

I. PROJECT IDENTIFICATION **229**

1. PROJECT TITLE
UPPER VOLTA SEED MULTIPLICATION

APPENDIX ATTACHED
 YES NO

2. PROJECT NO. (M.O. 1095.2)
57-11-130-202

3. RECIPIENT (specify)
 COUNTRY **Upper Volta**
 REGIONAL INTERREGIONAL

4. LIFE OF PROJECT
 BEGINS FY **1975**
 ENDS FY **1980**

5. SUBMISSION
 ORIGINAL **June 5, 1974** DATE
 REV. NO. _____ DATE
 CONTR./PASA NO. _____

II. FUNDING (\$000) AND MAN MONTHS (MM) REQUIREMENTS

A. FUNDING BY FISCAL YEAR	B. TOTAL \$	C. PERSONNEL		D. PARTICIPANTS		E. COMMODITIES \$	F. OTHER COSTS \$	G. PASA/CONTR.		H. LOCAL EXCHANGE CURRENCY RATE: \$ US (U.S. OWNED)			
		(1) \$	(2) MM	(1) \$	(2) MM			(1) \$	(2) MM	(1) U.S. GRANT LOAN	(2) COOP COUNTRY		
										(A) JOINT	(B) BUDGET		
1. PRIOR THRU ACTUAL FY													
2. OPBN FY 75	1,637	483	62	54	57	728	372						
3. BUDGET FY 76	-	-	-	-	-	-	-						
4. BUDGET +1 FY 77	-	-	-	-	-	-	-						
5. BUDGET +2 FY 78	145	118	15	-	-	-	27						
6. BUDGET +3 FY 79	98	91	11	-	-	-	7						
7. ALL SUBQ. FY													
8. GRAND TOTAL	1,880	692	88	54	57	728	406						

9. OTHER DONOR CONTRIBUTIONS

(A) NAME OF DONOR	(B) KIND OF GOODS/SERVICES	(C) AMOUNT
IBRD	Technical Assistance	As described in PROP
UNDP	Technical Assistance	

III. ORIGINATING OFFICE CLEARANCE

I. DRAFTER	TITLE	DATE
Peter K. Daniells	Project Design Team Leader	June 5, 1974
2. CLEARANCE OFFICER	TITLE	DATE
David Shear	Director, AFR/CWR	11/15/74

IV. PROJECT AUTHORIZATION

1. CONDITIONS OF APPROVAL
 Commodity procurement approved for Code 935, Free World.

2. CLEARANCES

BUR/OFF.	SIGNATURE	DATE	BUR/OFF.	SIGNATURE	DATE
AFR/DP	R. Huesmann	11/2/74	AFR/CWR	L. S. Peek	10/2/74
AFR/DS	P. Lyman	11/2/74	AA/AFR	D. Brown	
GC/AFR	E. A. Dragon	11/20/74	PPC/DFR	A. Handly	11/21/74

3. APPROVAL AAS OR OFFICE DIRECTORS
 SIGNATURE: **Samuel C. Adams, Jr.** DATE: **11/26/74**
 TITLE: **Assistant Administrator, Bureau for Africa**

4. APPROVAL AFR (See M.O. 1025.1 VI)
 SIGNATURE: _____ DATE: _____
 ADMINISTRATOR AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT NO.	SUBMISSION	(Number)	DATE
	<input checked="" type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION _____	PAGE <u>2</u> of <u>51</u> PAGES

CONTENTS

<u>Section</u>	<u>Page</u>	
PART I		
A. INTRODUCTION	3	
B. SUMMARY AND RECOMMENDATION	3	
PART II		
MAJOR ISSUES	6	
A. FERTILIZER	6	
B. GRAIN STABILIZATION	7	
PART III		
A. THE PROJECT GOAL	10	
1. Statement of Goal		
2. Measurement of Goal Achievement		
3. Basic Assumptions of Goal Achievement		
B. THE PROJECT PURPOSE	10	
1. Statement of the Purpose		
2. Conditions Expected at End of Project		
3. Basic Assumptions		
C. PROJECT OUTPUTS	12	
1. Statement		
2. Outputs Realizable		
D. PROJECT INPUTS	13	
1. U.S.		
2. Host Government		
3. Basic Assumptions		
4. Rationale		
5. Course of Action - Organization		
ANNEX I	List of Persons Contacted	34
ANNEX II	General Agricultural Statistics	36
ANNEX III	Crops - Worthy of Field Trials in Upper Volta	37
ANNEX IV	Price in CFA - Principle Food Crops	38
ANNEX V	Requirement for U. S. Assistance	39
ANNEX VI	Environmental Analysis	50

BEST AVAILABLE DOCUMENT

PROJECT NO.	SUBMISSION		DATE	PAGE <u>3</u> of <u>51</u> PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION _____		

PART I

A. INTRODUCTION

The Sahel Mid-term Planning Team arrived in Ouagadougou on Monday, April 8, 1974 to explore the feasibility of an expanded seed production and supply program for Upper Volta. An intensive schedule of meetings and field visits in the vicinity of Ouagadougou and Bobo Dioulasso led to a positive conclusion on the desirability of designing a seed program for implementation at the earliest opportunity.

During the course of its three week visit the team met with representatives of all major donors and international organizations active in Upper Volta. Above all, the team members made a special effort to meet African officials at all levels in the Government and in two of the ORDs. A few random visits were paid to farms engaged in both traditional and improved agricultural practices. In response to the team leader's request, the government assigned a liaison officer who accompanied the team during the greater part of their visit. Lastly, but most importantly, the GOUV Director of Agricultural Services met with the team on numerous occasions, both alone and with senior members of his staff, to answer questions, discuss issues and, in effect, to participate in the project design. (For list of persons contacted see Annex I.)

Special appreciation goes to the Charge d'Affaires and the staff of the American Embassy in Ouagadougou all of whom were particularly helpful in accommodating the many and varied official and personal needs of the team members.

B. SUMMARY AND RECOMMENDATION

Persistent drought in the Sahel-Sudano zone of Africa over the past several years has precipitated an agricultural production crisis in Upper Volta. Primitive and wasteful agricultural practices and methods can no longer produce minimum food requirements for a rapidly growing population as well as the primary agricultural exports crops so critical to Upper Volta's economy. Although the response from the international donor community to assist in Upper Volta's economic recovery has been relatively generous, other factors have combined to further complicate and threaten current plans for increasing agricultural production. Most notable is the world energy crisis which has caused sharp increases in transportation costs, particularly affecting the land-locked countries, and, more importantly, a drastic change in the availability of fertilizers. The outlook for the future, therefore, is uncertain. (See Annex II for General Agricultural Statistics.)

Within this rather gloomy setting, there do exist some positive factors, however, which give hope and encouragement to current efforts being made by the Government of Upper Volta in economic and social development. Firstly, the government itself appears to be taking its problems seriously and is in the process of reorganization to better serve development needs. Secondly,

PROJECT NO.	SUBMISSION	(Number)	DATE	PAGE 4 of 51 PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION		

an important effort is being made to replace foreign advisors in operational positions with Upper Volta personnel who in the last analysis are the only ones who can make and implement many of the hard decisions faced by governments of developing countries with very limited financial and human resources. Thirdly, a number of imaginative, ambitious and potentially productive projects are in advanced stages of planning and execution. These include the \$8.75 World Bank Black Volta Agricultural Development Project, the \$10 million multi-donor Onchocerciasis control project and the ongoing UNDP Matourkou Agricultural Training program. These are activities which can be expected to have substantial impact on increasing food production, expanding exports of cotton, opening up large unused areas to agricultural and training large numbers of key personnel in improved farming practices.

Because of the fundamental importance of seeds, and especially improved varieties, it is crucial for the Government of Upper Volta to institute a national seed program which could have the capacity to plan, the ability to provide technical services and the authority to establish quality controls. Not only is the government actively seeking U.S. assistance to establish such a program, but it is the most opportune time to integrate a national seed service into its plans for reorganization.

There currently is no formal seed production program in Upper Volta although numerous agencies of the government are engaged in seed multiplication. No integrated system exists to plan varietal trials, to utilize their results or to promote improved varieties. Research, largely in the hands of IRAT, is not coordinated with related activities to best serve national interests. Inevitably, important entities of the government begin to work at cross purposes.

The demand for all types of seeds in Upper Volta is significant throughout the country although admittedly difficult to substantiate. The demand for improved rice and peanut seeds is high and, if made available, could have important medium-term impact on increasing food production. Although improved varieties of corn are available it is more difficult to estimate the demand as corn production is of secondary importance and limited to those agricultural areas south of the 1,000 mm isohyet. Improved varieties of sorghum and millet giving significantly higher yields under local farming conditions are not presently available. However, the demand for sorghum and millet seeds of local varieties is widespread and as a matter of policy the government is anxious to build up reserve stocks in the event of renewed drought or continued irregular rainfall.

Most of the current effort in developing improved seed in Upper Volta is limited to purifying the varieties now in use (eliminating off-type, weed seeds, and low-germinating lots). Agricultural experts report that this process alone can result in yield increases of 15 to 20%. A more impressive impact must await the introduction of higher-yielding lines of the presently grown crops, or possibly of other crops. Investigation among regional agencies indicate that there are better selections of sorghum, maize, rice and peanuts which are far enough along to be tried in the various rainfall zones of Upper Volta. Seed is currently available in trial lots from IRAT, Major Cereals, IITA and ICRISAT. IITA has also announced a promising dwarf

pigeon pea (TUC-2705-3) which would be worthy of trial throughout Upper Volta. Not only does the pigeon pea yield a respectable crop, but the leguminous plant improves soil fertility for the ensuing crop.

An accelerated effort to field test new crops and new varieties in each ORD could hasten the realization of more dramatic increases in food production. (See Annex III.)

The proposed National Seed Service is designed deliberately to be as modest as possible and still be effective. The institutional base will serve as a foundation on which more elaborate systems can be built at such time as qualified personnel and necessary financial resources are available. On a phased basis, over a five-year period, the U.S. will assist the government of Upper Volta in the establishment and operation of a national seed program which would have as its purpose the assurance of a constant source of seed to the farmer and which would provide the organizational framework for multiplying improved seed of superior varieties as they are developed by either national or international research organizations.

As envisaged, U.S. assistance would provide minimum essential facilities and equipment to four major seed multiplication centers for rice, sorghum, millet, corn and peanuts. Primary emphasis would be given to training programs to be organized mostly within Upper Volta at existing institutions and in other African countries. Because the Regional Development Organizations (ORDs) will be responsible for second and/or third generation seed multiplication programs, some assistance is projected to meet their basic requirements in addition to training field trials officers, extension agents and other technical level personnel.

The total direct U.S. contribution to the project is estimated at ~~\$1,880,000~~ over the five-year period. Of this amount \$1,362,500 estimated local currency costs including procurement of selected items of equipment in third countries. The overall U.S. contribution could be reduced by cutting down the number of ORDs receiving assistance to whatever level would fit the availability of funds. The Government of Upper Volta has estimated its requirements, both cash and in-kind, at CFA 52,852,000 (\$222,000) for the first year. Recurring annual operating costs, mostly in the form of salaries, amounts to approximately CFA 15,126,000 (\$70,000).

As originally designed, the scope of the project included assistance to seed multiplication programs in each of the ten Voltan ORDs. Following the recommendation of the Executive Project Review Committee and the Technical Review Committee, however, the project scope has been reduced to provide assistance to seed multiplication centers in four ORDs. If the success of the program in four ORDs warrants assistance to additional regions based on an evaluation of the project, the scope may be expanded accordingly.

PROJECT NO.	SUBMISSION		(Number)	DATE	PAGE <u>6</u> of <u>51</u> PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION			

PART IIMAJOR ISSUESA. FERTILIZER

Fertilizer in Upper Volta is used almost exclusively for the production of cash crops, most notably cotton, groundnuts and rice. Roughly 4,000 tons of fertilizer will satisfy Upper Volta's needs for 1974 with about 2,500 tons directed to cotton production and the remainder to all other crops. Because of its high cost, the price of fertilizer to the farmer is heavily subsidized in the amount of approximately CFA 60 million (\$250,000) in 1973. It is believed that any additional increase in the cost of imported fertilizer would seriously over-tax the government's ability to maintain present price levels with resulting adverse impact on inflationary pressures on the economy. The consequences of sharply increased costs of fertilizer in 1974 on the world market, which appears inevitable, could be very serious for Upper Volta indeed.

Plans for more productive and rational approaches to agriculture in Upper Volta invariably include modest to generous application of fertilizer inputs. The World Bank^{1/} projects to increase cotton production and the Peoples Republic of China rice^{2/} project are entirely dependent on fertilizer. Without it the production of cotton and rice would collapse and groundnut yields, already extremely low, would decline to an uneconomic level. Agriculture in Upper Volta, therefore, is very highly dependent on uninterrupted imports of fertilizer.

More rational approaches to agricultural development are being taught at the educational facilities of the UNDP Matourkou project for training agricultural officers and extension agents. A fundamental concept introduced in all of their training is the interlacing relationship of sedentary agriculture with livestock. In this regard the use of oxen as work animals, nourished on feed produced on the farm, is totally new in Upper Voltan cultures. Practical demonstrations and experiments in traditional villages have proved successful and there now exists a growing demand for oxen teams, plows and extension services. Experience has proven, however, that the soils have very low fertility and will not produce the yields required to recover the investment costs - without the use of fertilizers. Fertilizer, therefore, is an integral part of the technological package, the present sources being primarily animal manure, compost and residual minerals from fertilizer applications on export crops (cotton, peanuts). The exploitation of Voltan phosphate resources may also in time help supply this element which is especially limiting to the

^{1/} The Black Volta Agricultural Development project plans to increase cotton production by 8,800 tons over four years. The West Volta Cotton project accounted for 73% of total cotton production in 1973.

^{2/} Vallee de Kou rice production being increased from 6,000 tons in 1973 to more than 8,000 tons by 1975.

PROJECT NO.	SUBMISSION		(Number)	DATE	PAGE <u>7</u> of <u>51</u> PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION			

legume crops.

In prior years fertilizer requirements for Upper Volta have been handled entirely by CFDT.* This private company has coordinated the requirements of the ORDs, and other users, sent out the invitations to bid and arranged for procurement and delivery. It is not certain that CFDT will continue to provide this service in the future for other than their own needs. This could have serious repercussions for agricultural production as the Government is unprepared to cope with the complexities of fertilizer procurement. It is of extreme urgency, therefore, that the Government of Upper Volta should develop its own capacity to evaluate needs, to assess requirements, to develop pricing policies and to implement efficient procurement and distribution systems that will provide the farmer with fertilizer at the time he needs it and at a price that he can afford.

The team discussed the fertilizer problem with the Head of the Secretariat of CILSS (Permanent Interstate Committee for Sahel Drought) with the suggestion that CILSS sponsor a technical meeting of experts representing the seven member countries to identify common problems, estimate needs and recommend steps for common action. It would make sense for the land-locked countries, especially, to consider the possibility of establishing joint procurement actions, for certain types of fertilizer, which could provide substantial savings on initial cost as well as transportation. The suggestion was taken seriously and CILSS has requested assistance of the Economic Commission for Africa in planning and conducting a technical meeting of country representatives.

B. GRAIN STABILIZATION

The Entente Fund Grain Stabilization program for West Africa got off to a bad start in Upper Volta. The creation of Office Nationale des Cereales (OFNACER) in 1970 coincided with the severe drought of 1970/71 which played havoc with the government's attempts to control prices. Acute shortages of grain led to emergency food relief programs for which responsibility was handled initially by OFNACER but subsequently given to another agency of the government for reasons which are not entirely clear. It is possible that OFNACER was not considered the most appropriate agency, for lack of storage facilities, but indications are that the decision was based on political grounds more than anything else. Meanwhile, OFNACER storage facilities, presently under construction following innumerable administrative and technical difficulties, should be completed by the end of November, 1974.

Of greater concern is the evident lack of authority in the government to enforce the terms and conditions of OFNACER's charter. Among others, these call for the licensing of 270 of the larger grain merchants in the country who were each expected to furnish 180 tons of grain to OFNACER at government prices, and provision for the ORDs to also purchase grain for delivery to ORD warehouses. This involved sorghum, millet and corn, but not rice. Even though these plans may have been ill conceived, the fact remains that no grain at all was purchased by the ORDs for delivery to OFNACER and only 400 tons were delivered by the licensed grain merchants. It would appear that OFNACER and the ORDs, in fact, are in competition with one another. Consequently, OFNACER has only 5,500 tons of food grains on hand as of April, 1974.

* Compagnie Francaise pour le Developpement des Fibres Textiles.

PROJECT NO.	SUBMISSION		(Number)	DATE	PAGE 9 of 51 PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION			

By the end of 1974, OFNACER will have storage capacity for 15,500 tons of grain at facilities scattered throughout the country. Whether this will be sufficient to stabilize prices under normal conditions remains to be seen, as it appears to be a very modest quantity.

The success or failure of the grain stabilization program is of some importance, not only to the economy of Upper Volta, but also to the proposed seed program. The Director of the GOUV Department of Agricultural Services has agreed fully that seed should command a price higher than that of grain. In fact, he would welcome a price which covers the cost of production. The great (see Annex IV for the price of grain per kilo - by month and by year) fluctuations in the market price of grain, however, make it almost impossible to establish a fair price for seed, usually set before the time for planting. In past years this has coincided with peak prices for grain reflecting widespread food shortages in the country. Because Upper Voltan farmers will be multiplying seed, under contract arrangements in many cases, it will become increasingly urgent, as the national seed program becomes a reality, to stabilize the market price of grain.

Serious consideration should be given to the possibility of using OFNACER facilities, warehouse space and transportation, to benefit the requirements of the National Seed Service, especially in the early years.

In light of the importance of the grain stabilization program and because of U.S. interests in the success of the program, it is recommended that a thorough analysis or evaluation of the program be made at this time and that the results, together with suggestions for government action, be given to the GOUV through the most appropriate channel, possibly the Entente Fund itself.

PROJECT NO.	SUBMISSION		(Number)	DATE	PAGE 10 of 51 PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION			

PART IIIA. THE PROJECT GOAL

1. Statement of Goal. In recent years Upper Volta has suffered a series of droughts, particularly in 1968, 1970 and again in 1972 and 1973. As a consequence, serious food shortages have developed, and in the northern Sahel zone of the country many animal and human lives have been lost. However, even under normal conditions the country is not self-sufficient in food production and needs to import about 30,000 tons of cereals. With hunger and malnutrition in much of the country and the ever present threat of continued drought, the Government of Upper Volta is seeking external assistance and mobilizing all available domestic resources to increase food production.

2. Measurement of Goal Achievement. The means for verifying the achievement of increased food production would be through official statistics for the production of food crops. Measurements can also be made of productivity increases by farmers using improved seed.

3. Basic Assumptions of Goal Achievement. The determination on the part of the Government of Upper Volta to increase food production must be sustained. Government authorities will have to allocate scarce resources and talent to agriculture and be prepared to provide policies that will establish the most favorable conditions for a more rational approach to production.

It is also assumed that external donors will maintain and even increase their assistance to the agricultural sector. Within this context it is of some significance that the Onchocerciasis Control Program be implemented because food production cannot be increased through improved productivity alone but must depend on putting additional land under production.

Two other assumptions are made: (i) that existing training programs will be continued for extension agents and other officials important to farmer motivation; and (ii) that the rainfall pattern of the past five years will not become more adverse to agricultural production.

B. THE PROJECT PURPOSE

1. Statement of the Purpose. The project purpose is to assist the Government of Upper Volta in the establishment and operation of a National Seed Service. Organized at the ministerial level the service would seek to assure a constant supply of seed to the farmer and it would promote a system of production and control through which high quality seeds of improved varieties may be introduced as they become available from national or international research organizations.

PROJECT NO.	SUBMISSION		DATE	PAGE 11 of 51 PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION _____		

2. Conditions Expected at End of Project. Conditions expected at end of project fall into the following categories:

a. Institutional Framework. The National Seed Service will have been established by Presidential Decree within the Ministry of Agriculture under the Department of Agricultural Services. This new service would be directly responsible for the administration of specific technical services, training and seed quality control. Additionally, it would serve in a coordinating role with organizations engaged in research, production and extension activities. Facilities would be constructed, equipped and staffed. The National Seed Committee and the Technical Advisory Committee will have been well established.

b. Seed Multiplication. Seeds of improved varieties would be produced under a seed certification type program, that is, the identification of generations of multiplication would be maintained; however, a seed certification program per se would not be undertaken in the initial stages of operation. In general, foundation seed, or first multiplication seed, would be produced by the research organization which developed or introduced the new variety, the last multiplication by the rural development organizations (ORDs), and intermediate multiplications where necessary produced at government stations. The ORDs would select farmers to assist in the production of the seed and would encourage private initiative in marketing where and when possible. The seed multiplication plan is primarily a plan through which seed of new and improved varieties may move rapidly and smoothly from the plant breeding stations through stages of multiplication and on to the farmer without losing the identity and value of the variety. Although major emphasis will be given to the multiplication and production of millet, sorghum, corn, rice and peanut seeds, seeds of all crops can and should be produced within the system. It is to be noted, however, that AID assistance is directed toward the goal of increasing domestic food production and that AID financing for the production of seeds for export crops, therefore, must not exceed 50% of total funds available.

c. Training. Fundamental to all aspects of the project is the training of personnel at all levels. By the end of the project all key personnel will have completed their training at international centers within Africa and at universities, experiment stations and farms outside of Africa. Training within the country for medium and lower level technicians would be organized under the direction of the Seed Service and in cooperation with appropriate local organizations.

d. Seed Multiplication Farms. All buildings and other facilities will have been constructed and equipment installed or delivered.

e. Assistance to ORDs. Physical facilities will have been completed and equipment and supplies delivered. The number of field trials on cereal grains will have been increased and appropriate demonstrations conducted under the general supervision of the National Seed Service.

f. Agricultural Research. Progress will have been made in getting agricultural research to serve better the practical needs of the diversified farmers.

PROJECT NO.	SUBMISSION <input type="checkbox"/> ORIGINAL <input type="checkbox"/> REVISION	(Number)	DATE	PAGE 12 of 51 PAGES
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3. Basic Assumptions. The National Seed Service will build on existing infrastructure and seek to coordinate and give guidance to agricultural activities which are already in operation. It is essential to the success of the Seed Service that these activities be continued. Many of them including research are receiving assistance from other donors and international organizations who will be asked to support the concept of a national program. It is assumed that this kind of support will be forthcoming.

Equally important will be the continued and sustained high level of interest in the successful creation of a national seed service by the Government of Upper Volta. The participation in the design of the project by officials of the government, including the Director of Agricultural Services, and the complete cooperation of the Ministry's foreign technical advisors, would seem to assure the level of interest required.

It is assumed that the Major Cereals project, and subsequently ICRISAT, will assign the services of a Field Trials Officer to Upper Volta. This is considered an essential element to the success of the project.

On a more pragmatic level it is assumed that a U.S. expert with the required qualifications, including fluency in the French language, can be found to manage the project over a five-year period.

C. PROJECT OUTPUTS

1. Statement

- a. The legal establishment of a GOUV National Seed Service.
- b. The construction, equipping and operation start-up of four seed multiplication and processing centers by end of Year I.
- c. An agricultural officer and 6 extension agents ("encadreurs") in each ORD, trained to conduct and supervise varietal trials and farmer seed multiplication plots, and to utilize them for farmer education purposes.
- d. A functioning National Seed Service headed by three professionally-trained officers.
- e. The capability of each of 4 ORDs to multiply grain seeds to meet the demands of their farmers.
- f. A functioning Technical Seed Advisory Committee in the Ministry of Agriculture.
- g. Conduct annual field trials of new, improved varieties.

PROJECT NO.	SUBMISSION		(Number)	DATE	PAGE <u>13</u> of <u>51</u> PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION			

2. These outputs should be realizable if:

- a. The GOUV decrees the establishment of the Seed Service and names high level personnel to its Technical Advisory Committee very soon after the initiation of this Project.
- b. Qualified and dedicated personnel are named for participation and training.
- c. On-going support by other donors (such as UNDP, FAO, IRAT, FED) continues at the current level.
- d. International organizations (IITA, ICRISAT, WARDA, USAID Major Cereals Project) continue their plant breeding and research work and make planting material available to GOUV.
- e. GOUV will continue to subsidize and make available sufficient fertilizer to meet minimal "package" recommendations for seed multiplication plots.

D. PROJECT INPUTS

1. U.S.

Agronomy

- a. Senior/Officer - 5 years, beginning September 1, 1974.
- b. Agronomist - 2 years, beginning July 1, 1975.
- c. Consultancies - 12 man-months. To provide technical assistance in installing seed processing equipment and in training personnel in the operation and maintenance of this equipment. Precise timing will be contingent upon the arrival of the equipment and the completion of physical facilities. It is estimated that three visits may be required with the first scheduled for July 1975. Plans and estimates are based on the provision of U.S. advisory services under Personal Services Contracts.
- d. Participant Training.
 - (1) Short-Term in U.S. Director of Seed Service and the two Section Chiefs for one academic year plus two months observation of seed multiplication, processing and analysis operations. 3 participants @ 12 months each, total of 36 months.
 - (2) Short-Term in Third Country. Director plus one agricultural officer per ORD for 4 weeks to study and observe plant breeding, variety trial layout, record keeping, purity maintenance at IITA, Ibadan and Major Cereals Center, Samaru. (IITA has offered to arrange entire program.)

PROJECT NO.	SUBMISSION	(Number)	DATE	PAGE 14 of 51 PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION		

(3) Short-Term within Upper Volta.

(a) Twelve encadreurs (3 per ORD x 4 ORDs) plus Chief of Technical Service for three weeks at Matourkou Agricultural School to study seed multiplication, cultural recommendations, record keeping, precautions, varietal trial layout, method and result demonstration approaches.

(b) To be repeated for 12 additional encadreurs following year.

(c) Chief of Quality Control Section - one week at each of 4 Stations (Vallee du Kou, Sariã, Komboïnse, Nyangoloko) to study varietal characteristics, roguing procedures, laboratory analyses in seed testing, cataloguing. 4 weeks total.

e. Commodities - Physical Facilities.

1. Office and warehouse, furniture, office equipment, seed laboratory equipment, vehicles and operating expense for 5 years at Seed Service Headquarters.

2. Tractor and implements, pick-up truck, warehouse, one set of seed processing equipment, electric generator, fertilizer and equipment operating expenses for 5 years. For each of 4 stations (Saria, Niangoloko, Vallee du Kou, and Komboïnse).

3. For final seed multiplication in each of 4 ORDs, a warehouse, tractor and implements, pick-up truck, fertilizer, operating expenses for tractor and vehicle for 5 years, a revolving fund (average \$15,000 per ORD) for one year's seed purchase from farmers.

4. Additional for Fada N'Gourma a 2½ ton truck, spares, and operating expenses for 5 years.

5. Additional for the Ouagadougou ORD, seed processing equipment to complete the existing center.

Of the commodity inputs above, the seed processing and laboratory equipment are recommended for U.S. procurement; vehicles and tractors of French origin would be preferred for compatibility with local maintenance capabilities; buildings would be constructed by local contractors under contracts awarded by competitive bidding procedures. Supervision of construction would be the responsibility of the Ministry of Works. Indigenous building materials would be used to the maximum extent available and imported materials such as cement, roofing sheets, hardware and electrical supplies would be off-the-shelf items commonly used in local construction.

PROJECT NO.	SUBMISSION		DATE	PAGE <u>15</u> of <u>51</u> PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION _____		

2. <u>Host Government</u>	<u>CFA (millions)</u>
a. Land, labor and furniture for Central Office	40.0
b. Salaries for Headquarters personnel (annual)	2.7
c. Salaries of personnel at 4 Seed Stations (annual)	2.2
d. Salaries of ORD personnel (annual) - 10 ORDs	7.8

The GOUV feels that the final two multiplication steps can become self-supporting and has indicated that the selling prices will be raised gradually until they cover the cost of production. Farmers would be given the option of buying seed for cash or paying the equivalent value in kind at the following harvest.

3. Basic Assumptions. The above list of inputs assumes that: U.S. commodities will be available within the total cost estimate; procurement waivers can be procured for non-U.S. commodities; GOUV will provide sufficiently qualified personnel for training; GOUV will meet personnel commitments on schedule.

4. Rationale

a. The Problem. In the spring of 1973 the Government of Upper Volta was faced with acute food shortages throughout the country. The situation in the north, the Sahel Zone, was particularly serious, to the extent that farmers were being forced to eat grain normally held as seed for the following planting season beginning in June/July. Government appeals for assistance included urgent requirements for more than nine thousand tons of seed. While the Government's estimates of seed requirements may have been highly exaggerated, it did illustrate the importance attached to seeds, especially in time of famine.

Both millet and early maturing sorghum seed were available from the Sudan; however, an FAO study showed that both cost and time factors precluded serious consideration of the procurement of seeds from this and other possible sources. Instead the FAO organized an emergency program under which grain held by merchants and speculators in Upper Volta was purchased (at high prices) and distributed gratis to farmers as seed. Each household received enough seed to plant one hectare. Altogether 386 tons of seed, mostly millet and sorghum with only 65 tons of peanut seed, were distributed to more than 45,000 families. Additionally, FAO arranged for the multiplication of small amounts of grain. 700 Kgs. were sent to each of two UNDP projects in the southern part of the country for multiplication. This has now been done and the resultant grain, about 250 tons, has been sent to the north where it is being held by the Government as reserve seed supplies to help meet new emergencies as they may evolve.

OBJECT NO.	SUBMISSION		(Number)	DATE	PAGE <u>16</u> of <u>51</u> PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION			

The emphasis for agricultural research in Upper Volta in the past appears to have been placed on cash crops, particularly cotton and peanuts. In this regard, much useful work has been done by the French research organizations IRCT (for cotton) and IRHO (for peanuts). IRAT has accumulated considerable experience with local varieties of cereal grains and intends to concentrate greater efforts in the future on studies of the inter-relationships of plants and soils, particularly as they concern inter-cropping and rotation. The importance of this line of study will take on far greater significance as plans are being developed for the development of agriculture in new lands that will become available as progress is made in the control of onchocerciasis (river blindness).

Meanwhile, the results of IRAT's research work on corn, millet and sorghum are encouraging. Close relationships have been developed with international programs, notably ICRISAT, IITA and the Major Cereals Project. Coordination of all IRAT activities in Africa is close and effective. However, it is IRAT policy to field test new seed varieties under optimal conditions, utilizing modern cultural practices and fertilizers. Certain imported plant materials crossed with local varieties have given good yields at the research station, but these results have been difficult to ^{readily} duplicate under normal farming conditions. For this reason there does not exist, at present, a millet or sorghum seed variety that has been developed in Upper Volta to satisfy local farmer needs. This is not true for corn, rice or peanuts for which improved seed varieties are available for multiplication.

A significant weakness in the conduct of agricultural research in Upper Volta is the paucity and inadequacy of field trials by seed variety and by geographical location. Furthermore, the level of technology utilized in trials to date is not closely related to on-the-farm application. For the time being there is a lack of organization at the national level to assess existing programs, to evaluate needs and to promote accelerated efforts using all available national and international resources.

Under the policy guidance and direction of the Ministry of Agriculture, the Regional Development Organizations (ORDs) are responsible for agricultural development in their respective areas. There are ten ORDs in the country and each of them has responsibility for the multiplication and supply of seeds to farmers. Their capabilities and resources for fulfilling this responsibility vary considerably but are, in general, quite limited. The need for improvement, however, is urgent. In the case of the Ouagadougou ORD, exceptional measures are being taken to increase their supply of seed to farmers. In the absence of improved seed varieties, for millet and sorghum, from the research institutes, the ORD is conducting a mass selection of local varieties for multiplication under contract with more progressive farmers. While their determination is admirable, it is regrettable that organized research is ill-prepared to serve the practical needs of agriculture in the country and that no system or procedures exist that would enable the needs of practical farmers to influence the orientation of research projects.

PROJECT NO.	SUBMISSION	(Number)	DATE
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION	PAGE 17 of 51 PAGES

An obvious gap between research findings and their application to farmer's operations will be addressed by the Project; the Technical Advisory Committee will include representatives of research organizations and the ORDs (who are in direct contact with farmers); the office of the National Seed Service will be in continuous liaison between research and the ORDs; and the ORDs will conduct field demonstrations on new varieties and new practices (as they are developed by research) for farmer observation. Further, the training input of the Project will send selected extension personnel to research stations to study latest developments in cereal improvement methodology for seed multiplication, and for conducting field trials.

The production of rice in Upper Volta has assumed ever increasing importance due in large part to the most successful efforts of the Tawainese who introduced irrigated rice on a large scale and the improved variety IR-8. Production of rice increased rapidly reaching 120 tons in 1973 and plans are underway to put more land under production which will enable Upper Volta to substitute imported rice with domestic production by 1976.

Rice is grown as a cash crop in Upper Volta for sale in the urban centers mostly to Government employees and other salaried workers whose annual income is more than ten times the national per capita average. The potential for increasing rice production in Upper Volta is exceptionally good and its importance as a food crop, therefore, is growing significantly. The demand for rice seed is very high and there is reason to believe that other improved varieties might be even more suited to local conditions and consumer taste than the IR-8.

b. Other Donor Assistance. The problems of seed production and supply, particularly of improved varieties, is of considerable concern to all external donors. The World Bank, in its proposed Black Volta Agricultural Development Project, has planned for the establishment of a small agricultural research station to conduct plant breeding and field trials of cereal grains. The need for more effective seed multiplication and distribution is a problem that almost all agricultural development plans are faced with and in the past year not only the FAO, but also the FED and FAC were actively engaged in the multiplication of local seed varieties to meet urgent needs.

Under FED sponsorship, the Italian firm of S.O.T.E.S.A. conducted a lengthy and very comprehensive study on the need for a national program for seed production and supply. Unfortunately, the recommendations were too elaborate and costly and, therefore, unrealistic for serious consideration by the Government of Upper Volta. Their studies left no doubt, however, as to the importance of a national seed service to the future of agricultural development in Upper Volta.

French interest, through FAC, has been significant and has made possible the planning and implementation of the AID Recovery and Rehabilitation project for the multiplication of foundation seeds at the IRAT station at Farako-Ba in southern Upper Volta. IRAT will make available 150 hectares of land, its personnel and other facilities. Under the AID grant of \$250,000 IRAT will

PROJECT NO.	SUBMISSION		DATE	PAGE 18 of 51 PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION _____ (Number)		

purchase equipment and supplies necessary to produce and process millet, sorghum, corn and rice seeds sufficient for sowing an estimated 6,625 hectares by the end of 1975. No system exists for the time being, however, to assure the most effective distribution of seeds produced at Farako-Ba, let alone the further multiplication of those seeds to second or third generations.

c. The Demand for Seeds. The demand for seeds in Upper Volta is exceedingly difficult to estimate. That the demand is strong is evident throughout the country. Official preoccupation with the drought and its after-effects has placed urgent need on the introduction of improved seed varieties which will give higher yields, mature faster and prove more resistant to pests and disease. From a practical standpoint, however, gains in food production could be obtained merely by improving the multiplication, processing, handling and protection of the best local varieties from one season to the next. Much has already been accomplished through introduction of a national campaign for the protection of seeds which has helped protect seeds from pests and has increased germination rates, but far more needs to be done. Seed multiplication programs need to be developed for the production of improved seed varieties already available and efficient methods must be introduced to assure the availability of local seed varieties which, experience now shows, may have to be sown not once but several times if the rains continue their current unpredictable cycles. The Government is determined, for all of these reasons, to improve the production and supply of seeds, an important element in either traditional agriculture or the introduction of the technological package designed for a more rational approach to agricultural production.

Each of the ORDs has made studies to determine requirements for seeds but the number of unknown factors, farmer acceptance of new seeds and new seed replacement rates, leave many doubts as to the reliability of their conclusions. It is known, however, that rice seed is in high demand, because farmers use new seed each year rather than holding back grain from the previous harvest, and new lands are being put into production annually. Peanut production has suffered drastically as a result of a plant disease and farmers are eager to buy a new variety which is resistant to the "rosette" disease and gives a higher yield. The improved seed variety is not available, however, in sufficient quantities and the demand is far from being satisfied. In the southern part of Upper Volta where corn is grown, there is a latent demand for improved corn varieties but farmers need to be convinced of their better qualities.

Of some importance in estimating the demand for seed is the United Nations regional Onchocerciasis Control Program for the Volta River Basic Area. It is a program which will eventually free large tracts of land for agricultural development within Upper Volta as well as neighboring countries. Onchocerciasis, or river blindness, has proved to be an effective deterrent to human habitation in those relatively fertile valleys infested with the blackfly that breeds in rapidly flowing sections of the rivers. United Nations studies have selected five development projects of which two are for Upper Volta. They would make available 473,000 hectares of land that could be

PROJECT NO.	SUBMISSION		(Number)	DATE	PAGE <u>19</u> of <u>51</u> PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION			

expected to produce 111,200 tons of food. Forty thousand families, or about 270,000 people, would be settled on the land, progressively, as the blackfly vector is brought under control.

While the Onchocerciasis control program is admittedly long term (currently planned for 20 years), it is nevertheless an active program with medium-term implications for seed production planning. Intensive spray operations in the western region of Upper Volta are scheduled to begin in the fall of 1974, after the rainy season, in conjunction with similar operations in northern Ivory Coast and northeast Ghana.

Experience has already shown that land settlement schemes can be organized and implemented successfully, as in the case of the Tawainese Vallee de Kou project. To be economically viable, however, they must incorporate more rational agricultural methods and practices. In this context, the role for seeds, especially improved varieties, could be important.

5. Course of Action

a. Implementation Plan. (It is assumed that an AID Project Manager will be assigned to this project either full time or part time and that he will be attached to the American Embassy, Ouagadougou beginning January 1, 1975.)

- November 1, 1974 - PROP approved.
- December 31 - Grant Agreement signed.
- January 1, 1975 - Prepare PIO/T for U.S. senior project officer.
- March 1 - Director of National Seed Service named and assumes duties.
 - U.S. Consultant arrives in country to assist drafting PIOs (2 months).
- March 15 - ORD officer i/c seed trials and multiplication designated.
- April 15 - PIO/Cs issued for U.S. procured commodities for National Office, 4 Seed Stations, 4 ORDs.
 - PIO/Cs issued for third country commodities for National Office, 4 Seed Stations, 4 ORDs.
- May 1 - Chief of Technical Service, Chief of Quality Control named and assume duties.
- May 15 - PIO/P for IITA training prepared.
 - PIO/P for U.S. training of Chief of Quality Control.

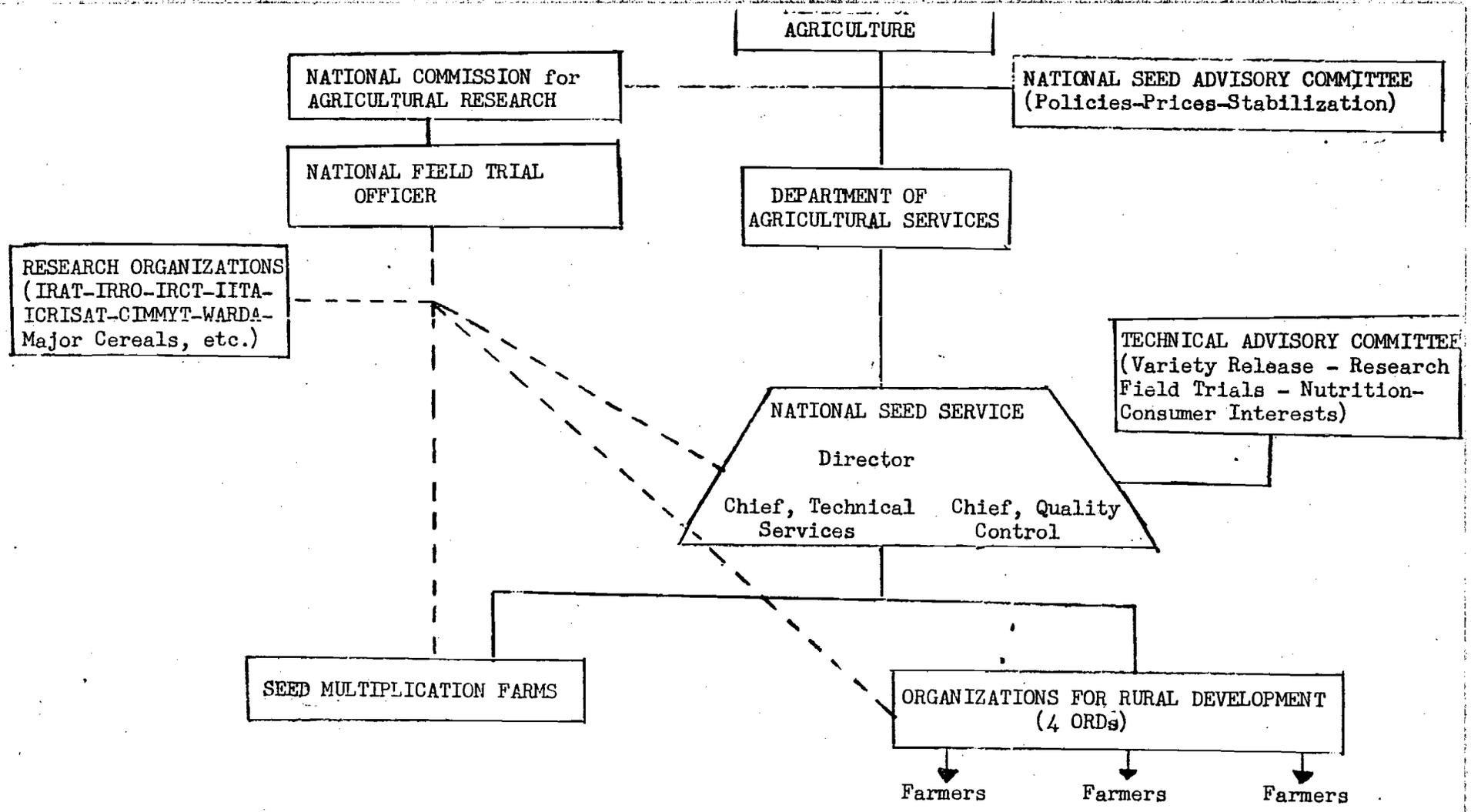
D 1025-1A (7-71) (NARRATIVE DESCRIPTION)

OBJECT NO.	SUBMISSION		DATE	PAGE <u>20</u> of <u>51</u> PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION _____		
June	- Invitations to bid issued on buildings for National Seed Service.			
	- Arrival of Senior U.S. Project Officer.			
July 1	- Director plus 4 ORD officers leave for 4 weeks training at IITA.			
	- Construction of seed processing buildings begins at Saria, Vallee du Kou, Niangoloko, Kamboinse.			
	- Construction of warehouses for ORDs of Ouagadougou, Bobo Dioulasso, Banfora, Ord de l'Est begins.			
July	- Chief of Quality Control departs for U.S. training (1 yr).			
	- Chief of Technical Services plus 30 encadreurs begin 3-week training at Matourkou.			
August	- Construction of buildings for National Seed Service begins.			
September	- Plans drawn up for R2 multiplication at 4 Seed Stations, and R3 multiplication in 4 ORDs.			
November	- PIO/Ps issued for Director of Seed Service and Chief of Technical Services.			
December	- Commodities begin to arrive from U.S. and Third Country for National Office, 4 Stations and 4 ORDs.			
	- Completion of processing buildings at 4 Seed Stations.			
	- U.S. Agronomist arrives.			
	- U.S. Consultant (Seed Processing Equipment) arrives - 3 months.			
	- Completion of warehouses for 4 ORDs.			
January 1, 1976	- Evaluation of progress to date and projected expansion of project.			
February 1	- PIO/C issued for Fada N'Gourma Seed Station if warranted.			
March	- PIO/T for Consultant services next August.			

AID 1028-1A (7-71) (NARRATIVE DESCRIPTION)

PROJECT NO.	SUBMISSION		(Number)	DATE
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION		
				PAGE <u>21</u> of <u>51</u> PAGES

- May/June/July - Planting of seed.
- August 1 - 12 additional encadreurs to Matourkou for training (3 weeks).
- Chief of Quality Control Branch returns from U.S.
- August 15 - Director of Seed Service and Chief of Technical Services to U.S. for 1 year.
- December - U.S. Consultant (Seed Processing Equipment) arrives (3 months).
- Project Evaluation.
- January 1977 - Chief of Quality Control begins 5-week observation-training trip in-country.
- February - PIO/T for next year consultant service, 3 months.
- August - Director and Chief of Technical Services return from U.S.
- December - U.S. Agronomist completes assignment.
- January 1978 - Project Evaluation and determination of need for additional consultant services.



P. 22-451

PROJECT NO.	SUBMISSION	(Number)	DATE	PAGE 23 of 51 PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION		

b. Narrative Description

1. The National Seed Service. The National Seed Service would be established within the Department of Agricultural Services of the GOUV Ministry of Agriculture. The accompanying diagram illustrates the organization of the Seed Service and its relationship with other concerned agencies. A description of the organization and function of its components are as follows:

National Seed Committee:

Membership of the committee would include, but not be limited to:

- Minister of Agriculture, Chairman
- Ministry of Commerce representative
- OFNACER representative
- National Agricultural Research Advisory Committee
- Director of Agricultural Services

This advisory committee would relate to the national seed program in terms of policy decisions concerning production, marketing, price stabilization, subsidies, etc. The committee would not be involved in administrative or operational details of the program.

Office of the National Seed Service

The Director of this Service, an agronomist, would direct or coordinate all seed-related activities. He would provide liaison service between the research organizations and production units and coordinate activities affecting the national program. He would be directly responsible for arranging training activities at all levels and be jointly responsible, through two assistants, for work in the two Sections of the Service. He should be especially involved with work in the Technical Services Section.

Technical Advisory Committee

Membership on this committee would include, but not be limited to, representation from:

- Director of Agricultural Services, Chairman
- Director of National Seed Service
- Research Organizations
- Field Station Seed Production Units
- ORD Directors (maximum of two)
- Rural Economics

This committee would be concerned with any matter on which the Director of the Seed Service would wish to be advised. Its principal functions, however, would be: (1) to decide which varieties should be produced and distributed under this program; (2) to decide which varieties should be dropped from the program; (3) to estimate future demands in specific areas for specific crop varieties as a guide to the production units; (4) to approve quality, field and laboratory standards relative to the control of seed quality.

PROJECT NO.

SUBMISSION

(Number)

DATE

 ORIGINAL REVISION _____PAGE 24 of 51 PAGESTechnical Services Section

In conjunction with the appropriate research organization, and the Technical Advisory Committee, the Chief of Section would ascertain those varieties which should enter field performance trials and the geographic location of the trials. The Chief of this Section should be directly in charge of the field trials, making sure that the plots are planted and harvested in the selected ORDs in accordance with instructions from the research institution. He would be responsible for collection and maintenance of the data, publicizing the results in accordance with the research station and the Director of the Seed Service. Further, he would work with extension agents in the ORDs where field trials are being conducted to plan use of the trials for farmer education.

Together with the Director of the Seed Service, the Section Chief would collect and maintain production records from each seed producing unit for use in anticipating seed demand by farmers and locating available seed supplies.

Quality Control Section

The Chief of this Section would be concerned with quality control of seed both during production and prior to marketing. He would be chiefly responsible for developing field standards for seed production, such as isolation of the seed field, mixtures in the field, etc., for consideration and adoption by the Director of the Seed Service and the Technical Advisory Committee. Likewise, he would develop standards for marketable seed lots for consideration and adoption by the committee. Upon adoption of standards he would be responsible for sampling and laboratory analysis. For those lots meeting the prescribed standard, he would provide analysis tags for use in labeling the bagged seed.

2. The Seed Multiplication System. The seed multiplication system would be the certification type where the identity and varietally pure seed arising from a plant breeding/introduction program are maintained during the several generations of multiplication. Seed certification per se, however, is not recommended at the present time. When exceptionally superior varieties become available and personnel involved in the program acquire experience and training, a certification program can be developed and administered through the quality control section of the Seed Service. Until the time when a certification program is established, seed produced and distributed through the Seed Service may be referred to and labeled as "improved seed", "inspected seed" or some other appropriate name other than "certified".

The generations of seed produced during the multiplication process would be identified as R (reproduction) generations as described below:

PROJECT NO.	SUBMISSION		DATE	PAGE <u>25</u> of <u>51</u> PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION _____		

- RO - Genetic seed - directly from the plant breeder.
- R1 - The first multiplication of genetic seed
(foundation or basic seed).
- R2 - The first generation increase of R1 seed
(or the second multiplication of the genetic stock).
- R3 - The first multiplication of R2 seed
(or the third multiplication of genetic seed)

Either the R2 or the R3 generation could be distributed generally to the farmer, depending upon the type of seed, supply, demand and available growers.

The agricultural research agency of the national government, represented by IRAT in the case of corn, sorghum, millet and upland rice, IRHO for peanuts and CERCI* for irrigated rice would be responsible for developing new and improved varieties and for providing the initial genetic seed, generation RO, for the program. Initially, these same organizations would also plant this RO seed for producing the foundation seed, the R1 generation. These multiplications would be done on the IRAT experiment station at Farako-ba or Saria, on the IRHO station at Niangoloko, and at the CERCI station in the Vallee de Kou.

The foundation seed (R1) produced on these experiment station farms would then be multiplied to the R2 generation on the Ministry field station at Kamboinse and at the CERCI station at the Vallee du Kou for irrigated rice, and on the IRAT stations at Saria and Farako-ba for millet and sorghum, on the Kamboinse station for corn, and on the IRHO station at Niangoloko for peanuts. The proposed station at Fada N'Gourma would be installed later, possibly in year III, as that proposed ORD project develops.

The last multiplication from R2 to R3, would be accomplished by the ORDs, through production agreements with selected cooperating farmers. This R3 generation seed produced by the ORDs would be available for general farm use.

Ideally, the multiplication system achieves maximum effectiveness when seeds of superior adapted varieties are used. But it is also effective when unimproved varieties are processed through the system, for merely cleaning and treating the seed can be expected to increase its value by 10-15% over grain held by subsistence farmers as seed.

The project has been designed to fully satisfy the estimated demand for improved seed of sorghum, millet, maize, and rice by the fifth year. Groundnut seed production may still fall short because of the higher hectareage requirements for seed multiplication.

* Centre d'Experimentation du Riz et des Cultures Irriguees (FAO sponsored center for research on rice and other irrigated crops).

The following targets should be attainable by 1979 or the fifth project year:

	Metric Tons		
	R2	R3	Total
Millet	11	720	731
Sorghum	16	1240	1256
Corn	13	625	638
Rice (Irrigated)	3.2	187	190+
Rice (Bas Fond)	6.4	172	178+
Peanuts	80	480	560

3. Seed Processing. Six processing plants working 8 hours per day could clean, treat and bag all seed within 2 to 3 months.

A moderate but sufficient amount of seed processing equipment and warehouse space would be required at Niangoloko, Vallee du Kou, Komboinse, Mogtedo, Saria and Fada N'Gourma. (The agricultural station at Farako-Ba is being equipped through an R&S project.) These locations are within the R&R boundaries of four ORDs and for the next four or five years would be expected to process not only the R2 seed produced by the stations, but also the R3 produced under the supervision of their ORDs. An estimate of the time required to clean, treat and bag R3 seed produced is shown below. As indicated in the table, the equipment suggested is of ample capacity to complete this processing operation in time for the next planting season. Until such time that the seed production program can be expanded appreciably, major production should be confined to areas which are accessible to the processing plants.

Required Time to Clean, Treat & Bag the
R2 and R3 Production from the ORDs

		<u>Days</u> <u>(R2)</u>	<u>Days</u> <u>(R3)</u>
Millet	731 Metric tons @ 1.5 tons per hour x 8-hour day =	1	60
Sorghum	1256 M.T.	2	105
Corn	638 M.T.	1	53
Rice (Irr)	190 M.T.	1	16
Rice (BF)	178 M.T.	1	15
Peanuts	560 M.T.	<u>7</u>	<u>40</u>
Total 8-Hour Days		13	290

PROJECT NO.	SUBMISSION		(Number)	DATE	PAGE <u>27</u> of <u>51</u> PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION			

4. The Role of the Extension Service. The major thrust of Extension in the project capitalizes on the field variety trials and the seed multiplication by farmers in each ORD. Pending the introduction of superior varieties, the Project will promote the on-going GOUV activities to purify the best local varieties. The refined seed stocks alone are estimated to provide at least 15% increase in yield by removing inferior and wild types. These stocks will be distributed to the appropriate ORDs for final multiplication by individual farmers or groups under the supervision of extension agents (encadreurs) previously trained by the Project.

The ORDs have already embarked on a system for final seed multiplication. A few selected farmers or groups are provided the improved seed for multiplication under the supervision of an encadreur. Land preparation, seed treatment, planting and cultural practices are overseen by the encadreur, with the farmer providing the labor inputs. The ORD purchases the harvest at a slight premium upon maturity. The ORD then collects, cleans, treats, bags, and stores the seed for sale to all interested farmers at the next planting season. Even though the added costs are included in the final selling price, the cost to the farmer is still below the cost of the corresponding grain at that time of year.

Sixty encadreurs who will be concerned with seed multiplication by farmers will be given in-service training on the care and maintenance of seed multiplication plots as well as extension methods which will maximize the publicity to be gained from the farmer plantings. Although the present system is of contract type between the ORD and the farmer, the seed production and distribution operations could become private enterprise, once the selling price of the seed is raised to at least slightly exceed the grain price.

This would expand and modify the present operations to include a traditional planting in close proximity to the seed multiplication plots. In this way the participating farmers, as well as non-participating farmers, would be afforded the opportunity to compare results obtained with the pure seeds (and any different cultural practices) with the productivity of the traditional planting. Thus, the seed multiplication plots should provide double value as method and result demonstrations.

An acceleration in the demand for forthcoming improved varieties is contemplated by the conducting of variety performance trials in each ORD, in collaboration with research personnel. The field trials, again with traditional plantings nearby, would be the focus of farmer tours conducted at appropriate seasons of the year. Farmers would thus be kept current of new developments and would be better prepared to decide on the merits of new varieties. The implementation of this system could save a year in the diffusion process.

JECT NO.	SUBMISSION		(Number)	DATE	PAGE 28 of 51 PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION			

5. The Role of Research. A strong and effective research program in plant breeding and introduction is prime requisite of a successful and productive seed program. The breeding program should be aimed at producing improved strains and varieties of the major food crops which will give superior field performance over local varieties taking into consideration the prevailing farm conditions and the availability, or non-availability, of the practical "package" of inputs. Agricultural research programs must be geared to search aggressively for superior germ plasm from both national and international sources. Exchange of information and germ plasm should be freely given and obtained through international organizations such as ICRISAT, ITTA, WARDA, IRRI, Major Cereals Program, etc. In the final analysis, the base of a truly successful agriculture is a well-planned, expertly-executed research program. Both basic research and adaptive research are needed. Since Upper Volta can ill afford to spend large amounts of funds on research, the research program in varietal improvement should concentrate on producing improved varieties, leaving the basic research in genetics, bio-chemistry, pathology and so forth to the international research centers and the more developed countries from which breeding materials and information can be easily obtained for incorporation into the local breeding program. See note below.

6. Seed Pricing Policy. The planning and implementation of pricing policies for seed will be of particular concern to the National Seed Service. Overriding budgetary constraints on the Government of Upper Volta dictate that the production and supply of seeds must be self-supporting to the extent possible.

From a practical standpoint, the Seed Service must be concerned with the price of seed paid by the ORDs to the Government seed stations. Ideally, the ORDs should be asked to pay a price that would cover the cost of production.

Of equal importance is the establishment of prices the farmer will be asked to pay for seed purchased from the ORDs. This should be at a price higher than the cost of grain. A suggested method of calculating prices to the farmer is one which would give added value to a seed in proportion to its superiority over the traditional variety. In this way a seed which is 50% better than the traditional variety would command a price 50% higher.

7. Seed Supply and Demand. It is difficult to predict the demand for seed in future years, although many attempts have been made. In their annual reports, the ORDs often include pertinent information on seed requirements. The 1972 reports for nine ORDs give indications of interest in seed by variety as follows:

NOTE: A Field Trial Officer (FTO) is an essential element in assuring research linkages and adequate dissemination of research results and their utilization for increased production.

TABLE 1.

ORD	CROP					
	Peanuts	Rice	Sorghum	Corn	Sesame	Millet
Ouagadougou	**	**				
Volta Noire	*	*	*	*	*	
Koupela	**	**	*	*		*
Koudougou	**					
Dedougou	**	**	**			
Sud Ouest	**	**	**	**	**	
Plateaux Mossi	**	*			*	
Bobo-Dioulasso	**	**	**	**	**	
Ouahigouya	**					
No. of ORDs "Interested" in Seed	9	7	5	4	5	1

One asterisk indicates that the seed was being sought for trials in 1973. Two asterisks indicate that a specific quantity of seed was mentioned either with regard to demand from the research stations or with regard to production and distribution within the ORD.

The one seed in which the Regional Development Organizations express most interest is the improved peanut seed. The next most discussed seed is rice seed, followed by sorghum and sesame, then corn and finally millet. The relatively high interest in sesame is deceptive, however, since the quantities of sesame desired are very small and could be supplied entirely by RI production from the research stations.

In addition to the ORD reports, the Direction des Services Agricole (DSA) has expressed a "demand" for seed in the form of various proposals for seed multiplication projects. The DSA has expressed a particular interest in rice seed production which corresponds to the high interest evidenced for this seed in the ORD reports. Other proposals are for the production of millet, sorghum and corn seed. The DSA proposals estimate that 70% of all farmers growing these crops will be willing to use improved seed seven years after the introduction of a rational seed multiplication program. On this basis the proposals seek to satisfy 100% of the projected demands for sorghum and corn seed, but only 75% of the estimated demand for millet seed. Thus the DSA project proposals reflect the same general ranking of seed by importance that was revealed in the ORD reports.

Seed supply and demand projections, for the fifth year of the project, are based on assumptions and data provided by the DSA. These include farmer acceptance rates for improved seeds and acreage estimates for crop production. No allowance is made for increased cultivation of peanuts and the increases assumed in corn and rice production are only those which are assured through newly approved or ongoing agricultural development projects. The projections follow in Tables 2, 3 and 4:

TABLE 2. Quantity of Seed Demanded by 1979

	Total Area Planted in Thous of Has 1973 1979		Rate of Replace- ment	Assumed % of Farmers Accepting Improved Seed	Area Using Improved Seed Annually	Seeding Rate Kg/Ha	Total Demand for Improved Seed after 1979 in Metric Tons
Peanuts	167	167	triannual	79%	40	90	3600
Sorghum white	622	622	"	60%	124	10	1240
Millet	720	720	"	30%	72	10	720
Corn	89	100	"	75%	25	25	625
Rice irrigated	2*	≠5*	annual	100%	≠5	35	≠175
Rice Partial control of water	1	≠3	"	100%	≠3	35	≠105

* The figures for irrigated rice include double cropping in the Vallee de Kou. The sign ≠ indicates that the number following is a minimum value.

TABLE 3. Quantity of Seed Supplied by the National Seed Program by 1979

	R2 Production on Stations		R3 Production in ORDs		Total Supply R3 as Percent of Predicted Demand	Total Annual Seed Production in Tons Sum of Columns 2 and 4
	Has	Tons	Has	Tons		
Peanuts	100	80	1000	480	13%	560
Sorghum white	17	16	1550	1240	100%	1256
Millet	16	11	1125	720	100%	731
Corn	8	13	520	625	100%	638
Rice Irrigated	1	3.2	74	187	107%	190
Rice Partial control of Water	4	6.4	144	172	164%	179
TOTAL	146	130	4413	3424	-	3554

NOTE: Tables 1-3 reflect targets formulated on the basis of seed multiplication in each of 10 ORDs. Following the recommendations of the mini-EPRC, however, the scope of the project has been reduced to the multiplication of seed in four ORDs. After an evaluation of the first years of project activity, these tables may be revised to reflect more accurately the quantity of seed demanded and supplied.

TABLE 4. Constants Assumed in Supply Projections of Table 3

	Peanuts		Sorghum		Millet		Corn		Irrigated Rice		Bas-Fonds Rice	
	Station	ORD	Station	ORD	Station	ORD	Station	ORD	Station	ORD	Station	ORD
Seeding Rate KG/HA	90	90	8	10	5	10	25	25	35	35	35	35
Yield KG/HA	1000	600	1200	1000	900	800	2000	1500	4000	3000	2000	1500
Loss in cleaning	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Net Yield KG/GA	800	480	960	800	720	640	1600	1200	3200	2400	1600	1200

In Table 3, the second and fourth columns are calculated on the basis of yield estimates supplied by the GOUV, less an assumed loss of 20%. The seeding rates and yield estimates are assumed to be more favorable on the seed stations than in the ORDs. The final production goals, listed in the fourth column of Table 3 will be approached gradually over the course of the project. Production at seed stations, in the early years of the project, will exceed the needs for R2 production in most crops and can be distributed directly to farmers thereby filling some of the need for R3 seed. As the R3 multiplication program gets under way in the ORDs it is anticipated that the amount of seed produced at the seed stations can be reduced to that amount necessary to fulfill R2 needs. The exception is peanut seed for which production will not meet estimated demand because of the relatively large resource requirements for the multiplication of this seed.

8. U.S. Assistance. Details on U.S. assistance contained in Annex V, reveal requirements for U.S. technical services, types of training envisaged for Upper Volta personnel, building and construction needs and equipment and supplies to be furnished.

The training of African personnel is designed to take place in-country to the extent possible with higher level officers attending special short programs in Senegal and at IITA. It is anticipated that the persons selected for the positions of Director of the National Seed Service and the two subsection Chiefs should receive some advanced training in the U.S.

Equipment and supplies for the seed stations and for the ORDs are more or less standard with only small variations based on type of seed to be produced, handled and processed.

Building requirements are held to an absolute minimum but are considered vital to the success of the project.

PROJECT NO.	SUBMISSION		DATE	PAGE <u>32</u> of <u>51</u> PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION _____		

It is anticipated that certain commodities may have to be purchased in third countries in order to serve the interests of standardization, to reduce significantly the delivery time or to meet local capacities for maintenance and servicing.

It is assumed that an AID Project Manager, either full-time or part-time, will be assigned to the American Embassy, Ouagadougou and that he will play an important role in drafting program documents and fulfilling other important functions regarding the scheduling of U.S. inputs.

9. Project Evaluation. Project evaluation should be conducted annually, ^{beginning} at the end of the first year of operation. The evaluation should ascertain the degree to which phasing of stated activities have been achieved and the extent to which the National Seed Service has been instrumental in assuring the farmers of a supply of improved seed at the time and place required. It will also identify necessary modifications to the project.

By the end of the third year of operation the evaluation may gauge the success of the project primarily upon the (1) quality and quantity of improved seed available for farmer use and (2) farmer acceptance of the seeds so produced. Additional factors which will help ascertain project success toward the end of the five-year period include attitudes of the people working in the project, the acceptability of the program at the ORD and farmer levels, the quality of leadership developed through experience and training provided by the project, and the willingness of the Government of Upper Volta to continue the project without significant external assistance.

It is suggested that the Centre Voltaïque de la Recherche Scientifique de Etudes et de Développement, located in Ouagadougou could assist in the evaluation.

LOGICAL FRAMEWORK MATRIX - PROP WORKSHEET

Summary	Objectively Verifiable Indicators	Important Assumptions
<p>A.1. Goal</p> <p>To increase domestic food production, specifically that of rice, corn, groundnuts, sorghum and millet.</p>	<p>A.2. Measurement of Goal Achievement</p> <p>Net annual increases in the production of food crops. Productivity increases by farmers using improved seed.</p>	<p>A.3. (as related to goal)</p> <p>That the GOUV will continue to place prior on increasing agricultural production. That qualified extension agents will be provided for farmer motivation. That the rainfall patterns of the past five years will not become more adverse to agricultural production.</p>
<p>B.1. Purpose</p> <p>Establish a National Seed Service to assure a constant source of seed to the farmer and to provide the organizational framework for multiplying improved seed of superior varieties as they become available.</p>	<p>B.2. End of Project Status</p> <p>The National Seed Service is an accepted institution effectively discharging its responsibilities to meet farmers requirements for seed.</p>	<p>B.3. (as related to purpose)</p> <p>That other donors will continue to support agricultural research and that improved seed varieties will be available to Upper Volta from all sources. That current extension/farmer relationships for seed multiplication in the ORDs continue and expand.</p>
<p>C.1. Outputs</p> <p>Upper Volta personnel trained abroad and in-country. Buildings constructed and equipment in place. Seed produced and distributed. Field trials and demonstrations conducted.</p>	<p>C.2. Output Indicators</p> <p>Number of persons trained. Kgs. of seed produced. Rice no longer imported. No. improved varieties introduced. No. field trials, demonstrations conducted. Evidence that Advisory and Consultative Committees are influential.</p>	<p>C.3. (as related to outputs)</p> <p>Government and ORDs make available suitable qualified people for training. UNDP and Other Donors continue to supply national training institutions for extension agents and technical personnel. Ancillary support will be forthcoming from regional project activities including IITA, IRAT, ICRISAT, WARDA and Major Cereals, etc.</p>
<p>D.1. Inputs</p> <p>Training. Two U.S. technicians for 7 manyears. Buildings and equipment. Local currency costs. GOUV decree establishing National Seed Service. Employment by GOUV/DSA of staff (3 professionals plus clericals)</p>	<p>D.2. Budget/Schedule</p> <p>The expenditure of funds on an orderly basis in accordance with planned phasing of project activities for both U.S. and GOUV inputs.</p>	<p>D.3. (as related to inputs)</p> <p>Goods and services will be provided on a timely basis and that commodity source waivers can be obtained in those instances where advantages of time and interests of standardization or maintenance are clearly demonstrated.</p>

PROJECT NO.	SUBMISSION		(Number)	DATE	PAGE <u>34</u> of <u>51</u> PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION			

ANNEX I

LIST OF PERSONS CONTACTED

- M. Salia Sanon, Director, Department of Agricultural Services (DSA) ✓
- M. Bidet, Senior Agriculture Advisor/DSA (FAC) ✓
- M. Virgilio Marchionneschi, Senior Ag. Advisor/DSA (Govt. Italy) ✓
- M. Gerard Philippe-August, Senior Ag. Advisor/DSA (FAO) ✓
- Mr. Joseph Kabore, Director, ORD/Ouagadougou ✓
- Mr. Julien Thombiano, Director, ORD/Fada N'Gourma ✓
- Mr. Leonard Ouedrago, ORD/Ouagadougou ✓
- M. Jean-Francois Poulain, Director, IRAT - Upper Volta and Mali ✓
- M. Jens Hogel, UN ResRep ✓
- M. C. Malcoiffe, Deputy Director of IRAT, Upper Volta
- M. L. deAzcarate, Team Leader, IBRD Economic Survey Mission to Upper Volta ✓
- Mr. Carl Allam, USAID Advisor to OFNACER ✓
- M. Ugo Fraddosio, Director, Matourkou Project ✓
- M. Morino, Extension Advisor, Matourkou Project ✓
- M. Damoue, Chief Coordinator of Vallee de Kou ✓
- M. Fulgence Toe, Director/ORD of Bobo-Dioulasso ✓
- M. Guillemine, Director, CFDT, Bobo-Dioulasso ✓
- M. Jean-Marc Boussard, Charge de Recherches, National Institute of Agricultural Research, Paris ✓
- M. Haeffner, Director, FED ✓
- M. Thierry Waffelaert, Deputy Director, FED ✓
- M. Gabaguin, Assistant Director at Kamboinsee Agricultural Station ✓
- M. Leberri, Director, IRAT Research Station, Saria ✓
- Mr. Arthur Westneat, Peace Corps Volunteer ✓
- Mr. John Reddy, Assistant Director of Peace Corps ✓
- M. Dhery, Director of Institute of Research on Oleaginous Crops, Saria ✓

PROJECT NO.	SUBMISSION		(Number)	DATE	PAGE 35 of 51 PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION			

ANNEX I 2

LIST OF PERSONS CONTACTED (continued)

- M. Francois Leger, Field Trials Officer, Major Cereals Project ✓
Dakar, Senegal
- Dr. F. Martin-Samos, WHO Representative, Upper Volta ✓
- M. Darendel, Director of Farako-Ba Station IRAT Upper Volta ✓
- Dr. Ibrahim Konate, Director, CILSS Secretariat, Ouagadougou ✓
- M. Thomas d'Aquin Some, Director, OFNACER ✓
- M. Louis Sow, DSA (Govt. Official assigned to Project Design Team) ✓
- Mr. William Garvey, USAID, Niamey ✓
- M. J. L. Ropiteau, World Bank/Washington ✓
- M. C. Bourgin, World Bank/Washington ✓
- Dr. Herbert Albrecht, Director, IITA, Nigeria ✓
- Dr. James Moomau, Head of Outreach, IITA ✓
- Dr. Hap Reeves, Training Officer, IITA ✓
- Dr. K. Rachie, IITA Plant Scientist ✓
- Dr. Clifton, Major Cereals Project, Samaru ✓
- Dr. Russell Olson, Food & Ag. Officer, USAID, Nigeria - ✓
- Mr. Winton Fuglie, Project Manager, Accelerated Food Crops, USAID, Nigeria - ✓
- Dr. Marius Bono, Senegal ✓
- Dr. Samuel Litzenberger, TA/AGR, AID/W -

ANNEX II

UPPER VOLTAGeneral Agricultural StatisticsProduction of Major Crops

	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1973</u>
<u>Sorghum & Millet</u>							
Area '000 ha.	1400	1500	1550	1450	1891	1750	1755
Prod. '000 tons	870	940	1010	860	943	742	734
Yield kg/ha	621	627	652	593	499	424	420
<u>Maize</u>							
Area '000 ha.	120	130	130	150	86	90	89
Prod. '000 tons	64	66	100	100	55	67	58
Yield kg/ha	533	508	531	666	640	744	658
<u>Groundnuts (Unshelled)</u>							
Area '000 ha.	95	100	100	100	158	122	167
Prod. '000 tons	73	75	75	75	69	66	63
Yield kg/ha	768	750	750	750	437	540	376
<u>Cotton</u>							
Area '000 ha.	52	65	75	84	78	76	
Prod. '000 tons	16	17	32	36	24	28	n/a
Yield kg/ha	311	264	426	431	301	370	
<u>Rice</u>							
Area '000 ha.	23	26	28	40	41	42	39
Prod. '000 tons	28	29	31	40	34	41	32
Yield kg/ha	800	900	900	1000	829	975	817
<u>Sesame</u>							
Area '000 ha.	30	30	31	30	36	22	n/a
Prod. '000 tons	4	4	5	6	5	4	5
Yield kg/ha	133	133	161	200	140	180	n/a

Source: GOUV Direction de Development Rural

(Note: Corresponding figures for 1972 are not available.)

PROJECT NO.	SUBMISSION		DATE	PAGE 37 of 51 PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION _____		

ANNEX III

CROPS, VARIETIES AND SELECTIONS WORTHY OF FIELD TRIAL IN ORDS IN
UPPER VOLTA

Dwarf Pigeon Pea
TUC-2705-3 (IITA)

Rice - Irrigated
CICA-4
IR-20

Maize
Jaun de Fo
Massayoumba
Western Yellow I
Samaru 123

Sorghum
Sorgho 29
Tioadi
Quedezoure
Gnofing
137-62
CE-90
Yi-Firi
7706

Millet
Dori
Zalla
Syn 71
Mil du G.A.M. (P² Bilquez)

Cowpea
Bambei 88-63

Groundnuts
V-90
28206
TE-3
1040
55-437
47-16
Bombei 55-437

ANNEX IV

PRICE IN CFA PER KILOGRAM IN OUAGADOUGOU MARKET OF PRINCIPLE FOOD CROPS

<u>CROP/1970</u>	<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>	<u>JUL</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>
Millet & Sorghum	39	30	32	27	32	33	32	32	36	31	34	26
Rice, white	90	82	96	81	75	76	92	56	59	61	59	58
Corn	46	41	48	28	37	34	45	43	48	25	48	41
Peanuts, shelled	59	96	50	79	67	76	74	96	46	46	35	68

<u>CROP/1971</u>												
Millet & Sorghum	30	31	34	37	41	47	49	43	42	49	40	36
Rice, white	58	63	60	60	63	60	59	64	64	63	65	70
Corn	46	45	48	50	44	44	48	50	36	46	43	36
Peanuts, shelled	89	86	89	102	96	111	119	96	79	125	61	79

<u>CROP/1972</u>												
Millet & Sorghum	44	41	42	27	49	58	34	41	41	43	32	37
Rice, white	68	63	62	63	58	70	70	64	67	69	67	69
Corn	41	50	39	32	44	57	33	79	56	51	41	50
Peanuts, shelled	44	55	56	59	83	77	119	192	78	64	98	37

<u>CROP/1973</u>												
Millet & Sorghum	46	34	49	56	68	76	69	72	64	75	56	54
Rice, white	70	78	72	79	78	-	-	-	-	89	80	74
Corn	56	57	78	56	74	81	105	75	58	57	80	45
Peanuts, shelled	39	56	55	91	70	-	64	128	58	88	62	52

<u>CROP/1974</u>			
Millet & Sorghum	59	60	67
Rice, white	73	73	76
Corn	63	68	66
Peanuts, shelled	54	63	82

Source: Direction de la Statistique et de la Mecanographie, Bulletin Mensuel d'Information Statistique et Economique

PROJECT NO.	SUBMISSION		DATE	PAGE <u>39</u> of <u>51</u> PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION _____		

ANNEX V

REQUIREMENTS FOR U.S. ASSISTANCE
for Obligation in FY 1975

A. U.S. Advisors

It is planned that two U.S. advisors will be required. The first will be the senior advisor recruited for a five-year period. Suggested qualifications follow: he should be fluent in the French language; a graduate of a U.S. Land Grant College of Agriculture; have had overseas experience in agricultural development; experience in grain seed production and processing; some experience in agricultural extension overseas; proven project management and leadership ability; and he should be in good health.

The advisor will work with GOUV Ministry officials in implementing the National Seed Program; advising GOUV on policies which are germane to the development of the Program; modifying plans to adapt to changing situations; supervising the establishment and training of the three GOUV officers for the National Seed Service; overseeing the procurement, distribution, and installation of seed processing facilities at six Stations; assisting in planning of each season's seed multiplication at Stations and ORDs; maintaining close liaison with research entities as regards field trials and potential new varietal introduction; planning in-service training for ORD officers and encadreurs who will be integrated into the overall Project; projecting the rate of expansion of the National Program and determining sequence of ORD participation; monitoring the use of U.S. funds.

A junior advisor is to be recruited for two years beginning in the second project year. He should be an extension advisor or general agriculturist with competence in the French language. He will serve as assistant to the senior advisor, and be primarily concerned with operations in the field.

Consultant services are to be provided to assist in drafting detailed specifications for equipment and other commodities and to supervise installation of seed processing equipment.

Estimated Costs:	Senior Advisor	-	\$300,000	
	Junior Advisor	-	120,000	
	Consultant Services	-	63,000	
	Total	-	\$483,000	\$483,000

(Cost estimates based on \$60,000 per man/year under personal services contract. Under institutional contract costs will increase to total \$620,000.)

PROJECT NO.

SUBMISSION

(Number)

DATE

 ORIGINAL REVISION

PAGE 40 of 51 PAGES

ANNEX V 2

B. Training. Training programs will have to be worked out for the different levels of personnel as indicated below. A special feature of the plan for training is the involvement of the National Seed Service officers in planning and executing courses and programs for operational level personnel.

Director, National Seed Service (Year 2)

One academic year at a U.S. Land Grant University, plus two months' observation tour.

University training to include courses in seed production, processing and marketing, quality control, varietal trials, seed storage.

Field observations to include commercial seed production and agricultural extension activities in varietal introduction.

Estimated cost: \$ 15,000

Chief, Technical Services, National Seed Service (Year 2)

Training will include one academic year at a U.S. Land Grant University plus one month observation of commercial seed production operations.

University courses in seed production, seed analysis, seed processing machinery, seed technology, field plot design.

Field observations to include multiplication programs, and production of foundation seed and certified seed.

Estimated cost: \$ 15,000

Chief, Quality Control Section, National Seed Service (Year 1)

Training will be very similar to that proposed for the Chief, Technical Services Section described above.

Estimated cost: \$ 13,000

Chief, Quality Control Section, National Seed Service (Year 2)

Five weeks at IRAT (Farako-Ba, Saria) and Vallee du Kou and Kamboinse to study varietal characteristics, roguing procedures, laboratory techniques in seed examination and testing, harvesting precautions, seed processing and storage, cataloging.

One week Farako-Ba
One week Vallee du Kou
One week Saria
One week Kamboinse
One week Nyangoloko

Estimated cost: \$ 1,000

PROJECT NO.	SUBMISSION		(Number)	DATE	PAGE <u>41</u> of <u>51</u> PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION			

ORD Agricultural Officers (Year 1)

There would be 4 people, one from each of the 4 ORDs, all told. Their training program to begin the first project year would be scheduled: Samaru - one week - to observe cereal breeding work and field trials, and study objectives and procedures, design of trials, field inspection, maintenance, record keeping (millet, sorghum, corn) "package recommendations; IITA, Ibadan - three weeks - to observe plant breeding work, variety trials, determining needs, seed processing, IITA procedure for regional field trials (upland rice, paddy rice, corn, other crops), cropping systems, rotation, cultural practices in seed multiplication, cultural practices for farmers, maintaining varietal purity.

Estimated cost: \$ 5,400

Extension Agents (Year 1 and Year 2)

Agents employed by the ORDs, three from each, for a total of 12 "encadreurs", or extension agents, involved with farmer seed multiplication would be selected for the following suggested training, the first project year and a similar group for the second year: encadreurs in ORDs involved with farmer seed multiplication, Project Year #1 - 4 ORDs x 3 encadreurs = 12 Three weeks training at Matourkou School: planning seed multiplication plot, cultural practices for each crop (sorghum, millet, corn, upland rice, irrigated rice, bas-fond rice; theory and field work in layout of plot, isolation requirements, supervision, record-keeping, fertilizer application, weed control, pest control, harvesting, extension methods (motivation method demonstrations, result demonstrations, publicity).

National Seed Program Organization.

Repeat for 12 additional encadreurs Year #2.

Estimated cost: \$ 4,600

TOTAL \$ 54,000

PROJECT NO.	SUBMISSION		(Number)	DATE	PAGE 42 of 51 PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION			

ANNEX V 4

C. Buildings, Equipment and Supplies

1. National Seed Service - Headquarters

Central Office. A building approximately 360 square meters to accommodate the three officers and their supporting staff, the seed testing laboratory and workroom. Year I (\$ 46,000) ^{1/}

A warehouse of 160 square meters to serve as temporary storage for seed stocks, and supply area. Year I (15,000)

Office equipment - desks, chairs (probably local procurement), filing cabinets, 2 typewriters, calculator, supplies. Year I 3,500

Seed laboratory equipment - germinators, balances, separators, microscope, magnifiers, purity boards, supplies (see detailed listing attached). Year I 10,000

Vehicles: 1 pick-up truck, 1 station wagon (Peugeots suggested) and 1 2½-ton capacity truck. First two for personnel and light deliveries; truck for larger scale transport of equipment, seeds, fertilizer. Include 20% spare parts. Year I 33,500

Vehicle operation and maintenance.
Estimated at \$8,000 per year for 4 years; \$4,000 for first project year (36,000)

Total Central Office \$ 47,000 ^{1/}

2. Seed Multiplication Farms. The project will support 4 seed stations in addition to Farako-Ba which is receiving U.S. assistance under the Sahel R&R program. The four stations are Saria, Vallee du Kou, Nyangoloko, and Kamboinse.

U.S. Contribution (on next page)

^{1/} In these budget estimates, line items in parentheses are included as "Other Costs" on the Face Sheet of this PROP; they are non-add items in the Commodity budget breakdown.

PROJECT NO.	SUBMISSION <input type="checkbox"/> ORIGINAL <input type="checkbox"/> REVISION _____	(Number)	DATE	PAGE <u>43</u> of <u>51</u> PAGES
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ANNEX V 5

U.S. Contribution

	<u>4 Stns</u>
1 tractor - approximately 60 hp. with diskplows, harrow, seeder, thresher, fertilizer attachment and trailer - incl 15% spare parts. Estimated cost: \$24,000	\$ 96,000
1½-ton pick-up truck (Peugeot desirable) with 10% spare parts. Estimated cost: \$6,000	24,000
1 warehouse - 3,000 sq. ft. Cement block construction. Estimated cost: \$30,000	(120,000)
Seed Processing equipment (see separate list below) Estimated cost: \$28,000	112,000
Complete fertilizer mixture - 30 tons at \$450/ton; two year supply requested. Estimated cost: \$27,000	108,000
Operating costs (tractor, vehicles, generators, etc.) x 5 years. Estimated cost: \$,000	(45,000)
Miscellaneous - procurement of pesticides, jute bags, plastic bags and seeds. Estimated cost: \$6,000	24,000
1 corn sheller (for Farako-Ba Station) Total estimated cost:	2,000
1 Peanut sheller (for Nyangoloko Station) Total estimated cost:	2,000
3 Generators (standby) Total estimated cost:	5,000
Total	\$ 373,000
Total 4 Seed Farms	\$ 373,000

PROJECT NO.	SUBMISSION		DATE
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION _____ (Number)	
			PAGE <u>44</u> of <u>51</u> PAGES

ANNEX V 6

Seed Laboratory Equipment
(suggested list)

<u>No.</u>	<u>Item</u>	<u>Cost</u>
1	Seed Sample Divider	340
2	Seed Scales, Metric @ 65	130
2	Seed Scales, Torsion Balance @ 225	450
1	Seed Scale, Chain-O-Matic	400
1	Weight Sets	35
3	Purity Work Board	150
3	Flourescent Lamp w/Magnifier	195
2	Hastings Triplex Magnifier	30
6	Forceps, 5½" long	18
6	Forceps, 5" long	12
2 dozen	Analytical dishes	16
4 dozen	Plastic Grain Sample Box	8
1 set	Seed Dockage Seives	70
1	South Dakota Blower	600
6	Sample pan, triangular	24
6	Sample pan, sprout type	36
6	Sample pan, round	18
1000	Spear envelopes for grain (4 oz.)	35
1000	Spear envelopes for grain (8 oz.)	46
1000	Spear envelopes for grain (12 oz.)	65
8	Counting Plates	88
96	Plastic containers	36
10,000	Seed Germination Towels	80
5,000	Seed Germination Blotters	100
1	Seed Germinator	2,500
24	Thermometers	24
5	Seed Triers	68
1	Oven	290
1	Moisture Tester	550
10 doz.	Vials	20
12 doz.	Bottles w/caps	20
	Assorted laboratory supplies	500
	Total FOB Supplies	7,014
	Crating & Shipping (30%)	2,104
	Inflation (15%) (rounded)	892
	Grand Total	\$10,000

PROJECT NO.	SUBMISSION		DATE	PAGE 45 of 51 PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION _____		

ANNEX V 7

Seed Processing Equipment
(detailed listing)

<u>No.</u>	<u>Item</u>	<u>FOB Total Cost</u>
1	Air and Screen cleaner w/motor & 24 screens (Re. Crippen Model H 442)	6,000
2	Dust Collectors for Cleaner @ \$400	800
1	Seed Treater, w/motor. Slurry & Liquid type	1,200
1	Baggage-Weigher (Re: Howe-Richardson Model G-17)	800
1	Surge Bin over Cleaner: 1.5 x 1.5 x 1.5 meter W.Hopper Bottom	600
1*	Surge Bin over Treater: 1.5 x 1.5 x 1.0 meter W/Hopper Bottom	500
1*	Surge Bin over Weigher-Bagger: 1.5 x 1.5 x 1.0 meter W/Hopper Bottom	500
2	Elevators @ \$950 (Re: Universal Model C 2-175)	1,900
1	Elevator (Re: Universal Model B 2-75)	850
1	Conveyor, portable aluminum (Re: Burrows No. 2200)	400
1	Bag Conveyor (Re: Burrows Model R-19)	1,000
1	Bag Closer (Re: Fischbein Model D)	500
1	Portable Platform Scales (Re: Fairbanks-Morse No. 1180)	350
4	Bag truck, 2 Wheel @ \$65	260
1	Heat Sealer, for plastic bags (W/4 extra heater bars)	200
1	Vacuum cleaner, Industrial type (Re: Tornado Model 420)	400
1	Blower, Portable (Re: Tornado Model 550)	150
1 Doz.	Aluminum baskets	75
2	Scoops for moving grain @ \$15	30
1 Set	Twenty-four hand-testing screens Sizes to be selected prior to ordering	100
2	Gram Scales @ \$60	120
2	Bag Trier @ \$40	80
1	Moisture Tester (Re: Stemlist Model 500 or Universal Moisture tester)	600
	Miscellaneous equipment & supplies (Hand scoops, sling psychrometer, prober, sample cans, thread, etc.)	1,000
1	Generator, diesel oil driven, 10 KW	1,000
Total FOB Supplies		19,415
Crating & Shipping (30%)		5,824
Inflation (15%) (rounded)		2,761
Grand Total		\$28,000

PROJECT NO.	SUBMISSION	(Number)	DATE	PAGE 46 of 51 PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION		

ANNEX V 8

3. ORD Seed Production. For each of the 4 ORDs, a locally-constructed warehouse for seed storage is recommended, as well as a utility truck to facilitate pick-up and delivery of seeds. A tractor and revolving fund are also indicated for each ORD to facilitate the local multiplication of seeds by farmer cooperators.

For these reasons U.S. commodity assistance in the first year will be directed to only 4 ORDs as follows: Ouagadougou, Bobo-Dioulasso, Banfora and the ORD de l'Est (Fada N'Gourma). Any decision to assist ORDs over and above the first 4 would be made following project evaluation.

<u>U.S. Assistance</u>	<u>1st Year</u> <u>4 ORDs</u>
1 warehouse - for seed handling and storage - 2,500 sq. ft. cement block construction Estimated cost: \$25,000 x 4 ORDs	(\$100,000)
1 Tractor - 60 hp. with implements (diskplow; harrow, seeder, thresher, fertilizer attachment and trailer) plus 15% spare parts Estimated cost: \$24,000 x 4 ORDs	96,000
1½-ton pick-up truck - (Peugeot suggested) plus 10% spare parts Estimated cost: \$5,500 x 4 ORDs	22,000
Fertilizer - Est. 30 tons each year at \$450/ton. Two year supply requested. Estimated cost: \$13,500 x 4 ORDs x 2 years =	108,000
1 2½ ton truck - for ORD de l'Est only. 10% spare parts. Est. cost \$12,000. Operating cost est. \$2,000 per year x 5 years = \$10,000 Total estimated cost:	12,000 (10,000)
Seed Processing equipment - for Ouagadougou ORD to complete their existing seed processing center. (see detailed list below)	10,000
Revolving Fund - for procurement of seeds, sacks and pesticides Estimated cost: \$15,000 x 4 ORDs	60,000
Sub Totals	\$ 308,000
Total 4 ORDs	\$ 308,000

Ouagadougou ORD

MOGTEDO Seed Processing Center
(detailed list of commodities)

<u>No.</u>	<u>Item</u>	<u>Cost</u>
1	Seed Treater, w/motor Slurry & Liquid type	1,200
1	Bagger-Weigher (Re: Howe-Richardson Model G-17)	800
1*	Surge Bin over Treater, 1.5 x 1.5 x 1.0 meter W/Hopper Bottom	500
1*	Surge Bin over Weigher-Bagger 1.5 x 1.5 x 1.0 meter, W/Hopper Bottom	500
1	Elevator (Re: Universal Model B 2-75)	850
1	Portable Platform Scales (Re: Fairbanks-Mores No. 1180)	350
4	Bag truck, 2 Wheel @ \$65	260
1	Heat Sealer, for plastic bags (W/4 extra heater bars)	200
1 Doz.	Aluminum baskets	75
2	Scoops for moving grain @ \$15	30
1 Set	Twenty-four hand-testing screens Sizes to be selected prior to ordering	100
2	Gram Scales @ \$60	120
2	Bag Trier @ \$40	80
1	Moisture Tester (Re: Stemlist Model 500 or Universal Moisture tester)	600
	Miscellaneous equipment & supplies (Hand scoops, sling psychrometer, prober, sample cans, thread, etc.)	1,000
	Sub-total FOB Supplies	6,665
	Crating & Shipping(30%)	1,999
	Inflation (15%) (rounded)	1,336
	Sub-Total	\$ 10,000

* Local construction.

D. GOUV Contribution

	Year I (CFA 000)	Year II and on (CFA 000)
<u>National Seed Service</u>		
Central Office - land, labor, furniture	40,000	-
Office Director	900	900
Chief Technical Services	240	240
Chief Quality Control	570	570
Secretary	570	570
2 Drivers	360	360
1 Orderly	132	132
1 Driver	-	180
2 Orderlies	-	264
1 Laboratory Assistant	-	400
1 Mechanic	-	180
Sub-total	(42,772)	(3,616)
<u>Seed Multiplication Farms</u> (4 Farms total)		
Station Director (CFA 570)	2,280	2,480
1 Tractor Operator (CFA 180)	-	900
1 Assistant (CFA 66)	-	330
Sub-total	(2,280)	(3,710)
<u>ORD Seed Production</u> (10 ORDs total - only 4 in 1st Year)		
1 Designated Director Seed Production (CFA 570)	2,280	2,280
1 Tractor Operator (CFA 180)	720	720
10 Daily Workers (CFA 660)	2,640	2,640
3 Extension Agents (in charge farmer seed multiplication - CFA 180 each)	2,160	2,160
Sub-total	(7,800)	(7,800)
Total	52,852 CFA (\$222,000)	15,126 CFA (\$70,000)

Recapitulation of U.S. Inputs
for Obligation in FY 1975

	Limited Project 4 Seed Farms 4 ORDs (\$000)	L/C Costs (\$000)	Full Project 5 Seed Farms 10 ORDs (\$000)	L/C Costs (\$000)
U. S. Advisors	483	-	480	-
Training	54	16	46	16
National Seed Service Hq. ^{1/}	144	143.5	157	143.5
Seed Farms ^{1/}	538	296	653	378
ORD Seed Production ^{1/}	418	300	1,159	825
Totals	1,637	755.5	2,375	1,362.5

^{1/} Includes Commodities and Other Costs

PROJECT No.	SUBMISSION	(Number)	DATE	PAGE <u>50</u> of <u>51</u> PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION		

ANNEX VI

ENVIRONMENTAL ANALYSIS

1. Project Description. The project will assist the Government of Upper Volta in the establishment and operation of a National Seed Service which would provide a constant supply of seed to the farmer and promote a system of production and control through which improved varieties may be introduced as they become available from national and international research organizations. The project would provide facilities and equipment essential to operate the following:

- a. The Central Office of the National Seed Service;
- b. 5 major seed multiplication farms for rice, corn, millet, sorghum and peanuts;
- c. Seed multiplication in up to 10 Regional Development Organizations.

The project and environmental analysis was carried out by the Sahel Mid-term Planning Team after intensive field investigations during April, 1974. The team consisted of a program coordinator, an economist, an agriculturist and a seed production and processing specialist.

2. Environmental Impact. The project envisages the construction of 17 buildings. These will consist of the offices for the National Seed Service, warehouses and other structures to house seed processing equipment. They will be located on sites identified by the Ministry of Agriculture and the ORDs. In all cases the land will be under the administration of the Government and proper measures will be taken to make sure that buildings are located to take maximum advantage of existing approach roads, that septic tanks for sewage disposal are designed properly and that construction activities do not have any adverse impact on soil erosion or water supplies.

It is anticipated that the proposed seed multiplication activities will have a beneficial impact on the environment for two important reasons: firstly, the program will help promote the use of improved agricultural practices including contour plowing, the use of legumes to improve the nutrients in the soil and better weed control; and secondly, through the systematic exploitation of improved seed varieties it can provide added economic justification for the development of lands freed for agricultural purposes under the regional onchocerciasis control program.

The project can also be expected to have favorable impact of a socio-cultural nature. It will play an important role in increasing domestic food production in a country suffering widespread famine as a result of persistent drought. Through the introduction of improved seed varieties the project also can help improve the nutritional value of local diets. In an entirely different aspect the project is expected to promote private enterprise in the commercialization of seeds and, in the longer run, in the production and supply of seeds.

PROJECT NO.	SUBMISSION		DATE	PAGE <u>51</u> of <u>51</u> PAGES
	<input type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION _____		

ANNEX VI 2

3. Alternate Project Designs: The design of the seed multiplication project was considered to have only very marginal potential for adverse environmental impact. For this reason alternative project designs were not considered from the environmental point of view.

4. Recommended Project Design. Recommended project design is as modest as can be devised. To the maximum extent all existing lands, buildings, roads and other facilities are being used as the basis for an expanded and accelerated seed multiplication program.

The proposed construction of storage facilities is considered essential not only for seeds produced but also for safeguarding fertilizers, insecticides and pesticides which constitute a potential hazard to both human and animal health.

Project evaluation and technical and quality controls are built into the design and can be expected to correct or enhance the implementation of the project in its various stages.

5. Effect of Environmental Measures on Project Costs. The project is not expected to have any adverse impact on the environment requiring special measures. The effect on project costs, therefore, is not applicable.