2.4	4.8	6.3	2.4	4.0	1.1
SALES	2.3	2.3	0.3	2.5	3.2	0.3	2.0	3.3	6.3	2.5	3.3	0.3
TRUCKS	0.2		0.3	0.2		0.3			2.5	6.2		0.3
MAINTENANCE LIST	2.2	2.2	0.3	3.0	2.4	0.3	2.0	2.4	3.6	2.9	2.4	0.3
CLEANING	2.1	2.0	-	2.0	2.0	-	2.0	2.0	-	2.0	2.0	-
TOTAL	10.2	10.2	2.9	24.2	14.6	2.9	24.2	13.9	19.5	22.2	13.9	1.1
TOTAL	24.7	24.3	3.4	10.4	3.7	1.1	1.7	2.6	2.7	2.9	1.1	1.1
TOTAL	41.9	44.2	32.4	34.6	18.3	4.0	25.9	16.5	24.8	27.0	15.0	2.2
2. <u>EXPENSES</u>	5.2	11.7	22.1	5.2	11.7	22.1	5.2	11.7	22.1	5.2	11.7	22.1
3. <u>NET</u>	110.0	110.0	70.0	110.0	93.5	70.0	110.0	93.5	70.0	110.0	93.5	70.0
TOTAL	150.7	150.4	130.0	150.0	130.0	130.0	150.0	121.7	120.4	142.6	130.0	130.0
1963:												
TOTAL	-	11.0	11.0	-	11.7	11.7	-	11.7	22.1	-	11.7	22.1

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BEST AVAILABLE DOCUMENT

BEST AVAILABLE DOCUMENT
BEST AVAILABLE DOCUMENT

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(CPA)

ADDITIONAL

DATE	DESCRIPTION	AMOUNT	CUMULATIVE
	CREDIT SALES (50%) RECEIPT	1,021,500	
	CONTRIBUTION (684-0202)	1,300,000	
	CEREALS & PEANUTS CREDIT SALES RECEIPT	1,000,000	
MAR 81	1980 RICE CREDIT SALES (50%) RECEIPT	1,021,500	
APR 81	PURCHASE FOUNDATION SEED 81/82		2,600,400
APR 81	CREDIT SALE OF FOUNDATION SEEDS 81/82		
APR 81	CREDIT SALE OF CERTIFIED SEEDS 80/81		
AUG 81	80/81 RICE CREDIT SALES (50%) RECEIPT	4,002,000	
DEC 81	PURCHASE CERTIFIED SEEDS 81/82		11,150,000
	CEREALS & PEANUTS CREDIT SALES RECEIPT		
	REIMBURSE ORD 80/81 PRODUCTION COSTS		9,832,000
MAR 82	81/81 RICE CREDIT SALES (50%) RECEIPT	4,002,000	
APR 82	PURCHASE FOUNDATION SEED 82/83		3,814,100
APR 82	CREDIT SALE OF FOUNDATION SEED 82/83		
APR 82	CREDIT SALE OF CERTIFIED SEED 81/82		
AUG 82	81/82 RICE CREDIT SALES (50%) RECEIPT	6,410,000	
DEC 82	81/82 CEREALS & PEANUTS CREDIT SALES RECEIPT	14,106,000	
DEC 82	PURCHASE CERTIFIED SEEDS 82/83		19,700,000
JAN 83	REIMBURSE ORD 81/82 PRODUCTION COSTS		12,610,000
MAR 83	81/82 RICE CREDIT SALES (50%) RECEIPT	6,410,000	
APR 83	PURCHASE FOUNDATION SEED 83/84		2,400,000
APR 83	CREDIT SALE OF FOUNDATION SEED 83/84		
APR 83	CREDIT SALE OF CERTIFIED SEED 82/83		
APR 83	82/83 RICE CREDIT SALES (50%) RECEIPT	8,870,000	
DEC 83	82/83 CEREALS & PEANUTS CREDIT SALES RECEIPT	24,418,000	
DEC 83	PURCHASE CERTIFIED SEEDS 83/84		16,680,000
MAR 84	83/83 RICE CREDIT SALES (50%) RECEIPT	8,870,000	
MAR 84	REIMBURSE ORD 82/83 PRODUCTION COSTS		16,618,000
MAR 84	DEPOSIT INTO CAPITAL ASSETS RESERVE FUND		3,000,000

NOTE: Above analysis does not include income from interest on credit sales and custom work income.
 *Analysis assumes all sales of seeds are on a credit basis.
 **CPA will absorb production costs for 79/80 season.

BEST AVAILABLE DOCUMENT

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Old Man-Houlango
Quarterly Billing to Old Seed Service
to _____

SEED PRODUCTION COSTS:

----- Labor _____
Fertilizers, Herbicides _____
POL _____
Vehicle Maintenance _____
Total Production Costs _____

SEED PROCESSING COSTS:

Inspections _____
Transport _____
Sacks _____
Treatment _____
Maintenance/Labor _____
Cleaning _____
Total Processing Costs _____

TOTAL BILLING FOR THE QUARTER _____

APPROVED: _____
Director, OS

ACCEPTED: _____
Old Seed Production Office

BEST AVAILABLE DOCUMENT

ADD:

A. Receipts - Seed Sales	Foundation	
1. Sorghum		
a. Cash Sales	_____	_____
b. Credit Sales	_____	_____
2. Millet		
a. Cash Sales	_____	_____
b. Credit Sales	_____	_____
3. Corn		
a. Cash Sales	_____	_____
b. Credit Sales	_____	_____
4. Rice		
a. Cash Sales	_____	_____
b. Credit Sales	_____	_____
5. Peanuts		
a. Cash Sales	_____	_____
b. Credit Sales	_____	_____
Total Seed Sale Receipts	_____	_____

B. Interest - Seed Sales	
Sorghum	_____
Millet	_____
Corn	_____
Rice	_____
Peanuts	_____
Total Interest	

C. Receipts - Custom Work

LESS:

A. Reimbursements to GRD	
Production Costs	_____
Processing Costs	_____
Marketing Costs	_____
Total Reimbursements to GRD	

B. Foundation Seed Purchases	
Cereals	_____
Rice	_____
Peanuts	_____
Total Foundation Seed Purchases	

CASH BALANCE, AT THE END OF PERIOD

BEST AVAILABLE DOCUMENT

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Accounts Receivable

a. Foundation Seed

- Cereals
- Rice
- Peanuts

_____	_____	_____
_____	_____	_____
_____	_____	_____

b. Certified Seed

- Cereals
- Rice
- Peanuts

_____	_____	_____
_____	_____	_____
_____	_____	_____

Total Receivables

_____	_____	_____
-------	-------	-------

4. Inventory (at cost)

a. Foundation Seed

- Cereals
- Rice
- Peanuts

b. Certified Seed

- Cereals
- Rice
- Peanuts

Total Inventory

LESS:

Expenses to GED

_____	_____	_____
-------	-------	-------

INVOLVED FROM SALARY AT _____

BEST AVAILABLE DOCUMENT

SUPPLEMENTARY ANNEX G
ADMINISTRATIVE ANALYSIS

I. LEADERSHIP

A. Source of Prior and Current Leadership

The NSS was established by the project in early 1975, and Mme. M. Sanwidi was named Chief, NSS, under the Department of Agricultural Services (DSA) headed by Mr. J. Kaboré. Mme. Sanwidi has a B.S. in biology from Montpellier, France; Mr. Sow Louis was named as the only agent for the NSS, having had post-high school agricultural training in Ivory Coast. Unfortunately, these two did not have seed technology backgrounds, but gained experience through on-the-job training. In 1977, Mme. Sanwidi was replaced by Koumassi Yago, then the Assistant ORD Director of Comoé (since 1974). Mr. Yago has a B.S. in Agronomy from the University of Moscow and is well versed in other areas of agriculture. His field and administrative experience gained while in Banfora supported him well as he assumed control of the NSS. Mme. Sanwidi became Director of Agricultural Research for the DSA. In early 1978, Aimé Zoungrana was named as Chief of Technical Bureau at the NSS. He has a B.S. in Agronomy from the University of Belgrade and was formerly Director of ORD's of Koupela and Koudougou. These two individuals currently represent the top leadership at the NSS.

B. Probability of Continuity of Current Leadership

Over the past three years, the NSS leadership has built up both administrative and technical expertise in the national seed program. As the seed program is just beginning in Upper Volta, there are virtually only a hand-full of trained agriculturalists with special knowledge of seed technology. Most of them either work for or were trained by the NSS. Given the fact that both Yago and Zoungrana are technocrats, as opposed to being political appointees, there is a high probability that they will continue in their present roles. By 1984, the project will have trained two agents at the B.S. level in Seed Technology in the U.S. who, upon returning, will assume control over the Technical and Quality Control Bureaus.

II. STRUCTURE

A. Legal Basis

The NSS was made official by ministerial decree, Arrete No. 23/DR, 19 July 1976. At that time it was given the

the following responsibilities and authority:

1. The NSS will take care of seeds of all crops and varieties cultivated in Upper Volta.
2. The NSS will have two sections: Production and Quality Control and Certification.
3. The production section will:
 - set national seed policy and production levels in collaboration with the research institutes and ORDs;
 - maintain official variety catalog;
 - promote the introduction of new superior varieties;
 - carry out field trials and demonstrations in liaison with research institutes and ORDs.
4. The quality control section will:
 - insure proper isolation requirements for seed production;
 - make field inspections;
 - do seed testing;
 - inspect processing and treatment procedures;
 - issue official seed bag tags.

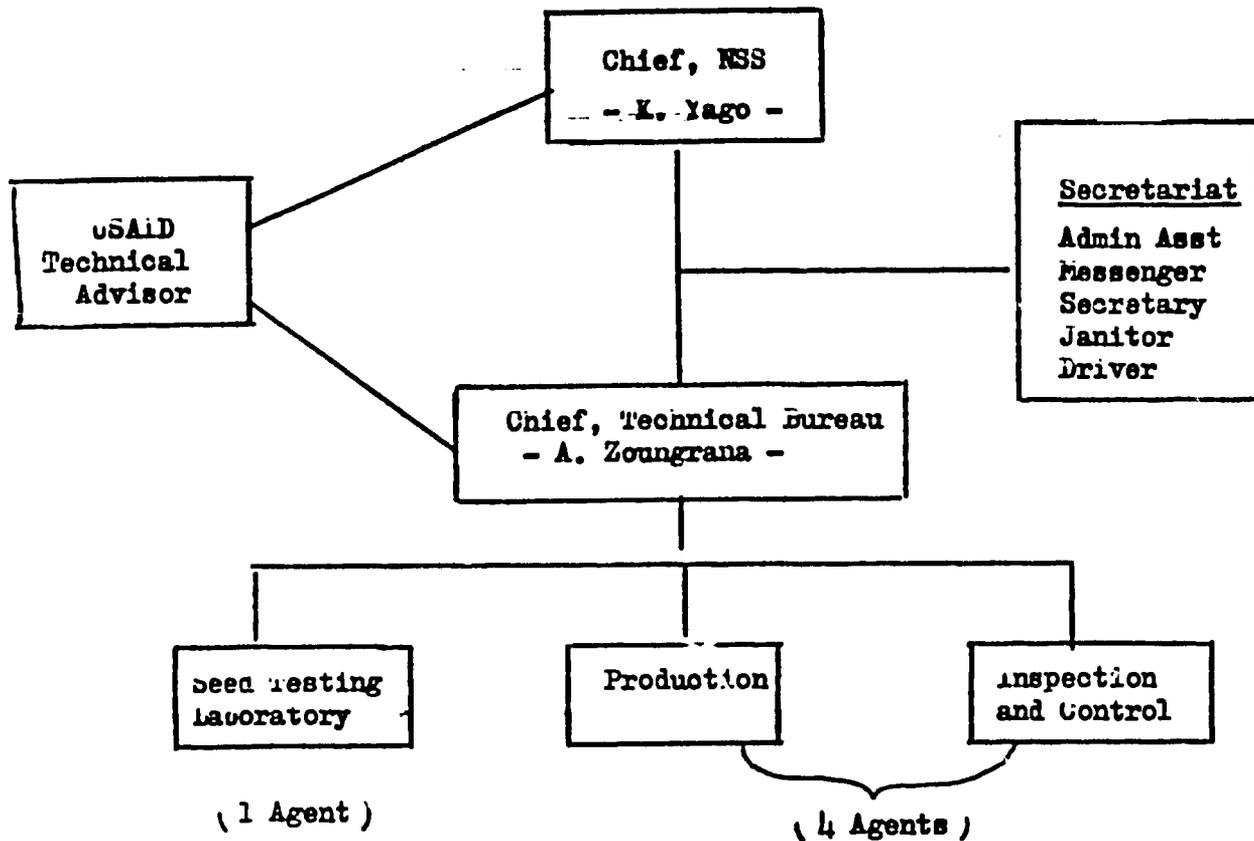
This legal authority allows for all contemplated activities of the project. It is anticipated that the pricing policy shall be authorized through a ministerial decree and a mechanism set up to study and propose new prices each year. Specifically, the NSS will conduct each year a financial analysis of seed prices prior to November 1. Guidelines for such an analysis are given in the financial and economic analyses, Supplementary Annexes F and C. Once the study is completed, price guidelines may be set. These guidelines are proposed by the NSS to the Director of the DSA who, in turn, submits them to the Secretary General of the Ministry of Rural Development. ~~As these~~ are technical recommendations based on financial analysis, they should receive approval at the ministerial level. A decree would then be forthcoming establishing annual pricing guidelines.

The Phase II will concentrate on strengthening the quality control program. The role of the inspector will be emphasized along with his authority at the beginning of the NSS.

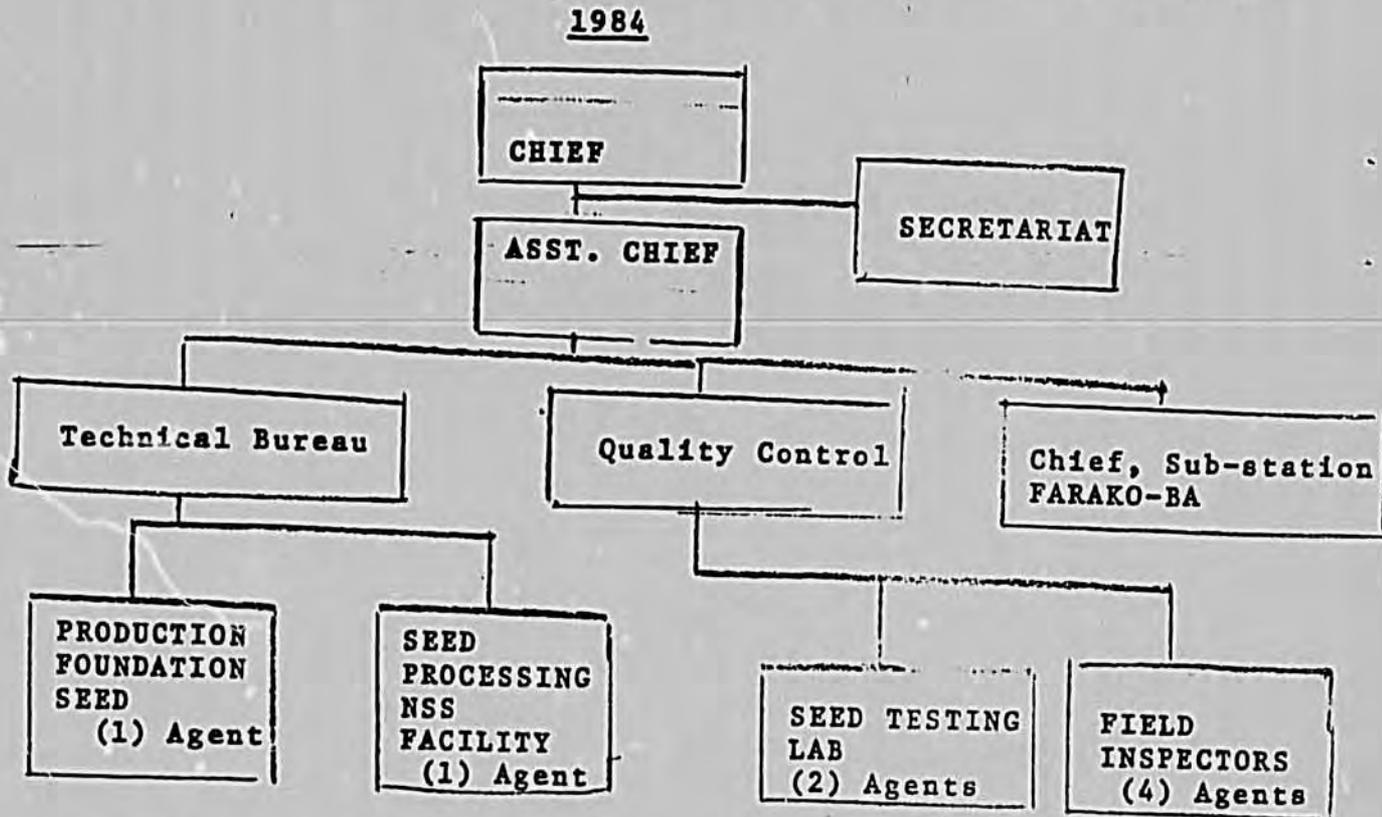
B. Pattern of Internal Organization

The following diagram shows the organizational structure of the NSS at the current time.

PRESENT ORGANIZATION AT NSS 1980



Given the GOUV personnel, this pattern works fairly well. However, as the demands upon the seed service increase and new personnel are needed, a new pattern should be established. By 1984, the following organizational pattern will be expected.



It is important to note that included in the Secretariat is a position for an accountant/bookkeeper for the NSS. With expected growth, NSS activities of establishing production contracts, of buying and selling of foundation seed, and collection of fees for testing and processing will also expand. Currently, the Chief of NSS does most accounting, provides financial statements and maintains the books. He cannot continue to do this work as it occupies a lot of his time. Also, this position will facilitate monitoring of project funds at the NSS.

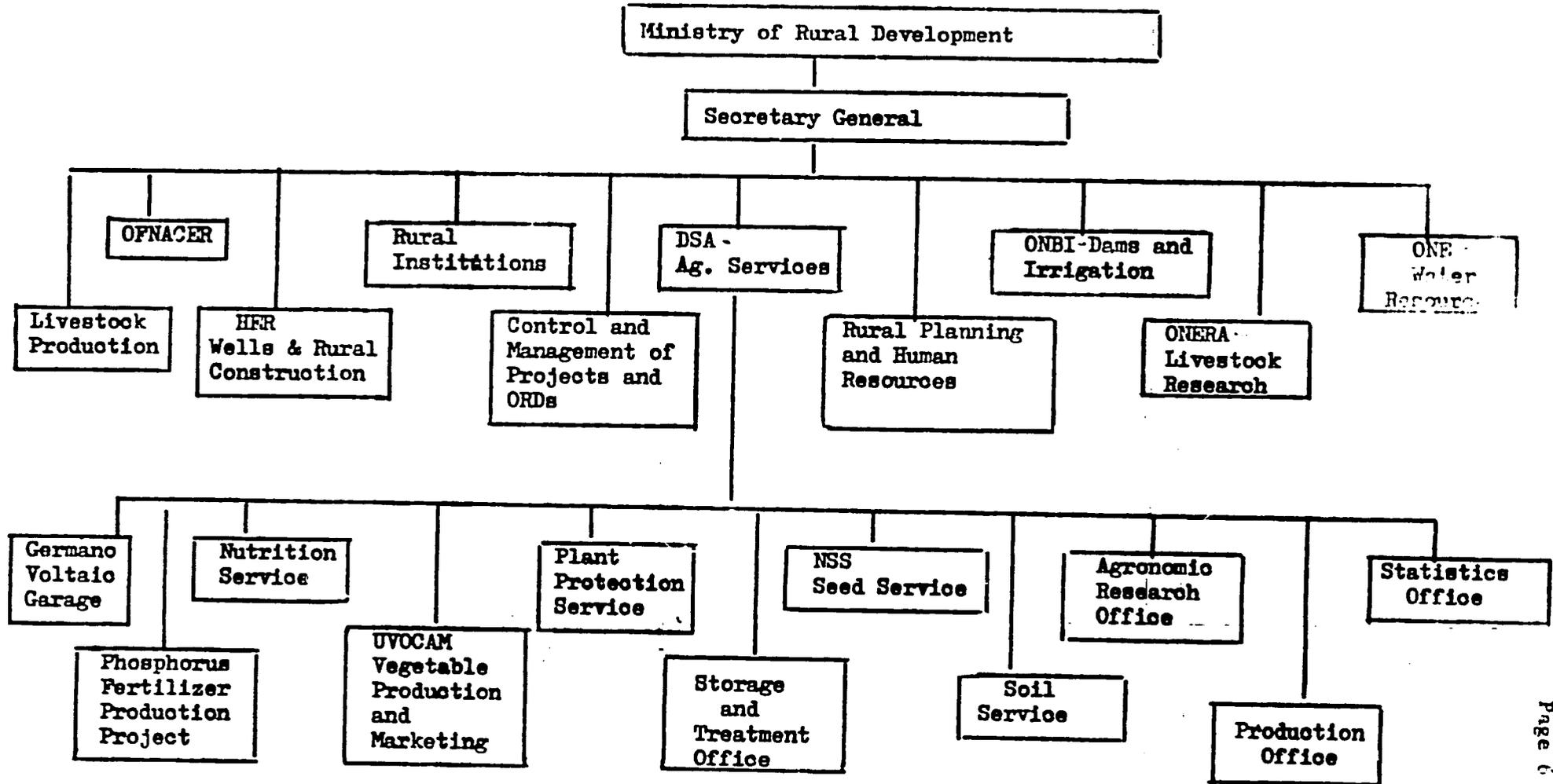
The accountant/bookkeeper will work in cooperation with the FDR (Fonds de Développement Rural), the accounting clearinghouse for rural development project funds. This person will provide quarterly budgets, quarterly financial statements and relevant bank records, to the NSS and AID/Ouaga. He will also monitor the revolving fund for foundation seed production and the revolving fund for certified seed production.

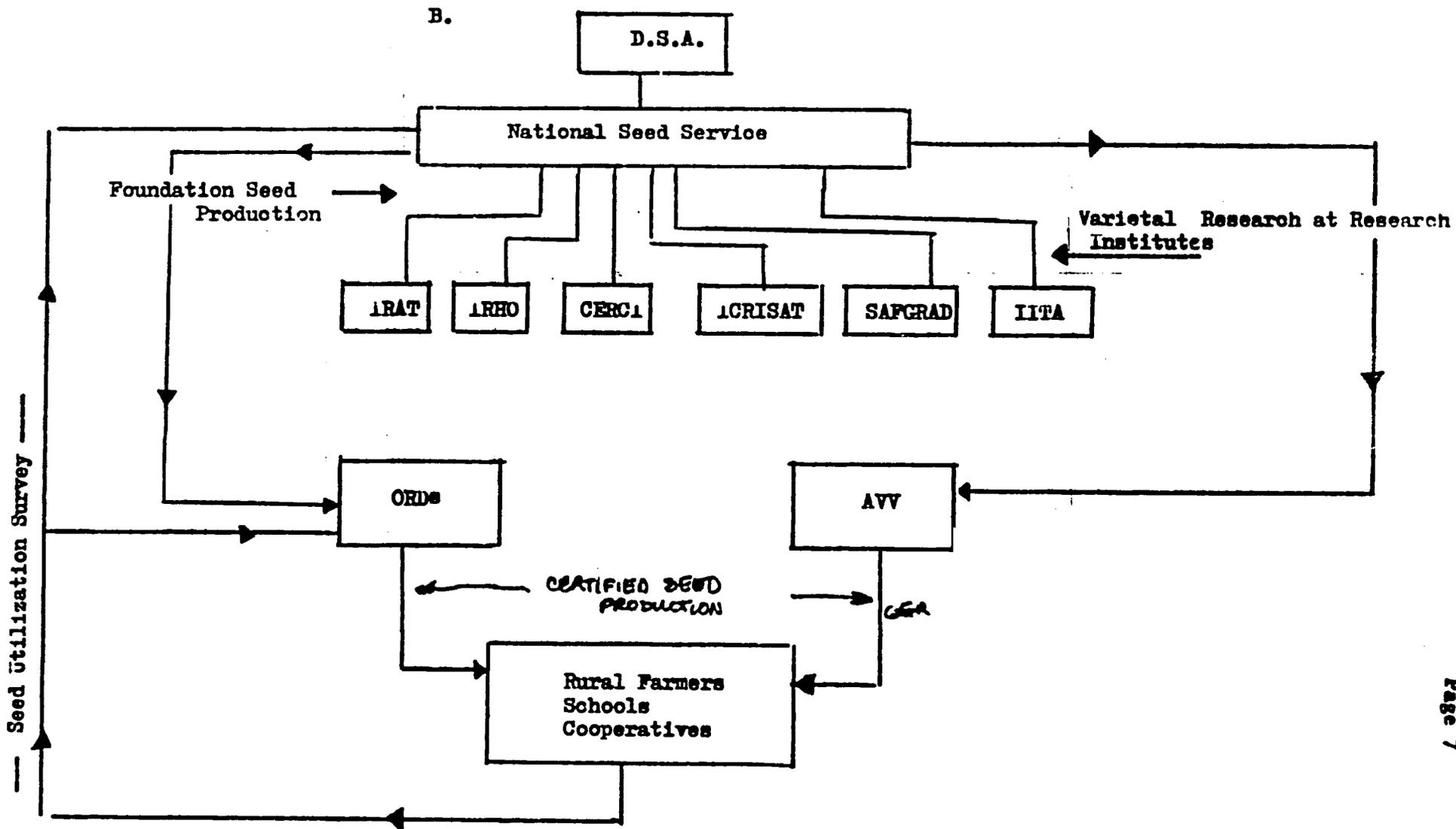
Not only will the NSS grow in personnel, the sub-station of the NSS at Farako-ba will be put into operation. The facility at Farako-ba is logistically complete to serve as a regional sub-station for the NSS. The Chief of the Sub-station

(Poda, Etienne) will live at the house on the station and will occupy the office space and laboratory (equipment for this lab has been provided under Phase I). This office will provide direct contact with foundation and certified seed growers in that region and provide testing services in a more timely fashion. Note: It is only in 1981, 6 years after being completed that this center (built through R&R funds) will have an NSS agent stationed there. As more than 65 percent of seed produced comes from this region, it is rational to operate a sub-station there.

The NSS does not operate in a vacuum, it plays a dynamic, crucial role in the national scheme for agricultural development. As such, the NSS must have effective liaison among several other organizations.

EXTERNAL ORGANIZATION





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Supplementary Annex J "Life of a New Variety" clearly illustrates the crucial position a seed program occupies.

Liaison occurs constantly throughout the year. In March each year, representatives of research institutes and ORDs meet for the Annual Seed Production Coordination Meeting. The Chief of the Seed Service will be a member of the National Variety Release Committee. Representatives of the NSS participate in the Annual Agronomic Research Coordination Meeting held each spring. NSS agents have direct contact with seed procedures at research institutes and ORDs during the production cycle. The NSS also holds annual seminars for ORD seed production personnel in an effort to improve ORD seed technology programs. Direct farmer feedback will result from interpretations of the seed survey.

C. Informal Structure

The Director of the DSA maintains tight control over the technical services under his administration. Consequently, the Chief of the NSS must have DSA approval for all transactions and he gives weekly reports to the Director, DSA. In reality the Chief of the NSS has daily contact with the Director, DSA.

The staff of the NSS is composed of 9 official civil servants and 5 contract personnel. The Chief of the NSS has little control over appointment, transfer or removal of the official staff. However, he does have input as to selection of agents who are assigned generally to the DSA. How persuasive he is at that time determines, to a large degree, his staff level.

The problem of coordination of the different activities within the service has become more complex with the recent growth of NSS personnel. Recently the Chief of the NSS instituted bi-monthly staff meetings. He has also wasted long range inspection trip planning now that he has more inspectors. A phone system has been installed to serve each of the offices within the NSS, thus breaking up the constant cluster of people around the Chief's office where the only phone existed.

Within the last four months, the Chief of NSS has reorganized the document classification system. Now all documents are classified chronologically and by subject. Handling of daily correspondence runs smoothly provided the current volume is not greatly exceeded.

At present, all financial planning and decision-making are done by the Chief of the NSS with advice from his technical advisor/USAID and his assistant chief. Quarterly budgets and quarterly financial statements are required as well as a

photocopy of the NSS' bank account transactions. However, as the NSS grows, the need for a bookkeeper will increase. Such things as records for daily transactions, sale of seed and sacks, and production contracts for all need more careful monitoring. As noted above, an accountant/bookkeeper will work at NSS under Phase II.

III. ROLE AND COMMITMENT

The role of the NSS as defined by the GOUV is to "take care" of seed of all crops and cultivated varieties in Upper Volta including cereal and food crops, industrial, forage and vegetable crops. (Arrete 006/DR, 18 April 1979.) This means that the NSS has a "carte blanche" with respect to seed production and quality control as far as the Voltaics are concerned.

The role of the NSS as seen by others is more singular, i.e., the NSS will assure a supply of seed to be used by farmers. As seen from USAID's point of view, the NSS serves as a catalyst for the activities of the National Seed Program. As such, the success of the national program rests to a large extent upon the success of the activities of the NSS. In this capacity, the NSS will coordinate production levels for foundation and certified seed, finance contracts for foundation seed production, assure quality of seed produced through a quality control program of seed testing and inspection, gain statistical information on regional seed utilization and promote seed technology by training and publicity.

The activities proposed for the Phase II are compatible with the present purpose and activities of the NSS. These proposed activities are based upon six years of project experience and as such provide a logical, rational working base. The GOUV, through the Chief of the NSS, has worked very closely with USAID to design the activities of Phase II into a realistic workable plan.

The need for a national seed program goes without question at all levels of government. The value of a functioning program cannot be underestimated, but it evolves only very slowly. Commitment by the GOUV and USAID must be long-term in order to assure the proper development of a seed program's infrastructure.

Among the different services within the DSA, the NSS is considered to be one of the strongest, if not the strongest, due to the support and assistance USAID has provided over the past six years. Due to its donor-funded nature, the project offers certain incentives and benefits to the project personnel.

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Project has built a large, modern office building to serve as the headquarters where all staff have ample office space. In addition, a modern seed testing laboratory has been provided along with training of the lab technician. Transportation and POL have been provided (cars, pickups, mobyettes) for project purposes to NSS staff and to field operational staff. The project funds travel per diem for those agents who travel outside of Ouagadougou based on standard government allowances. The project funds different training programs throughout the year. Promotion within the Civil service is independent of whether you work with a project or not. However, if the project can offer training that is officially recognized with a diploma acceptable within the French educational system, then the agent could be promoted due to project activities. (It is anticipated that two "B" level agents will be sent to the U.S. for training at the B.S. level. Once they return in 1984, they will be promoted to "A" level due to their new diplomas).

Agents within the project may also be stimulated in other ways. There is definitely an "esprit de corps" among the NSS agents which makes for a more stimulating work environment. As NSS inspectors, agents will assume responsibility for quality in a national program and as such they represent a unique cadre of agricultural agents. The project has insured that these agents have the needed technical materials.

IV. RESOURCES

The NSS is located in Ouagadougou and consists of a modern headquarters building with five offices, the National Seed Testing Laboratory and a conference hall, and a seed processing warehouse of 160 m². There is a varietal demonstration field next to the headquarters.

There are 9 civil servants and 5 contract personnel. (See list of NSS staff below). These are paid by the GOUV and such represent the major GOUV contribution to the project.

The headquarters building and warehouse were funded by USAID under Phase I as well as the office, lab and warehouse equipment. All offices are air-conditioned. There is a photocopy machine in the Chief's office. All office supplies are controlled and stocked in the Chief's office. The laboratory is fully equipped with American Seed testing equipment for purity, germination and moisture testing, and it serves as office space for the four seed inspectors. The warehouse has a cleaning system (cleaner, elevator, powder treater), storage space for foundation seed stocks, and a spare parts cage. The warehouse is electrified and has a telephone.

STAFF NSS - CIVIL SERVANTS

- Koumassi Yago, B.S. Agronomy, USSR 1969-74, Chief NSS
- Zoungrana, Aime, B.S. Agronomy, Roumania, 1968-73, Chief Technical Bureau
- Poda, Etienne, B.S. Plant Breeding, France, 1972-78
- Zongo, Appolinaire, BAC, Agriculture, Ivory Coast
- Barry Mamadou, Technical Agent, Martoukou, H.V. Lab Technician, Jan. 77 - Jan.
- Sedou Kuadio, Technical Agent, Martoukou
- Sawadago, Samuel, Technical Agent
- M. Paul Guingde, Admin. Asst.
- Mme A. Tiema - Secretary

Contract Personnel

- Gardien -
- Driver
- Messenger
- Secretary
- Warehouse attendant

The NSS also has a branch center at [redacted], built with R&R funds in 1974-1976. Located on the station, the center consists of a headquarters building with garage, library, laboratory and 2 offices, a seed processing warehouse fully equipped with seed cleaners, drying cribs for 60 tons of grain, and a house for the chief of the center. 1981 will see the first direct use of this facility by NSS personnel; Mr. Poda, Etienne has been named NSS agent in charge of the center and he will occupy the house. This under-utilized resource will provide the NSS with a means to decentralize its operations into the most productive region of Upper Volta, i.e., the southwest. This will save much travel time by having an agent permanently assigned there with a vehicle. It is also anticipated that the agent will manage an operating fund, coordinate inspection activities and the regional seed survey, oversee foundation seed production at the station and carry out related research and field trials.

A major constraint on the NSS has been the lack of trained personnel at the middle level, i.e. inspectors. For five years, until 1980, the NSS had only one agent responsible for a national program. As already noted, there are currently five agents at the NSS, a significant improvement over previous years. Consequently, much of the infrastructure put in place during Phase I and the R&R phase can now be more effectively utilized. The Quality Control Section now has substance in the form of four full-time inspector/agents. Unfortunately, the supply of these sorts of agents will continue to be greatly inferior to the demand as GOUV agricultural agent training capacity remains very small. The Agricultural Human Resources Project (No. 686-0221) is attempting to improve this situation by increasing the volume of students at CAP Martoukou.

The NSS and related seed program infrastructure as created and supported in Phase I, are in place and operational. The Phase II will concentrate on making the NSS a more effective service whose activities are managed efficiently at a high level of technical expertise. The inputs contemplated for Phase II will directly complement existing resources. These inputs consist of vehicles, spare parts, POL, technical assistance, Foundation Seed Marketing Fund, promotional materials and a large training package. These inputs will allow the NSS to improve its quality control program for all seed classes.

Agents of the NSS spend a good portion of time in the field. The NSS procedures for field trips requires that official travel authorization be given by the DSA for any NSS agents each time they travel. At the same time, the Chief of the NSS requests the FDR to issue travel allowance checks before the agents leave on the field trip. The per diem rate is set at 3,500 CFA/day for the Chief and Assistant Chief, and 2,500 CFA/day for inspectors and 1,000 CFA/day for the driver. These rates conform to GOUV travel per diems.

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Vehicle usage, condition, and estimated kilometers travelled are found in Annex U. The purchase of six 4 X 4 Jeeps will provide adequate transportation for all NSS agents for the next 4-5 years. All NSS American vehicles are serviced by a local mechanic on a regular scheduled basis. One major problem with respect to vehicles over the past years concerns GOUV drivers. Unfortunately, since these are service vehicles, GOUV drivers feel they can abuse the vehicle without repercussion, as it does not belong to them. Consequently, cars quickly deteriorate. The NSS proposes that individual agents drive their own vehicles and be responsible for their upkeep and maintenance (as if it were his own personal vehicle). With prudent driving and proper professional maintenance, American vehicles will last up to 5 years, despite the severity of rural roads.

As the seed program progresses, the demands on the NSS will increase particularly in the form of inspectors. Recurrent costs must include these new agents (4 more) and the vehicles and POL for them. See the Economic and Financial Analyses for details of recurrent costs.

OUTSIDE ADMINISTRATIVE ENVIRONMENT

The GOUV's primary development goal is to become agriculturally self-sufficient. A functioning seed program is at the core of such a goal as Upper Volta's agricultural environment is improved. Unfortunately, most GOUV officials have no farming experience.

A recent change in government makes it very difficult to predict the future political climate in Upper Volta. At the working level, however, the GOUV has demonstrated its desire to maintain an effective seed program. In the past two years, Mr. J. Faboré, Director of DSA, has been particularly supportive of the project and recently the new Minister of Rural Development has been extremely forthcoming in resolving project problems.

GRASS ROOTS MANAGERIAL CONSIDERATION

Phase II will fund an annual seed utilization survey on a regional basis so that farmer feedback can reach the national level and be used to improve upon the selection of varieties and national seed production programming. This survey creates a mechanism whereby farmer seed use patterns can be established and studied. Breeders will be guided by these patterns as they breed new varieties using the same criteria that the farmer uses for selection.

Fortunately, most Voltaic farmers know the value of seed and good storage. If a new variety can be demonstrated before his own eyes and it proves to be superior after several seasons, then he will not hesitate to obtain seed of that variety. He is already skilled at selecting seed for future years from his current harvest.

A cooperative of farmers can provide a means for obtaining demonstrations, information and seed. Positive word-of-mouth will spread information rapidly. The ORD, charged with responsibility for rural development, will be a source to farmers and farmer groups for demonstrations, information and seed. The ORD is well placed as a regional organization to identify those varieties most adapted to their own region. Obviously, it is impossible to produce seed adapted to one zone if it is produced in a different zone. Thus ORD's are equally well placed to be producers of seed.

The role and value of seed is being taught in the CFJA's (young Farmer Schools) in rural environments. When these young people mature and have their own farms, they will be fully aware of and responsive to an effective seed program. Possibly, by the time they do grow up, the private sector would permit establishment of seed companies which can produce and market seed at a profit. See Annex X for a further discussion of the private sector role.

SUPPLEMENTARY ANNEX H

ENVIRONMENTAL ASSESSMENT, RISK/BENEFIT ANALYSIS AND

GUIDELINES FOR USE OF PESTICIDES

FOUNDATION SEED PROJECT

U. S. Agency for International Development
USAID Ouagadougou, USAID Upper Volta

Drafted by: OPR,CJFredrickson:ma:09/22/80

Revised by: C. J. Fredrickson and DS/AGR:ts:01/28/81

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The Initial Environmental Examination quite adequately addressed the environmental impact/concerns related to the project activities with the exception of the use of pesticides.

Since the ultimate beneficiary of this project will be the small farmer, it is essential that in the production of superior seed varieties, pest management practices utilized in their production will be the same as recommended to the farmers, thus assuring results similar to those obtained at the research stations and seed multiplication farms.

A discussion of the integrated pest management (IPM) concept as the technology develops in Upper Volta is hereby presented to provide an understanding of the overall goals of the project and at the same time minimizing the potential adverse impacts on the environment.

Simply stated, IPM utilizes a package of technologies in an integrated manner to achieve maximum crop yields, at minimum cost and at the same time, avoids ecological damage.

The more desirable IPM components include the use of crop plants that genetically resist or tolerate pest populations; the use of naturally-occurring biological organisms such as predators, disease agents, pathogens, and parasites; and the use of cultural or habitat management practices such as crop rotation, destruction of post harvest crop residues, selection of planting time and selection of appropriate crop mixes. Some of these techniques are as effective as chemical use and are as old as traditional agriculture itself.

An objective of IPM is to identify and maximize the use of natural, biological, environmental, and traditional control methods known to be effective. Pesticides may prove to be effective in the IPM schemes, but only when definitive data demon-

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...rate their economic advantages over other methods; their use should be based on economic threshold levels determined by the population dynamics of the target species. It is also this project's goal to encourage and seek those pesticides which pose a minimum risk to humans, other non-target organisms, and the environment.

Pesticides which will be recommended for use by project staff are listed in Table 1. The criteria used in selecting these pesticides are specified in amended Regulation 16 of the Code of Federal Regulations, Part 216, Environmental Procedures (effective date June 26, 1976 as amended May 3, 1978), which establishes guidelines for the use of pesticides in AID projects. Paragraph 216.3(b)(1)(i) of Environmental Procedures establishes procedures for evaluating the risks and benefits of pesticides proposed for AID projects, and these were used in the preparation of this paper.

RISK/BENEFIT CONSIDERATIONS

1. EPA Registration Status of Pesticides. All chemicals proposed for use in the project are registered by the United States Environmental Protection Agency (EPA) for the same or similar use and have an EPA recommended tolerance or alternative have had an acceptable daily intake (ADI) established by the joint FAO/WHO Expert Committee on Pesticide Residues. In the latter cases, further criteria indicate that they are not under the Rebuttable Presumption Against Registration (RPAR) process, and have not been cancelled, withdrawn, suspended or restricted in the U.S. In the case of those pesticides not currently registered by EPA but possessing an ADI as recommended by FAO/WHO, permissible use patterns must be established on a case-by-case basis, and may require the collection and analysis of samples for pesticide residues under proposed patterns of use if the data supporting the FAO/WHO maximum residue levels (MRLs) is considered to be inadequate.

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It should be noted that MRLs are roughly equivalent to U.S. "tolerances" as covered under Section 301 of CFR 40.

Small quantities of other pesticides may be used for trial evaluations to obtain data, but the above criteria must be met before general recommendations can be made.

2. Basis for Selection of Pesticides. Whereas the National Seed Service will not be purchasing or applying pesticides itself, except for seed protectants, the staff will be in a position to influence research workers and farmers to use those pesticides on the AID approved list. In this context, discussions were held with the research entomologists Yogendra Rathore of IITA and Kanayo Ikwane of ICRISAT, both stationed at Kamboinse Research Station under the SAFGRAD program. Both scientists are strong proponents of the IPM approach and will be relying principally upon varietal resistance to pests and diseases, biological control and cultural techniques. Their research is especially important since standardized trials are being performed in 25 cooperating countries and with the other research stations in Upper Volta in order to obtain comparable results.

These scientists, the agronomists with whom they will be working, and the Project Manager, were made fully aware of the necessity to comply with EPA regulation and labelling requirements. To assure compliance with these regulations, a compendium of U.S. recommended application instructions are being supplied to the Project Manager for duplication and distribution to responsible staff of the NSS and the research entomologists.

3. Extent to Which Pesticides Use is Part of an Integrated Pest Management Program. Another boon to the IPM program is the AID/CILSS/FAO research project on IPM with a focus particularly on sorghum and millet. With these efforts, the

project will greatly benefit and adverse environmental impacts will be minimized.

A thrust of SAFGRAD entomologists relates particularly to the introduction of parasites and predators of as many of the major pests as possible. Once a parasite or predator is established, an added measure of control is usually available, involves no cost to the farmers, and at the same time presents no environmental hazard.

In any pest management program the judicious use of pesticides is required and those listed in Table 1 are considered the safest for use in Upper Volta. Table 2 provides use information on the pesticides by crop.

4. Methods of Pesticide Application. The pesticides used in the seed production program will be applied under the direct supervision of trained personnel at the research stations of Kamboinse, Saria, Cerci, Farako-Ba and Niangoloko. Additionally, the ORD's are charged with the supervision of proper pesticide application under guidance from the National Seed Service. In this manner careless handling can be avoided and applicators can be made to wash thoroughly with soap and water and change clothing daily. Those persons in charge of pesticide use will provide and enforce the use of appropriate safety devices as required.

Pesticides and application equipment should be stored in locked storerooms to prevent entry of anyone but designated personnel. The pesticides and equipment should not be stored near human food, animal feed, or drinking water.

The consultant entomologist observed personally the facilities for storage of pesticides both at the NSS and at the experiment stations. All locations observed proper storage methods including locked storerooms.

Pesticide containers and left-over pesticides will be disposed of in areas designated for that purpose according to label instructions, and properly buried assuring there is no danger of run-off or contamination of nearby water sources.

All pesticides purchased should have appropriate labels with recommendations and warnings including rates, frequency of application, time of field reentry into treated fields, observance of minimum number of days between last application and harvest, container disposal methods, poisoning symptoms, etc. In the event of human pesticide poisoning, responsible personnel should determine in advance the locations of the nearest treatment center and should also be aware of the proper antidote in order to effect the correct treatment.

5. Any Acute or Long-term Toxicological Hazards Associated with Use and Measures to Minimize Such Hazards. All pesticides by their nature are potentially hazardous to humans and the environment, and should be treated accordingly regardless of their relative toxicity.

The pesticides recommended for use in Table 1 are available without restriction according to EPA regulations, except for Carbofuran and Phostoxin. All are relatively non-toxic to warm blooded animals, as evident by the acute oral toxicity values (LD 50) as shown in Table 1, and as explained in Footnote 2 of the table. They are all biodegradable and do not persist for long periods. Cypermethrin is not registered in the U.S., but has an established acceptable daily intake (ADI) set by the FAO/WHO. Certain uses of carbofuran are proposed as a termiticide because of its particular effectiveness against the several species of African termites. As utilized presently at the research stations, the danger of bird kills are minimal as the granules are applied at the time of seeding and/or fertilizing in the rows and are therefore covered with soil. Likewise, termite mounds are treated by removing the top and introducing the granules into the galleries and covering with earth.

Land cleared and mounds treated for termites are normally left fall until the next growing season. Therefore, any excessive concentration of toxic material would have been biodegraded.

In view of the cancellation of EPA of the "hard pesticides", carbofuran is a good alternative for termite control and the risk is minimal to the environment. (See also cable from Whittemore, AID/W/DSB to Fredrickson dated 09/09/80 in Appendix V , and DS/AGR Addendum dated 10/20/80.)

Another product which is registered by EPA for use in maize as a soil insecticide is Chlorpyrifos (Vorsban), which has been found to be particularly effective against termites.

A potential problem associated with the use of pesticides is the development of genetically resistant insect strains that can no longer be controlled by previously effective materials. The repeated use of the same pesticide in the same area may result in the selection of resistant strains. This problem can be lessened by applying pesticides selectively and judiciously based on actual need in conjunction with an appropriate IPM system.

6. Effectiveness of Recommended Pesticides for Proposed Use. The pesticides will be used in accordance with manufacturers' instructions, but where preharvest intervals, rates and frequency of application on the label are different than those provided to the Project Manager by AID/W-DS/AGR, those given by AID/W should be overriding. All pesticides proposed are expected to be efficacious for the use intended.

7. Compatibility of Proposed Pesticides with Target and Non-target Ecosystems. The very action of pesticides through contact or ingestion makes them also incompatible with non-target species. The honey bee in particular is easily

killed by more pesticides and insect parasites may often be affected. Careless use and contamination of water will naturally affect aquatic life. Problems of affecting non-target species can be minimized by adopting appropriate safety precautions and selectively using pesticides in a timely fashion.

8. The Conditions Under Which the Pesticides are to be Used Including Climate, Flora, Fauna, Geography, Hydrology and Soils. A comprehensive discussion of these factors is covered in the IEE under description of the project.

9. The Availability and Effectiveness of Other Pesticides and Non-Chemical Control Methods. There is a general lack of quantitative data on pesticide efficacy in Upper Volta and prior to initiation of the project it will not be possible to compare the effectiveness of the proposed pesticides with alternative chemicals. Additionally, it will not be possible to compare the effectiveness of methods such as biological control, traditional cultural practices, and use of new genetic materials, as these are only now being tested out by the SAFGRAD project. Nevertheless, these other alternatives are recognized as providing the best long-term assurance in an integrated system. It is the goal of SAFGRAD to capitalize on maximization of other methods and to minimize the use of chemical methods.

10. The Country's Ability to Control the Distribution, Use, and Disposal of Pesticides. At present, GOUV has no effective regulatory controls on pesticide usage which makes it imperative to utilize those chemicals which are the safest and at the same time most effective for small farmer use. Unfortunately, the largest consumer of pesticides in the country is the cotton cooperative SOFITEX, which utilizes pesticides such as endrin, DDT, and parathion, although pesticides

which are hazardous to humans and the environment are being introduced. This project is not concerned with cotton, but the ORD's should be aware that a cotton farmer can also be a cowpea farmer or be producing other crops including vegetables. It therefore behooves this project's management and technical staff to encourage whenever possible, the acceptable environmentally safe methods of pest control.

11. Provisions for Training of Users and Applicators. See discussion in #4 above.

12. Provisions Made for Monitoring and Use of Pesticides. Monitoring is being carried out on a continuous basis by the research stations and the ORD's on the use and effectiveness of pesticides. See also discussion in #4 above.

PESTICIDES TO BE USED FOR THE PROTECTION OF FOUNDATION SEED IN STORAGE

Apart from the production of seed and the manner in which it is produced, the handling of seed for storage is discussed separately below.

Climatic conditions in Upper Volta are generally favorable for storage despite the fact that temperatures range between 20°C and 40°C. The southwest region has an average relative humidity of 65% for 7 months of the year and for over 9 months of the year in the rest of the country.

The molds die off rapidly below a relative humidity of 70%, and will not survive if grain is stored with a moisture content below 12% which is in equilibrium of a relative humidity of 60% and a temperature of 32°C.

Insects cannot breed successfully below a relative humidity of 40%, which is in equilibrium of grain at a moisture content of 8%. This is the climatic condition only during four months--December to March. Therefore, before and after this period a program of pesticide usage is indispensable.

Rodents apparently are not a problem, mainly because all storage facilities observed by the consultant were well-maintained, free of weeds and debris, which are conducive to ideal rat habitats. Occasionally, placing traps will indicate the extent of any rodent problem.

The National Seeds Service has been using the following products for protection of their foundation and certified seed stock:

Nexion XP 40 powder

Actellic (pirimiphos methyl)

Synexa (BHC)

Thioral

Seed is stored at the warehouses of the ORD's and therefore the seed treatment may be properly supervised and monitored. Discussions with the Director of NSS confirmed their willingness to comply with EPA regulations precisely, despite the fact Nexion (bromophos) is safe to handle and probably should be a registered product in the United States.

The product Actellic (pirimiphos methyl), although not registered, is also not banned in the U.S. Its safety for use is reflected in the high oral LD/50 of 2000 mg/kg and the same for Dermal. Its use is approved to date for peanuts only, but should be acceptable on grain products.

Synexa (BHC) has been cancelled by EPA, and will not be used by the NSS. Thioral (thiram plus heptachlor) is not registered in the U.S., and all heptachlor registrations are effectively cancelled (See "Suspended and Cancelled Pesticides," second revision, October 1979, OPA 159/9.) Thiram per se, however, is registered in the U.S. without restriction and is required to contain a red dye according to FDA Regulations. This will help prevent diversion of treated seed to human consumption as discussed elsewhere in the social and economic analysis sections of the Project Paper.

The project therefore in addition to Thiram, will recommend the use of the following measures as alternative pest control measures which will provide the same, if not improved, effectiveness:

Malathion ULV concentrate (Cythion) is recommended in lieu of Nexion and Actellic for warehouse use. It may be used for spraying walls, pallettes and bags. It's safety is reflected by the fact that it may be used in homes and for use on humans to control body lice. Malathion has an added advantage in that it can be admixed directly with grain at the rate of 60 grams of Premium Grade 1.0% dust per 50 kg. sack of grain. It should be used with dry grain only.

Phostoxin (a restricted use pesticide in the U.S.) is recommended for fumigation of seed grain and presents no environmental problem as it is universally used throughout the world and is registered in the U.S. for use in grain, peanuts, soybeans, and as a space fumigant in warehouses. When properly used in accordance with directions, there has been no record of pest resistance to Phostoxin. There would be no adverse environmental effects for general use of Phostoxin as envisioned for the Foundation Seed Project. The following precautions must be pointed out and supervised by competent personnel:

1. Gloves should be worn when tablets or pellets are dispensed by hand.
2. Respirators need to be worn when the material is being dispensed under conditions where the operator does not breathe the vapor of the released phosphine. Under normal conditions, there is a delayed action of the fumigant; however, respirators should be on hand in the event of an emergency.
3. Odor of the fumigant cannot be relied upon as an indication that the operator may be breathing hazardous concentrations.
4. It is recommended not to smoke or eat during application of Phostoxin.
5. Adjoining enclosed spaces to the fumigation application should be continuously aired.

6. All persons working in the area should be notified that fumigation is in progress. A good practice is to post warning signs.
7. When fumigation is completed and the grain is turned, or aeration is undertaken, precautions must be taken to ensure that no person is exposed to any residual vapors of the fumigant. Phostoxin is a restricted use pesticide in the U.S. based on user hazard (inhalation toxicity).

RECOMMENDATIONS

It is recommended that those products listed in Table 1 be given the highest priority, not only because of their EPA registered status and/or their acceptance by FAO/WHO, but also due to their relative degree of safety for the small farmer.

Follow-up to any project having a pesticide component is highly desirable. Although residue monitoring in food, feed and humans frequently represents the best and most direct approach to deletion of misuse, such methodology is cost prohibitive for routine surveillance. However, project conformity to the spirit of AID Regulation 16 should be checked during the normal project evaluation review cycles. Thus, one review team member should be knowledgeable of pesticides and pesticide use practices. Also, under the DS/AGR centrally-funded CICP/AID Pest Management and Related Environmental Protection Project, technical experts in pesticides will frequently be traveling the African continent. These project personnel could be diverted at minimal expense to assist in a quick updating of Regulation 16 conformity.

Finally, it is essential that feedback be obtained with regard to the efficacy of the chemicals used in AID projects.

The project personnel should cooperate closely with the research stations and the ORD's to develop data on the cost-effectiveness of the various pesticides and other known chemical and non-chemical means of pest management.

Because of the complexity of the use of pesticides, questions regarding use may arise and project personnel may contact:

Dr. Frederick W. Whittemore
Environmental Coordinator
Agricultural Production Division
Office of Agriculture, Development Support Bureau
Agency for International Development
Washington, D.C. 20523

When submitting questions, the exact generic chemical name should be specified, formulation to be utilized, method of application, pest or pest complex to be controlled (scientific names, if known), and crops to be treated or other proposed uses.

AN OVERVIEW

Pesticide use will undoubtedly destroy some beneficial species within the target area, especially natural enemies and pollinators in the crop habitat. Insecticides also with continued use may unleash some non-target species which may cause them to increase and thereby develop a new pest problem. These ecological upsets are commonly associated with heavy and indiscriminate use. The use of pesticides based upon actual need, and integrated with other techniques, is the surest way to avoid disruptions of the ecology.

The training component advocated in the project is the best way to mitigate the human health hazards and to assure the chemicals are utilized properly. It should be noted that safety training is mandatory when a restricted pesticide such as phostoxin is used in an AID project.

Table 1

Recommended for Use in Seed Program

(Toxicity in terms of Acute Oral LD/50)

<u>Generic and Trade Names of Pesticides¹</u>	<u>Acute Oral LD/50 MG/KG²</u>
Malathion (I)(Cythion)	1375
Carbaryl (Sevin) (I)	850
Diazinon (I)	300-400
Permethrin (a pyrethroid) (I)	1030
Fenvalerate (a pyrethroid) (I)	451
Cypermethrin (a pyrethroid) (I)	82-485
Orthene (Acephate) (I)	945
Bacillus thuringiensis (I) (Dipel, Thuricide)	See Footnote 3
Trichlorfon (Dylox) (I)	450-630
Sulfur (F)	See Footnote 4
Mancozeb (Dithane M-45) (F)	8000
Chlorpyrifos (Lorsban) (I)	97-276
Phostoxin (G)	2.8 mg/liter of air (2000 ppm)
Thiram (G)	780
Furadan (Carbofuran) (I) (2% granular)	490
Warfarin (rodenticide)	Safe to humans

¹I = Insecticide; F = Fungicide; G = Grain Protectants.

²An oral LD/50 value is a statistical estimate of the dosage in milligrams of active toxicant per kilogram of body weight (mg/kg) necessary to kill 50% of

white rats or other test animals to which the pesticide is administered. LD/50 values are based on a single dose orally given to test animals (usually rats) followed by observation of the treated animals for a definite period. They are useful in comparing the relative toxicity of different pesticides. The oral LD/50 may be rated as to oral toxicities by the following table:

<u>Rating</u>	<u>LD/50</u>
highly toxic	50 and below
moderately toxic	50 - 500
mildly toxic	500 - 5000
non-toxic	above 5000

These ratings do not indicate the possible hazards that may arise from skin contact or inhalation of the substances nor the precise toxicity of pesticide formulations of different composition.

³LD/50 is not established, but *Bacillus thuringiensis* is considered harmless to humans, animals and most useful insects.

⁴LD/50 not established, but sulphur is considered non-toxic to humans although it may slightly irritate the skin.

Pesticides Recommended for Foundation Seed Program by Crop

	Millet	Sorghum	Maize	Cowpeas	Soybeans	Peanuts	Rice
Malathion	x	x	x	x	x	x	x
Carbaryl	x	x	x	x	x	x	x
Diazinon	x	x	x	x		x	
Acephate					x		
Bacillus thuringiensis	x	x	x	x	x	x	x
Trichlorfon			x	x	x	x	
Permethrin			x	x	x		
Fenvalerate		x	x	x	x	x	
Cypermethrin			x	x			
Sulfur	x	x	x	x	x	x	x
Phostoxin	x	x	x	x	x	x	x
Thiram	x ²		x ²				
Carbofuran	x	x	x		x		x
Dithane M-45	x ²	x ²	x			x ²	x ²
Chlorpyrifos			x				x
Warfarin	x	x	x	x	x	x	x
Pyrethrums	x	x	x	x		x	x

x = recommended; x² = as a seed protectant.

Table 2

¹All chemicals proposed for use in the project are either registered by the U.S. EPA for the same or similar use, or have an acceptable daily intake (ADI) and maximum residue limit (MRL) established by the Joint FAO/WHO Expert Committee on Pesticide Residues (JMPR). In the latter event, a further criterion is that they are not under the Rebuttable Presumption Against Registration (RPAR) process, and have not been cancelled, withdrawn, suspended, or restricted in the U.S.

APPENDIX I: Major Pests - pre harvest

The NATIONAL Seeds Service will be concerned with the control of pests in their foundations seed program. The major pests are identified by crop as follows:

Millet

Spike head borer	<i>Raghuva albipunctella</i>
Sudan Millet Bug	<i>Agonoscellis versicolor</i>
Stem borers	<i>Acigona ignefusalis</i> <i>Sesamia calamistis</i>
Army worm	<i>Spodoptera</i> (sp)

Sorghum:

Sorghum shoot fly	<i>Atherigona soccata</i>
Sorghum midge	<i>Contarina sorghicola</i>
Stem Borers	<i>Eldana saccharina</i> <i>Sesamia calamistis</i> <i>Busseola Fusca</i>
Army Worm	<i>Spodoptera</i> (sp)

Maize:

Army worm	<i>Spodoptera littoralis</i>
Termites	Several species
Stem borers	<i>Sesamia</i> (sp)
Corn Ear worm	<i>Heliothis</i> (sp)

Cowpeas:

Legume pod borer	<i>Maruca testacealis</i>
Leafhoppers	<i>Empoasca</i> (sp)
Thrips	<i>Megalurathrips sjastedti</i>

Pod sucking bugs

Green stink bug

Anoplocnemis curvipes
Acanthosoma (sp)
Nezara viridula

Soya:

Seed moth

Green stink bug

Darkling beetle

Cydia ptychora

Nezara viridula

Lagria villosa

Peanuts:

Plant lice

Leaf worm

Millipedes
Cutworm

Army worm

Aphidae

Amsacta moloniya

Agrotis (sp)
Spodoptera (sp)

Rice:

Rice gall midge

Rice stem borers

Leaf hoppers

Mites

Orsedia oryzae

Chilo zeaonius
Chilo diffusilimens
Sesamia (sp)

Jassidae

Acaricus (sp)

A common pest to all crops is the grasshopper (Acrididae) with several species represented. Occasionally local epidemics occur which must be controlled with pesticide applications.

Likewise the Migratory Locust (Locusta migratoria) may flare up. This pest is kept under surveillance by an international organization and action to combat locusts is undertaken on a large scale by these organizations when large numbers appear to be building up.

APPENDIX II: Stored product pests - post harvest

Order and family	Scientific & common names	Crop	Comments
Coleoptera Bruchidae	<i>Caryedon serratus</i> Peanut borer	Peanut	unshelled pods
	<i>Callosobruchus maculatus</i> Cowpea borer	Cowpea	Dry peas
Coleoptera Curculionidae	<i>Sitophilus oryzae</i> <i>Sitophilus granarius</i>	Millet Sorghum Rice	grains
Coleoptera Tenebrionidae	<i>Triboleum</i> (sp) Flour beetle	all grains and stored products	Most common
Coleoptera Cucujidae	<i>Oryzaephilus</i> (sp) Saw-toothed Grain beetle	grains	Most stored products
Coleoptera Dermestidae	<i>Trogoderma granarium</i> Khapra beetle	all stored products	Most prevalent in maize
Lepidoptera Gelechiidae	<i>Plutella maculipennis</i> Angoumois Grain Moth	all grains	Very common
Acaridae	<i>Dermanyssus</i> Grain mites	all grains	
Rodents:	<i>Rattus norvegicus</i> Brown rat or Norway rat	all grains	Common
	<i>Rattus rattus</i> Roof rat or Black rat	all grains	Good climber common
	<i>Mus musculus</i> Common mouse	all grains	Can cause much damage

APPENDIX III : List of Manufacturers of recommended pesticides (basic producers)

Malathion American Cyanamid Co.
Agricultural Division
P.O. Box 400
Princeton, New Jersey 08540

Carbaryl Union Carbide Corp.
Agricultural Products Division
7825 Baymeadow Way
Jacksonville, Florida 32216

Fenitrothion Bayer AG
Pflanzenschutz
509 Leverkusen Bayerwerk
Federal Republik of Germany

Mobay Chemical Corp.
Agricultural Chemicals Div.
P.O. Box 4913
Hawthorn Road
Kansas City, Missoun 64120

Diazinon FMC Corporation
Agricultural Chemicals Division
100 Niagara St.
Middleport, New York 14105

Ciba-Geigy Corp.
Agricultural Division
P.O. Box 11422
Greensboro, North Carolina 27409

Pyrethroids ICI Americas, Inc.
Specialty Chemicals Div
Wilmington, Delaware 19797

FMC Corp.
Agricultural Chemicals Division
100 Niagara St.
Middleport, New York 14105

Orthene Chevron Chemical Co.
Ortho Division
575 Market Street
San Francisco, California 94105

APPENDIX III (con't)

**Bacillus thuringiensis
(Thuricide)**

W.R. Grace and Co.
Agricultural Chemicals Group
100 North Main St.
Memphis, Tennessee 38101

Sandoz Ltd.
Agro Department
CH-4002 Basle, Switzerland

Trichlorfon

Mobay Chemical Corp.
Agricultural Chemicals Div.
P.O. Box 4913
Hawthorn Road
Kansas Coty, Missouri 64120

Bayer AG

Sulphur

Stauffer Chemical Co.
Agricultural Chemicals Div.
Westport, Connecticut 06880

Chevron Chemical
W.R. Grace
FMC Corporation

Mancozeb (Dithane)

Rohm and Haas Co.
Independence Mall West
Philadelphia, PA 19105

Cythion

American Cyanamid Co.
Agricultural Dept.
P.O. Box 400
Princeton, New Jersey 08540

Phostoxin

Phostoxin Sales Inc.
P.O. Box 469
Alhambra, California 91802

Degesch GmbH
6 Frankfurt (Main) 1
Post Box 3993
West Germany

Furadan (Carbofuran)

FMC Corporation

APPENDIX III: (con't)

Thiram

E.I. du Pont de Nemours and Co.
Biochemicals Dept.
1007 Market St.
Wilmington, Delaware 19898

Warfarin

Prentiss Drug and Chemical Co.
363 Seventh Avenue
New York, New York 10001

SUPPLEMENTARY ANNEX I

Evaluation Plan - FOUNDATION SEED PRODUCTION (No. 686-0245)

I. Summary of Evaluative Elements

A) Baselines

1. Project specific baseline - Project specific baseline will come from the official statistics of the National Seed Service and from the headquarters of the various ORDs in Upper Volta, particularly the Hauts-Bassins ORD. The questions these data will answer are how much certified seed is being produced at present, how much is being sold and to what degree is the seed production mechanism able to meet the costs of production through seed sales.
2. Socio-economic baseline - Official ORD statistics will give the relevant socio-economic baseline. The questions here are concerned with farm size, crops grown, yield per hectare cultivated. The UNDP is currently conducting a farm survey in the ORD des Hauts-Bassins. Much baseline data can be had by consulting their documents. Finally, the first of the annual seed surveys gives additional useful baseline data for the status of farmer demand for seed in the project area.

B) Targets

1. Project specific targets - If the project is to meet its specific targets, the following conditions will exist at the end of the project:
 - a) The NSS will be recognized as the only official source of foundation cereal seeds in Upper Volta;
 - b) Foundation seed produced under NSS auspices will meet international standards;
 - c) The NSS will have operated a quality control program for 80 MT of foundation seed and 1,300 MT of certified seed during the life of the project;
 - d) The 1,300 MT of seed certified by the NSS will be recognized as being of consistently high quality;
 - e) The NSS and Hauts-Bassins ORD will be meeting their costs of production through sales.
2. Socio-economic targets - The main socio-economic target is not only an expansion of demand in the absolute but a diffusion of demand over larger and larger geographical areas and through all levels of society. This will include women in the zones where women cultivate autonomously.

C) Progress Indicators

1. Project-specific indicators - The most important indicator of progress toward the project-specific targets will be acquired by an audit of National Seed Service and relevant ORD records. The important questions will be the evolution of seed sales and the evolution of income for seed versus outlays for seed production.

2. Socio-economic indicators - The indicators for the socio-economic targets will be gotten from a tabulation of the data on annual seed surveys. To provide the data necessary for evaluation purposes, the survey should be amended slightly. The administration of the surveys should be randomized. The sample universe would probably have to be limited to the contact producers and the follower producers. There is no way to include the so-called "other" producers. The assumption would, therefore, have to be that the benefits of the project largely accrue to the first two classes of producers. This is a fairly reasonable assumption, in fact. If the sample were randomized it would be possible to get an accurate picture of the numbers of beneficiaries and the patterns of seed acquisition and use for the collective family fields only. It is desirable to acquire comparable information from all the fields cultivated by any member of the producer family. Surveyors should go through the form with the family head and then ask him if there are any members of his family, men or women, who cultivate satellite fields. Each cultivator of a satellite field should be surveyed as well. The relationship to the family head should be noted as well as the sex of the cultivator. Finally, a question should be added to the seed survey to record what seed is acquired for cash and what seed was acquired on credit. Was the seed acquired on credit purchased through the ORD, from a grain merchant or from a neighbor or family member?

D) Planning Assumptions

The most important assumption in the project is that farmers will recognize production advantages in the acquisition of certified seed. It is also assumed that they will have the means, either cash or credit, to acquire the seed to meet their needs at prices that enable the National Seed Service to meet its financial obligations.

It is assumed that the market qualities and culinary qualities of the selected varieties will not be inferior to

those of currently used varieties and that research institutions will continue to develop high quality seed. It is assumed that the Hauts-Bassins ORD has an extension system to reach producer families and that it has the administrative capacity to produce certified seed. It is assumed that a parallel women's extension program will be active in appropriate zones. Finally, it is assumed that the GOUV will meet conditions precedent regarding pricing policy and provision of trained personnel.

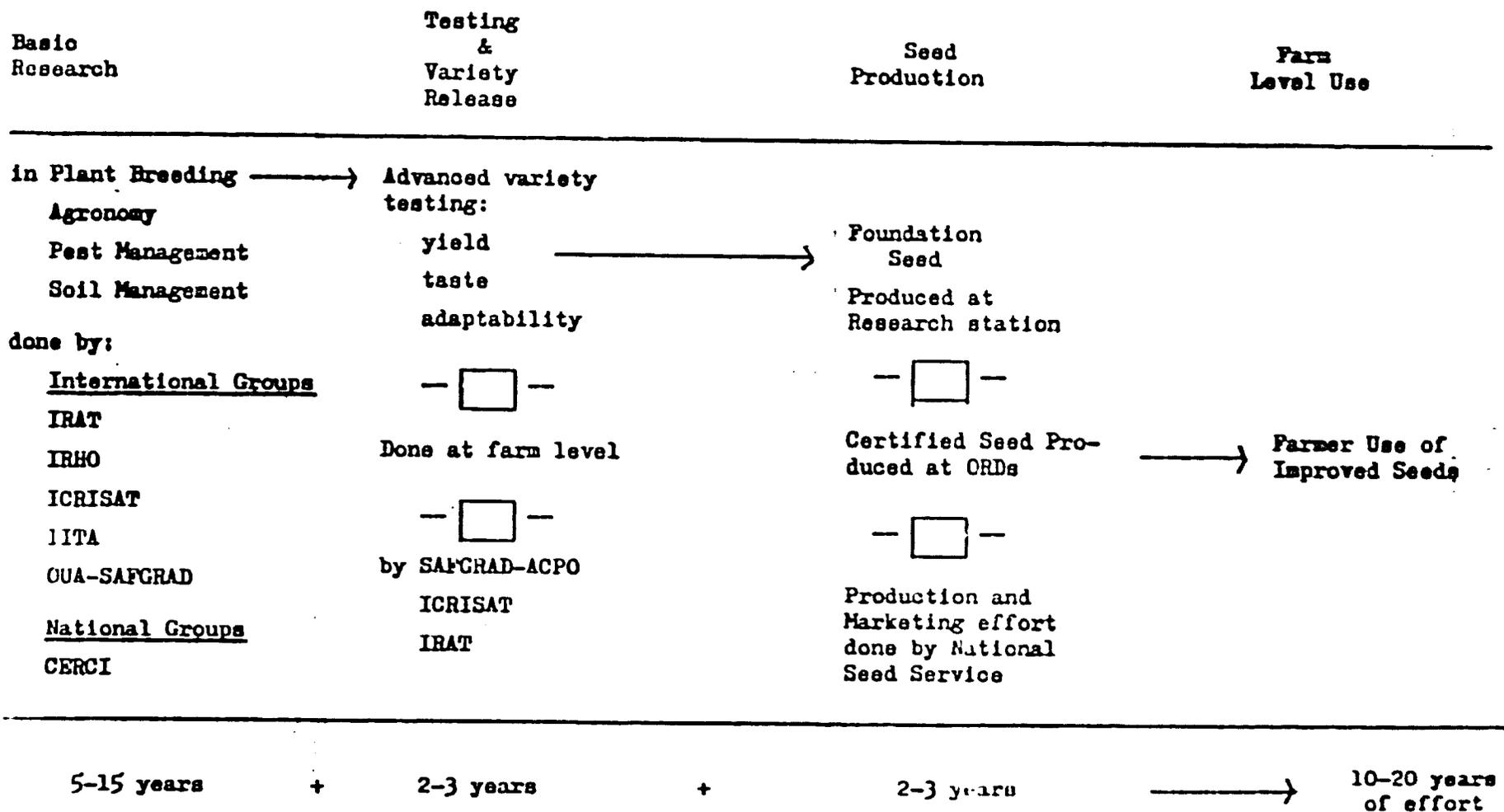
E. Causative Factors

1. Project-specific targets - A potential cause of failure to meet the project-specific targets would be that the NSS is unable to raise its prices to the producer substantially without discouraging demand. That would throw financial viability of the project into question. Producers will resist the price rise or even resist purchase of seed at present prices if they felt the seed gave them no advantage. This would be a function of the quality or qualities of the seed.
2. Socio-economic targets - A failure to meet the socio-economic targets could be caused by limitations of the extension system, limitations of credit purchase and/or the failure to develop viable strains of subsistence food crops.

II. Arrangements for Evaluations

The evaluation team should consist of at least one seed technologist, one economist and one sociologist/anthropologist. They should arrive in May, 1983. At that point they should have access to the seed records through the 1982 seed buying campaign. They should also have access to the 1980-1982 seed use surveys. The team will need no more than two to three weeks to gather its data and one to write its report.

LIFE OF A NEW VARIETY
in Upper Volta



SUPPLEMENTARY ANNEX J

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SUPPLEMENTARY ANNEX K

Equipment procured under Phase I

<u>1. WAREHOUSE EQUIPMENT</u>	<u>Quantity</u>
Bag Trucks	20
Bag Closers	6
Automatic Bagger-Weighter	3
Platform Scales	6
Conveyer, Bag	5
Bucket Elevator	1
Seed Treater	1
Generator 9 KW	6
Air-Screen Seed Cleaner	7
Peanut Seed Cleaner	1
Thiram-Seed Treatment	200 lbs
<u>2. LAB EQUIPMENT</u>	
Desk Lamp w/Magnifier	2
Grain Sample Pans	37
Germinator	6
Oven, Drying	1
Sling Psychrometer	3
Grain Scales	6
Boerner Seed Divider	1
Purity Boards	2
Hand Sizing Screens	1 set
Sample Envelopes	3,000
Grispero for Germination	72
Blotter Paper	25 rms
Bag Triers	7
Moisture Testers	6
Seed Purity Blaver	7
Vacuum Cleaner	1
Torsion Balance	3
Stereo Microscope	1

3. FIELD EQUIPMENT

Quantity

Vehicles

4-Wheel Drive Vehicles	2
Station Wagon	1
Pick-ups	9
Mobylettes	3
Tractors	8

Farm Equipment

5 T Wagons	8
Fertilizer Spreaders	8
Threshers	7
Seed Drills	8
Harrow, Spiked Tooth	4
Tandem Disc Cultivator	4
Mouldboard Plows	8
Kidger	1
Disc Plow	7

Fertilizer

475 T

SUPPLEMENTARY ANNEX I

TOTAL SEED PRODUCTION, UPPER VOLTA 1974-1979

ANNEX I

Under USAID Seed Multiplication Project (686-0202)

NATIONAL SEED PRODUCTION
(1974-79)

	YEAR OF PRODUCTION (IN Kg)						TOTAL (Kg)
	1974	1975	1976	1977	1978	1979	
WHEAT	16,700	11,100	6,000	12,487	20,958	3,125	70,370
SOYBEANS	25,100	26,000	23,248	33,007	29,800	4,350	151,505
CORN	14,100	22,558	14,041	24,478	51,508	5,276	131,961
PADDY RICE	--	200,170	129,484	268,687	235,618	38,546	872,505
GROUNDNUTS	220,500	210,260	71,549	52,941	33,850	37,749	626,849
SOYBEANS	6,000	--	8,725	17,043	35,995	3,619	71,382
COYBEAS	--	--	760	2,604	7,000	1,160	11,529
SESAME	1,000	--	8,544	--	751	--	10,295
TOTAL	283,400	470,088	262,231	411,247	425,480	93,825	1,946,391

Source: Direction des Services Agricoles, Service National de Semences-Annual Reports on Seed Production.

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SUPPLEMENTARY ANNEX M

ESTIMATED INCREASES IN PRODUCTION BY CROP DUE TO UTILIZATION

ANNEX M

OF PROJECT-PRODUCED SEEDS IN UPPER VOLTA, (1975-79)

CROP	Yields-Local Varieties kg/ha	Yields-Improved Varieties, kg/ha	Yield Difference kg/ha.	Seeds Actually Planted kg.	kg/ha	Corresponding Surface Area (ha)	Increase in Production (T)
MILLET	500	700	+200	42,222	15	2,814	563
SORGHUM	650	1,000	+350	98,478	15	6,565	2,298
CORN	700	1,500	+800	105,569	40	2,639	2,111
PADDY RICE	950	1,900	+950	828,870	120	6,907	6,562
GROUNDNUTS	800	1,500	+700	595,507	100	5,955	4,169
SOYBEANS	800	1,200	+400	57,106	40	1,428	571
COWPEAS	450	800	+350	5,147	35	147	51
TOTAL				1,732,907		26,455	16,325

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Estimate of Effective Farm Utilization Percentage for Improved Seeds by:

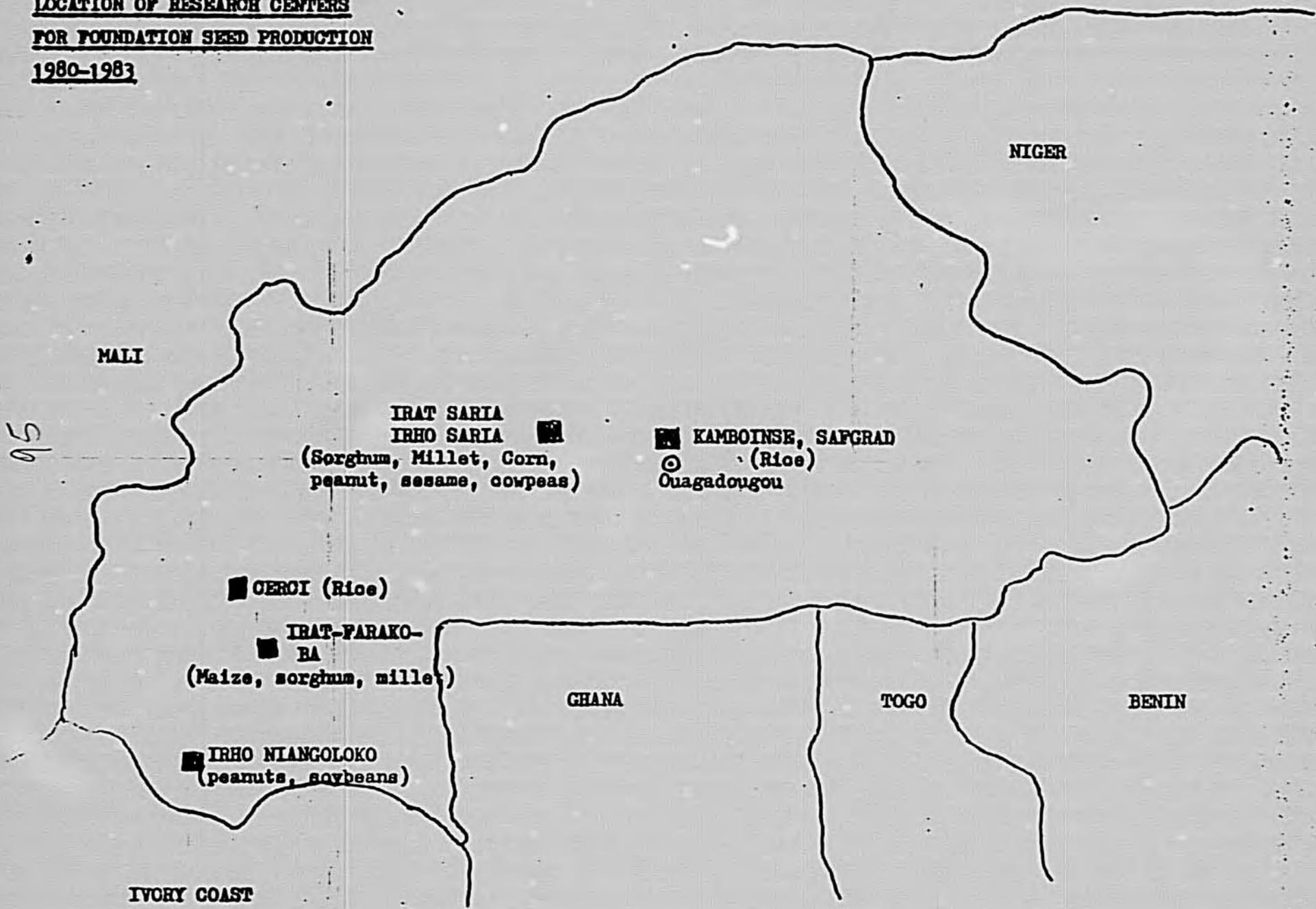
Millet 60%	Paddy Rice 95%	Cowpea 50%
Sorghum 65%	Groundnut 95%	
Corn 80%	Soybean 80%	

SOURCE: Direction des Services Agricoles, Service National de Semences

LOCATION OF RESEARCH CENTERS
FOR FOUNDATION SEED PRODUCTION
1980-1983

SUPPLEMENTARY ANNEX K

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PRODUCTION SUBSIDIES FURNISHED BY USAID

ANNEX O

TO PRODUCTION CENTERS: 1975-1979
(000 FCFA)

	<u>IRAT</u> <u>Farako-Ba</u>	<u>IRAT Sarria</u> <u>IRHC Sarria</u>	<u>IRHO</u> <u>Nyangoloko</u>	<u>Kamboinse</u>	<u>ORD</u> <u>Ouaga</u>	<u>ORD</u> <u>Fada</u>	<u>ORD</u> <u>Banfora</u>	<u>ORD</u> <u>Vallee du Kou</u>	<u>TOTAL</u>
1976	--	583	583	583	583	583	583	1,116 3,920	8,534
1977	1,500	1,500	1,500	1,100	500	500	500	1,200	8,300
1978	2,500	2,000	1,200	1,200	500	--	--	2,000 2,500	11,900
1979	5,197 <u>1/</u>	--	346	2,630	--	--	--	1,085	9,258
TOTAL	9,197	4,083	3,629	5,513	1,583	1,083	1,083	11,821	37,992

Figures are shown in thousands of F.CFA
CFA 200/\$1.00

1/ Includes 1979 money for Sarria

SUPPLEMENTARY ANNEX O

9/6

DRAFT
SEED MULTIPLICATION
PES**13. Summary**

The Seed Multiplication Project is making progress towards achievement of its stated purpose. The National Seed Service (NSS) has been established and is functioning as well as can be expected given the constraints under which it must operate.

The NSS was charged with the responsibility for the overall administration of a national seed program including the planning of seed production, specific technical services, training and seed quality control. Additionally, it was to serve a coordinating role with the organizations in Upper Volta engaged in research, production and extension activities.

One major constraint has been the continuing government-wide problem of inadequate numbers of trained personnel for assignment, specifically there is a tremendous lack of lower level agricultural agents - those to serve as encadreurs, production and field managers, and seed inspectors. The NSS, with one lab technician, has made a start on a quality control program, but still lacks personnel in the field inspector category, a minimum of two are needed urgently, as well as a qualified Chief of Seed Production and a qualified Chief of Quality Control. One U.S. technician, an agronomist, is presently working on the project and has established a very good working relationship with his Voltaic counterparts. His efforts have been instrumental in moving the project forward. However, one important area yet to be addressed is that of field demonstrations of improved varieties by NSS personnel at the farm level. Again, a lack of trained Voltaic personnel has been a factor.

An additional issue yet to be resolved is that of a pricing policy. Prices are now set according to food price policy; 30% above official grain price for cereals, 15% above official grain prices for peanuts. A policy change being considered would allow foundation seed to be sold at up to six times official grain market prices and "certified" seed at up to three times official grain market prices. Voltaic personnel working with the project in the NSS and OEDs are well-motivated and enthusiastic which augurs well for future project efforts.

14. Evaluation Methodology

The evaluation was conducted in conjunction with PID preparation for a follow-on Foundation Seed Production project. The primary purpose was to assess progress towards achievement of purpose and ascertain the need for continued AID assistance to the National Seed Service in the form of a follow-on project.

This was an in-house review conducted by USAID/Upper Volta. Discussions were held with the National Seed Service Director and his staff, as well as with individuals working at the Karboinse Research and Farako-Ba research stations, and the Bobo-Dioulasso ORD, who are associated with this project.

15. External Factors

Inadequate numbers of trained Voltaic personnel and initial difficulty in securing the services of French-speaking U.S. technician advisors by USAID hampered project implementation progress. The commitment to provide personnel by both the GOUV and USAID seemed to have been genuine, but getting personnel assigned to the project presented a formidable undertaking. Indication are that the National Seed Service will have four new graduates from Matourkou assigned as field inspectors in June. This should alleviate significantly one aspect of the personnel constraint and enable a more active and obvious presence by the National Seed Service at the ORD level.

Assumptions as put forth in the original project design remain valid with two exceptions. The National Seed Committee was formed by the GOUV. However, it has never met and performs no useful function in the seed program for Upper Volta. It was originally envisioned as an advisory committee relating to the national seed program in terms of policy decisions on production, marketing, pricing, and subsidies. A second group, a Technical Advisory Committee composed of the Director of Agricultural Services, Director of the National Seed Service, research organizations, field station seed production units, ORD Directors and rural economists has never been formally constituted. The primary functions of this group were to have included selection of seed varieties to be produced and distributed, estimate future varietal demands, and approve quality field and laboratory standards concerning quality control. The functions envisioned for this committee are in fact being performed at a annual gathering of the NSS, research organizations and ORD representatives.

Individuals connected with the project are of the opinion that it is very unlikely that either of these groups will even be functioning entities in the seed program. The Director of the NSS suggests that the Director of Agricultural Services should decide policy issues (production, marketing, price stabilization, etc.) on the advice of the NSS. The Director of the NSS appears to be a very capable individual and knowledgeable on these issues, and such a change would help streamline seed production operations. The Ministry of Rural Development would then promulgate the policy.

16. Inputs

The project is now in its final year of implementation. AID inputs consisted primarily of technical assistance, commodities, production center operating funds, and funds for training. Production center operating funds are still being provided by project funds; in 1979 \$40,000. It is highly unlikely that the GOUV is capable or willing to provide this amount on a continuing basis assuming that there would be no follow-on AID project. Project funds have been utilized to subsidize seed production costs. Seed prices, both foundation and certified, have been pegged to official market grain prices and at an artificially low level which has been insufficient to cover production costs. However, a change in seed pricing policy will allow seed production costs to be covered. The new policy will allow foundation seed to be marketed at three to six times official market grain prices and certified seed at two to three times official market grain prices.

Timeliness of inputs has been a significant problem since its inception. The project originally called for the services of three middle-level Voltaic technicians and two U.S. technical advisors. The National Seed Service has a chief, an assistant to the chief and a lab technician. The assistant to the Chief is handling the function of Production Chief, but full-time Chiefs of Production and Quality Control still have not been recruited.

A major point made by the Bobo-Dioulasso ORD Seed Multiplication Officer was that there wasn't sufficient inspection of activities at the ORD level by NSS personnel. This is a manifestation of the NSS's personnel problem. The intent was to field NSS inspectors at the ORD level to ensure adequate technical supervision of multiplied seed production for a certification-type program. Inspectors need to be recruited and trained.

The first U.S. advisor (other than the USAJD project manager), a seed processing/marketing technician, arrived in 1976 and had little impact on the project's development other than of equipment procurement. He spoke very little French and was unable to adequately communicate with his Voltaic colleagues. The second technician, a French-speaking agronomist, arrived in 1979. Since his arrival a closer working relationship with the National Seed Service, research stations and involved ORD personnel has developed. He has opened a direct line of communication with SAFGRAD administrators and scientists. As a result, the seed production sector is now being explored in SAFGRAD conferences. The NSS is in a direct line between plant breeders from research organizations and the farmer. The USAID agronomist has also established a concrete link between IRAT and the NSS through frequent direct contact with IRAT scientists and workers. In the same vein, personal contact has been made with the ICRISAT sorghum and millet breeders at Kamboinse. Mr. Joseph Kabore, the Director of the DSA has indicated that a great improvement has occurred over the last year in USAID/DSA relations due to the frequent contact with the USAID agronomist. Accelerated interest in project activity and success has resulted as more frequent personal contact has been fostered.

All major commodities have been received except for spare parts for the Clipper Seed Cleaners and the two Chevy Blazers. The need for some items, including automatic bagger-weighers, large aluminum bag conveyors, vacuum cleaners, and generators was seemingly misjudged as they remain unutilized. The other farm equipment and vehicles have been utilized and some are in need of repair or replacement. Remaining project funds should be utilized to insure that there is adequate operational equipment for the seed production program during the next three to four years.

The following table recapitulates the status of project funds as of December 31, 1979:

	<u>Obligated</u>	<u>Disbursed</u>	<u>Unliquidated</u>
Technical Assistance	\$232,464.51	\$145,700	\$ 86,764.51
Commodities (Agr. Equipment, Vehicles)	729,000	540,327.08	188,672.92
Training	39,000	15,181.72	23,818.28
Other Costs (warehouse construction, opera- ting funds, etc.)	<u>660,000</u>	<u>433,428.51</u>	<u>226,571.49</u>
Unearmarked	\$ 218.21	---	\$ -218.21

Since all project commodities have been received the only accruals against remaining project funds will be for technical assistance. The balance of about \$500,000 should be used, as noted above, for replacement equipment and spare parts.

17. Outputs

During the project to date (thru 1979) 1,900 MT of various seed varieties have been produced - both foundation and multiplied. Adequate records were not kept to indicate how much of each was produced. Determining demand has proven to be a continuing problem, which in one instance resulted in the sale of 100 MT of rice seed on the food grain market. Given the small margin between seed prices and official food grain - no more than 30% - as set by the GOUV in the past, it is possible that additional seed has ended up as food. How much is not known. The price policy change noted earlier should preclude this happening in the future.

A related problem has been the financing of seed purchases by ORDs from the foundation seed production centers. In the past, credit purchases by ORDs has resulted in non-payment. As noted previously project funds have been used to offset this loss thru subsidies to the seed production centers. All future seed transactions for foundation seed will be in cash.

No field trials or demonstrations have been conducted by NSS personnel. The NSS has had no personnel to do so. However, extension agents in the Bobo ORD are working with IRAT in this regard.

Training, on a modified scale, has been provided. The Chief of the NSS received three months of U.S. training rather than an academic year as planned. Training has been provided to 10 of the 24 encadreurs contemplated, but to 11 instead of four ORD Seed Multiplication officers. Training for NSS inspectors can take place only after low-level agricultural agents are assigned to the Service. To date the assignment of these personnel has been a major drawback to the NSS taking an active role in conducting demonstrations of improved seed varieties. As a result, this is one area of project outputs which has not been realized, and one for which the need is obvious.

Construction on the last nine warehouses contemplated under the project was completed in 1979. The equipment package, as modified with additional seed cleaning equipment, is in place and operational.

18. Purpose:

The purpose of the project is "to establish a National Seed Service (NSS) to assure a constant source of seed to the farmer and to provide the organizational framework for multiplying improved seed of superior varieties". Research stations were to develop, introduce and evaluate improved varieties and produce foundation seed. The four ORDs selected to participate in the project 1/ were to identify seed demand, multiply foundation seed, conduct farm level demonstrations of new varieties, distribute seed of known quality and provide extension services to assure appropriate use of new varieties. At the present time, only the Bobo-Dioulasso ORD is actively involved with the NSS seed multiplication activities under this project, and is basically carrying out the above noted functions. A primary reason for project operations continuing in Bobo is the dedication and effectiveness of its seed multiplication officer. The NSS has been established and is functioning. Since the beginning of the project over 1,900 MT of seed have been produced under its auspices. A continuing problem is that of determining demand for seed, especially

1/ Bobo-Dioulasso, Fada, Banfora and Ouagadougou.

foundation seed which must be determined three years in advance of multiplied seed sales to the farmer. At the time of this review, EOPS pertaining to establishment of an institutional framework, seed multiplication activities, training, assistance to ORDs and agricultural research are very near to being realized. The National Seed Committee is the major exception. The Committee, as such, has never convened. Its envisioned role continues to be performed by an annual meeting of the NSS, research stations, the AVV, and ORDs to determine seed supplies and needs.

There are many different opinions concerning the exact role and importance of seed legislation in a country such as Upper Volta. The NSS has concluded as a result of recent visits to other West African countries that an effective seed law cannot be drafted and implemented until seed trade and marketing has been well developed. They see no need for preventive law making. However, efforts are underway to establish certain guidelines, and restrictions on seed production, marketing and pricing. This is a long-term process of which the NSS finds itself in the very initial stages.

19. Goal:

The goal which this project addresses is "increase domestic food production in Upper Volta". There is, at present, no verifiable means to assess the direct impact of this project on food production. No 100 percent reliable compilation of the number of farmers utilizing improved seed is available, nor on how many hectares it is being grown. Estimates based on statistics supplied by the Directorate of Agricultural Services indicates that 15,000 tons of the increase in the total food crop production of Upper Volta from 1975-1979 can be attributed to utilization of improved seed produced under the auspices of this project. Research on sorghum and millet seed, the two primary staples, has not made a significant improvement on varieties presently grown by Voltaic farmers. However, improved varieties of rice, corn, groundnut and cowpea seed have been developed and there appears to be a growing demand for them. While the quantity of seed produced and sold to farmers can be tabulated, there has not been follow-up to determine how much of the seed has been actually utilized as seed. This information, for two ORDs, will be gathered through an intensive seed survey at planting time (May-June). Because of pricing policy, the cost of the seed has been virtually the same as that of food grain on the market. In addition, because an effective system for

determining seed demand has not been developed, present means of determining that demand are less than accurate.

20. Beneficiaries:

Primary beneficiaries are the small farmer families who utilize the improved quality seed. As noted previously, an accurate count of those farmers has not been compiled as it was thought that data was not available. During this review, sources of data were identified and it is expected that a definitive read-out on beneficiaries will be prepared. Discussions with the Bobo ORD Seed Officer revealed that lists of credit seed sales, which amount to about one half the total sales, are available, as are lists by sub-sectors within the ORD, of people requesting seed.

An estimated 16,000 farmers have utilized improved seed made available through the project. Again, because of insufficient pre-planning for data collection and lack of personnel, the magnitude of benefits can not be adequately assessed. In that there is a demand for the improved seed and research results indicate increased productivity of improved seed over unimproved, it seems reasonable to assume increased productivity has resulted. A more concerted and refined effort is required to obtain a realistic quantification of that increase in productivity and its effect on the beneficiaries.

21. Unplanned Effects: N/A

22. Lessons Learned/Special Comments:

This project, in the view of a Voltaic involved in its design, was designed too quickly, was too ambitious, and wasn't based on an adequate envisagement of the problems. The design for a follow-on project in Upper Volta should focus on the experience gained during the five years this project has been in implementation. One of the main problems initially was the lack of operating funds for the ORD seed multiplication units. When moneys were provided, an accounting procedure had not been set up. As a result, AID funds were mixed with general ORD funds with no immediate way of determining for what the AID funds had been utilized. Fortunately, this problem is being resolved through the adoption of a special accounting procedure similar to that used by the CILSS and the FDR for AID funds.

A follow-on project should zero in on foundation seed production and assure quality control. Seed multiplication should be left to the ORDs.

Training provided under this project may have benefitted the individuals receiving it, but because most of the trainees returned to assignments only tangentially connected with the project, the benefit to the project of this training has been diminished. There should be firm assurances that any personnel, trained under the auspices of a follow-on project will be required to work on activities connected with the project following completion of that training.

It is essential that technician/advisors assigned to projects in Upper Volta have at least a working knowledge of French. The view was expressed that it was more important for a person to be able to communicate directly, even though less experienced technically, than to be technically experienced but without the language capability. Consultants could be brought in as needed to assist both the advisor and the Voltaics. It's an interesting view-point and should be given some careful thought, especially if such a dichotomy should require resolution in the future.

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1. Veuillez au dessus du questionnaire indiquer le nom du village, le nom du Chef de famille et le nom de la personne chargée de remplir ledit questionnaire.

SUPPLEMENTARY
ANNEX Q

SEED SURVEY
QUESTIONNAIRE

2. Remplir les cases numérotées de la gauche vers la droite. Prière de le faire avec les codes appropriés.

ENQ 1 1
ORD 10111
SEC 1 1 1 (1 - 5)
S/SEC 1 1 1 (1 - 24)
U.E 1 1 1

ANNEE 1 1 1 9 1 8 1 0 1

N° Vil 1 1 1 pour chaque sous secteur
N° Expl 1 1 1 1 pour chaque encadreur

3. Case 19 1 1 Utilisez vous des animaux de trait pour vos cultures ?
19

Réponse : Oui - 1 Non - 2

4. En haut du tableau que vous avez sous les yeux figurent horizontalement des désignations, et sous chaque désignation figurent verticalement des colonnes comprenant des cases en blanc.

Prière poser les questions suivantes et remplir les cases selon les réponses obtenues et selon le code ci-dessous. Des séries de questions devraient être posées pour toutes les variétés des espèces que le paysan sème.

• Sous la colonne (1) utiliser le code suivant pour les espèces et les variétés :

		ESPECE	VARIETE
<u>MIL</u>	Mil P-8 ou Synthétique 71.....	01	01
	Mil 12.....	01	02
	Mil de Sirakore.....	01	03
	Mil de Séfa.....	01	04
	Mil local.....	01	09
<u>SORGHO</u>	S 29.....	02	01
	Ouédzouré.....	02	02
	Gnofang.....	02	03
	139-2.....	02	04
	135-4.....	02	05

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RIZ

Frécha.....	02	08
E 31.....	02	09
VS 702.....	03	01
Sorgho 10.....	03	02
C 74.....	03	03
Gambiaka.....	03	04
Dourado.....	03	05
IR 15-29.....	03	06
VIJAYA.....	03	07
Sintane Diofor.....	03	07
IRAT 10.....	03	09
Riz local.....	03	09

MAIS

Massayomba.....	04	01
Jaune de FC.....	04	02
Jaune Flint.....	04	03
Synthétique Jaune.....	04	04
IRAT 80.....	04	05
Maïs local.....	04	09

ARACHIDE

KH 149 A.....	05	01
241-D.....	05	02
R M P 12.....	05	03
R M P 91.....	05	04
TS 32-1.....	05	05
Te 3.....	05	06
Arachide locale.....	05	09

SOJA

G 115.....	06	01
G 121.....	06	02
G 5.....	06	03
Jupiter.....	06	04
Cobbs.....	06	05
Davis.....	06	06
Soja local.....	06	09

NIEBE :

88-63.....	07	01
KN-1.....	07	02
Niébé local.....	07	09

SESAME :

38-1-7.....	08	01
Sésame local.....	08	09

Questions à poser :

- 1 . Espèce : Exemple Riz 10131
- 2 . Variété Exemple C 74 10111
- 3 . Source Vous-même.... 1
 - Famille..... 2
 - Marché..... 3
 - ORD..... 4
 - Autres..... 5

4 . Quantité de semences utilisées cette année par variété (en kg)
 exemple : 100 Kg de sorgho S 29 1110101

Pour les semences améliorées

- 5 . Superficies 0 - 1/4 ha - 1
 - 1/4⁺-1/2 ha - 2
 - 1/2⁺-3/4 ha - 3
 - 3/4⁺-1 ha - 4
 - 1 - 2 ha - 5
 - Au dessus de 2ha - 6

6 . Quantité utilisée de semences améliorées(en kg)
 Exemple : 110 Kg de Riz utilisés cette année 1110101

7 . Montant total des achats de semences améliorées (F CFA)
 Exemple : 8 000 F CFA payé 181010101

Pour les semences locales achetées

- 8 . Source : Marché..... 1
 SEE #5 ORD..... 2
 Autres..... 3

9 . Quantité de semences locales achetées (en kg)

10 . Montant total des achats de semences locales (en F CFA)

MISSISSIPPI STATE UNIVERSITY
Academic and Training Programs
in
Agronomy-Seed Technology
SEED TECHNOLOGY LABORATORY
AGRONOMY DEPARTMENT

Background

The definition and concern of Seed Technology varies widely among institutions, authors, and countries. At MSU Seed Technology encompasses all the technical and support activities involved in the production and supply of seed: production, harvesting, conditioning, processing, storage, testing, quality control, distribution, and marketing. Although agronomic crops such as corn, cotton, rice, sorghum, wheat, other cereals, soybeans and cowpeas receive major emphasis, attention is also given to seed of forage and pasture, vegetable, and forest species.

The Seed Technology Laboratory (STL) is a section of the Agronomy Department. Crops and Soils are the other sections. While the STL is an integral part of Agronomy, the program in seed technology at MSU has been multidisciplinary since its beginning in 1950. The Departments of Agricultural and Biological Engineering and Agricultural Economics are major, long-term cooperators. Other departments, laboratories, and agencies located at MSU participate in various seed research projects, training courses, graduate study programs, and service work. These include the Mississippi State Seed Testing Laboratory, Mississippi Seed Improvement Association (certification agency), Foundation Seed Stocks, Forest Tree Seed Laboratory (FS, USDA), Extension Agronomy Department (CSES), and the Departments of Horticulture, Biochemistry, Forest Resources, and Plant Pathology and Weed Science.

The seed technology program at MSU has a three-fold purpose: teaching/training, research, and service. Teaching/training activities are discussed in the next section. Research is conducted within the Mississippi Agricultural and Forestry Experiment Station (MAFES), and covers most areas in the field of seed technology. Special emphasis, however, is given to the areas of seed drying, processing, storage, quality evaluation and control (including testing). Research is organized on a project basis and is supported by state, federal, and grant funds.

The STL provides a variety of services to seed producers and suppliers: advice and assistance on seed operations; informational materials; individual training programs; short courses; and problem identification. Under terms of contractual agreements with the U.S. Agency for International Development, the services of the type mentioned above are available to cooperating countries - mostly underdeveloped countries - around the world.

BEST AVAILABLE DOCUMENT

Teaching

Specialized Training Courses

The Seed Technology Laboratory offers two non-academic training courses each year. For U.S. seedsmen, a three-day Short Course for Seedsmen is held each year, usually in April. This Short Course uses a conference/workshop/demonstration format to communicate the latest technical developments in seed technology to persons involved in various activities in the seed industry.

In June-July, a six-week Seed Improvement Course is offered for international participants. This is an intensive course designed to train seed workers from the underdeveloped countries in the important technical and managerial elements of a seed program/industry. The Seed Improvement Course is organized and programmed by the USDA and AID.

Undergraduate (B.S. Degree) Program

Two specialized "seed" curricula are offered by the Agronomy Department. Both are based on the traditional Agronomy major with course work emphasis in the several areas of seed technology during the junior and senior years. The curricula are: Seed Technology, which is intended to prepare students for professional careers in the seed industry and related fields; and Seed Science, which is intended to prepare students for graduate studies and research careers. Although the Seed Technology curriculum emphasizes the development of professional skills, graduates with good grades and an appropriate selection of electives are well qualified for graduate study.

Graduate Programs

Graduate programs in Agronomy and Seed Technology are offered to qualified students at the M.S., Ph.D., and non-degree study only (non-degree) levels. The minimum requirement for admission to the Graduate School for advanced studies in Agronomy-Seed Technology are: (1) a B.S., B.A., or equivalent degree from a fully recognized 4-year educational institution; (2) an adequate background of courses in Agronomy and the Plant Sciences; (3) a grade point average of 2.50 out of 4.00 points (maximum) or equivalent, for the junior and senior years of the undergraduate program, or a minimum score of 800 on the Aptitude Test of the Graduate Record Examination.

M.S. Degree

For the M.S. degree a minimum of 30 semester hours of course work is required, one half or more of which must be made up of courses at the 8000 and 9000 levels, exclusive of thesis research and thesis for which 6 semester hours are earned. In practice, most M.S. degree students in Agronomy-Seed Technology take 36 to 40 semester hours, of which 3 to 10

... courses required to correct deficiencies in ... and background.

Facilities, equipment, and field plots are available for conducting thesis research in most areas of seed technology. Students holding graduate assistantships generally select some phase of an on-going STI research project for their thesis. Insofar as possible, international students are encouraged to select thesis problems that are relevant to the situation and needs in their countries.

Ph.D. Degree

The requirements for admission to a graduate study program leading to the Ph.D. degree in Agronomy-Seed Technology are the same as for the M.S. degree, except that in addition, the applicant must possess qualifications which, in the opinion of the Head of the Agronomy Department, the Agronomy Graduate Studies Committee, and the Dean of the Graduate School, indicate ability to do work at the doctoral level.

A minimum of three academic years beyond the B.S. degree are necessary to meet the course requirements. The actual number of semester hours required will vary according to the applicant's background, and his specific interest. Students working for the Ph.D. degree must select at least one minor field of study.

The foreign language requirement for the Ph.D. degree can be fulfilled in three ways: demonstration of a reading knowledge of two modern foreign languages by standard test or by passing two "reading courses" for each language with grade of at least B; or demonstration of a reading knowledge of one modern foreign language in manner indicated above, and completion of two courses (six semester hours) of advanced work in a collateral field with grades of at least C, in lieu of the second language.

Candidates for the Doctorate are required to prepare and present a dissertation demonstrating a mastery of research techniques, and a distinct contribution to the field of investigation or study. A minimum of 20 semester hours must be scheduled for dissertation research and dissertation.

The comments above regarding thesis research are also applicable to dissertation research.

Graduate Programs and Course Offerings

A formal graduate studies program is developed by the student and his major professor and graduate program committee during the first semester of enrollment in the Graduate School. The course composition of the graduate program varies with the student's specific interests, background, and degree objective. The courses included in the graduate program are most often selected from among those listed below. Those underlined are generally required for Agronomy-Seed Technology graduate programs unless taken as advanced undergraduate at MSU or other institutions.

DEST AVAILABLE DOCUMENT

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AGRONOMY-CROPS and AGRONOMY-SEED TECHNOLOGY:

AGN	6123	Grain Crops
AGN	6203	<u>Seed Production 1/</u>
AGN	6213	<u>Seed Analysis</u>
AGN	7103	Plant Breeding
AGN	7213	<u>Seed Technology</u>
AGN	7263	<u>Seed & Grain Conditioning & Storage</u>
AGN	8113	Advanced Plant Breeding
AGN	8203	<u>Seed Physiology</u>
AGN	8123	Crop Ecology
AGN	8163	Crop Plant Metabolism (Crop Physiology)
AGN	8703	Methods in Agronomy
AGN	8000	Thesis Research and Thesis (6 hrs.)
AGN	9000	Dissertation Research and Dissertation (21+hrs.)

AGRICULTURAL AND BIOLOGICAL ENGINEERING:

ABE	6163	Agricultural Machinery Management
ABE	6364	Agricultural Structures
ABE	6863	<u>Seed Processing Machinery</u>
ABE	8863	<u>Seed Processing Plant Design and Mgmt.</u>

BOTANY:

BOT	6103	Taxonomy of Spermatophytes
BOT	6114	General Plant Physiology
BOT	6144	Plant Anatomy
BOT	8133	<u>Embryology of Angiosperms</u>
BOT	8163	Advanced Plant Physiology I
BOT	8173	Advanced Plant Physiology II

BIOCHEMISTRY:

BCH	7615	General Biochemistry
BCH	8205	Analytical Biochemistry
BCH	8143	<u>Phytochemistry (Ph.D)</u>

ENTOMOLOGY:

ENT	8552	Structural and Stored-Products Pests
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HORTICULTURE:

HO	8563	Post-Harvest Physiology of Horticultural Plants
HO	8523	Advanced Plant Propagation

PLANT PATHOLOGY AND WEED SCIENCE:

PW	8135	Diseases of Field Crops
PW	8143	Advanced Plant Pathology I
PW	8153	Advanced Plant Pathology II
PW	7713	Principles of Weed Control
PW	8713	Advanced Weed Science

ms Welch, Professor of Agricultural and Biological Engineering.
Ph.D., Oklahoma State University, 1965. Major Interest Areas:
seed harvesting, drying, processing, seed plant design.

Additional Information

Additional information on academic and training programs in Agronomy-
Seed Technology At MSU can be obtained from:

Seed Technology Laboratory, MSU
P.O. Box 5267
Mississippi State, MS 39762

The Graduate School, MSU
Drawer G
Mississippi State, MS 39762
(application forms, catalogs)

Office of International Programs
Agriculture and Forestry, MSU
P.O. Drawer NZ
Mississippi State, MS 39762
(prospective international participants, students,
international agencies).

STATISTICS:

- ST 8114 Statistical Methods for Biological Sciences
- ST 8214 Design and Analysis of Experiments

AGRICULTURAL AND EXTENSION EDUCATION:

- AEE 7103 Objectives and Procedures of Programs of Agricultural and Extension Education
- AEE 8203 Advanced Communication in Agricultural and Extension Education
- AEE 8243 Admin. and Supervision in Agricultural and Extension Education
- AEE 8503 Program Planning and Development in Agricultural and Extension Education

Faculty:

James C. Delouche, In Charge, Professor of Agronomy and Seed Technology. Ph.D., Iowa State University, 1961. Major Interest Areas: seed physiology, dormancy, storage, quality control, testing, vigor.

C. Hunter Andrews, Professor of Agronomy and Seed Technology. Ph.D., Mississippi State University, 1960. Major Interest Areas: seed production, quality evaluation, vigor, certification.

A.H. "Bill" Boyd, Professor of Agronomy and Seed Technology. Ph.D., Mississippi State University, 1974. Major Interest Areas: seed drying and processing, plant design and management; grain handling.

Warren C. Couvillion, Sr., Associate Professor of Agricultural Economics. Ph.D., University of Tennessee, 1973. Major Interest Areas: seed production/processing - costs and investments, feasibility studies for seed operations, marketing.

Howard C. Potts, Professor of Agronomy and Seed Technology. Ph.D., Texas A&M University, 1966. Major Interest Areas: seed production, varietal maintenance, weathering and weathering resistance, certification, management of seed operations.

Charles E. Vaughan, Professor of Agronomy and Seed Technology. Ph.D., North Carolina State University, 1969. Major Interest Areas: seed testing, quality control, morphology, weed seed.

Charles C. Baskin, Associate Extension Agronomist (grain crops and seed), and Associate Professor of Agronomy. Ph.D., Mississippi State University, 1970. Major Interest Areas: seed extension programs, seed production, testing, quality control, storage.

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SUPPLEMENTARY ANNEX S

TRAINING PROGRAM DESCRIPTION

Training Program

The NSS, with the assistance of the U. S. technical advisor, will coordinate a multi-dimensional training program designed to develop the necessary technical skills for those individuals directly involved in a seed program. The types of programs include an annual two-week seminar for seed production officers (25 agents each seminar), semi-annual one-week seed "awareness" courses for ORD and GOUV administrative personnel, a three-month session each year at IITA, Ibadan, Nigeria for two seed production agents at their Tropical Production Course, and two NSS agents will be recruited to participate in a two-year program in seed technology at Mississippi State University at either the B.S. or M.A. level. In addition, two NSS agents will participate each year in the USDA's Seed Improvement summer course.

A. Annual Technical Training for Voltaic Seed Production Officers

Each year in the fall or the spring, a two-week program will be given to those ORD agents responsible for seed production activities. Other organizations such as the AVV will also be invited to participate. Since Upper Volta's seed program is still in the beginning stages, many problems have yet to be resolved. Most of these revolve around the technical activities such as proper production techniques, harvesting, processing, storage and marketing.

During the two weeks, participants will concentrate on seed testing, seed certification and inspection, seed harvesting, air-screen seed separation, storage, use of various types of chemicals such as insecticides and fungicides, and basic program management. Significant time will be spent outside the classroom and on field trips to research stations (Kamboinse and Saria) and to farmers' fields. Printed technical material will also be supplied. As time goes on, these annual seminars will increase in depth and specialization. It is anticipated that 60 agents will participate during the life of the project.

B. Semi-Annual Seed Awareness Course

In the spring and in the fall, the NSS will sponsor a regional program of one week, whose purpose is to educate those administrative personnel responsible for decision-making in agricultural development at the ORD level. This course will complement the technical course by attempting to demonstrate to the participants the role and value of high quality seed of improved varieties as a key input for increased agricultural productivity.

The first program will occur in the spring of 1982 with the assistance of technical services from MSU Seed Program/Development Cooperative Agreement (AID/DSAN-CA-0148). Thirty Voltaics will participate in this and in each of the other sessions. The choice of sites will remain flexible. Topics of discussion will include qualities of good seed, seed program and infrastructure development, seed mentality vs. grain mentality, seed production, seed testing, quality control, processing and storage, marketing and pricing.

One can, therefore, see a two-level in-country training effort aimed at both field technicians and development administrators. If successful, a direct channel of information concerning seed will be established from administrators, to production officers, to extension agents, to the farmer.

C. Third Country Short-Term Training in Tropical Crop Production at IITA, Ibadan, Nigeria

Eleven ORD agents benefitted from a three-month training program at IITA in Phase I. The project anticipates sending 6 more agents, two each year, to participate in the same training program. The course concentrates on all areas of tropical crop production with a specific session on seed production and technology.

D. U. S. Training: Short-Term

Two NSS agents will be selected each year to participate in the six-week Seed Improvement Course sponsored by USDA and AID. MSU administers this program for international technicians. Held every June-July, the program attempts to provide exposure to the American seed industry for those individuals from foreign countries. Part of the time is spent in the classroom and seed technology laboratory at MSU, the remainder of the time is spent on extensive field trips in several states. As this program is very intensive, a good working knowledge of English is mandatory. It is therefore recommended that the two participants selected each year be given a one-month intensive course in English prior to departure. The Chief of the NSS is the only Voltaic to have participated in this program (1977).

E. U. S. Training: Long-Term

One key to the future success of Upper Volta's Seed Program is manifested by the existence of seed technicians with in-depth training in seed technology. At present, Upper Volta has no professionally trained seed technology personnel. To rectify this situation, two NSS agents will be trained to the B.S. or M.S. level in seed technology at MSU. See Supplementary Annex R on MSU Academic Training Program in Agronomy-Seed Technology for specific details on programming and course content. As previously mentioned, English proficiency is needed. Therefore, it is recommended that candidates selected be required to take a six-month intensive course in English prior to enrollment funded by the project.

TECHNICAL ASSISTANCE

SCOPE OF WORK, CONTRACTOR

A. Objective

The purpose of this contract is to obtain the services of an Agronomist/Seed Technologist to serve as a technical advisor to the Upper Volta National Seed Service and serve as principal project officer

B. Description of Services

1. The contractor shall provide advice on both long range and current program planning and implementation to increase the technical capability of the National Seed Service to operate its national seed program. In carrying out this responsibility the contractor will provide the following services:

- a) advise on the organization and operation of National Seed Service with reference to agronomic standard;
- b) gather data with respect to the supply and demand of improved seed. From this data, help formulate production plans;
- c) provide technical input for the formulation and implementation of a national seed policy;
- d) carry out technical liaison with research institutes, ORDs and the National Seed Service;
- e) advise on the organization and implementation of a seed quality control program including training of field inspectors;
- f) participate in training programs for seed technicians and Voltaic extension agents;
- g) participate in period evaluations of the project;

2. Service as project's principle officer with the following duties:

- Administer project activities under Division of Rural Development;
- Prepare all obligation and implementation documents; such as, Project Implementation Orders, Project Agreements and needed amendments;

BEST AVAILABLE DOCUMENT

- Procurement of commodities according to AID regulations and monitoring their purchase, transport to post, and final utilization by project;
- Maintain project filing system; be responsible for project traffic cable and correspondence communications with both the GOV and others;
- Participate as principal officer in quarterly financial reviews and periodic project review;
- Monitor financial activities of NSS accounts as managed by the Chief of the National Seed Service;
- Provide technical input into Mission's long-range agricultural planning strategy.

ANNEX U

PROJECTED VEHICLE USAGE 1981 - 1983

At the beginning of Phase II, there will be four vehicles in operation at the NSS. These are: one 504 station wagon used by the Chief, NSS, which is 4 years old (will need replacing in 1981), a 404 pickup also 4 years old, used by the Chief of Technical Bureau and in need of replacement in 1981; two Chevy Blazers both 18 months old, one used by the technical advisor, the other used by the inspectors. The following chart illustrates proposed vehicle designation for NSS staff for the next three years.

NATIONAL SEED SERVICE VEHICLE
DESIGNATION, 1981 - 1983

Vehicle	User	1981	1982	1983
504 station wgn	YAGO, Chief NSS	X		
404 pickup	ZOUNGRANA, Chief Technical Bureau	X		
Blazer #1	RACHMELER/USAID	X	X	X
Blazer #2	Inspector, NSS/Bobo	X	X	X
Jeep Cherokee #1	ZOUNGRANA		X	X
Jeep Cherokee #2	reserve			
Jeep J/20 p/up #1	Inspector/NSS		X	X
Jeep J/20 " #2	YAGO		X	X
Jeep CJ7 #1	Inspector/NSS		X	X
Jeep CJ7 #2	Inspector/NSS		X	X

ESTIMATED MILEAGE, 1981 - 1983

VEHICLE	1981	1982	1983
504 station wagon	12,000	10,000	
404 pickup	10,000	10,000	
Blazer No. 1	12,000	12,000	12,000
Blazer No. 2	12,000	12,000	15,000
Cherokee No. 1		6,000	15,000
Cherokee No. 2		6,000	15,000
Pickup No. 1		6,000	15,000
Pickup No. 2		Reserve 1/	Reserve 1/
Jeep No. 7		Reserve 1/	12,000
Jeep No. 2		Reserve 1/	12,000
TOTALS	46,000 km	62,000 km	96,000 km

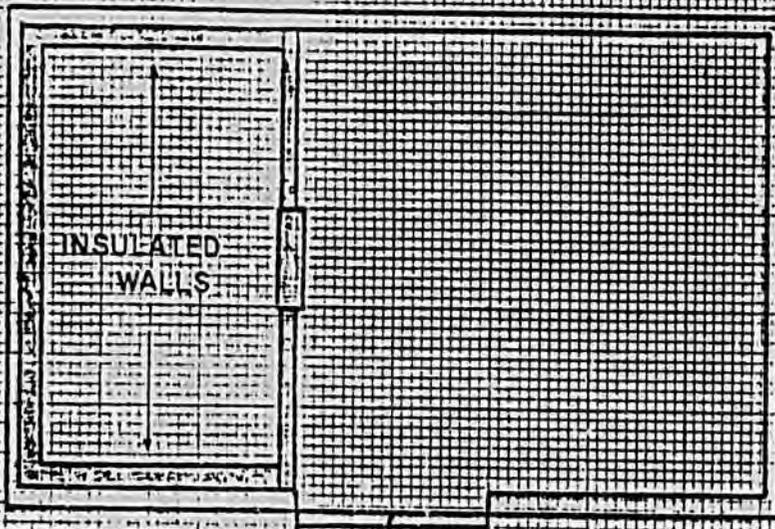
1/ Use depends upon condition of the other vehicles, particularly the 504 and the 404.

MOPEDS:

During 1981, there will be no means of transportation for agents of NSS as they wait the arrival of new project vehicles scheduled for delivery in early 1982. Therefore, three agents at NSS need mobyettes during 1981 as well as the agent assigned to Bobo - FaraKoba. The fifth mobyette will be reserved for the messenger at the NSS for business in Ouagadougou.

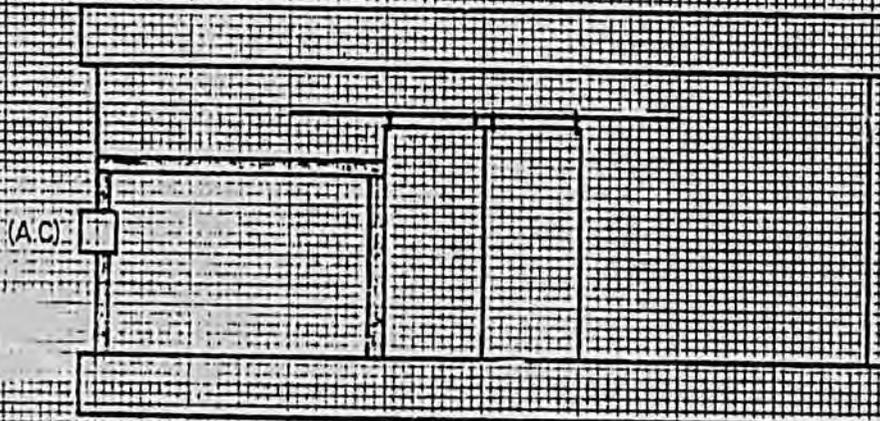
Once the cars arrive, mobyettes will continue to be used in the city. This will decrease overall gasoline consumption, as well as deterioration of vehicles due to city stop-and-go use.

A final use of the mopeds will be to provide inspectors with access to areas which cannot be reached by cars during the rainy season.



TOP VIEW

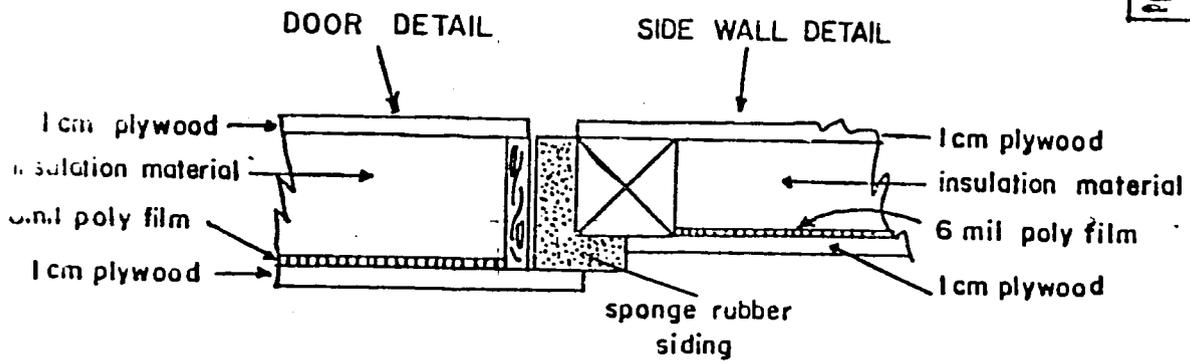
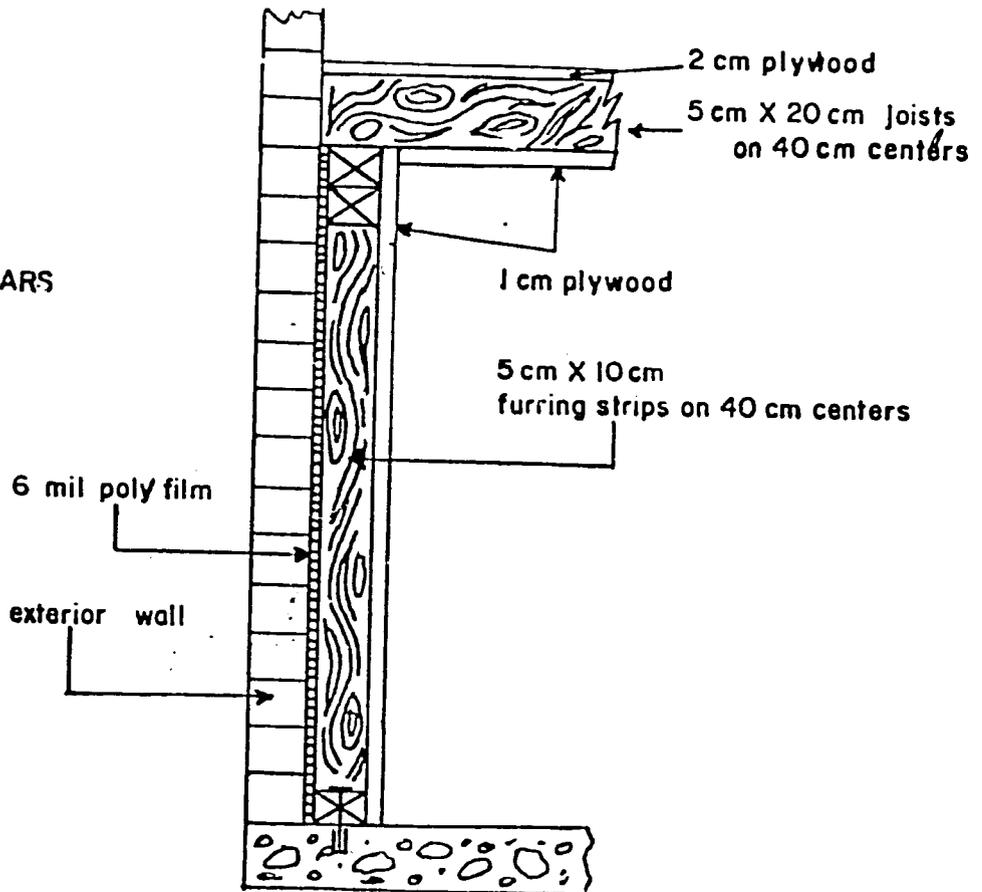
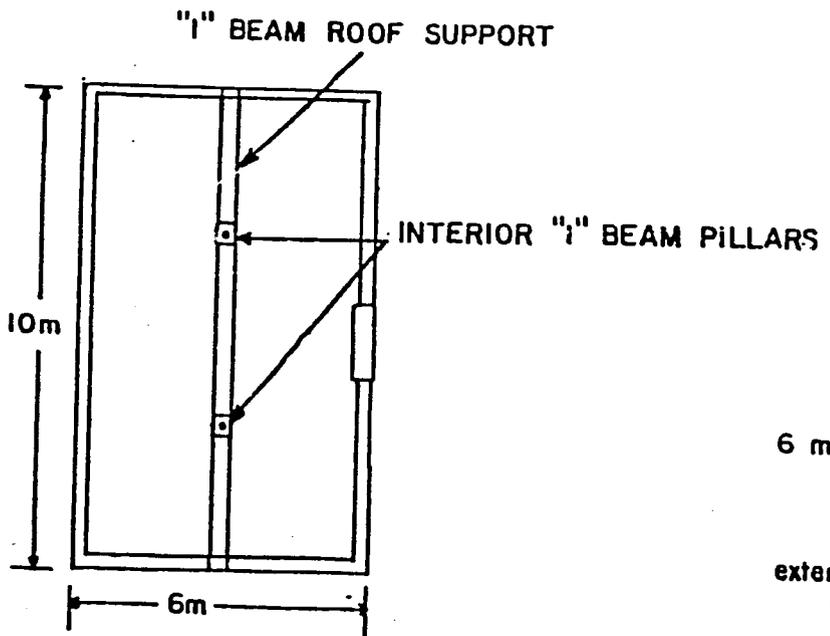
SHADED SECTIONS TO BE ADDED TO EXISTING STRUCTURE



NORTH VIEW OF WAREHOUSE

FOUNDATION SEED STOCK
COLD STORAGE ROOM (60 M²)
NATIONAL SEED SERVICE,
OUAGADOUGOU

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Three 24,000 BTU heavy-duty air conditioners will be used to maintain an average temperature of 22-24° C, with a 60% R.H. To permit more effective use of available energy, the room will be insulated with a layer of sheet styrafoam or expanded polystyrene.

SUPPLEMENTARY ANNEX W

CONTRACT STAFF EMPLOYEES AT NSS, 1981

	<u>MONTH</u>	<u>YEAR</u>
1. Secretaries (2) at 28,000 FCFA	56,000	672,000
2. Drivers (2) at 24,200	48,400	580,800
3. Messenger/Janitor	21,600	259,200
4. Night guard	21,600	259,200
5. Warehouse man	25,000	300,000
6. Accountant/bookkeeper	29,000	348,000
7. Workman/laborer	<u>17,200</u>	<u>206,000</u>
	218,800 FCFA	2,625,200 FCFA

PRIVATE SECTOR ROLE IN SEED MULTIPLICATION

When speaking about expanding the seed supply within a country, five alternative types of seed enterprises are available:

1. Private seed firms that have their own R&D programs and control all multiplication and marketing activities.
2. Private seed firms that receive partial assistance from the government; such as, publicly bred varieties, reserve seed stocks, special credit and subsidies and no government price controls.
3. Private seed enterprises and seed production activities that get maximum government assistance; such as, equipment and building leases, other lease-purchase arrangements, marketing help, and incentives provided to seed multipliers.
4. Joint seed enterprises that involve both private and public capital.
5. Government seed enterprises and seed activities that have government participation in all parts of the seed production and marketing programs.

Worldwide, many developing countries have wholly private enterprises as well as those partially assisted by government. Mexico, for example, has wholly private seed enterprises, ones receiving partial government assistance and government enterprises. Brazil has all types, but is moving to eliminate government enterprise. In Tunisia and in Algeria, vegetable seeds are handled by private enterprises while cereal seed production is in the hands of a government agency. Kenya has all types except wholly private and wholly governmental. The Kenya Seed Company started as a private seed enterprise, but is now a joint venture. The Agricultural Development Corporation of Kenya owns shares along with private stockholders. Countries in Eastern Europe, the USSR, and many Sahelian countries have only government enterprises.

Figure I graphically shows the five different approaches for developing seed production capacity. Upper Volta is clearly in the last category and its program may be termed as government enterprises (NSS and research institutes) that provide breeder seed and foundation seed, stimulate commercial seed production for certain crops in certain areas, train government agents (at ORD level) in seed growing, processing and quality control. The exception to this is the SOFITEX firm that has sufficient resources to develop, breed, multiply, store and market cotton seed.

In Figure I, the column under commercial and certified seed production indicates partially private activities for this function under the government program (last line). In Upper Volta these are the contract growers (subsistence farmers) who depend totally upon the support, supply of inputs, control and marketing by the government (ORD personnel and material).

Given the past GOUV policy of price controls, promotion of private enterprises either with partial or maximum government support has been impractical. Even though seed enterprise capital requirements may be modest in comparison with other businesses, they certainly are beyond the means of the vast majority of Voltaics, and working capital needs, particularly at harvest time are very high. (For example, purchase of 100 T of maize seed at 100 CFA/kg requires an outlay of 10,000,000 CFA). The enterprise does not have to own much land, but the supply of trained, competent seed growers is almost non-existent.

The PID uses the term commercial seed producers. The term commercial is somewhat misleading and a qualification is needed. The government (the NSS, ORD, AVV) contacts subsistence farmers who might be interested in growing seed. The farmer's input is composed of his fields and his labor. The government provides seed (on credit) fertilizer and control inspections. The return to the peasant farmer is 5-7 CFA (\$0.02 - \$0.03/kg) for growing seed and selling the unprocessed seed back to the government (ORD). As farm holdings are very small in Upper Volta, 1-2 ha/individual, and with a yield of one ton of threshed grain per ha, the farmer may gain 5,000 CFA more than if he sold his produce on the market. The small margin in absolute terms precludes calling this farmer a commercial grower in the American sense of the term.

During the next 10 to 15 years, production will be an activity of the ORDs, not private seed enterprises. The NSS will assume responsibility for quality control, marketing and regulation of seed production and processing, and testing and storage procedures.

The financial viability of this Voltaic system is dependent upon many variables. As in most businesses, pricing is crucially important. Administrative orders must clearly distinguish between seed and grain prices. Government enterprises must at minimum cover their cost of operation and production costs if a non-subsidy program is adopted. With the decision to adopt prices allowing for a return on investment, the potential for a greater private role is created. However, it will be many years before the financial viability of seed production is demonstrated and more before capital can be generated for this purpose. In the interim, government has a production role to play. When private growers become

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established, the quality control program of the NSS will be needed as much, if not more, than at present.

Figure 1: Alternative methods for developing seed enterprises

