

I. PROJECT IDENTIFICATION

1. PROJECT TITLE <b>Niger Cereals Production</b>		APPENDIX ATTACHED <i>121 p</i> <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
3. RECIPIENT (specify) <input checked="" type="checkbox"/> COUNTRY <b>NIGER</b> <input type="checkbox"/> REGIONAL <input type="checkbox"/> INTERREGIONAL		2. PROJECT NO. (M.O. 1095.2) <b>683-11-130-201</b>
4. LIFE OF PROJECT BEGINS FY <b>75</b> ENDS FY <b>78</b>		5. SUBMISSION <input checked="" type="checkbox"/> ORIGINAL <b>4/1/75</b> DATE <input type="checkbox"/> 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. OPRN FY <b>75</b>	<b>5,976</b>	<b>1,322</b>	<b>372</b>	<b>242</b>	<b>235</b>	<b>2,295</b>	<b>2,117</b>	<b>1,322</b>	<b>372</b>	<b>2,785</b>		<b>150</b>
3. BUDGET FY <b>76</b>	-	-		-		-	-	-	-	-		
4. BUDGET +1 FY <b>77</b>	<b>2,716</b>	<b>861</b>	<b>246</b>	<b>198</b>	<b>160</b>	<b>343</b>	<b>1,314</b>	<b>861</b>	<b>246</b>	<b>856</b>		<b>679</b>
5. BUDGET +2 FY <b>78</b>	<b>944</b>	<b>498</b>	<b>142</b>	<b>66</b>	<b>57</b>	<b>45</b>	<b>335</b>	<b>498</b>	<b>142</b>	<b>198</b>		<b>236</b>
6. BUDGET +3 FY												
7. ALL SUBJ. FY												
8. GRAND TOTAL	<b>9,636</b>	<b>2,681</b>	<b>760</b>	<b>506</b>	<b>452</b>	<b>2,683</b>	<b>3,766</b>	<b>2,681</b>	<b>760</b>	<b>3,839</b>		<b>1,065</b>

\*In kind

9. OTHER DONOR CONTRIBUTIONS	(A) NAME OF DONOR <b>Peace Corps FAC</b>	(B) KIND OF GOODS/SERVICES <b>Volunteers Plant Physiologist, Plant Protection Spec.</b>	(C) AMOUNT <b>\$570,000</b>
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III. ORIGINATING OFFICE CLEARANCE

1. DRAFTER <i>SL Ms DN</i> <b>JLivingston/MBaker/DBlane</b>	TITLE <b>Project Manager/Entente Desk</b>	DATE <b>4/1/75</b>
2. CLEARANCE OFFICER <i>David Shear</i> <b>David Shear</b>	TITLE <b>Director, AFR/CWR</b>	DATE <b>4/10/75</b>

IV. PROJECT AUTHORIZATION

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

Project to be evaluated in-depth prior to allotment of FY 177 funds.

2. CLEARANCES					
BUR OFF.	SIGNATURE	DATE	BUR OFF.	SIGNATURE	DATE
AFR/DS	P. Lyman		DAA/AFR	D. Brown	
AFR/DP	R. Huesmann	<i>4/17/75</i>	PPC	P. Birnbaum	<i>5/13/75</i>
GC/AFR	E. Dragon	<i>4/11/75</i>	GC	C. Gladson	
PPC/DPR	A. Handly				
AA/TA	S. Butterfield	<i>4/17/75</i>			
3. APPROVAL AAS OR OFFICE DIRECTORS			4. APPROVAL A/AID (See M.O. 1025.1 VI C)		
SIGNATURE	DATE	SIGNATURE	DATE	SIGNATURE	DATE
<i>Samuel G. Adams, Jr.</i>	<i>4/16/75</i>	<i>[Signature]</i>	<i>5/14/75</i>	<i>[Signature]</i>	<i>5/14/75</i>
ASST. ADMINISTRATOR, BUREAU FOR AFRICA			ADMINISTRATOR, AGENCY FOR INTERNATIONAL DEVELOPMENT		

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PART I

INTRODUCTION

This Project Paper recommends initiation of support for a national cereals production program in Niger and is based on a request from the Government of Niger made in April 1974. Project components include adaptive research, seed production and multiplication, promotion of a recommended package of cultural practices, training centers for extension and cooperative staff and for demonstration farmers, and an expansion of the cooperative and credit organizational structure.

The technology applied largely will be that with which the agricultural authorities of the country already are familiar and which they have employed. The program will make inputs and **services** available where they have not previously reached the farmers of Niger. AID financing will be used for the provision of agricultural inputs and the establishment of new facilities and services, including operating costs. Technical assistance will also be provided for all components. The Government of Niger (GON) will also request Peace Corps to provide additional Volunteers in support of the program. A participant training program will train Nigeriens as replacements for all expatriate personnel.

This Project Paper has been prepared on the basis of an initial design effort undertaken in April 1974 by a team composed of the following members:

Kenneth Levick, AA/TA, Team Leader

Kenneth Rachie, Research Agronomist (IITA, Ibadan, Nigeria)

Martin Billings, Economist

James Clifton, Seed Specialist (Major Cereals, Samaru, Nigeria)

Tom Reynolds, Agricultural Extension Specialist

Morris Solomon, Financial Analyst/Project Design Specialist

James Lucas, Agricultural Manpower Advisor

Henry Gerber, Agricultural Credit Specialist

Francois Leger, Agronomist (Major Cereals, Dakar, Senegal)

Dianne Blane, Program Officer

Since the departure of the AID design team, the GON and the Area Development Office in Niamey have jointly developed a First Year Plan of Action. An important element of this plan of action is the provision of short-term consultants to assist in the detailed design of the project components. The following contract consultants were provided in November-December 1974:

Research and Foundation Seed Farm - Dr. Howard Sprague, Senior Consultant, TAB  
Agronomy  
Dr. Ralph Cummings, ICRISAT

Seed Multiplication - Howard Potts, Seed Specialist, MSU

Extension and Credit and Cooperatives - Ralph Battles and Carl Ryan, AGDI

The additional design effort undertaken by these consultants is reflected in this Project Paper.

The technical package and the approach methodology outlined in this Project Paper should be carefully evaluated, not only for their applicability in Niger, but also as integral elements of AID's longer term strategy for increasing food production on the arid sub-Saharan zones of West and Central Africa. The project has been designed with technical and administrative approaches which are positive responses to on-going currents of change and supportive of the social structure.

There are risks involved, and there are unresolved issues. There will be limitations to what AID or the other donors can accomplish in the environmentally determined marginalities of Niger. However, this project design should demonstrate that life need not be so tenuous in the Sahel and that with opportunity, adaptability and determination Niger can produce sufficient food to feed its population.

TABLE I

AID/OTHER DONOR/GON	SUMMARY OF PROJECT COST				TOTAL	FOR EX	LOCAL COST (\$ equiv.)
	FY 75	FY 76	FY 77	FY 78			
1. <u>A.I.D.</u>							
U.S. Personnel	\$1,322,550	-	\$860,550	\$98,300	\$2,681,400	\$2,626,400	\$55,000
Adaptive Research	848,000	-	286,150	39,150	1,173,300	530,890	642,410
Foundation Seed Production and Seed Multiplication	1,017,830	-	285,550	130,300	1,433,680	736,855	696,825
Cooperatives and Credit	1,579,450	-	629,100	-	2,208,550	902,430	1,306,120
Agricultural Extension	966,400	-	456,800	210,000	1,633,200	494,400	1,138,800
Participant Training	242,000	-	198,000	66,000	506,000	506,000	-
<u>Sub-Total</u>	<u>5,976,230</u>	<u>-</u>	<u>2,716,150</u>	<u>943,750</u>	<u>9,636,130</u>	<u>5,796,975</u>	<u>3,839,155</u>
2. <u>Other Donor</u> (2 FAG Techs)					570,000	570,000	-
3. <u>GON</u> (Farm, land and salaries)					1,065,000	-	1,065,000
					<u>11,271,130</u>	<u>6,366,975</u>	<u>4,904,155</u>
				<u>TOTAL</u>			

4

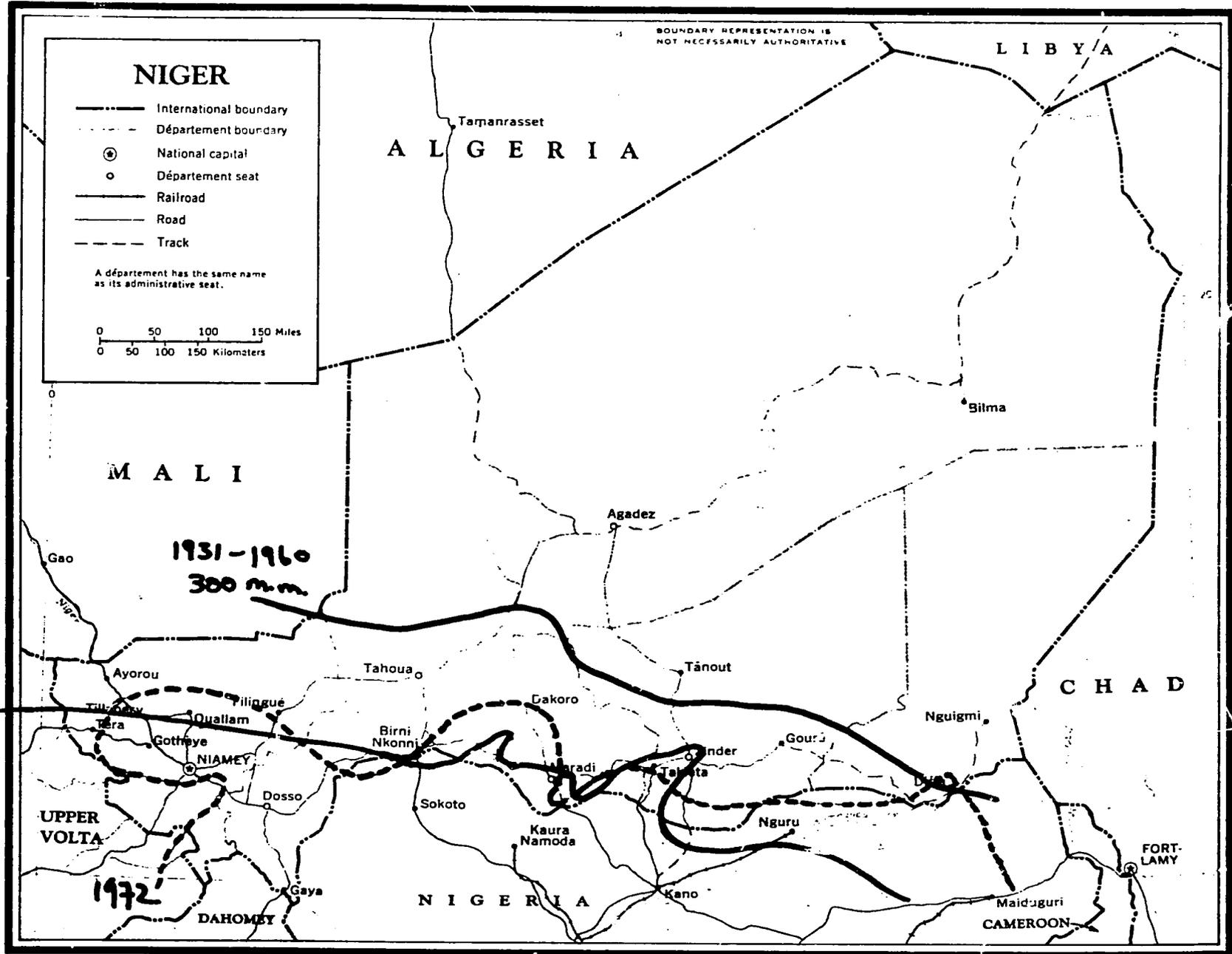
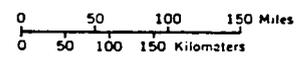
RAINFALL MAP ISOTHERM: 300 mm.

BOUNDARY REPRESENTATION IS NOT NECESSARILY AUTHORITY

# NIGER

- International boundary
- - - - - Département boundary
- ⊙ National capital
- Département seat
- +—+— Railroad
- — — — — Road
- - - - - Track

A département has the same name as its administrative seat.



5

1973

1931-1960  
300 mm.

1972

## PART II

### A. PROJECT DESCRIPTION

#### 1. Summary Description

The program for increased cereal production in Niger includes the following interrelated components:

- (a) An intensified adaptive research effort to develop improved varieties of millet for the specific conditions of Niger;
- (b) A foundation seed farm which will multiply breeder seed released by the research station;
- (c) A system of five seed multiplication centers producing improved seed directly and also selecting, training, and providing inputs for demonstration farmers, each of whose one-hectare plots will concurrently serve as a demonstration unit for the new varieties and for the recommended package of cultural practices;
- (d) Expansion of the agricultural cooperative structure of Niger (the UNCC), to extend its coverage into areas where it is not now active;
- (e) Expansion and improvement of training centers for the instruction of personnel for extension staffing for various functions in the cooperative system and for demonstration farmers;

Each component is described in detail in Annexes A-E.

#### 2. Project Goal and Purpose; Logical Framework Analysis

##### Goal

To strengthen the predominantly agricultural society of Niger, ending its dependence upon donated external cereal supplies except in

years of extraordinary drought and improving the economic condition and performance of the farm community to support a viable and ecologically secure way of life for the Sahelian population.

#### Purpose

To achieve increased production and availability of cereals at prices within the reach of non-producing consumers through a sustainable agricultural production system.

#### Outputs

(a) Annual availability of incrementally-improved varieties of millet and other cereals providing higher yields and increased resistance to drought and other conditions which limit cereal production in Niger;

(b) Higher yields of cereals per hectare cultivated and per unit of farm labor applied;

(c) More reliable production in years of reduced rainfall;

(d) Improved services and stronger farmer institutions at the village level; and

(e) Improved soil quality and productive capacity.

#### Inputs

(a) Millet breeding research for varietal adaptation and development;

(b) Continuous supply of selected and controlled-quality seeds of improved varieties of cereals and cowpeas;

(c) Demonstration and promotion through the extension system of a recommended package of cultural practices and the supply of associated inputs;

(d) Increased use of animal traction;

(e) Widespread direct application of powdered rock phosphate;

(f) Broadened availability of credit and extension services;

and

(g) Trained personnel for these activities.

#### Target

The quantifiable achievement target for this program is increased cereal production of 200,000 tons by 1980, over the 10-year average for 1965-1974.

### 3. Justification of the Project

This program is an appropriate response to the Sahel drought situation as it is encountered in Niger. It offers the only practical means to increase cereal production in the relatively short term. The technology input is of a relatively uncomplicated order but is available and readily employable at this time. The very simple and inefficient cereal cultivation methods now being employed make possible significant increases in production without advanced technology.

Although there are risks in undertaking support of the program, they seem to be within an acceptable range in terms of the special circumstances of the Sahel. If the drought continues, the proposed investments will be of limited effectiveness. However, one must assume

for operational purpose. that there will be a return to more normal rainfall patterns. The only alternative is the unacceptable one of mass population transfer and practical abandonment of the production potential of Niger. The activities proposed will help assure greater production than would have resulted in their absence, at whatever levels of rainfall the country does experience in the next few years. The effort will be concentrated in the southern area of the country, south of latitude fourteen degrees, where rainfall ordinarily has been sufficient for a reasonably productive pattern of cultivation. It should be noted that an estimated ninety per cent of Nigerian cereal producers farm south of this parallel and will be affected by the program.

The use of selected seed of improved varieties, employed with optimum agricultural practices is not a speculative, hastily-conceived response to the drought but rather is an agricultural improvement of a classic type which must come to Niger sooner rather than later. No improvement could have a negative effect on production under any circumstances. The program predominantly consists of extending facilities and services developed within Niger. A major portion of the U.S. financing will be used for local costs. Given the slender financial resources available to the GON, there is no possibility that the essential facilities and services included in the program could be provided to the cereal producers of Niger without this external financing.

#### 4. Host Country Program

The proposed AID assistance involves financial support for Niger's national cereals production program. The program has a very high policy priority for the Government of Niger, which has been forced by its dependence upon imported grain during the last two crop years to recognize the importance of increased cereal production and the damaging effect of the relative inattention given to cereals production in previous agricultural programming. The GON has now made increased cereal production a basic target of agricultural policy and resource allocation. The country cannot neglect the export crops (cotton and peanuts) which have provided the bulk of its foreign exchange earnings in the past. However, it now will give increased priority to cereals production until an improved production system has been established which will permit the people of Niger to grow their own cereals consumption requirements, to re-establish their on-farm, carry-over stocks, and to fill the emergency supply/market stabilization storage capacity of the UNGG and the Niger cereals marketing board (OPVN).

As is discussed in detail in this project design, the GON already has government and quasi-government organizations to deal with the agricultural sector of the national economy. The agricultural extension system is organized from the ministerial level to the arrondissement level (local government), with an additional three levels to the farmer possible in the "development zones" of donor projects. The UNGG and CNCA also provide the administrative framework for cooperative development and farmer credit. To date,

outside of the development zones, UNCC and CNCA activity has been largely restricted to the production and marketing of cotton and peanut cash crops. The organizational structure, however, can be strengthened to include cereals production within its scope of responsibility.

##### 5. AID Strategy

The AID strategy response to the special assistance requirements arising out of the Sahel drought in Niger is to concentrate resources on cereal production in a national crop program designed to provide a significant increase in domestic cereal availability within three to five years. This direction of AID's efforts and resources was selected with three objectives in view. The primary objective is to end the country's dependence upon food aid from abroad, except in the very worst years of reduced rainfall, and secondly to establish the economic and institutional base for a predominantly rural society which is needed for sound national development. The third objective of the selected strategy is to achieve, through concentration of resources on cereal production, an operational relationship and continuing interaction with the Government of Niger through which AID can make a constructive contribution to the Government's agricultural and economic policies and programs. AID will help the GON to identify policies and programs conducive to continuous increase in cereal production and productivity, equitable distribution of available cereal supplies, and long-term agricultural development providing an improved way of life for subsistence farmers and the

adoption of land-use practices designed to support the increasing population of Niger. This long-term strategy objective is supported by the selection of a broad range of inter-related cereal production components for AID financial support.

The AID approach is not only compatible with but practically inseparable from the host country's strategy and policy emphasis. The drought has provided the opportunity which this program seeks to address, as it has forced the GON to recognize that greater attention needs to be given to the domestic food production. The scarcity resulting from the drought has made it painfully evident to the Government that there is an excessive dependence upon external sources for basic food grains.

#### 6. Prior AID Assistance in the Cereals Sub-Sector

In the recent past much of AID's "regular" technical assistance program for Central and West Africa has been placed within a regional context. Considerable support has been channeled through various regional institutions which are capable of addressing key development requirements of the member countries. The Entente Mutual Aid and Loan Guaranty Fund (EF) of the Council of the Entente is the principal regional organization through which AID has provided assistance to Niger in grain stabilization. The focus of this assistance has been on the commercialization of cereals (millet and sorghum) in the principal producer countries of the Entente region - Upper Volta and Niger. Through an expanding market participation of national cereals offices in Upper Volta (OFNACER) and Niger (OPVN), in competition

with private grain merchants, it was intended to achieve modifications in market performance: higher prices to the farmers; reduced margins between purchases and sales prices; and more regular flow of grain from farmer to consumer.

AID assistance in this effort has been three-pronged: (1) The national cereals offices were supported through operating budgets and working capital provided by other donors (CIDA and FAC) supplemented by counterpart generations from the sale of P.L. 480 Title II sorghum imports. The USG agreed to make available up to 50,000 tons of sorghum over a five year period. Niger imported 15,000 tons in 1971 and 10,000 tons in 1972. (2) In June 1972 a loan agreement was signed with the EF for \$1.8 million to provide financing for the import of required commodities in support of the construction of grain storage facilities in Upper Volta and Niger. (3) Long-term technical assistance personnel have been assigned to both OFNACER and OPVN as grain marketing advisors. Since initiation of the project, AID grant support has totalled approximately \$630,000 including as well in-service participant training to the cereal offices' middle-level personnel.

With the onset of the drought emergency in FY 1973, the PL 480 sorghum imports for the grain stabilization program were required to supplement the emergency foodstuffs. This drought situation has continued to the present (through 1974). Under this extraordinary circumstance the requirements for continued technical assistance are being re-evaluated, and recommendations for continued or additional inputs will be incorporated in a redesign of the project.

## B. PROJECT ANALYSIS

### 1. Management/Organizational Analysis

The management and organizational aspect of this project is complex. Effective management must insure the meshing of a multi-functional ministry, the programs of several major external donors, plus several autonomous or semi-autonomous organizations within Niger. As well, activities will be conducted among a dispersed agricultural population covering a wide geographical area.

The major portion of the activities undertaken by this project are under the direction of the ministry of Rural Economy (MER). Activities of the cooperative and credit component are not within the management responsibilities of the MER, but sufficient organizational linkages exist to insure the necessary alignment of objectives and implementation coordination.

Several other ministries involved in rural development exist outside of the MER's sphere of influence. The Ministry of Human Promotion operates an "Animation" program designed to assist rural communities in self-designed programs which are often of an agricultural nature. In addition, the Ministry of Education has an adult education program in rural communities. Obviously, these programs can relate directly or indirectly to this project's goals. It is hoped that during the life of the project, closer coordination of activities can be institutionalized. The project has no current input into these ministries and consequently, no coordination or supervision is explicitly demanded.

The basic line of authority essential to the management of this project originates in the Office of the Minister of the MER and is passed

intact to the Office of the Secretariat of the MER. Here it has traditionally been divided functionally into four separate departments. Each of these departments is composed of several functional divisions. The divisions /are organized either on a geo-political or functional basis. (See Chart, page 17.)

In addition to the four departments, several other offices are linked directly to the Secretariat. These are horizontal process-type offices that demand interaction with each department. A new National Cereals Office is being added to focus on and centralize the management of the various components in this project. The A.I.D. project management staff will parallel this newly-created office. By its placement, the project management will have the same accessibility and authority in relation to the MER Secretariat as the National Cereals Office.

The means of supervision and control available in the line authority network include policy determination, resource allocation (both financial and manpower), fiscal accountability and communication. The focus of authority, of course, rests with the Secretariat.

The communication network follows the same lines as delegation of authority, and consequently few communication channels run horizontally in the ministry. A rudimentary communications network has been designed into the project which will increase the horizontal flow of information, particularly within the Department of Agriculture of MER. Conscious effort must be made to increase the coverage and effectiveness of such channels.

The Secretariat of MER chairs a committee which determines the policy and resource allocation for all institutions engaged in agricultural research. The committee is composed largely of MER officials plus

representatives of the various research agencies. The body fills primarily a coordinat ... function to decrease possible duplication of research efforts. As can be noted in the organizational chart, the research component of this project is also within the direct line of authority of the Secretariat through the National Cereals Office. Indirect lines of authority connecting MER with other organizations involved in this project are also concentrated in the MER Office of the Secretariat.



## 2. Technical and Social Feasibility

### a. Technical Feasibility

In attaining the objective of increased cereals production, several technical constraints were considered in designing the project. The first major technical constraint is of an economic nature. Given the fair market price of millet, the technology of new agricultural inputs must result in a reduction of the unit cost of cereal output. Most western technologies being extended in the Sahel are the increased-output types, namely inorganic fertilizers and mechanization.

A second major technological constraint in Niger cereals production is the amount of new land that can be brought under cultivation. While areas in the Sahel often appear underutilized, land is required to lay fallow for a considerable length of time when compared to the duration of its utilization. Little additional land can be brought into production without shortening the length of fallowing. Given several cultivation practices, the period for which ground must lie fallow can be shortened.

Recognizing these two major constraints, a package of improved practices (Annex C) has been developed which, for the most part, represents rather minor adaptations of the existing available technology. Because of its simplicity, this package will probably not increase production dramatically. The value of its use is to make incremental changes first and to create a willingness to change among farmers. Then, as research produces new technological innovations that are rigorously tested, a distribution channel and a favorable cultural environment will be available. The primary package of practices includes the following elements:

- a) making available existing improved varieties of millet, sorghum, and cowpeas.
- b) encouraging closer spacing of planting millet.
- c) treatment of food crop seeds with fungicide and insecticide

before planting to prevent losses and improve plant vigor.

- d) greater emphasis on prompt and thorough weeding.
- e) encouraging the production of pure stands of cowpeas with insecticide treatment which can increase the yield.
- f) systematic rotation of crops with emphasis on legumes to increase the nitrogen content of the soil.
- g) increased utilization of animal manure and vegetable matter in composts which can be spread on fields.

This package of practices has been kept simple because it will serve primarily as an initial vehicle to establish relations with farmers and to gain their confidence and trust in adopting new secondary technical innovations and cultural practices. Among these secondary and more sophisticated technical innovations is the promotion of the use of animal traction to improve tillage and weeding as well as to conserve moisture and permit greater acreage per family where possible. In the recent past, animal traction has not proved economically feasible primarily because of relatively costly oxen-drawn equipment. Alternative types of equipment, such as the wooden Egyptian stick plow, are under consideration and will be tested in the research component of the project.

Another secondary technical innovation will be a more soil-fertility-responsive millet seed, such as P-3 Kolo and other seed types adapted and tested by the adaptive research and seed multiplication components of the project.

A third major technical innovation considered by this project will be the possible use of rock phosphate fertilizer to remove phosphorus as a limiting factor in crops. This practice will be especially rewarding for grain legumes such as peanuts and cowpeas. However, the known deposits of phosphates must be further examined to determine the feasibility of such an operation.

Lastly, the primary and secondary technical innovations described above should have a positive environmental impact by improving soil structure and checking soil erosion if implemented in a controlled manner. The extension and cooperative components of the project have been designed to provide the necessary supervision required for the introduction of these technical changes.

b. Social and Anthropological Feasibility

Any program to be instituted in a developing country must be adapted to the culture and thinking of the people. Programs designed with disregard for the culture and mentality of the people often are regarded as foreign; the concepts will not be accepted and the methodologies will not be practiced wholeheartedly. The farmers of Niger are positively disposed towards extension guidance. There is a strong correlation between prior extension contact and the current utilization of improved practices. One of the most frequently-cited changes desired by farmers questioned in a FED 1972 sample survey was the presence of an extension agent in the village. This attitude bodes well for the introduction of new technology.

Animal traction calls for some departures from tradition. Traditionally, cattle owners are not farmers, and farmers are not cattle owners. Farmers will have to be taught both how to train and care for oxen and how to use ox-drawn equipment. These changes have already begun in some areas. Young men who have been trained at the CFJAs (Annex E) have learned to use and care for oxen and equipment, and each was provided with a pair of oxen and a set of equipment on completion of his training. In 1971 there were 1,000 pairs of oxen being used in Niger, so the practice has been introduced in some areas. These people

have already accepted this new method of farming and are enthusiastic about it. Most Nigerian farmers would like to use animal traction if they could afford it.

Most Africans are aware of the value of animal manure but are not informed on how to preserve its value. For instance, they tie animals in an area without bedding, and much of the value of the liquid manure is lost. Also many farmers arrange with shepherds to camp on their farms so the cattle will fertilize the farms at night. This has some value, but as the manure is left exposed on top of the ground, it loses much of its value.

One of the improved practices to be taught is the preparation of compost. All of this wasted grass and cornstalks should be used for bedding for the animals. This would preserve the value of the manure and would facilitate the decay of the grass and stalks, thereby providing both humus and nitrogen for the enrichment of the soil. Since nitrogen fertilizer is so costly, it is important to conserve all possible soil nutrients.

Millet is the preferred crop. Many farmers say that the most important thing they want is support and guidance in millet culture. Since they are so concerned about growing millet, the more progressive farmers will be willing to use compost and commercial fertilizer, if they can be shown that the yield will be sufficiently increased to make it profitable. As others see the value of this practice, more of them will follow that example.

### 3. Economic Feasibility

#### a. Economic Analysis

The economic impact of this project depends on the ability

of the project components to influence the cultivation practices of Nigerian farmers. The average yield of millet and sorghum is presently around 400 kg/ha. In years of low rainfall, such as 1972/73, yields were 380 kg and 360 kg per hectare respectively for millet and sorghum; however, considerably higher average yields were attained in 1968 (535 kg and 660 kg for millet and sorghum respectively) and in 1970 (480 kg and 485 kg respectively) when rainfall was abundant. Thus the goal of the project can be also stated as safeguarding against unreliable rainfall patterns to assure consistently high levels of production.

Table A demonstrates the fluctuation in cereal production in Niger since 1967. Although average production has been fairly high when compared to a 12-year average (1961-73) of 970,591 M.T., this reflects the needs of a larger population. Furthermore, it reflects large increases in area cultivated in millet and sorghum. The drought induced hectareage expansion for cereals of around 30% between 1967 and 1971, although the total area cultivated was increased even more, so that the percentage of total cultivated area devoted to cereal production declined from 70.2% to 68.3% between 1967 and 1973. (See Table A)

TABLE A

Niger: Area and Production of Cereal Crops (000 MT)

	<u>Millet</u>	<u>Sorghum</u>	<u>Total Cereal</u>
1967	841	280	1121
1968	1000	350	1350
1969	732	215	947
1970	1095	290	1385
1971	880	337	1217
1972	958	267	1225
1973	<u>918</u>	<u>208</u>	<u>1126</u>
Average	918	278	1196

Areas of production  
(000 hectares)

	<u>1967</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Millet	1740	2270	2380	2350	2370
Sorghum	<u>545</u>	<u>595</u>	<u>605</u>	<u>580</u>	<u>580</u>
Total Cereal	2285	2865	2985	2930	2950
% Total Cultivated Area	70.2%	68.4%	68.5%	67.2%	68.3%

Source: IBRD, Appraisal of Maradi Rural Development Project, May 6, 1974.

Derived from Annex I, p. 4.

Thus production levels have been maintained through expanding hectareage, a practice which under traditional methods of cultivation may be detrimental to soil condition in the long run by reducing periods of fallow.

Exact figures for imports of cereal are not available for the relevant time frame. However, in the 1960's Niger was a surplus producer of cereal; 1968 was the last year in which Niger exported millet or sorghum (59 tons). In 1974 about 55,000 tons of sorghum were imported; however, this figure does not represent total cereal needs because substantial amounts of other grain foods were included in a total of food imports of 214,000 MT.

Projections for demand of millet and sorghum based on past consumption patterns appear in Table B. If production does not expand above the seven year average noted in Table A, the shortfall will range from 75,000 MT in 1976 to 463,000 MT by 1986 using low estimates. Using the high estimates which are based on past consumption patterns, the cereal deficit will range from 328,000 MT in 1976 to 793,000 MT by 1986.

It is fallacious to assume that cereal deficits will be fully met by imports. While a proportion may be met by imports, it is likely that some diminution of food intake will occur. Taking a low estimate that 20% of projected import needs will actually be imported, import costs have been estimated in Table C. It should be noted, however, that projections beyond five years become increasingly hypothetical and therefore should not be relied upon. However, the high estimates approximate recent levels of cereal imports (55,000 tons in 1974) and are therefore probably more realistic than the low estimates.

TABLE B

## NIGER: PROJECTION OF DEMAND FOR MILLET AND SORGHUM

	<u>Population<sup>1)</sup></u> ( <sup>'000</sup> )	Estimated Demand <sup>2)</sup> ('000 MT)			
		High Estimate <sup>3)</sup>		Low Estimate <sup>4)</sup>	
		(229 kg/cap/year) <u>Cereal Consumption</u>	<u>Production Necessary</u>	(191 kg/cap/year) <u>Cereal Consumption</u>	<u>Production Necessary</u>
1976	5,656	1295	1524	1080	1271
1977	5,809	1330	1565	1109	1305
1978	5,965	1366	1607	1139	1340
1979	6,127	1403	1651	1170	1376
1980	6,292	1441	1695	1202	1414
1981	6,462	1480	1739	1234	1452
1982	6,636	1520	1788	1267	1491
1983	6,816	1561	1836	1302	1532
1984	7,000	1603	1886	1337	1573
1985	7,189	1646	1936	1373	1615
1986	7,383	1691	1989	1410	1659

- 1) Assumes base of 5.36 million in 1974, with an annual growth rate of 2.7%.
- 2) Not all cereal produced is consumed owing to losses in storage, transportation and processing. An acceptable estimate of loss is 15%. Columns 3 and 5 (Cereal Consumption) reflect actual consumption needs.
- 3) Column 3 was calculated on the basis of total production over a 12-year period minus 16% for losses and a small proportion for exports.
- 4) Column 5 was obtained by weighing three separate consumption group estimates by their proportion in Niger's total population, as follows:

	<u>% Population</u>	<u>Per capita Consumption</u>
Rural Sedentary	75.0%	213 kg/year
Rural Nomadic	20.7%	120 kg/year
Urban	4.3%	146 kg/year

Source: compiled from population data and assumptions with regard to consumption from John Becker, "An Analysis and Forecast of Cereals Availability in the Sahelian Entente States of West Africa," AID Contract No. AID/CM/afr-c-73-20, January 1974, pp. 27-8.

TABLE C

	High Estimate <sup>1)</sup>		Low Estimate <sup>2)</sup>		International <sup>3)</sup>
	Tons	Cost (\$m)	Tons	Cost (\$m)	Price at Niger Farmgate (\$ Per Ton)
1976	51,000	\$12.0	400	\$0.1	\$236
1977	54,200	12.0	2,200	0.5	222
1978	57,400	12.0	4,000	0.8	209
1979	61,000	12.3	6,000	1.2	202
1980	64,400	12.9	8,200	1.6	200
1981	67,600	13.5	10,200	2.0	200
1982	71,600	14.3	12,400	2.5	200
1983	75,800	15.2	15,000	3.0	200
1984	80,000	16.0	17,400	3.5	200
1985	84,200	16.8	19,800	4.0	200
1986	88,600	17.7	22,600	4.5	200

1) Based on assumption that 20% of cereal deficit is imported and that cereal production increases by 2% per annum.

2) See Table B for definitions of estimates.

3) Based on projected world price plus transportation and distribution costs. This does not necessarily reflect price paid by the consumer, since food subsidies are common in Niger.

Source: IBRD, Maradi Project, Annex 20, Table 2.  
(These projections assume no inflation)

b. Cost-Benefit Analysis

A measurement of goal achievement is an increase in cereal production of 200,000 tons by 1980. For the purposes of this analysis, it will be assumed that 10% of the increase occurs by 1976, 15% by 1977, 20% by 1978, 25% by 1979 and 30% by 1980. These increases amount to a 2% increase over recent levels of production in 1976, 3% in 1977, and so on. Calculations of the present value of the project benefits, based on the above assumption, are shown in Table D.

The costs of the project are shown in the second part of Table D. Only costs directly attributable to the project are included. Thus research, the principal benefits of which will be obtained after the project, is excluded. Similarly the overhead components of expatriate and consultant costs have been deducted.

The benefits of the project vary considerably depending on whether foreign exchange savings or the domestic value of production is used. The interpretation of Table D depends on the assumption one makes with respect to import needs (Table C). If significant imports commensurate with past levels of cereal consumption (high estimate) are required, then increased production must be valued at the foreign exchange plus domestic distribution cost. If less cereal is needed, there will be no imports, and possibly some exports. The value of this production should be assessed in terms of world market prices, which in 1974 were slightly over the domestic value of millet and sorghum and falling (i.e., 26,000 CFA/ton rather than the 25,000 CFA/ton of domestic value). Whichever approach is taken, the benefit/cost ratio of the project is high, ranging from 5:1 to 2.5:1.

TABLE D  
Benefit/Cost Analysis

Benefits of Niger Cereal Production Project

	Cereal Production (TONS)	Foreign Exchange Savings <sup>1/</sup> (,000 \$)	Domestic Value <sup>2/</sup> of Production (,000 \$)	Present Value(000\$) <sup>3/</sup>	
				Foreign Exchange	Domestic
1976	20,000	4,720	2,120	4,215	1,893
1977	30,000	6,660	3,180	5,308	2,534
1978	40,000	8,360	4,240	5,952	3,019
1979	50,000	10,100	5,300	6,424	3,371
1980	60,000	12,000	6,360	6,804	3,606
TOTAL	200,000	41,840	21,200	28,703	14,423

<sup>1/</sup> At rates established in Table C.

<sup>2/</sup> At 25,000 CFA per ton.

<sup>3/</sup> At 12% per annum

Costs<sup>1/</sup> of Niger Cereal Production Project

<u>Project Component</u>	<u>Total Cost</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Extension	1,633,200	966,400	456,800	210,000
Seed Production	1,433,680	1,017,830	285,550	130,300
Local Support	55,000	25,000	15,000	15,000
UNCC (Coop)	2,208,550	1,579,450	629,100	-
Expatriate Costs	1,253,700	606,900	415,275	231,525
Consultants	105,000	105,000	-	-
TOTAL	6,689,130	4,300,580	1,801,725	586,825
Present Value	5,694,212	3,840,417	1,435,975	417,820

<sup>1/</sup> Only costs which are directly attributable to the project are included. Therefore research is excluded, and the overhead components of expatriate and consultant costs have been deducted.

c. Farmer Incentive. Micro-economic Analysis

No matter how profitable a project appears, the project cannot be expected to be successful unless it is profitable for individual farmers to engage in the yield-increasing practices propagated by the project.

The average yield for millet and sorghum is around 400 kg/ha, although on better soils, yields average 500 kg/ha. Table E shows (1) estimates of yield increases, (2) the costs of inputs required to achieve these estimated increases, and (3) the net incomes derived from using these inputs. From this data the practices fostered by the project are profitable, although it must be recognized that they have not in every instance been tried under the conditions that Nigerian farmers face. Therefore, the risk factor is larger than usual. Furthermore, the cash flow or credit constraint may be substantial. Therefore, it seems likely that fungicides and improved seeds will be adopted earlier and by more farmers than land preparation (which requires animal traction) and fertilizer, both of which require substantial capital investment.

The project area covers about 90% of Niger's cereal farmers, or about 1.5 million farm families. If the project reaches even 5% of these per annum, increasing their yield from 500 to 650 kg/ha., then output will expand by 22,124 tons. This exceeds not only the first year target, but also all subsequent incremental targets. It is probably too optimistic. But if only 2.5% of farmers each year adopt these practices, which the seed multiplication component will support, the five-year target will be nearly met (i.e. 165,000 tons of grain will have been produced by 1980), and the project will still have a favorable cost-benefit ratio.

TABLE E

Estimated Yield Increases Accompanying Improved Practices  
(in Kg. per hectare)

	<u>Average Sandy Soil</u>				<u>Better Soil</u>			
	<u>Yield</u>	<u>Cost</u>	<u>Gross Income</u>	<u>Net Income</u>	<u>Yield</u>	<u>Cost</u>	<u>Gross Income</u>	<u>Net Income</u>
Traditional	400	-	10,000	-	500	-	12,500	-
with fungicide	425	200	625	425	525	200	625	425
improved seed	500	660	1,875	1,215	650	660	3,125	2,465
land preparation	700	2,250	5,000	2,750	850	2,250	5,000	2,750
fertilizer	900	3,000	5,000	2,000	1,100	3,000	6,250	3,250

Source: I.B.R.D., Maradi Project Appraisal, Annex 10, p.4.

#### 4. Financial Soundness

The estimated total project cost, including AID, Other Donor and the GON contributions, is \$10,369,330. The foreign exchange component is estimated at \$6,298,975, or 60.7 percent of total cost. Project costs are summarized in Table I and detailed in Tables II - VII on the following pages.

##### NOTES ON PREPARATION OF THE PROJECT COSTS:

#### 1) Personnel:

- a) U.S. Technicians: Projections are based on standardized AID cost estimates of \$60,000 per man-year of service, plus additional post adjustments;
- b) Junior-Level Technicians: Assuming the recruitment of former Peace Corps Volunteers, cost projections are based on the lowest starting salary for AID employees (FSR- 8), plus post differential, cost of living, housing and other allowances and privileges normally provided by AID;
- c) Local-Hire Staff: Cost projections are based on 1974 MER personnel reports submitted to AID short-term consultants.

NOTE: A 5 per cent cost of living increase has been included in all salary estimates for the life of the project.

#### 2) Commodities:

Assuming Code 935 Free World procurement, equipment and vehicle cost estimates are based on MER reports and dealer quotations in Niamey.

##### NOTE:

- a) A 10 per cent cost escalation factor has been included in cost estimates for vehicles, equipment and all other costs,

b) Of the total number of vehicles required for the project components 21 passenger vehicles, one pick-up truck and 8 motorcycles will be retained for the expatriate, contract team for their support and in-project use. At the time of project completion or because of a demonstrated need, these vehicles will be transferred to the GON. The Project Manager's office and the contract Team Leader will be responsible for vehicle operation and maintenance costs and for vehicle use management.

c) Ten local drivers/mechanics, 4 office clerks and one translator will be locally employed to support the project management and contract offices. For this purpose \$85,000 has been added to the project budget (Table II), including \$30,000 for administrative office supplies and equipment.

### 3) Construction:

Projections are based on local contractors' cost estimates and actual construction costs cited in recent OPVN reports.

NOTE: A 15 per cent cost escalation factor has been included for all construction estimates.

### 5. Evaluation Plan

In consultation with AID, a detailed evaluation and monitoring plan for the project within 60 days of signature of the Project Agreement. The plan will be incorporated in the reporting responsibilities of the Ministry of Rural Economy so that problems can be immediately recognized and the necessary corrective action taken. The GON should participate with the AID Project Manager in quarterly evaluation meetings when problems can be jointly resolved. There should also be an annual joint project review with participation from AID/W. As noted in the Project Paper face sheet, this project will be evaluated in depth prior to the allotment of FY 77 funds. This is a condition under which the project is being forwarded for approval.

TABLE 1

LOCAL  
COST (\$ equiv.)

AID/OTHER DONOR/GON	SUMMARY OF PROJECT COST				TOTAL	FOR EX	LOCAL COST (\$ equiv.)
	FY 75	FY 76	FY 77	FY 78			
1. <u>A.I.D.</u>							
U.S. Personnel	\$1,322,550	-	\$860,550	\$498,300	\$2,681,400	\$2,626,400	\$55,000
Adaptive Research	848,000	-	286,150	39,150	1,173,300	530,890	642,410
Foundation Seed Production and Seed Multiplication	1,017,830	-	285,550	130,300	1,433,680	736,855	696,825
Cooperatives and Credit	1,579,450	-	629,100	-	2,208,550	902,430	1,306,120
Agricultural Extension	966,400	-	456,800	210,000	1,633,200	494,400	,138,800
Participant Training	242,000	-	198,000	66,000	506,000	506,000	-
<u>Sub-Total</u>	<u>5,976,230</u>	<u>-</u>	<u>2,716,150</u>	<u>943,750</u>	<u>9,636,130</u>	<u>5,796,975</u>	<u>3,839,155</u>
2. <u>Other Donor</u> (2 FAG Techs)					570,000	570,000	
3. <u>GON</u> (Farm, land and salaries)					1,065,000	-	1,065,000
					<u><u>11,271,130</u></u>	<u><u>6,366,975</u></u>	<u><u>4,904,155</u></u>

TOTALW  
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TABLE II

U.S. Technicians	MM	Cost/ Man Year	U.S. PERSONNEL (000)				TOTAL	Foreign Exchange	REMARKS
			FY 75	FY 76	FY 77	FY 78			
Project Mgr	(36)	\$(60)	\$(89.25)	-	\$(63.0)	\$(36.75)	\$(189.0)	\$(189.0)	Non-add as Direct Hire
Asst. Proj. Mgr.	36	60	89.25	-	63.0	36.75	189.0	189.0	
Secretary	36	12	17.85	-	12.6	7.35	37.8	37.8	
Plant Breeder	36	60	89.25	-	63.0	36.75	189.0	189.0	
Agronomist	36	60	89.25	-	63.0	36.75	189.0	189.0	
Ag. Engineer	36	60	89.25	-	63.0	36.75	189.0	189.0	
Seed Specialist	36	60	89.25	-	63.0	36.75	189.0	189.0	
Seed Prod. Spec.	24	60	89.25	-	36.75	-	126.0	126.0	
Coop. Spec.	36	60	89.25	-	63.0	36.75	189.0	189.0	
Extension Training Specialist	36	60	89.25	-	63.0	36.75	189.0	189.0	
11 Junior-Level Technicians	396	24.3	392.7	-	277.2	161.70	831.6	831.6	May be former Peace Corps Vol.
Consultants(S-T)		72	173.0	-	63.0	42.0	278.0	278.0	For project component activities and independent project evaluation
Project Manager and Contractor Office Support			25.0		30.0	30.0	85.0	55.0 - Local (\$ equiv) 30.0 - Foreign exchange	
<b>TOTAL</b>			<b>1,322.55</b>	<b>-</b>	<b>860.55</b>	<b>498.30</b>	<b>2,681.40</b>	<b>2,626.40</b>	<b>+ 55.00 Local</b>

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COMPONENT: ADAPTIVE RESEARCH

TABLE III

ITEM	UNITS	UNIT COST	[0000]				TOTAL	FOR EX	LOCAL COST (\$ equiv)
			FY 75	FY 76	FY 77	FY 78			
Branch Stations	3	\$51	\$103.5	-	\$57.5	\$14.95	\$175.95	\$35.19	\$140.76
Main Station	1	70	80.5	-	-	-	80.50	16.1	64.4
Ni rien Personnel			147.0	-	141.75	-	188.75	-	288.75
Vehicles - Passenger	12	8	105.6	-	-	-	105.60	105.6	-
Vehicles-Pick-Up	5	8	44.0	-	-	-	44.00	44.0	-
Trucks	1	15	16.5	-	-	-	16.50	16.5	-
Tractors	5	15	82.5	-	-	-	82.50	82.5	-
Field Equipment			77.0	-	45.1	-	122.10	122.1	-
Shop Equipment	1	11	11.0	-	-	-	11.00	11.0	-
Lab Equipment	1	44	44.0	-	-	-	44.00	44.0	-
Roads & Fencing			6.6	-	1.1	-	7.70	-	7.7
Electric Generator	5	3	13.2	-	3.3	-	16.50	16.5	-
Irrigation & Wells	4	6	26.4	-	-	-	26.40	-	26.4
Pumps & Equipment	4	2	8.8	-	-	-	8.80	8.8	-
Fertilizer			22.0	-	11.0	11.0	44.00	-	44.0
Insecticides			4.4	-	2.2	2.2	8.80	8.8	-
Operational Cost			22.0	-	11.0	11.0	44.00	-	44.0
Office Equipment			13.2	-	6.6	-	19.80	19.8	-
Hand Tools			19.8	-	6.6	-	26.40	-	26.4
<b>TOTAL</b>			848.00	-	286.15	39.15	1,173.30	530.89	642.41

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COMPONENT: FOUNDATION SEED PRODUCTION AND SEED MULTIPLICATION

TABLE IV

ITEM	UNITS	UNIT COST	1977				TOTAL	FOR EX	LOCAL COST (\$ equiv)
			FY 75	FY 76	FY 77	FY 78			
<b>1. Seed Multiplication:</b>									
SMC Housing	5	\$	\$64.4	-	\$78.2	\$11.5	\$154.1	\$23.115	\$130.985
SMC Operations	5		92.0	-	57.5	43.7	193.2	38.64	154.56
<b>2. National Seed Farm:</b>									
Shops, Warehouses, Offices	1	92	92.0	-	-	-	92.0	18.4	73.6
Local Personnel Costs			90.3	-	63.0	63.0	216.3	-	216.
Generators - 40KW	2	12	27.5	-	11.0	-	38.5	38.5	-
Generators - 25KW	6	5	33.0	-	-	-	33.0	33.0	-
Generators - 5KW	6	2	13.2	-	-	-	13.2	13.2	-
Vehicles-Passenger	9	7	69.3	-	-	-	69.3	69.3	-
Trucks	7	11	84.7	-	-	-	84.7	84.7	-
Motorcycles	6	800	5.28	-	-	-	5.28	-	5.28
Wells(Systems)	7	7	40.25	-	24.15	-	64.4	-	64.4
Fencing			3.3	-	3.3	1.1	7.7	-	7.7
POL & Maint.			16.5	-	16.5	11.0	44.0	-	44.0
Field Equipment			193.6	-	4.4	-	198.0	198.0	-
Lab Equipment			18.7	-	1.1	-	19.8	19.8	-
Seed Planting Equipment			173.8	-	26.4	-	200.2	200.2	-
<b>TOTAL</b>			<b>1,017.83</b>	<b>-</b>	<b>285.55</b>	<b>130.30</b>	<b>1,433.68</b>	<b>736.855</b>	<b>696.825</b>

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COMPONENT: COOPERATIVES AND CREDIT

TABLE V

ITEM	UNITS	UNIT COST	[000]				TOTAL	FOR EX	LOCAL COST (\$ equiv)
			FY 75	FY 76	FY 77	FY 78			
Office Const.	15	\$15	\$189.75	-	\$69.0	-	\$258.75	\$51.75	\$207.0
Equipped Shops	8	17	97.75	-	58.65	-	156.4	25.28	131.12
Silos	150	1	86.25	-	86.25	-	172.5	34.5	138.0
<u>National</u>									
Vehicle-Passg.	12	7	77.0	-	15.4	-	92.4	92.4	-
Vehicle-Trucks	9	20	198.0	-	-	-	198.0	198.0	-
Local Personnel			67.2	-	58.8	-	126.0	-	126.0
<u>Field</u>									
Vehicle-Passgn.	12	5	66.0	-	-	-	66.0	66.0	-
Field Pick-Ups	20	7	154.0	-	-	-	154.0	154.0	-
Operating Expenses			137.5	-	88.0	-	225.5	115.5	110.0
Fertilizer			330.0	-	165.0	-	495.0	-	495.0
Insecticides			44.0	-	22.0	-	66.0	66.0	-
Animal Tools			44.0	-	22.0	-	66.0	-	66.0
Hand Tools			22.0	-	11.0	-	33.0	-	33.0
Sprayers			22.0	-	11.0	-	33.0	33.0	-
Office Equip.			44.0	-	22.0	-	66.0	66.0	-
<u>TOTAL</u>			1,579.45	-	629.10	-	2,208.55	902.43	1,306.12

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COMPONENT: AGRICULTURAL EXTENSION

TABLE VI

ITEM	UNITS	UNIT COST	[0000]				TOTAL	FOR EX	LOCAL COST (\$ equiv)
			FY 75	FY 76	FY 77	FY 78			
Office Const.	6	\$2	\$57.5	-	\$57.5	\$57.5	\$172.5	\$34.5	\$138.0
Vehicle - Passg.	12	7	92.4	-	-	-	92.4	92.4	-
Vehicle - Pick Up	12	7	92.4	-	-	-	92.4	92.4	-
Motorcycles	36	1	39.6	-	-	-	39.6	-	39.6
Bicycles	300		13.2	-	6.6	-	19.8	-	19.3
POL			44.0	-	33.0	22.0	99.0	-	0.0
Commodities			66.0	-	22.0	11.0	99.0	99.0	-
Local Salaries			263.5	-	157.5	52.5	473.5	-	473.5
<u>CFJA Support</u>									
New Const.			69.0	-	46.0	23.0	138.0	27.6	110.4
Maint. & Repair			33.0	-	22.0	11.0	66.0	-	66.0
Training Supplies			27.5	-	16.5	11.0	55.0	55.0	-
Shop Equipment			33.0	-	-	-	33.0	33.0	-
Animals			77.0	-	55.0	11.0	143.0	-	143.0
Animal Equipment			22.0	-	16.5	11.0	49.5	-	49.5
Office Supplies			16.5	-	11.0	-	27.5	27.5	-
Office Equipment			19.8	-	13.2	-	33.0	33.0	-
<u>TOTAL</u>			966.40	-	456.80	210.00	1,633.20	494.40	1,138.80

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PARTICIPANT TRAINING

TABLE VII

Participant Training	UNITS	UNIT COST	[000]				TOTAL	FOR EX	LOCAL COST
			FY 75	FY 76	FY 77	FY 78			
U.S.	11	\$20	\$110	-	\$110	\$22	\$242	\$242	-
Third Country	30	8	132	-	88	44	264	264	-
		<u>TOTAL</u>	<u>242</u>	<u>-</u>	<u>198</u>	<u>66</u>	<u>506</u>	<u>506</u>	<u>-</u>

*fw*

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## 6. Project Implementation

### a. Conditions and Covenants

Within no more than 180 days following execution of the Project Agreement, the Government of Niger will be asked to furnish to AID in form and substance satisfactory to AID:

(1) A stated policy for the sale and distribution of seeds to the farmer. The purchase of improved varieties of millet and sorghum and other food grain seeds will be facilitated through the UNGC organization. The cost to the farmer should be higher than the cost of ordinary seed so that, once the seed service is fully operational in providing improved seeds to the farmer, the system can be self-supporting with an autonomous accounting system.

(2) In consultation with AID, a detailed evaluation and monitoring plan for the project within 60 days of signature of the Project Agreement. The plan will be incorporated in the reporting responsibilities of the Ministry of Rural Economy so that problems can be immediately recognized and the necessary corrective action taken. The GON should participate with the AID Project Manager in quarterly evaluation meetings when problems can be jointly resolved. There should also be an annual joint project review with participation from AID/W.

(3) A fertilizer policy to be agreed to jointly with AID, taking into account AID input and support in the initial years of the project activity.

(4) An agreement by the GON to make every effort to assume during the fourth and fifth years of the project the salary costs of Nigerien personnel hired for the project.

KEY:

b. PERI Chart for the Cereals Project

**A.**

1. Construction of department offices.
2. Recruitment and training of instructors.
3. Selection of trainees.
4. Conduct training programs.
5. Placement of trainees at field posts.
6. Design of plan of operations for first year.
7. Marketing division- short term training.
8. Purchase grain cereals from farmers.
9. Storage and/or resale of grain cereals.
10. Provision of ag. inputs.
11. Initial visit to farm communities and supply demonstration material to the Extension Service.
12. Provide commercial ag. inputs and services to local cooperatives.
13. Estimate amount and scheduling of post harvest grain movements.
14. Short-term training session.
15. Provision of agricultural inputs to local cooperatives.
16. Preparation of demonstration materials.
17. Distribute demonstration material to arrondissement level Extension Service.
18. Distribute Commercial agricultural inputs to local cooperatives.
19. Plan evacuation of cereals and distribution to urban markets and storage points.
20. Short term training course.
21. Plan delivery of agricultural inputs to Extension Service and local cooperatives.
22. Construction of five additional UNCC office compounds.
23. Construction of five additional UNCC office compounds.

**B.**

1. Construction of CFJA centers.
2. Construction of three arrondissement level compounds.
3. Selection of extension trainers and initial training.
4. Recruitment of trainees.
5. First year training outside of Niger (Five Candidates).
6. Training of extension agents and supervisors.
7. Placement of agents and supervisors in field posts.
8. Organization of arrondissement level offices and preparation for first year campaign.
9. Scheduling of demonstration areas and provision of technical expertise to local farmers.
10. Conduct demonstrations and assist in cereal production by provision of agricultural services.
11. Activity evaluation by extension/cooperative team.
12. Field evaluation of extension work by extension trainers.
13. Design of extension training course.
14. Conduct training sessions for extension agents and supervisors.
15. Construction of three arrondissement level compounds.
16. Formation of cooperative/extension team and estimate farm needs.
17. Design demonstration plots, schedule input arrivals, etc.
18. Assist in cereal marketing activity.

19. Evaluation of activities by Cooperative/Extension team.
20. Second year training outside of Niger (seven candidates).
21. Third year training outside of Niger (seven candidates).
22. Normal operations (repeat activities 16 - 19).

C.

1. Construction of compound.
2. Procurement of supplies.
3. Recruitment of staff and short-term training.
4. Tour production conditions.
5. Tour existing research activities.
6. Finalize operation plans for coming year.
7. Production and experimentation.
8. Construction of branch stations.
9. Evaluation of experimentation
10. Design report on results of experiments for distribution to other components.
11. Design next year's research program.
12. Begin second year's experimentation preparation.
13. Design annual operation plans.
14. Production and experimentation.
15. Repeat steps 9 - 11.

D.

1. Recruitment and training of personnel.
2. Tour of production conditions.
3. Tour of existing research facilities.
4. Construction of Seed Farm Center.
5. Plan production.
6. Recruit personnel for branch multiplication centers.
7. Produce foundation seed.
8. Process seed.
9. Package seed for distribution to various clients.
10. Construction of branch multiplication centers.
11. Plan production
12. Implementation.

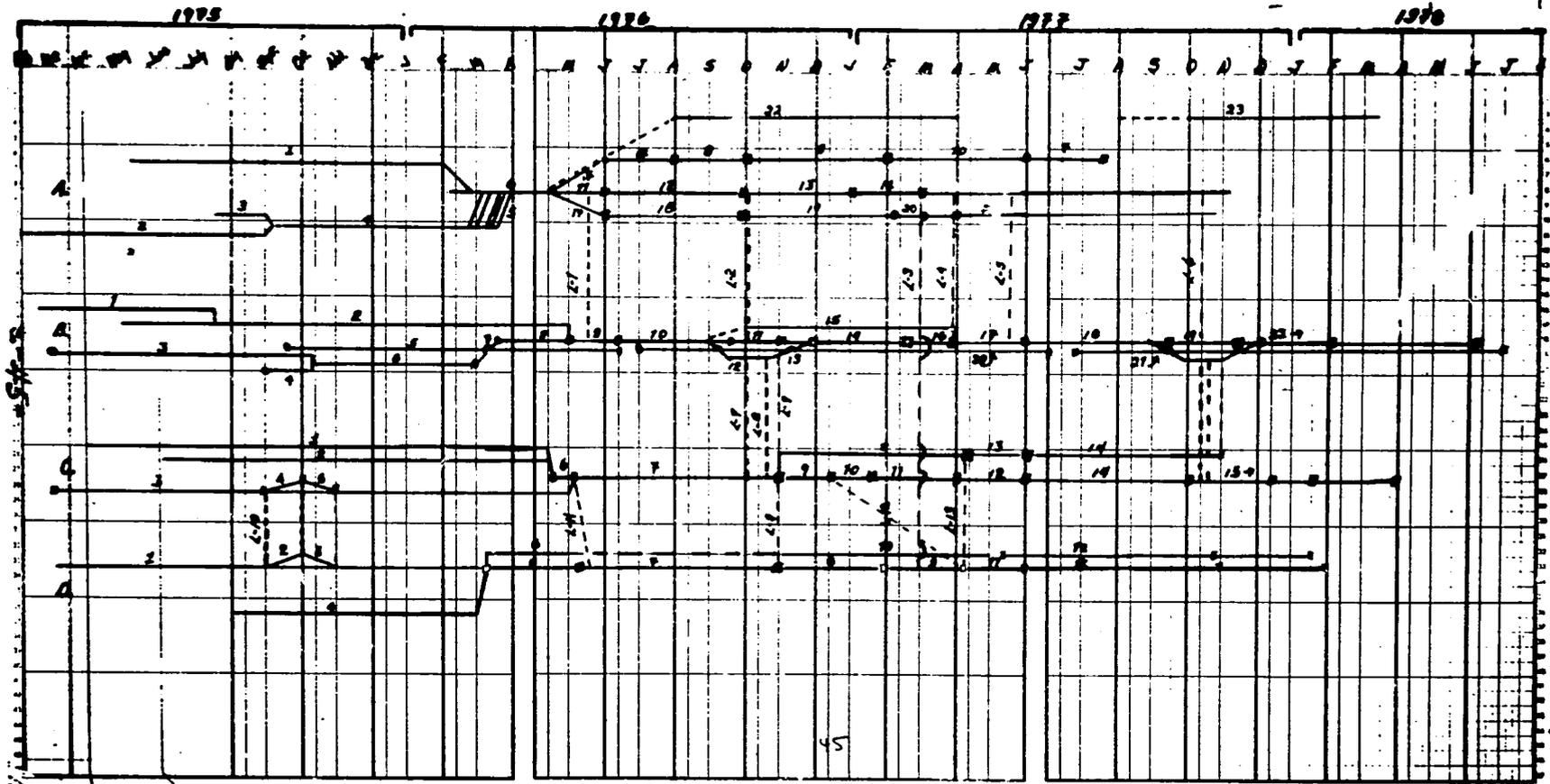
#### Linkage activities.

L

1. Extension/Cooperative team formation.
2. Joint team evaluation of activity.
3. Supply UNCC with seed from Seed Multiplication Unit.
4. Transmission of information from extension/cooperative team to respective authorities in Extension service and UNCC.
5. Coordinate delivery of agricultural inputs by UNCC to Extension service, cooperatives and village mutuals.
6. Joint team evaluation.

7. Transmission of team evaluation to research unit as input in research design.
8. Transmission of extension trainer team evaluation to research unit as input in research design.
9. Provision of research findings to extension trainers for inclusion in training sessions.
10. Joint tour.
11. Transmission of activity plans and recommendations for multiplication seed.
12. Transmission of research seed to seed multiplication unit.
13. Transmission of activity plans plus additional seed if needed.

PROJECT PERT CHART



ADAPTIVE RESEARCH

The adaptive research component of the project is proposed to evaluate rapidly the complete package of improved inputs and practices which are to be distributed to Nigerian farmers. The research will test the technical soundness and economic feasibility of each aspect of the extension package. This research will immediately be utilized in the seed multiplication, extension and cooperative components. Thus, from the first, the evaluation of the project should focus on what is readily adaptable for use by the Nigerian farmers.

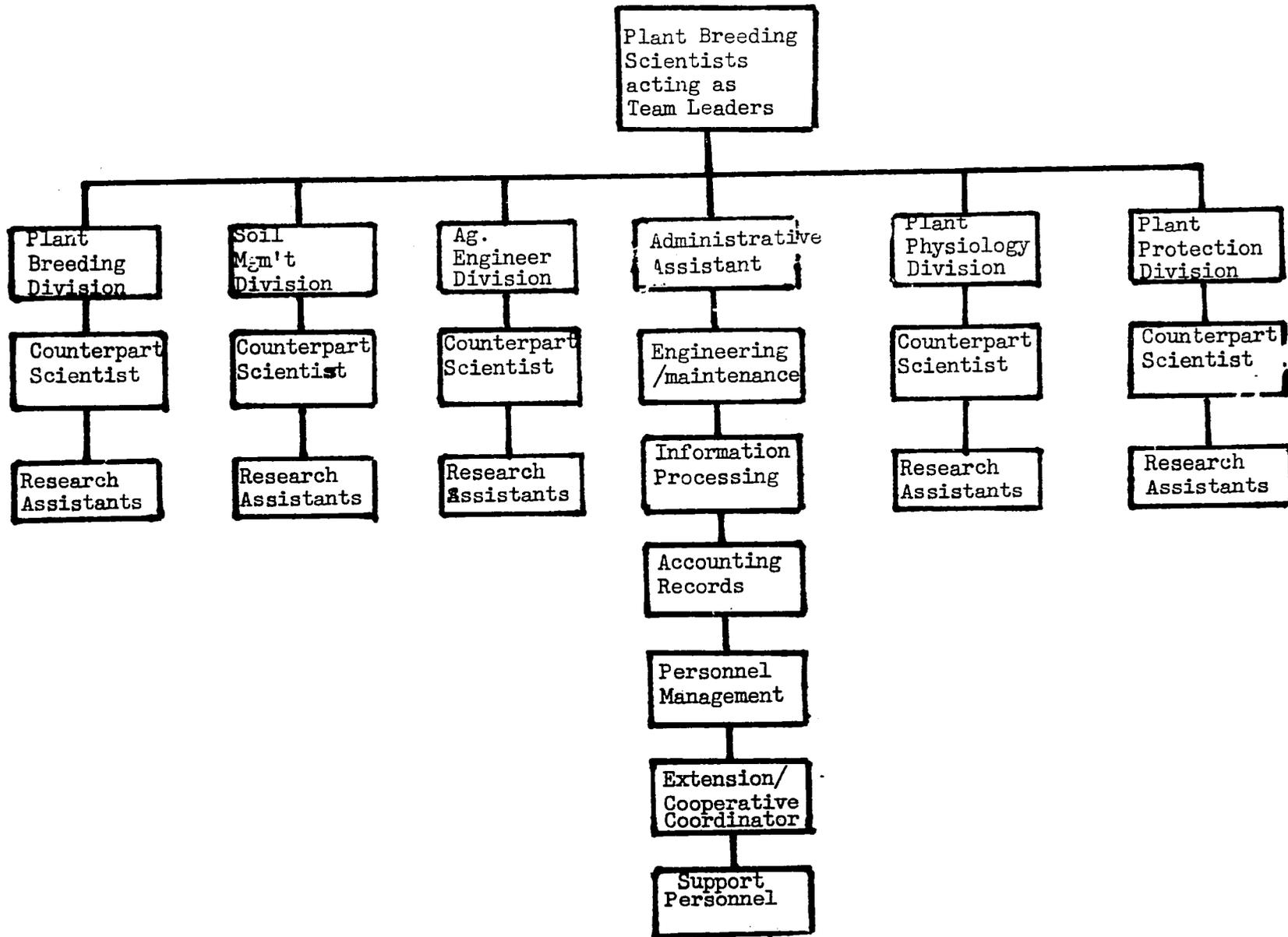
A. National Research Center

The organization of the research effort reflects the needs and possibilities for increased production which have been noted by the design team and by the short-term consultants. Five major areas of research have been identified, and these are reflected in an organizational chart as being five research divisions (see chart, p.47). A description of each of the divisions, its functions and manpower needs is discussed below.

1. Research Division of Plant Breeding.

Major emphasis will be on improved millet varieties, and secondary emphasis will be on the improvement of sorghum and cowpea varieties. This division will identify and develop foundation seed

ORGANIZATION OF THE NATIONAL RESEARCH CENTER



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of superior types and varieties of cereals which are high yielding, drought resistant and pest resistant. IRAT's collection of some 250 indigenous millet types will be useful in identifying superior strains. Research will also focus on developing strains of millet which are better suited for different climatic and soil conditions in Niger. Desirable characteristics will be genetically reproduced by developing improved "pure-line" strains, composite varieties and hybrids. The plant breeding division also provides integration of the other seed research activities because it takes this research and combines the findings into a useable variety of seed plus a package of improved practices.

Manpower requirements include a Nigerien and an expatriate scientist, both of whom should be capable of planning and carrying out the above functions and adapting the research to a package that is useable by local farmers.

The Nigerien scientist should either have a university degree or have research experience plus several years of university training. This scientist will assist in research experimentation and in integration of the research efforts and conclusions of the other research divisions.

The expatriate counterpart scientist should be a senior plant breeder capable of handling research design and implementation responsibilities. This technician should also be capable of training his Nigerien co-worker to carry on this functional type of research.

The division will be aided by two Nigerien research assistants. Candidates require at least a high school degree but, hopefully,

may have some university education.

2. Research Division of Soil Management.

Major research responsibilities will be to identify systematically soil mineral nutrient deficiencies, effective use of fertilizers and soil amendments, and use of legumes and animal manure to improve soil fertility. Other major types of research activities will include evaluation of tillage practices on soil structures, improved planting practices, crop rotation and effect of crop rotation on soils in different climatic zones and different types of soil. Research is needed to determine the economic value of reinforcing rock phosphates and triple superphosphates with different levels of trace minerals, legumes and organic fertilizers.

Manpower requirements include an agronomist or soils scientist to plan and conduct the research and develop an integrated national soil research capacity. Also required are a Nigerian research counterpart and two Nigerian research assistants.

3. Research Division of Agricultural Engineering.

Research responsibilities of this division will focus on the identification of predominant types of soil structures and the potential availability of sufficient sub-soil moisture for irrigation. Other responsibilities include the design of irrigation systems for use at the National Research Center and the construction of facilities at the Center and branch stations.

The manpower required in this division will be a senior agricultural engineer capable of assuming the above responsibilities and training nationals in similar capacities and skills. The

division will also have a Nigerian research counterpart and two Nigerian research assistants.

4. Research Division of Plant Physiology and Ecology.

Major research responsibility will be the isolation of genetic characteristics in cereal plants that are resilient to drought conditions, soil and air-borne diseases and fungi, and insect pests. Research on early-maturing varieties of cereals will be necessary, as well as efficient use of soil moisture by the promotion of certain soil and water management practices. The major effort will be in identifying and isolating the desirable characteristics and coordinating efforts with the plant breeding division to combine these characteristics into one variety.

Management of the division will require the services of a senior plant physiologist capable of assuming the above responsibilities, integrating the division's research with the other team members and training nationals to continue such research. A staffing pattern also provides for a counterpart Nigerian scientist and two Nigerian research assistants.

5. Research Division of Plant Protection.

Major responsibilities will include identifying major recurring pest problems to cereal plants. Effective means of controlling various insect pests, plant diseases, nematodes, weeds and animal/bird pests will also be studied. Research of this division will be coordinated with the research of other divisions in treating problems

of soil-carrying diseases and developing varieties of seeds which are resistant to certain types of pests, such as molds and mildews.

Manpower requirements for this division include a plant protection specialist to fill the senior scientist position who is capable of performing the above functions. Assistance will be provided by a Nigerian counterpart scientist and two Nigerian research assistants.

#### 6. Administrative Division.

The administrative division in the organizational design of the adaptive research component provides the direction and coordination of efforts and administrative support of the various research activities. (See Chart, p. 47 )

The research team leader, designated also as senior Plant Breeder, will be responsible for guiding the overall research activity within the guidelines determined in conjunction with INRAN. The team leader will represent the research component in project management activities and top level coordination with other research organizations.

The team leader will be assisted by an Administrative Assistant who is responsible for supervising the administrative division of the National Research Center. This includes jointly determining the policy of the research effort with the team leader and supervising the implementation of those policies. He will insure the necessary coordination between divisions. As supervisor of the Administrative Division, the incumbent will be directly responsible for necessary records and accounts, personnel management, maintenance of the physical

plant, information processing, and coordination with the extension and cooperative components.

It is planned to recruit two former Peace Corps volunteers to assist in the Administrative Division. One will work in processing information flowing in and out of the National Research Center. The other will be specifically responsible for coordinating activities between the various project components as they relate to the adaptive research effort.

The engineering/maintenance position within the Administrative Division will be the joint responsibility of the national staff and the expatriate agriculture engineer.

The remaining Administrative positions will be filled by Nigeriens.

#### B. Branch Stations.

Three branch stations will be constructed in the second and third years of the project. The justification for these branch stations is a) to place research centers in major crop-producing areas where local farmers can see the results of various research activities. and b) to test different varieties of cereals in differing climatic and soil conditions. The branch stations will also provide assistance to the cooperative and extension units in their immediate areas. The staffing will be modest, and the research will be designed with assistance from the National Research Center staff. Specific research activities will be based on local conditions and needs, and priorities will be determined by the National Seed Service.

Personnel requirements for each branch station include a

Nigerien responsible for the station's research program which will be jointly designed by the National Research Center and the branch station management. The manager will have a former Peace Corps volunteer to assist him in his technical and administrative duties. Two Nigerien research assistants also will be assigned to each branch station. Some supportive assistance such as vehicle, driver, equipment operator, and seasonal field labor will also be provided as required.

C. Coordination of the Research Effort.

It is essential to establish an information system between the various project components. The basic system should provide information inputs to the National Research Center on the current production problems in the agricultural regions of Niger. This is necessary to keep the research adaptable to local farmers' needs. Secondly, the findings of the research efforts will be disseminated to the primary producers through the extension service. To keep the research current and responsive to the needs of farmers, communication must be frequent and continual.

To insure such coordination and communication, several institutional devices will be used. First, overall coordination and communication will be established through INRAN which will provide compatibility and uniformity of goals and objectives. Secondly, this top-level coordination will continue most frequently through the Project Manager's office and the newly created National Cereals Office in the Ministry of Rural Economy (See chart, p. 17).

Thirdly, each component is designed with a liaison-type office to coordinate and insure the orderly and timely flow of information between these components. Lastly, team efforts will be organized among the project components in areas where the branch stations are located.

Coordination is also necessary between the National Research Center and the other agencies involved in agriculture research. To facilitate this, the Government of Niger has created INRAN as the instrument for coordinating all agriculture research in Niger. It provides the forum for consultation between the administrators and scientists of this project with those of the IRAT stations, the CIDA plant protection project, the research activities of UNDP-FAO, and the FED program. Also, ICRISAT, through its Director, has initiated discussions of methods for exchange of promising plant materials, information on research findings and conferences between scientists at ICRISAT and at research stations at Bambey (Senegal) and Samaru (Nigeria).

One of the most effective methods of coordinating research efforts to expedite significant progress is to employ selected specialists from these other agencies as "consultants". An illustrative cost of enlisting such consultants is included in the AID proposed budget (see chart, p. 35). The reciprocal procedure of sending scientists from this project to ICRISAT, LITA, Bambey, Samaru, Zaria, etc., for conferences will require supplementary funding.

**D. Capital Construction Requirements and Costs.**

**1. National Research Center:**

a. Housing requirements if the Center is located near Niamey or Maradi:

1) Six units for married research assistants each totalling 100 sq. meters;

2) One dormitory for unmarried research assistants, 120 sq. meters. Total estimated cost: \$13,200

b. Laboratories and administrative offices:

1) Laboratories and team scientists' offices, plus a general conference room. (30m. x 16m. or 480 sq. meters); Estimated cost: \$28,800;

2) Administrative offices, small conference room, general library facilities, etc. 145 sq. meters; estimated cost: \$8,700

3) 100 sq. meters of closed storage space; 70 sq. meters of shop and repair facilities and 140 sq. meters of open storage space; estimated cost: \$8,400.

4) Generator building and pumphouse; estimated cost: \$1,800.

Total estimated cost of constructing capital facilities at the National Research Center is \$60,900.

**2. Branch Stations:**

a. Two residences for the station manager and managerial assistant at 130 sq. meters each; two residences for the research assistants at 100 sq. meters each; total estimated cost: \$27,600;

- b. One laboratory, 70 sq. meters; estimated cost: \$4,200;
- c. One administrative building including offices, conference room, library, and adequate space for clerical workers, files, etc., 130 sq. meters; estimated cost: \$7,800.
- d. One closed warehouse of 140 sq. meters; estimated cost: \$4,200.
- e. One covered storage area of 140 sq. meters; estimated cost: \$4,200;
- f. One diesel generator building, well and pump housing; estimated cost: \$3,000.

Total construction cost for one branch station: \$51,000

Three branch stations will be built for a total construction cost of \$153,000.

**TOTAL CONSTRUCTION REQUIREMENTS FOR ADAPTIVE RESEARCH COMPONENT:**

A. National Research Center	\$ 60,900
B. Branch Stations	<u>153,000</u>
TOTAL	\$213,900

COMPONENT: ADAPTIVE RESEARCH

ITEM	UNITS	UNIT COST	FOCUS				TOTAL	FOR EX	LOCAL COST (\$ equiv)
			FY 75	FY 76	FY 77	FY 78			
Branch Stations	3	\$ 51	\$ 103.5	-	\$ 57.5	\$14.95	\$175.95	\$ 35.19	\$140.76
Main Station		70	80.5	-	-	-	80.50	16.1	64.4
Nigerien Personnel			147.0	-	141.75	-	288.75	-	288.75
Vehicles - Passenger	12	8	105.6	-	-	-	105.60	105.6	-
Vehicles-Pick-Up	5	8	44.0	-	-	-	44.00	44.0	-
Trucks	1	15	16.5	-	-	-	16.50	16.5	-
Tractors	5	15	82.5	-	-	-	82.50	82.5	-
Field Equipment			77.0	-	45.1	-	122.10	122.1	-
Shop Equipment	1	11	11.0	-	-	-	11.00	11.0	-
Lab Equipment	1	44	44.0	-	-	-	44.00	44.0	-
Roads & Fencing			6.6	-	1.1	-	7.70	-	7.7
Electric Generator	5	3	13.2	-	3.3	-	16.50	16.5	-
Irrigation & Wells	4	6	26.4	-	-	-	26.40	-	26.4
Pumps & Equipment	4	2	8.8	-	-	-	8.80	8.8	-
Fertilizer			22.0	-	11.0	11.0	44.00	-	44.0
Insecticides			4.4	-	2.2	2.2	8.80	8.8	-
Operational Cost			22.0	-	11.0	11.0	44.00	-	44.0
Office Equipment			13.2	-	6.6	-	19.80	19.8	-
Hand Tools			19.8	-	6.6	-	26.40	-	26.4
<b>TOTAL</b>			<b>848.00</b>	<b>-</b>	<b>286.15</b>	<b>39.15</b>	<b>1,173.30</b>	<b>530.89</b>	<b>642.41</b>

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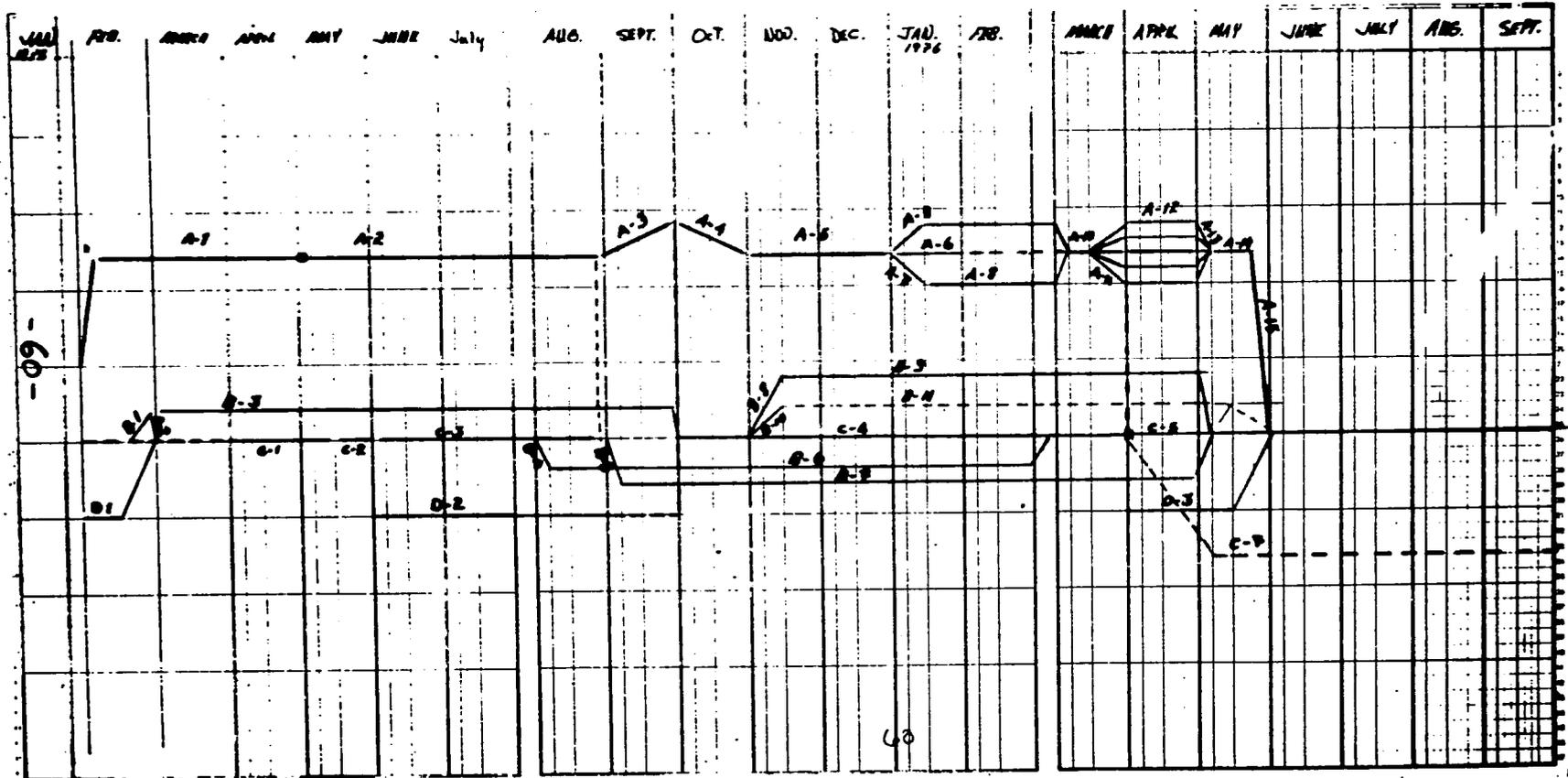
List of activities described in PERT diagram for the Adaptive Research component.

KEY:

- A. 1. Contract senior see scientists.
  2. French language training.
  3. Tour of agricultural production conditions.
  4. Tour of existing agricultural research facilities.
  5. Design basic research policy with INRAN.
  6. Preliminary resource allocation.
  7. Assessment of training needs of research staff.
  8. Structuring of basic in-service training component.
  9. Plan interaction with other project components.
  10. Review package of improved agricultural practices.
  11. Design individual research programs.
  12. Develop individual research programs.
  13. Integrate individual research programs.
  14. Allocate personnel, land and other resources for the first year's activity.
  15. Start research activity.
- 
- B. 1. Estimate number of vehicles needed and time of desired arrival.
  2. Make arrangements to purchase at least one vehicle locally for use by Ex-PCV. coordinator.
  3. Order and delivery of vehicles.
  4. Estimate needed farm equipment.
  5. Estimate needed office and laboratory equipment.
  6. Order and delivery of farm equipment.
  7. Order and delivery of office and lab. equipment.
  8. Determination of needed library and research reference materials.
  9. Procure library facilities and reference material.
  10. Estimate needed agricultural inputs in conducting research.
  11. Procurement of agricultural inputs, some of which will be provided by MER or UNCC.
- 
- C. 1. Design and plan of facilities to be constructed.
  2. Approval of design by REDSO.
  3. Award contract.
  4. Construction.
  5. Start operation of facilities.
  6. Start construction of branch stations as soon as weather permits.

- D.
1. Recruitment of one Ex-PCV to act as coordinator.
  2. Recruitment of Nigerien scientists and research technicians.
  3. Recruitment of branch managers and Ex-PCV assistants who will be stationed at the central research station until the branch facilities and programs are completed.

Mat'l Research Center



FOUNDATION SEED PRODUCTION AND SEED MULTIPLICATION

The principal goals and responsibilities of the seed production and multiplication component are as follows:

- (a) to increase the quantity of seed of superior varieties of millet, sorghum and cowpeas to assure those farmers receiving the seed that it will have performance characteristics equivalent to the variety released by the National Research Center;
- (b) to train a corps of Nigerian technicians and farmer-seed producers in the techniques required for the production, processing, distribution and marketing of high quality seed to provide the basis for a self-sustaining Nigerian seed program; and
- (c) to the degree possible, and within technical, financial and supervisory constraints, produce seed by utilizing a "package" of production practices within the economic and technical capability of the average Nigerian farmer.

The above goals largely restrict the role of the seed production and multiplication component to technical production and first-level distribution of seed as a production input.

During the first year or two of project activity, emphasis will be placed on the multiplication of seeds of the best available varieties of millet and sorghum. However, the scope of activity will be expanded to include the multiplication of cowpea seed when possible because it is an important potential export crop as well as a source of nitrogen for subsequent crops.

A further description of the functions to be performed, construction and manpower requirements, and organizational design of the component follows.

A. National Seed Service (NSS)

Because of the/<sup>GON's</sup>highly decentralized spatial organization, an administrative group in a National Seed Service office will assume the overall responsibility of coordination, evaluation, and control for this component of the project. This office will be responsible for providing top-level guidance in establishing national cereal production policy and in assuring conformity in national, project, and component goals and objectives. The NSS will also be responsible for planning, coordinating, implementing and evaluating the technical, educational and promotional activities required to achieve the determined objectives. Included as well are accounting and reporting of project activities, purchasing supplies and equipment, and selecting professional personnel.

In conjunction with the National Research Center and the National Seed Farm, <sup>(described below)</sup> this office will determine the varieties and quantities of millet and sorghum that should be reproduced. Such planning will also determine the quantities to be produced in each of the seed multiplication centers and by contract farmers.

The NSS will schedule the distribution of the seed to the UNCC and extension groups to insure that it will be available to farmers before the planting season and with sufficient lead time to facilitate the coordinated delivery of other necessary production inputs.

As in other components, the training of national staff will be required. It is assumed that the NSS and National Seed Farm will function a year before the completion of the regional seed multiplication centers. Before assignment to these regional seed centers, the staff will be trained in the NSS and on the National Seed Farm. In addition to on-the-job training, scheduled group training sessions will be conducted in conjunction with the National Research Center. The NSS will be responsible for the design of such training programs for its personnel.

Manpower required to staff the NSS includes a Nigerien national director acting as chief administrative officer and capable of the policy and management functions described above. The director will work under the supervision of the Nigerien manager of the National Cereals Program. A senior seed specialist, acting as Team Leader, with experience in seed technology, management of a seed activity, and planning and implementing training programs in seed technology, will be assigned to this component to assist the director of the NSS. He will emphasize the technical and training aspects of the directorate. Responsibility will also be assumed for coordinating the establishment of the Seed Multiplication Centers (SMC).

The services of a Nigerien accountant with training and experience in cost accounting and maintenance of inventory records will also be required. His primary responsibility will be to maintain records of expense and seed sales, an inventory of seed supplies and billings for sales and service. In performing these functions, he will be responsible to the NSS directorate but will work closely with the National Seed Farm and the SMC managers.

Staffing also includes an administrative assistant and necessary clerical staff.

The Ministry of Rural Economy will provide three two-man offices. The equipment needed to furnish these offices includes: desks, typewriter, calculator, files, slide projector and equipment, public address system, and 1 four-wheel drive, airconditioned vehicle.

B. National Seed Farm (NSF)

A National Seed Farm will serve as the vehicle for launching the technical operations of the seed production and multiplication program. Operationally, the process begins with the production/breeder's seed and continues with seed multiplication, harvest, drying, processing, storage, marketing and distribution. The NSF is well suited for in-service training of personnel for future responsibilities in the expansion of the program.

The National Seed Farm will produce and supply some seed for use by farmers at least in the initial stages of operation. However, its orientation should be maintained as an elite organization whose primary functions are to make the initial multiplication of breeder's seed received from the National Research Center and to distribute its seed output to seed multipliers. Additionally, this facility will catalyze interest in production of commercial quantities of seed; serve as a center of expertise, training and information for the developing seed program; and maintain a reserve of high quality seed of each variety in current use as a safeguard against crop failures.

The first multiplication from the National Research Center will not require a large amount of land; however, because it is foundation seed, purity and quality control must be strictly enforced to insure that quality seed will be received by the Seed Multiplication Centers. As a consequence, the cost per kilo of this first multiplication will be high.

The estimated annual production of distributable foundation seed produced by this facility is estimated at 800 kg. This will provide a sufficient quantity of seed for the planting requirements of the regional Seed Multiplication Centers, plus a surplus stock which can be distributed to local farmers or held in reserve. (see Chart, p. 17).

1. Personnel Requirements:

(a) Manager of NSF: to insure coordination between the NSS and the NSF, the Manager will also be the Assistant Director of the NSS. Responsibilities of the position include planning, implementing and supervising foundation seed production, processing, storage, testing and distribution of outputs. The incumbent will also be responsible for coordinating activities with the research program on technical matters and planning and supervising training programs. The Manager will report directly to the Director of the NSS.

(b) Assistant Manager of NSF: primary responsibilities include the implementation of farm operations, supervision of seed testing activities, and coordination of sub-professionals' activities. In this capacity, a priority will be the scheduling of events at the seed farm to

coincide with outside demand. The incumbent will be directly responsible to the Manager of the NSF.

(c) Senior Seed Specialist: this technician should have an advanced degree in Seed Technology or Agronomy, plus experience in training programs related to seed technology. Duties will include working with the NSF management in the planning and execution of their responsibilities, plus the development and implementation of the desired training programs. The incumbent will report to the Team Leader and the Director of the National Seed Service.

(d) Managerial Assistant (former PCV): the incumbent will be responsible for coordinating physical outputs and information between the seed multiplication, adaptive research, extension, and cooperative components. He will also assume some training responsibility, working both with the Senior Seed Specialist, above, and the Agricultural Engineer (adaptive research component).

(e) Seed Analyst : duties will include evaluation and reporting on the physical and biological quality of all seed produced under the NSS auspices. The Nigerian will report to the Assistant Manager.

(f) Processing Technicians: there will be three positions for Nigerians to operate and maintain seed processing and storage equipment and handle distribution activities. They will report to the Assistant Manager.

(g) Production Assistants: Two Nigeriens will be responsible for soil preparation, planting, cultivation and pest protection, and harvesting. These positions are important because of the necessity of quality controls in the production of seed-bearing plants. They will report to the Assistant Manager.

(h) Supporting staff. Nigerian personnel is needed for the following positions: Laboratory technician (1), mechanic (1), tractor and vehicle drivers (6), and a secretarial staff, including an assistant accountant to assist the NSS accountant (3).

2. Construction Requirements (Total \$81,020)

(a) Two residences of 120 sq. meters for the Manager and Assistant Manager; estimated cost: \$14,400;

(b) Four residences of 75 sq. meters each for the Seed Analyst and processing technicians, estimated cost: \$18,000;

(c) Eleven small residences using native-type construction for staff; estimated cost: \$1,020.

Total estimated cost of supplying the living facilities described above is \$33,420.

(d) One office/laboratory building of 200 sq. meters will have five offices, a conference room, library, supply and equipment storage, and seed testing lab; estimated cost: \$12,000;

(e) One seed processing building with sidewalls of 4 to 5 meters, encompassing 200 sq. meters and including an office and storage room (both 3m. x 5m); estimated cost: \$12,000.

(f) One seed warehouse - 300 sq. meters , including a 5m x 10m airconditioned seed storage room and sidewalls of 4 meters; estimated cost: \$18,000.

(g) One shop (50 sq. m.), generator building (10 sq. m.), pump-house and storage tank (5 sq. m.); estimated cost: \$5,600.

Total cost of construction of operational facilities: \$47,600.

### C. Seed Multiplication Centers

A series of five regional seed multiplication centers (SMC) will be used to increase the quantity of seed in the second stage of multiplication and to shorten the distribution channels between the seed producers and the primary cereal producers.

Each SMC will function as an active seed production unit by operating a farm of approximately 30 hectares. The SMCs will receive seed from the National Seed Farm for planting; then the seed will be harvested, processed, stored, tested and distributed. The equipment designed for use at these centers will be low-cost and for use with animals. Consequently, the SMCs will also serve to a limited extent as demonstration units.

The location of these regional multiplication facilities will be determined in conjunction with the establishment of the research branch stations. This is necessary for the production of different strains of cereals which are best suited for certain areas. Equally, the proximity of these facilities can serve to reduce some overhead costs as well as promote organizational coordination of effort.

Three SMCs will be established in the first year of project activity after the National Seed Farm is in operation. The remaining two centers will be established as soon thereafter as is feasible and will be located close enough to an existing SMC that the seed can be trucked to and processed at the other SMC and then transported back to the original producing center for distribution. In this way additional transport requirements will be less expensive than installing and maintaining additional seed processing equipment.

1. Personnel Requirements at each SMC

(a) Manager: The Manager will be responsible for fiscal, technical and personnel management of the SMC, coordinating the SMC activities with various Departmental and Arrondissement agencies, and reporting back to the National Seed Service. The incumbent will also be responsible for planning, supervising and implementing farm activities in seed production, processing, storage and distribution. He will report to the Director of the NSS.

(b) Assistant Manager: Primary responsibility will be supervising the daily activity of the farm and assisting the Manager in the distribution of seed during the dry season. He will report to the SMC Manager.

(c) Co-manager: The incumbent will work with the Manager and Assistant Manager in developing planning and technical skills, supervising the repair and maintenance of equipment, and maintaining necessary records and inventory control. He will also report to the Director of the National Seed Service.

(d) Production Assistant. Three Nigeriens will be responsible for producing seed and will report to the Manager. The incumbents will be recent graduates of the Young Farmer Training Centers and will have experience in innovative farming practices.

(e) Processing Technicians: There will be three Nigerian positions to operate and maintain the farm equipment. They will report to the SMC Manager. These positions are necessary only for the first three SMCs.

(f) A limited number of supportive staff and seasonal labor will be needed.

2. Construction Requirements (Total: \$291,550)

(a) For each of the first three centers:

(1) Two 100 sq. m. residences are required for the Manager and Co-Manager; estimated cost: \$6,000 each; estimated total cost: \$12,000;

(2) Four 75 sq. m. residences are required for the Assistant Manager and processing technicians; estimated cost: \$4,500; estimated total cost: \$18,000;

(3) Six residences constructed of local material; estimated total cost: \$510;

(4) 1 seed processing plant of 200 sq. m.; estimated cost: \$12,000;

(5) 1 seed storage warehouse, including three offices, with 300 sq. m.; estimated cost: \$18,000;

(6) 1 shop and additional storage with 70 sq. m.; estimated cost: \$4,200;

(7) 1 generator housing and pumphouse with storage tank; estimated cost: \$2,500;

(8) 1 10m x 10m drying fl. ; estimated cost: \$2,000.

Total cost for construction for each major center: \$69,210 x 3 = \$207,630

(b) For the remaining two centers:

(1) Residences

1-100 sq.m. for Manager: \$6,000.

2-75 sq.m. for Co-and Assistant Managers: \$9,000.

6-locally constructed houses: \$510.

(2) Operation facilities

1-10m x 10m drying floor: \$2,000.

1 seed storage/office building of 300 sq.m.: \$18,000.

1 shop and storage facility of 70 sq.m.: \$4,200.

1 generator housing and pumphouse with storage tank: \$2,250.

Total cost of construction for remaining two centers: \$41,960 x 2 = \$83,920

TOTAL CONSTRUCTION COSTS FOR FOUNDATION SEED PRODUCTION AND SEED

MULTIPLICATION COMPONENT:

National Seed Farm	\$81,020
Seed Multiplication Centers (5)	291,550
	<hr/>
	\$372,570

COMPONENT: FOUNDATION SEED PRODUCTION AND SEED MULTIPLICATION

ITEM	UNITS	UNIT COST	1977				TOTAL	FOR EX	LOCAL COST (\$ equiv.)
			FY 75	FY 76	FY 77	FY 78			
<b>1. Seed Multiplication:</b>									
SMC Housing	5	\$	\$64.4	-	\$78.2	\$11.5	\$154.1	\$23.115	\$130.985
SMC Operations	5		92.0	-	57.5	43.7	193.2	38.64	154.56
<b>2. National Seed Farm:</b>									
Shops, Warehouses, Offices	1	92	92.0	-	-	-	92.0	18.4	73.6
Local Personnel Costs			90.3	-	63.0	63.0	216.3	-	16.3
Generators - 40KW	2	12	27.5	-	11.0	-	38.5	38.5	-
Generators - 25KW	6	5	33.0	-	-	-	33.0	33.0	-
Generators - 5KW	6	2	13.2	-	-	-	13.2	13.2	-
Vehicles-Passenger	9	7	69.3	-	-	-	69.3	69.3	-
Trucks	7	11	84.7	-	-	-	84.7	84.7	-
Motorcycles	6	800	5.28	-	-	-	5.28	-	5.28
Wells(Systems)	7	7	40.25	-	24.15	-	64.4	-	64.4
Fencing			3.3	-	3.3	1.1	7.7	-	7.7
POL & Maint.			16.5	-	16.5	11.0	44.0	-	44.0
Field Equipment			193.6	-	4.4	-	198.0	198.0	-
Lab Equipment			18.7	-	1.1	-	19.8	19.8	-
Seed Planting Equipment			173.8	-	26.4	-	200.2	200.2	-
<b>TOTAL</b>			<b>1,017.83</b>	<b>-</b>	<b>285.55</b>	<b>130.30</b>	<b>1,433.68</b>	<b>736.855</b>	<b>696.825</b>

7/2

## PERT CHART

Activities required by the Seed Multiplication Component.

### KEY:

#### A. Personnel Organization

1. Contract of senior seed specialists (2).
2. Recruitment of Director of NSS.
3. Recruitment of NSS accountant.
4. Recruitment of Ex-PCV coordinator.
5. Recruitment of twelve Production Assistants.
6. Placement of personnel in positions.
7. Placement of production Assistants in Kolo Training Center.
8. Organization of NSS office.
9. Estimation of equipment required for first year production.
10. Procurement of equipment.
11. Kolo training for twelve production assistants.
12. French training for senior seed specialist.
13. Move specialists to field.
14. Assist in organization of NSS office.
15. Organize National Seed Farm office.
16. Tour existing agricultural research facilities.
17. Add Kolo graduates to staff. (Have them attend Extension program).
18. Design interaction with other project components.
19. Determination of training needs of staff.
20. Coordination of arrival of equipment and installation of equipment.
21. Design of in-service training program.
22. Installation of equipment in National Farm.
23. Development of detailed plan of operation for first year.
24. Coordination component plans with Project Manager.
25. Development plans of operation for second year. (tentative)
26. Select site for SMC's (2).
27. Preparation of farm for planting.
28. Design of construction of two SMC's.
29. Recruitment of personnel for SMC's.
30. SMC personnel move to National Seed Farm for observation of operation.
31. Initiate limited production of foundation and M<sub>2</sub> millet seed.
32. Contract for SMC construction.
33. Determine transportation needs for first year operation.
34. Procure vehicles locally for use by staff.
35. Procure other vehicles.

#### B. Establishment of National Seed Farm

1. Design of National Seed Farm construction.
2. Approval of construction plans by REDSO.
3. Contract construction.
4. Construction.
5. Put into operation.



PACKAGE OF IMPROVED PRACTICES

Farmers using local practices typically get 300-500 kilograms of grain per hectare. With this low yield, it is difficult for them to provide food for themselves, much less provide for the urban population or store a surplus for a poor year. To increase production, IRAT has tested a package of improved practices that usually double the present yield. Within the operation of this project this set of improved practices will be demonstrated to the farmer through the agricultural extension agents on the staff of the Ministry of Rural Economy. The practices are:

1. Cultivating the soil before the first rain - In many areas the ground is somewhat hard. When the first rain comes, much of the water runs off and is wasted, rather than soaking in. By cultivating the soil, those farmers who have access to animal traction can break up the soil thus increasing soil moisture absorption and giving the plants a better start.

2. Use of improved seeds - Local varieties of millet give a very low yield and do not respond well to fertilizer. IRAT developed P-3 Kolo by selecting from local varieties. Without the improved practices, it yields little more than the local variety and, with less than 250 mm of rainfall, often does not perform quite as well. Also, P-3 Kolo matures in ninety-five days. IRAT is experimenting with another variety that will mature in seventy-five days. With sparse rainfall in recent years, the early-maturing, drought-resistant varieties could assure a crop. IRAT also has a variety of cowpeas, TN 88-63, which matures in seventy-five days and can produce a crop with 250 mm of rain. Improved sorghums are available from IRAT and from the West African Major Cereals Project at Samaru, Nigeria.

3. Pure stands of cowpeas Cowpeas are ordinarily intercropped with millet. Substantially increased yields can be obtained by cropping cowpeas by themselves and spraying with insecticide. This avoids extensive damage from insects to both the foliage and the bean.

4. Planting at the right time - Millet should be planted at the first rain that dampens the soil to a depth of four inches. If a planting rain has not come by June 15, it should be planted in the dry ground to be ready when the first rain comes. Peanuts should be planted after the first heavy rain following the planting of millet.

5. Seed Treatment - When the seed is planted in the dry ground, it is subject to mildew and attack by insects or other pests. To avoid this, the seed should be treated with an insecticide-fungicide mixture. This is mixed with the seed in a gourd just before the seed is planted and usually results in better germination.

6. Density - The recommended spacing of hills of millet is 1m X 1m. Sorghum spacing is .80m X .60m, which is closer than is presently practiced but results in increased yields.

7. Weeding - The first weeding should be ten days after planting. Another weeding should be after twenty-four days, with additional weedings as needed. Proper weeding will increase the yield.

8. Animal traction - Cultivating by hand limits what a man can farm. The only way to expand the size of the farm with a fixed number of laborers is to employ animals to cultivate. Two men and a pair of oxen

can easily cultivate more than 7 men can by hand. Recently, some farmers have been cultivating with a donkey cultivator and have found that one man and a boy with a donkey can cultivate as much as three or four men can by hand. Use of oxen has four advantages: (a) it enables the farmer to cultivate the soil before the first rain in order to conserve moisture; (b) it enables him to expand the size of his farm; (c) it enables him to plow under organic material which helps preserve soil condition with reduced periods of fallow; and (d) the oxen produce needed fertilizer for the farm.

9. Use of fertilizer - Most of the soils in Niger have been depleted and need fertilizer, particularly  $P_2O_5$ . However, millet does respond well to manure. Any kind of waste grass or vegetable matter can be made into compost with animal manure, and the compost can be used in lieu of commercial nitrogen fertilizer. Tests have been done at IRAT which show that the same results can be obtained with compost as with commercial nitrogen fertilizer. Considering the high cost of nitrogen, it is important to conserve any waste stalks, grass, old roofs or fences for use as bedding for animals thereby retaining the value of the manure and supplying humus.

COOPERATIVES AND CREDIT

The general scope of activity to be undertaken in the cooperative and credit component of the project is to increase the capability of the Union Nationale de Credit et Cooperatives (UNCC) to deliver agricultural production inputs and its capacity to market agricultural outputs. These objectives require numerous specific activities involving a delivery capacity of tangible inputs such as seed, fertilizer, animal-drawn implements, work animals and hand tools. It also involves increasing the UNCC's capacity to procure produced cereals, groundnuts, and cotton. The UNCC will act as the market channel from the farm gate to the first processor which will in turn act as a production incentive for the farmer. The effective functioning of UNCC/also involves a delivery capacity of selected services and non-tangible goods, such as credit and farm management practices.

Under this component a delivery capacity will also be created for a behavioral set of ideas capable of re-structuring the current organization of primary producers' markets into a cooperative effort. As a result of AID inputs the capacity of the organization's guidance function will be increased by including training programs for top and middle management personnel located at the national and regional levels. This training will specifically attempt to create more systematic information and communication channels as well as strengthen planning and scheduling capabilities.

The UNCC is a vertically structured organization with top-level offices located in Niamey. The national office is in operation, and assistance will include only some short-term in-service training seminars designed to increase

the organizational management capabilities of its officers. These training sessions will be designed to focus the management's attention more acutely on a better defined scope of action for the organization and on certain administrative procedures that will insure more effective and efficient operation. Such procedures will include the design of information channels and organizationally integrated teams at the local and regional levels to coordinate the various activities undertaken by different government agencies. Since an increasingly important function of UNCC will be the extension of credit to village cooperatives, seminars will be conducted to assess the value that different types of credit programs and structures can have in the Nigerian socio-economic system. These seminars will be organized as conferences rather than typical training sessions because of the input capable of being provided by these officials.

An expatriate advisor will be assigned to the national office to design and schedule these training seminars/conferences and to assist in the design and implementation of various programs to be undertaken by the UNCC. The UNCC is a multi-purpose organization, and its organizational structure does not reflect its current and envisioned activities. The advisor should jointly consider with UNCC officials organizational patterns that reflect its functions as a credit supplier, cooperative commodity marketing agent, and agricultural input supplier. This advisor should be a specialist in cooperative management and have experience in top-level cooperative management.

In addition, twelve passenger-type vehicles will be provided to increase the mobility of the staff at the national level which will be

charged with the design and implementation of training programs for regional-level personnel. These vehicles will be assigned to specific divisions that demonstrate a need for transportation in their program activities.

At the secondary or departmental level AID inputs will include the construction of twelve office compounds, each containing a minimum of six offices depending on the area serviced by the departmental office. Also included in the building design will be a training room, storage for office and training equipment, and limited storage for agricultural supplies available to farmers. These offices will support smaller operational units in the region. Three smaller sub-departmental stations will also be constructed in regions where the concentration of activities demands. Obviously, warehousing and storage of supplies is subject to economies of scale to avoid the stockpiling of supplies at the local level. On the other hand, time constraints require that stockpiles and warehouses be located close enough to major towns to allow for timely distribution of inputs and collection of outputs. On the basis of these two considerations, locations will be chosen to coordinate the flow of goods and services to and from the farmers.

Seven vehicle and equipment maintenance and repair centers will be constructed in connection with the centrally located department level offices. This construction includes a garage facility and equipment plus storage space for repairs and maintenance supplies. One center will be constructed at the national office.

Training programs will be needed to increase staff capabilities; this staff will in turn train the cooperative and village mutual-level staff. Staffing patterns will be developed at the national level, and training programs will be established to meet these manpower requirements. The training programs designed for departmental level accountants and grain storage/handlers \* will be conducted at the national level, with AID providing short-term consultant services to help in the program design and implementation. Training programs will also be needed to develop a cadre of instructors capable of training local-level personnel. The training program for the instructors will be designed to satisfy the needs generated by these local-level programs and the skills needed to conduct them properly.

To meet partially the needs of UNCC's grain marketing and storage function, AID will provide one hundred and fifty silos. These silos will be of 10 metric ton capacity and will be constructed in outlying areas where production and marketing is sufficient to utilize such storage. The management of these silos will be supervised from the department level. Nine trucks will be assigned to the department level to be used to transport grain. The trucks will be most efficiently used to transport grain from the department silos to national distribution centers. Twenty

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\* Numerous persons were supposedly trained in warehousing and handling of grain under the AID Grain Production project and are employed by OPVN. An assessment will be made to identify Nigeriens who perform this function and to determine if they are employed by one organization and trained accordingly.

pick-up type vehicles will be provided to the department offices for dispatch to the lower-level operation units to transport the grain from the village level to the department silos. Where sufficient bulk can be accumulated at one time, larger trucks can be efficiently used. Such considerations will be treated when a detailed schedule is prepared dealing with post-harvest grain movements. The trucks and pick-ups will also be used to deliver supplies to be sold or distributed free for demonstration purposes.

In order to insure the proper functioning of such an operation, considerable training will be required. Accounting and marketing staffs must be trained and periodically given refresher courses. The warehouse managers, who are stationed at the sites of the silos, must also have a suitable level of expertise. Transportation staff will be trained in scheduling and delivering inputs and grain to fit the typical planting and marketing movements. They must also be trained in the supervision of drivers and maintenance of trucks. These training programs will be designed for the first year while the equipment is on order and facilities are under construction. Additional and periodic evaluation and refresher sessions will be scheduled throughout the life of the project.

The local level presents the area of critical interface between the UNCC and its target impact group. The essential activities which must be carried out at this level include establishment of a cooperative

structure and its subsequent organization; scheduling of input delivery and coordination with technical assistance inputs for the extension service; post harvest evacuation of grain; and assessment of activities.

At the cooperative level, persons must be trained in explaining the basic cooperative concepts and functions. The cooperative representative will explain UNCC procedures for selling inputs, credit, consultative services, and grain purchasing. He will also explain (1) how the credit program functions, i.e., in what form the farmer will receive the credit and how it must be repaid; (2) the responsibilities of being a cooperative member, as well as the benefits that are associated with the cooperative system; and (3) the legal status of the cooperative and the legal requirements it must meet. Training courses will be designed at the department level to provide this type of basic understanding. The instructors for this training will have been trained at the national level.

For an organized cooperative, which is a composite of several village mutuels, the UNCC representative and the extension agent will visit the village as soon as possible after the announcement of OPVN's grain prices for the coming crop and before the crop is planted. This extension/cooperative team will explain the consequences of the announcements and will help the coop members plan their production on the basis of a simple model of several hectares and the commodity prices announced by OPVN. The team members must show what outputs can be expected by various production plans and the additional inputs from the use of improved seed and fertilizer. Some assessment should be jointly conducted as to those

inputs the farmers desire and which financial arrangements are suitable. A simple schedule will be set up between the team and the village farmers for the delivery of the inputs and the technical assistance required from the extension service. The team's report will be submitted to the cooperative level and then to the sub-regional or department level. Procurement and distribution schedules will also be drawn up and transmitted back to the cooperative level. Periodic visits will be required to the village mutual to insure the prompt delivery of inputs and technical services and to provide additional assistance if needed by farmers. These efforts need not be a team effort.

Prior to the harvest the extension/UNCC representative team will assess the probable harvest yields and will discuss marketing patterns with farmers to estimate the transportation and storage requirements. These requirements will be coordinated through the department office, and the cooperative will report the scheduled evacuation of outputs to the farmers.

At a suitable post-harvest time, the team will present an evaluation of activity to the local farmers. This session will form the basis of a report submitted annually to the department office. Specific notation of successes and failures will be mentioned. These reports will be summarized and incorporated into an annual department or sub-regional report and will be distributed to other concerned organizations and the national office.

As is easily seen, the process described is too extensive to be implemented at one time. Initially, this program will be concentrated in several promising regions and expanded as feasible.

COMPONENT: COOPERATIVES AND CREDIT

ITEM	UNITS	UNIT COST	{000}				TOTAL	FOR EX	LOCAL COST (\$ equiv.)
			FY 75	FY 76	FY 77	FY 78			
Office Const.	15	\$15	\$189.75	-	\$69.0	-	\$258.75	\$51.75	\$207.0
Equipped Shops	8	17	97.75	-	58.65	-	156.4	25.28	131.12
Silos	150	1	86.25	-	86.25	-	172.5	34.5	138.0
<u>National</u>									
Vehicle-Passg.	12	7	77.0	-	15.4	-	92.4	92.4	-
Vehicle-Trucks	9	20	198.0	-	-	-	198.0	198.0	-
Local Personnel			67.2	-	58.8	-	126.0	-	126.0
<u>Field</u>									
Vehicle-Passgn.	12	5	66.0	-	-	-	66.0	66.0	-
Field Pick-Ups	20	7	154.0	-	-	-	154.0	154.0	-
Operating Expenses			137.5	-	88.0	-	225.5	115.5	110.0
Fertilizer			330.0	-	165.0	-	495.0	-	495.0
Insecticides			44.0	-	22.0	-	66.0	66.0	-
Animal Tools			44.0	-	22.0	-	66.0	-	66.0
Hand Tools			22.0	-	11.0	-	33.0	-	33.0
Sprayers			22.0	-	11.0	-	33.0	33.0	-
Office Equip.			44.0	-	22.0	-	66.0	66.0	-
<u>TOTAL</u>			1,579.45	-	629.10	-	2,208.55	902.43	1,306.12

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KEY:

PERT Chart for the Cooperatives and Credit Component

A. Training Operations

1. Policy and program evaluation
2. Determination of staffing pattern
3. Determination of trg needs
4. Selection of trainees
5. Selection of areas of geographical concentration.
6. Withdrawal of personnel from normal operations.
7. Schedule trg facilities and materials.
8. Contract trainers and design of trg program
9. Assignment of trained personnel to estimated manpower needs and positions.
10. Withdrawal of personal from normal operations.
11. Schedule of trg facilities and materials.
12. Placement of trainees in cooperative training facilities.
13. Training of coop instructors
14. Placement of trainees in specialized training facilities.
15. Trg of accountants
16. Trg of cooperative credit mgers
17. Trg of grain mgers
18. Assignment of personnel to coop level trg programs
19. Trg program design
20. 1st trg session 3 wks and assignment to coop level positions
21. 2nd trg session
22. transfer of trained manpower to personnel
23. transfer of trained manpower to regional positions
24. 3rd trg session
25. 4th trg session
26. Assignment of Coop instructors to regional offices
27. Placement of Coop instructors to regional offices
28. Evaluation and reporting of manpower training and remaining trg programs to be conducted
29. Design of trg programs for 1976

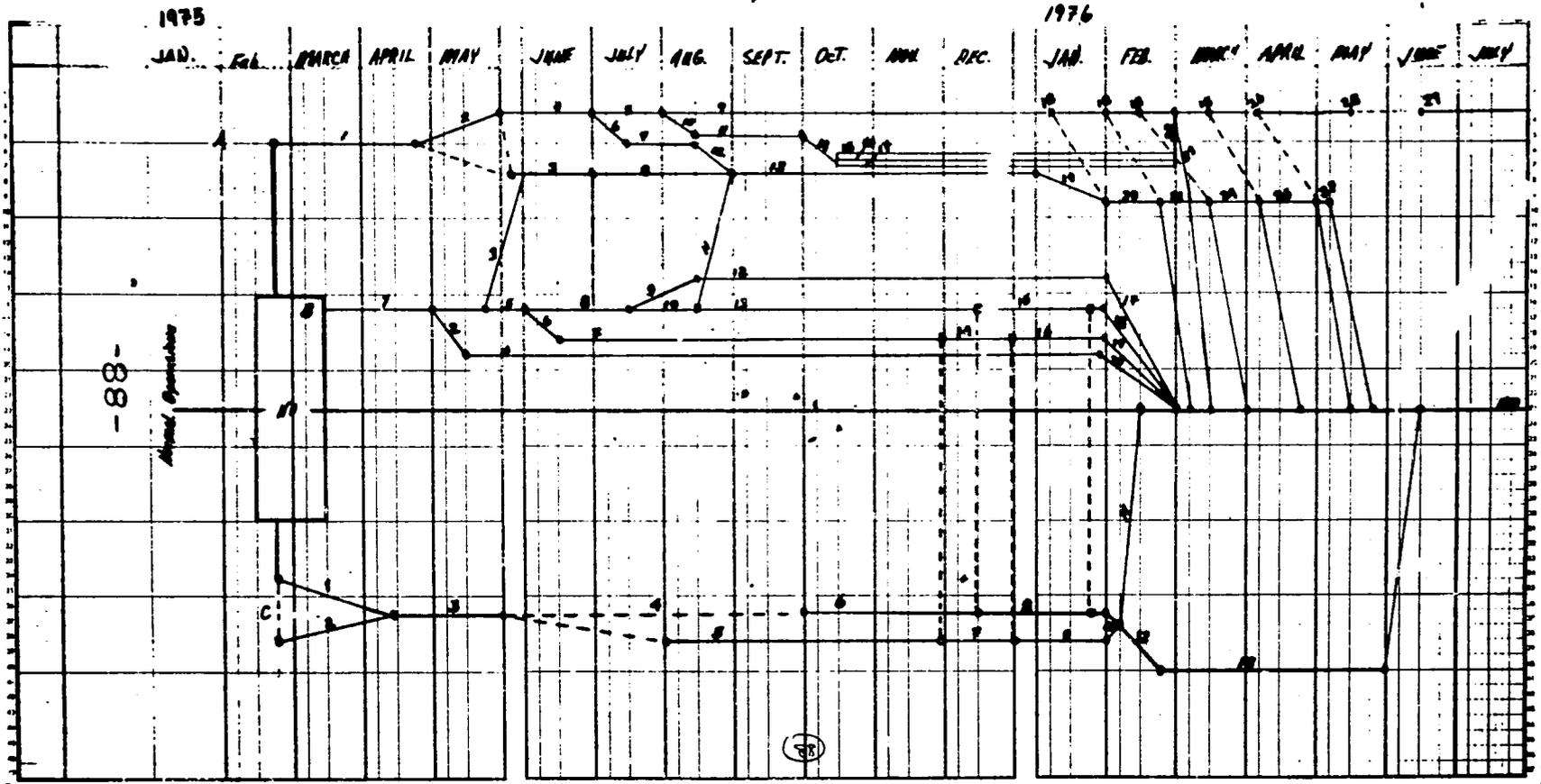
B. Logistic Operations

1. Organization of procurement office and procedures
2. Estimate future transport needs
3. Purchase of transportation vehicles (3) locally for trg staff
4. Order and delivery of vehicles
5. Arrange maintenance facilities for locally purchased vehicles.
6. Estimate needs for maintenance center equipment
7. Order and delivery of maintenance center equipment
8. Estimation of trg equipment needed
9. Estimation of ag inputs required for 4 regional centers
10. Transfer of trg equipment to trg facilities
11. Order and delivery of trg equipment
12. Order and delivery of ag inputs
13. Order and delivery of office supply and equipment for regional centers
14. Transfer of maintenance center equipment to building site
15. Transfer of office supply/equipment to regional centers sites
16. Completion of transfer and installation of maintenance center equipment
17. Installation of ag inputs in regional warehouse
18. Installation of office equip/supplies in regional centers
19. Completion of installation of maintenance equipment
20. Transfer of vehicles to regional offices

C. Construction Requirement.

1. Design of regional office compounds
2. Contract construction
3. Preliminary construction and foundations etc.
4. Rainy season
5. Design and ordering of construction material for maintenance centers and start of construction when possible.
6. Resume construction on regional offices
7. Installation of first tranche of equipment in maintenance centers
8. Installation of office equip/supplies in regional office
9. Complete installation of equipment in maintenance centers
10. Test run of equipment
11. Staff and put into operation of regional offices and maintenance centers
12. Site selection of storage silos
13. Construction of 30 silos

UNCC CDD/CREDIT



AGRICULTURAL EXTENSION

The extension service is a subdivision of the Department of Agriculture in the MER. (See chart, p. 17) Its organizational design includes divisions from the national to the village level. Currently, because of a shortage of funds and a shortage of trained manpower, extension staffing is complete only to the Arrondissement level. The staff at the village level are considered volunteer workers although they receive a small compensation during the five month cropping season.

A second recurring problem is duplication of effort. UNCC has become involved in some extension activities, especially in connection with cash crops. Consequently, some regions of the country are without extension services, and the two organizations are in competition in other regions.

The major impact of our planned involvement in the extension service will be to identify areas where AID can increase the effectiveness and efficiency with which the extension service interacts with primary cereal producers. The existing extension service and agricultural policy form the parameters within which this project component will be implemented. The activities which will be undertaken are not directly planned to create new functions or facilities for the extension service.

A. Training

In the organization chart of the MER, (p. 17), one finds that it is structured along commodity and functional groupings with

geo-political divisions being a secondary consideration. Closer internal collaboration will be needed as the organization grows in certain functional areas. To stimulate this collaboration and to oversee the AID inputs to the extension service, a full-time Extension Specialist will be provided. Organizational problems will be discussed with ministry officials, and when they so desire, in-service training programs for top-level managers will be conducted to facilitate control and coordination between various administrative divisions. Such training will include the Nigeriens involved in the direction of each department and the directors of agencies which make up these departments. The trainer will be a senior short-term consultant specialized in organizational design of agricultural services in LDC's. He will also be French-speaking with experience in dealing with African public organizations.

In addition to top-level in-service training, some participant training is required. This training will be academic, non-degree training for a year in a specially designed course to include field observations. Five participants will be selected and given in-country English language training. They will then be sent to the U.S. to study extension in the various technical aspects of agricultural production:

- a) land and water management
- b) technical seed research
- c) use of organic and non-organic fertilizers
- d) farm management
- e) communications systems to reach target groups

Upon their return, these persons will form a functional nucleus to

staff the training division of the National Extension Office.

The project will also include third country training for 20 Nigeriens. Approximately half will receive a year's training emphasizing general agricultural systems and public administration. They will then occupy positions in the department directorate of the extension service. Their positions will be primarily administrative to guide, control, and coordinate various departmental activities in which the extension service is involved. A training program will be found which will reflect the needs of such a position.

The remaining ten participants will be trained in third country programs to develop a cadre of national service trainers. These persons will staff the future in-service training programs designed to up-grade and up-date, on an annual basis, the extension service personnel. They will also be responsible for designing training programs with assistance from the U.S. consultant and will actually conduct these seminars. The training will also include field trips to observe types of extension education activities in the third countries. The detailed design and scheduling of these training programs will be jointly the responsibility of the Project Manager and the ministry officials, including the AID Extension Advisor.

A training and reporting division will be created in the National Extension Office. This six-man team will be responsible for designing, implementing, and evaluating the training programs offered to the extension service personnel. The office will be staffed by participants trained in the U.S. Until their return from the U.S., the Extension Specialist, his assistants and the Assistant Project Manager will

supervise such training programs with a small national staff. This national staff will then take positions at the Department level where they will coordinate and supervise the training programs undertaken in their jurisdiction.

The training division will need to receive feedback from the extension agents on the viability of the improved practices and on the effectiveness of the demonstrations and delivery of inputs. In order to provide this essential feedback, the training division will conduct periodic evaluations.

#### B. Extension Operations

A major effort in this component is promoting mobility and upgrading the lower echelons of the extension service. A common problem facing extension agents is the difficulty of visiting the villages to which they are assigned. Part of this problem would be solved by increasing the manpower in the extension service, thereby decreasing the geographical area covered by an individual agent. The government, however, lacks resources with which to pay this additional staff, and secondly, persons with adequate skills and training to act as extension agents are not available. To alleviate partially the problem of the multiple extension services in MER and UNCC, the project will aim for the transfer from UNCC of those persons acting in the capacity of extension agents and will incorporate these persons into the existing MER extension service structure. This will not increase the overall number of extension agents; however, it is hoped that the extension service coverage will be improved by a more efficient system of distribution.

Efforts of the extension services will be concentrated in

millet-producing areas. The project will not attempt to extend the extension service to those areas marginally engaged in cereal production which are presently covered by the service.

To facilitate the management of both the UNCC and the MER, the personnel transfer will be undertaken during the length of the project. The first transfer will involve approximately thirty persons whose training and background are primarily in general agricultural production. They will be given additional training prior to entry into the MER and will be given civil service status. The training program will deal primarily in aspects of cereal production. The second year, an additional forty persons will be retrained and transferred. The third year forty persons who previously worked in cotton production will be transferred and offered similar retraining to familiarize them with cereal production.

The national and Department offices will concurrently organize personnel teams so that a team of agents with diverse experience and skills will be operating at least on the Arrondissement level. The teams will include agents with four skill-types: cereal production, cash crop production, animal traction, and fertilizer usage. These teams will serve as back-up personnel to the more general type extension agent.

The extension/cooperative team will visit the village.

The demonstration plots will then be selected by the village authorities with guidance from the extension/coop team. The amount of agricultural inputs needed for the demonstrations will be assessed by the team and transmitted back to the UNCC offices and the Arrondissement-level extension administrator.

The supplies will then be delivered to the extension compound in the village and distributed free for the field trials.

According to the organizational plan currently being followed, the Department level office is envisioned as having an administrative/supervisory function. The Arrondissement level is planned to be the basic operational unit which will provide technical and administrative support to lower-level staff. Demonstration programs will be coordinated and supervised from the Arrondissement unit, and the demonstration inputs will be warehoused at this point pending utilization. In the Departments of concentration, nine Arrondissement units have been selected for expansion and improvement. The specific locations of these facilities will be LOGO, DOGONDOUTCHI, BIRNI-NGAOURI, GAYA, DOSSO, in the Dosso Department, and GOURE and TANOUT in the Zinder Department. The additional two locations will be established in the Tahoua Department during the second year.

Construction plans for each Arrondissement office include 200 sq. m. building with adequate space for a conference room, four technical support offices and one administrative office. In addition, a warehouse will be needed to store the collected demonstration and training equipment inputs which will be delivered to the Arrondissement offices before the start of the rainy season. This stock will be utilized during the growing season when roads are in disrepair. An estimated 200 sq. m. of storage space will be adequate with an attached covered garage.

Included in the component is the provision of 24 vehicles which will be distributed between the MER national extension office in

Niamey and the Department-level offices. Motorcycles and bicycles will also be provided for the Arrondissement and village-level extension agents.

It is anticipated that each village agent will be responsible for extension work in an area with not more than a five kilometer radius. Obviously, for an agent to cover effectively this area within time constraints, some type of transportation is necessary to speed travel. Bicycles were chosen over horses or donkeys because they provide cheaper transportation. Motorcycles will be supplied to Arrondissement supervisors who cover several village groupings and who must assist several village-level extension agents.

C. Young Farmers Training Centers (CFJA)

To up-grade the quality of the extension agents, an annual in-service training session is planned for at least the life of the project and will be continued on an alternating year basis after the initial phase of activity. The in-service training program will be scheduled at the Young Farmer Training Centers from December to February when the regular educational program is not in session. The centers at Maradi and N'Dounga /sponsor a three-week training session which will be repeated four times. Forty participants will attend each session. Thus, in eight seminars, approximately 320 village-level extension agents and their immediate superiors will receive at least three weeks of training.

Instruction in these short-term sessions will be offered primarily in the introduction and justification of the package of improved practices, plus guidelines and suggestions as to how these

practices can be demonstrated and introduced to the local farmers. Other subjects will include the methods of reporting and general statistical survey techniques. The training courses will be designed and implemented by the training division at the national and Department levels.

Four Young Farmers Training Centers were built about 1965, located at Diffa, Maradi, Bellande, and N'Dounga, to serve four of the five Departments in the agricultural zone of Niger. These Young Farmers Training Centers were created to teach young farmers all important production practices for the major agronomic and horticultural crops, with special emphasis being given to the use of oxen and animal traction equipment in farming operations.

Candidates from 21-30 years of age are chosen by village officials to receive nine months of training at the centers, after which each is provided with a pair of oxen and a set of ox-equipment on credit with four years to pay for it. While at the training center, each student is provided food and lodging and 2,000 CFA (\$8.00) per month, half of which is used as down-payment on the 80,000 CFA loan for oxen and equipment. Ox-equipment consists of a cart and multi-purpose tool bar with plow, cultivator, ridger, and peanut lifter.

Training is offered in animal traction, care of oxen, care and use of animal manure, crop rotation, the use of pesticides, fertilizers, vegetable gardening and the production of citrus, guava, and dates. In addition to agriculture, they are taught adult literacy, French, major local languages, and simple money management. About two-thirds of the training is of a practical nature, with remainder being classroom theory.

Three staff members are employed at each training center. Facilities for each center include a dormitory, classrooms, office-space, oxen and equipment, shelter for oxen, tool shed, limited storage for crops, and approximately one hectare of land for each student. The N'Dounga and Maradi centers have eighty hectares of land each.

The past operations of most of the training centers have not been as successful as was expected due to a number of problems, most of which can be adequately overcome. Among the problems hampering success are poor selection of candidates for training, little follow-up after candidates complete their training and too large a debt burden for the oxen to be repaid in too short a time.

In 1972, there was a change in the mode of operation of the Maradi center that made the operations more successful. UNCC became involved, and candidates for the training are now chosen by village representatives of UNCC. Better-quality candidates are chosen, and UNCC provides the follow-up and collects the loan re-payments. Candidates feel a responsibility to go back to their villages and succeed. This experience will be used in other training centers in the future.

#### New Plans for Young Farmers Training Centers

The center at N'Dounga with eighty hectares of land is to be expanded to accommodate eighty students. The one at Maradi also will be expanded to accommodate additional students. These are to be upgraded to become part of the cereal program, turning out extension staff to work at village level.

Training will continue as in the past, with additional training added to teach extensive methods and techniques so that graduates can effectively communicate to the farmers what they have learned at the centers. They will be taught in teams of six to eight trainees each and will learn group psychology and how to develop leadership and become leaders in the villages.

Under this component additional facilities at the N'Dounga and Maradi CFJAs will be provided for upgrading the training. They may include lodging, additional dormitories, classrooms, storage, water tanks, deep wells, water pumps, irrigation and watering equipment, two vehicles, oxen and equipment, furniture, and kitchen equipment.

With increased levels of mechanized transportation being introduced into the area, facilities must be also built to insure proper maintenance and repair of the vehicles. These will be used for educational purposes for the regular students as well as for the short-term training programs for extension agents and supervisors receiving motorcycles and bicycles.

COMPONENT: AGRICULTURAL EXTENSION

ITEM	UNITS	UNIT COST	{000}				TOTAL	FOR EX	LOCAL COST (\$ equiv)
			FY 75	FY 76	FY 77	FY 78			
Office Const.	6	\$ 2	\$ 57.5	-	\$ 57.5	\$ 57.5	\$ 172.5	\$ 34.5	\$ 138.0
Vehicle - Passg.	12	7	92.4	-	-	-	92.4	92.4	-
Vehicle - Pick Up	12	7	92.4	-	-	-	92.4	92.4	-
Motorcycles	36	1	39.6	-	-	-	39.6	-	39.6
Bicycles	300		13.2	-	6.6	-	19.8	-	19.8
POL			44.0	-	33.0	22.0	99.0	-	99.0
Commodities			66.0	-	22.0	11.0	99.0	99.0	-
Local Salaries			263.5	-	157.5	52.5	473.5	-	473.5
<u>CFJA Support</u>									
New Const.			69.0	-	46.0	23.0	138.0	27.6	110.4
Maint. & Repair			33.0	-	22.0	11.0	66.0	-	66.0
Training Supplies			27.5	-	16.5	11.0	55.0	55.0	-
Shop Equipment			33.0	-	-	-	33.0	33.0	-
Animals			77.0	-	55.0	11.0	143.0	-	143.0
Animal Equipment			22.0	-	16.5	11.0	49.5	-	49.5
Office Supplies			16.5	-	11.0	-	27.5	27.5	-
Office Equipment			19.8	-	13.2	-	33.0	33.0	-
<u>TOTAL</u>			966.40	-	456.80	210.00	1,633.20	494.40	1,138.80

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## FERT Chart for AGRICULTURAL EXTENSION COMPONENT

### A. Design and Construction of Facilities

1. Design of CFJA additional classrooms and dormitories.
2. Construction of CFJA additional classrooms and dormitories.
3. Equipping and furnishing classrooms and dormitories.
4. Design and construction of initial 6 arrondissement compounds.

### B. Commodity Procurement

1. Order and deliver vehicles for use on national, department and arrondissement levels.
2. Procurement of training materials and supplies.
3. Procurement of office supplies and equipment for arrondissement compounds.

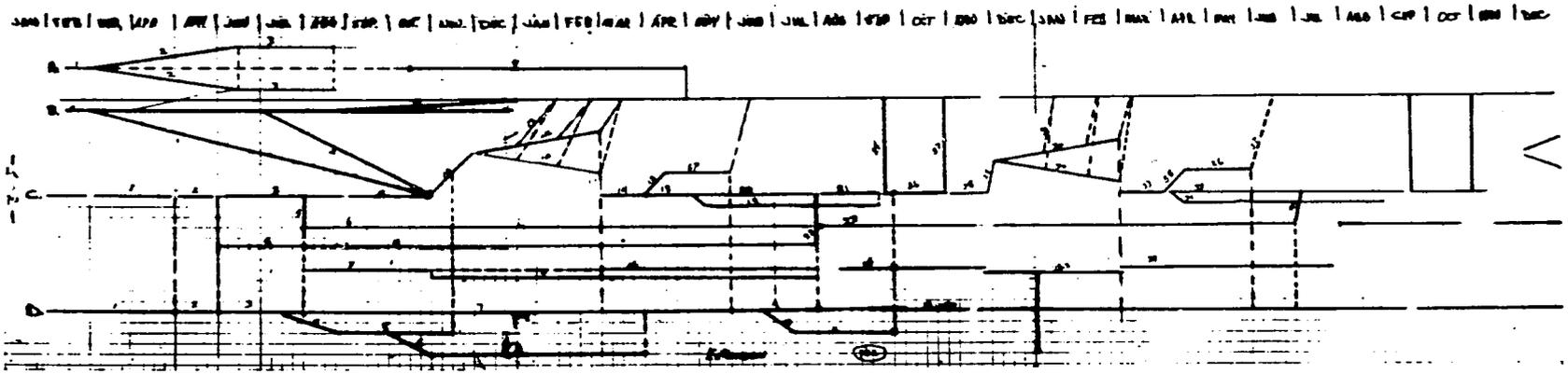
### C. Personnel Training and Placement

1. Organization of the training division.
2. Design of training requirements for first group of participant trainees.
3. Design and contracting of instructors to give in-service seminars and develop cadre of extension training team.
4. Search for suitable training programs for first group of participants in a francophone African country and mutual design of non-degree program (4).
5. Notification of persons to be trained in U.S. and scheduling of their preparatory activities and normal training activities.
6. Search and make arrangements for second tranche of participant trainees; will include selection of U.S. universities and design of non-degree program. Also selection of third country programs and assignment of trainees to these institutions.
7. English language training for participants to the U.S.
8. Training of extension instructors.
9. First tranche of participants leave for training (4 persons).
10. Design and publication of training material for extension seminars for local level agents.
11. English training for trainers not on assignment to extension seminars.
12. Conduct extension seminars at CFJAs.
13. Transfer of extension agents back to field with training/demonstration aids.
14. Evaluation by extension instructors.
15. Plan and design training programs for transferred UNCC agents.
16. Resume English language studies.
17. Training of transferred UNCC agents.
18. Design of high-level management seminars.
19. Publication of additional training aids.
20. Conduct high-level management seminars.
21. Planning for field evaluation survey and assignments.
22. Reassignment of returned participants to evaluation design team.
23. Departure of second tranche of participants.
24. Planning for arrondissement-level operations.
25. Begin English course.
26. Conduct field evaluation.
27. Return to National headquarters.
28. Design of extension agent seminars.
29. Assignment of teams to CFJAs.
30. Conduct seminars.
31. Reassign field personnel to field.
32. English training.

33. Evaluation.
34. Trainers resume English language training.
35. Design training program for UNCC personnel transferred to MER Extension Service.
36. Conduct training program for UNCC-transferred personnel.
37. Assignment of transferred personnel to field.
38. Continue top management seminars.
39. Design radio extension programs.
40. Assignment of returned participants to training staff.

D. Participant Training and Placement

1. Organizational evaluation.
2. Selection of candidates for first year participant training.
3. Selection of candidates for second year participant training.
4. Design staffing pattern from arrondissement level to village level.
5. Design Department staffing pattern.
6. Assignment of personnel to areas of emphasis via training seminars at CFJAs.
7. Selection of new extension personnel from Kolo seminar.
8. Assignment of personnel to Department-level offices.
9. Evaluate capacity of returning trainees and assign.
10. Design national level staffing pattern.
11. Assignment of personnel.
12. Normal activities of reviewing staffing patterns, determining needs, notifying training group of training needs and assigning persons to positions.



LOGICAL FRAMEWORK MATRIX

Summary	Objectively Verifiable Indicators	Important Assumptions
<p><b>A.1. Goal</b> Strengthen the predominantly agricultural society of Niger, ending its dependence upon donated external cereal supplies except in years of extraordinary drought and improve the economic condition and performance of the farm community to support a viable and ecologically secure way of life for the Sahelian population.</p>	<p><b>A.2. Measurement of Goal Achievement</b></p> <ol style="list-style-type: none"> <li>1. Increased cereal production over the 1961-73 annual production average by 20%.</li> <li>2. No imports of food grains.</li> <li>3. Replenishment of on-farm cereal storage.</li> <li>4. Increase in reserve stocks held by government agencies.</li> </ol>	<p><b>A.3. (as related to goal)</b></p> <ol style="list-style-type: none"> <li>1. Internal stability in Niger</li> <li>2. GON follows policies in other areas which support general social and economic development.</li> <li>3. Foreign assistance, other than emergency feeding, continues to be available at current levels or is replaced by oil or mineral export earnings.</li> </ol>
<p><b>B.1. Purpose</b></p> <p><u>Short Term</u> - Achieve a production and distribution capability providing sufficient cereals at reasonable prices to feed Niger's growing population even under adverse weather conditions, within five years.</p> <p><u>Long Term</u> - Provide sufficient food for a larger population with a smaller ratio of land to people in an ecologically sustainable production system, in order to free land and people for export production and non-agricultural activities.</p>	<p><b>B.2. End of Project Status</b></p> <ol style="list-style-type: none"> <li>1. Cereal production increased by 200,000 tons over 1961-73 year average.</li> <li>2. Carry-over storage to assure supply of 60,000 tons.</li> <li>3. Diversion of 100,000 ha. of land formerly planted millet to other crops while increasing total cereal production.</li> <li>4. Release of labor to work in other agricultural production.</li> <li>5. Decrease cost of producing one kilo of millet by 10%.</li> </ol>	<p><b>B.3. (as related to purpose)</b></p> <ol style="list-style-type: none"> <li>1. Rainfall returns to near-normal</li> <li>2. GON/OPVN follow price policy which encourages planting and flow to market of cereals.</li> <li>3. New, higher-yielding variety millet becomes available by 1978.</li> <li>4. Extension system proves as effective for cereals as it has been for cash crops.</li> <li>5. FED projects successful.</li> <li>6. AID funding available for years 4-5 of this project</li> </ol>
<p><b>C.1. Outputs</b></p> <ol style="list-style-type: none"> <li>1. Effective delivery system of ag. inputs</li> <li>2. Effective cereal storage system.</li> <li>3. Continuous flow of improved seeds.</li> <li>4. Continuous flow of suitable technical advances.</li> <li>5. Operative communication system between farmers and agricultural organizations.</li> <li>6. Functional and effective GON organizations capable of responding to farmers' needs.</li> <li>7. Training capacity to keep personnel upgraded on a continual basis.</li> </ol> <p><b>B. System to provide credit to farmers.</b></p>	<p><b>C.2. Output Indicators</b></p> <ol style="list-style-type: none"> <li>1a. Distribution of 1,000-5,000 tons of fertilizer annually.</li> <li>b. Provision of a source of millet seed to 20% of Nigerian farmers annually.</li> <li>2a. Increase in tonnage of cereals in storage.</li> <li>b. Establish an annual carry-over stock of 60,000 tons.</li> <li>3a. Distribution annually of 120 tons of improved seed.</li> <li>4a. Research component's output serves as viable input into extension program.</li> <li>b. An increase of 50% in the use of animal traction over the life of the project.</li> <li>5a. Observable use by farmers of improved practices and seed varieties.</li> <li>b. Extension demonstration plots are conducted annually in major villages in each department of concentration.</li> <li>6a. Intra-organizational communications network established.</li> <li>b. Project personnel can identify, communicate and solve production bottlenecks.</li> <li>7. All training sessions conducted periodically</li> <li>8. Increased use of agricultural inputs and credit over life of the project.</li> </ol>	<p><b>C.3. (as related to outputs)</b></p> <ol style="list-style-type: none"> <li>1. GON will give necessary priority to cereals program in allocation of personnel and executive attention.</li> <li>2. Farmers will be unusually receptive to innovation due to drought trauma.</li> <li>3. Combination seed multiplication and demonstration proves feasible, does not overload seed system management.</li> <li>4. Phosphate rock application proves feasible or import P205 becomes available and less costly.</li> </ol>
<p><b>D.1. Inputs</b></p> <p><u>National:</u> 1) Land and personnel for research center, foundation seed farm and multiplication centers. 2) Training of personnel for seed system. 3) Production and marketing credit. 4) OPVN grain stabilization operations. <u>AID:</u> 1) Support for GON project budget. 2) technicians. 3) Commodities. 4) Training. 5) Project Management. 6) Linkages to international research network. <u>Other Donors:</u> Two research scientists by FAC. Agricultural Volunteers by Peace Corps.</p>	<p><b>D.2. Budget/Schedule</b></p> <p>See Budget summary, p. 4 . Also see component budget breakdowns in Annexes A, B, D and E.</p>	<p><b>D.3. (as related to inputs)</b></p> <ol style="list-style-type: none"> <li>1. GON program management will be vigorous and timely.</li> <li>2. AID project management positions filled promptly</li> <li>3. Ex-PCVs respond to opportunity to return to Niger as contract professionals.</li> <li>4. FAC and IRAT will be able to find qualified people for research positions.</li> </ol>

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OTHER DONOR ASSISTANCE, PRESENT AND PROPOSED

The major development objectives of the Government of Niger are contained in the 10-year targets for the period 1965-1974 which are outlined in two development plans for 1965-1968 and 1971-1974. The latest plan was a collaborative effort of the GON and the UNDP. Among the stated objectives is the development of the rural sector with a priority on the increased production of food crops, plus improved cash crops and modernized stock-raising. It is to this objective that several members of the donor community have developed a number of projects now underway or proposed for Niger. These projects are listed below.

UNDP/FAO: Pilot Agricultural Development in the Dallol-Maouri Region (Dosso Department)

The specific objectives of this project included establishment of three pilot agricultural farms; demonstration of irrigated agriculture; promotion of an improved package of practices; a field trial center for applied research; introduction and expansion of animal traction; establishment of a training center-workshop for the manufacture and repair of simple farm implements and animal traction equipment; extension of improved livestock practices on the farm level; and training of extension workers to assure the continuity of the project. This was planned as a four-year project (1972-1976) at a total cost of \$1.1 million. According to the UNDP Resident Representative in Niamey, by mutual GON-UNDP agreement this project was terminated in 1974. The UNDP Res Rep gave several reasons for

the failure of the project to achieve any of the objectives by 1974:  
lack of farmer participation or interest (psychological factor);  
lack of farmer interest in irrigated, as opposed to dry-land, farming  
(physical labor factor); faulty focus on the production of asparagus  
and coconut palms; and the high cost of animal traction equipment  
relative to observed benefits.

UNDP: Industrial Processing of Millet

For the industrial processing of millet, UNDP assistance is being offered to the Société pour la Transformation du Mil (SOTRAMIL) and the Société Africaine de Développement des Industries Alimentaires à Base de Mil (SADIAMIL).

World Food Program: Promotion of Cereal Production  
(UN-WFP Project NIGER 2133/Q)

The GON requested WFP assistance for an emergency seed supply program for 1974 for farmers in drought-affected areas. The GON distributed 5,500 MT of millet seed free of charge to about 183,000 farmers for the May-July 1974 planting season. The farmers were given 30 kilos of seed per family, sufficient to plant an estimated 550,000 hectares of land. WFP assisted this program by providing 45 kilos of sorghum for family consumption. The total costs of the WFP project was \$1,985,500 for the sorghum, transportation to Niger, local supervision and a contribution for internal transportation and distribution.

FED: Development of the Badeguicheri Valley (Tahoua Department)

The objectives of this project are the establishment of village

cooperatives for the marketing of food and cash crops; agricultural extension of the improved package of practices; the construction and upgrading of 100 kms of farm-to-market roads; and an increase in general agricultural production. This four-year project was started in 1972; the technical advisor has been on the project site since July 1973.

FED: Rural Development in the Zinder Department (Project 3M)

The objectives of this four-year project are an intensification of the production of food crops (millet and sorghum) in light of an increasing population in the project area; an increase in the production of export crops (peanuts and cotton); the restoration and maintenance of soil fertility; and the promotion of mixed farming. Also included are road improvements, the construction of about fifty wells, and the construction of several agricultural extension training centers. The project is being implemented through the UNCC using the existing cooperative structure. The project is also called "3 M" because of the location of the project activity in the Mirriah, Magaria and Matameye arrondissements. The total estimated cost of the project is \$2.1 million.

FED: Rice Production

On December 3, 1973, the GON announced the FED agreement to finance a rice production project along the Niger river at a total cost of \$3.2 million. The objectives of the project are an increase in rice production, employment for approximately 925 farmers in the area, and fuller utilization of the rice husking plant at Tilliberi. (Niamey A-01 of January 11, 1974)

FED: Seed Multiplication

For the 1974 planting season, FED provided a CFA 10 million (\$40,816) grant for seed multiplication.

Libya: Agricultural Production

As the result of an official visit to Niger on March 7-9, 1974, a cooperation agreement between the Governments of Libya and Niger was announced for the establishment of three joint organizations to deal with agriculture and livestock production and the development of ranges, forestry and irrigation. No details of the organization and no commitments. Funds have been announced to date. (Niamey 709, March 12, 1974)

Germany: Rice Production

At the conclusion of a five day visit to Niger on October 2-6, 1973, the FRG Minister for Economic Cooperation announced an agreement in principle for a soft, untied loan of DM 14.85 million (approximately \$6.0 million) for the financing of two livestock projects and a rice production project to be located near Tilliberi on the Niger river. (Niamey A-81 of December 7, 1973)

Republic of China: Rice Production

The ongoing intensive irrigated rice production project on the Niger river outside Niamey will be expanded by an additional 3,500 hectares to a new total of 4,500 hectares. Of the present 1,000 hectares under cultivation, 400 ha. are under Nigerien management, 300 ha. are in the process of being jointly worked with the Chinese technicians

and the Nigerien farmers, and the remaining hectares are being levelled. Pilot plots have produced 12 tons of rice per hectare with two crops per year. There are 65 Chinese workers on the project, including irrigation, extension and maintenance teams. (Niamey 3262 of October 26, 1973 and Niamey 168 of January 17, 1974)

FAC: Niger National Cereals Production

Within the framework of this cereals production project, the GON has requested FAC assistance in providing the services of a Plant Physiologist/Entomologist and a Plant Pathologist. These scientists will work in cooperation and conjunction with the Adaptive Research component (Annex A, p. 46) and the U.S. technical assistance inputs. It is estimated that the cost of this contribution is \$570,000.

Peace Corps: Cereals Production

It is anticipated that the GON will request an increase in the number of Peace Corps Volunteers working in cereals production and agricultural extension in Niger.

MAJOR ISSUES

Technical Feasibility. Does the proposed program have the potential technical power to achieve its purpose? While the production increase which is potentially available in the project's three-to-five year term is limited, it is sufficient to permit achievement of the production increase required to end Niger's dependence upon external cereals if rainfall returns to even sub-normal levels. Should the drought continue at anything like its 1972-73 intensity, there is no viable agricultural production system in Niger with the technology currently available or anticipated in the near future. The proposed investments are necessary to make it possible for Niger to take advantage of technology improvements which can be anticipated for the longer term, such as high-yielding millet and sorghum varieties and high-protein sorghum.

Economic Feasibility/Cost Effectiveness. The proposed expenditures cannot be examined in isolation, as they would not by themselves be sufficient to accomplish the program's purpose. The FED investment in the Zinder Department is essential to the proposed AID assistance. The two programs together offer the prospect of a significant upgrading of the technology practiced by the bulk of Niger's farmers in cereal production and the consequent ability of the country to provide its own essential food supply except in possible future periods of such severe drought as has been experienced in 1972 and 1973. This will not be a one-time improvement, for these programs will establish agricultural service and support systems (research, seed supply, extension, input delivery systems, credit, fertilizer availability) which are required for and which will permit the continuous further improvement in agricultural production. While most of the proposed expenditure will cover local costs, the facilities and services to be financed are very inexpensive, so that the return on this investment can be relatively high. In terms of overall cost effectiveness, the investment offers a favorable comparison with the cost of continuing to provide cereals from outside of the country for a portion of the population of Niger. Unless early progress is made to improve the cereal production system, the expanding population of Niger will require external supplies even in normal rainfall periods.

Equity. Is it necessary and why is it proper to concentrate the program's expenditures in the relatively favored southern areas of the country, where farmers can be expected to get back on their feet fairly quickly when rainfall improves to even lower-than-normal levels? How will this program benefit the nomads and pastoralists who have lost their means of production?

The overriding necessity for Niger is to produce the cereals required to feed its people. The only way that can be accomplished is by improving methods in the southern part of the country where normal rainfall makes a sustained production system potentially achievable, and where the delivery and contact system to reach the farmers is already in existence or can readily be established. There is no possible way to increase production by working with the scattered population of the more northerly areas, where adequate rainfall always will be problematic and where the cost of establishing the infrastructure and supporting services would be prohibitive in comparison with possible benefit. The pastoralists will have to be helped to re-establish their way of life with other means and through other programs. When rainfall is near normal levels, they will again have the capability of trading products and services of their herds for the cereals they will need. The international research center system hopefully will make available over the longer term a drought-resistant, short season millet which would permit them to grow a subsistence crop in years of normal rainfall.

Price Policy for Cereals. Will the GON have the ability and the will to stabilize the price of cereals at levels providing an adequate incentive for their production in amounts required for current consumption and carryover stockage? This will be a different area of program management. Determination of the precisely appropriate price level and of the optimum method for its administration are complex matters on which even American specialists do not yet agree. The new military government of Niger has not yet been able to express any position on this key question. Its current policy in setting prices for the sale of imported grain seems to be dominated by a concern for consumers, but this may be an understandable reaction to the near-complete destitution of the non-salaried population. AID, through the Grain Stabilization Project, has been involved in this problem for three years and currently is planning further assistance to improve the basis for effective price determination. The GON should be required to endorse an appropriate price policy in the project agreement for this proposed assistance, and a continued dialogue with the government should be pursued by the Area Development Officer (ADO) during project implementation.

Sector Relations and Dialogue. Does the proposed assistance provide the opportunity for a continued interaction with the GON on broader questions of agricultural and economic policy? Given the central importance of cereals in the consumption pattern and the economy of Niger, particularly as the drought emergency has focused attention on cereals availability, it seems evident that the ADO will have adequate opportunity during implementation of this program to pursue a dialogue on price policy and other key considerations for overall economic direction of the country.

Follow-on Costs. Will there be follow-on costs after this program is completed which the GON might not be able to meet? Does the initial AID funding imply continued financing that might be difficult for the Agency? This proposal is for three-year funding of a GON cereal production improvement program which would have continuing costs, although at lower levels than during the initial period, if it were to be carried on and if the initial investment were not to be wasted. It is unlikely that Niger will be able to finance the full post-1977 costs. The country has some prospect of achieving self-financed modernization if the current search for oil is successful. That development could not occur fast enough, however, to be significant with respect to this program. Thus, it must be recognized that there will be strong pressure for AID to continue financing the cereals production effort for at least an additional two years. The GON might be able to assume all salary costs for this period. By 1979, the success of the program itself could have generated the additional income which would permit the GON to carry it on without further external support for the basic operating costs.

Personnel Costs. Should AID finance the cost of salaries of personnel added to the rolls of the Ministry of Rural Economy and of the UNCC under this program? There seems to be no alternative to AID financing of these costs. Other donors, such as the FED, support the full cost of additional personnel in their projects. The GON was only able as recently as 1970 to get by for the first time without general budget support from France, and it has been necessary this year to reinstitute French financial assistance for routine government operating costs not included in development activities. The extension and cooperative structure is staffed at the operating level only where an external donor or a commercial export crop has provided the resources. It has not proved possible to identify non-salary, program-related costs previously carried by the GON which could be shifted to the AID account to release government funds to cover new personnel costs. The essential agricultural services cannot be established without external financing of salaries, and it is accordingly concluded that AID should cover these costs unless it is absolutely impossible.

Fertilizer. The design team's technical personnel felt strongly that it would be necessary to provide fertilizer (diammonium phosphate, DAP) if the program's goal of a significant increase in cereal production were to be achieved in three years. However, there not only is a real question as to the availability of either DAP or nitrogenous fertilizer for Niger, but the GON has taken the position that it does not wish to use even grant assistance funds to procure fertilizer. The responsible authorities of the Ministry of Rural Economy feel that the very high current fertilizer prices will not be reduced in the foreseeable future to levels which would make it economical to apply fertilizer in cereal production in Niger. The apparently attractive alternative of direct application of local rock phosphate was identified and is incorporated in the program, subject to examination of certain technical and economic questions. It is concluded a) that there is a valid possibility of achieving the required five-year increase in cereal production without imported fertilizer; b) that the use of powdered local rock phosphate should be pursued if it proves feasible; and c) that the program should be supported even without the availability of imported fertilizer.

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Proj: 6830201  
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ACTION MEMORANDUM FOR THE ADMINISTRATOR

MAY 14 11 17 AM '75

THRU : ES

FROM : AA/PPC, Philip Birnbaum  
*A. Shalim* EXECUTIVE SECRETARIAT

SUBJECT : Niger - Cereals Production Project

683-11-130-201

Problem: Because this proposed grant exceeds \$2.0 million your authorization of the attached Project Paper is requested.

Discussion: Located within the Sahel-Sudano zone of West Africa, Niger has suffered seriously from the effects of the recent drought. Crop production and livestock are the most important sectors of the economy for employment, exports, domestic products and income. Despite major constraints, Niger was a net exporter of cereals, peanuts and cotton prior to the drought. Niger was also a major supplier of beef to Nigeria and other coastal countries. During the worst period of the drought, Niger was the recipient of emergency foodstuffs from the donor community in an international effort to prevent mass starvation. As Niger enters, hopefully, the post-drought period, the U.S. and other members of the donor community are anxious to assist Niger in rebuilding and expanding the agricultural sector with special emphasis on increased production of basic staple cereals. Progress will be slow, however, because transportation systems are lacking, farmers are traditional and isolated, rainfall is customarily precarious, and Nigerien planning and management skills are practically non-existent.

In April 1974 the Government of Niger (GON) requested A.I.D. assistance in launching a national cereals production program. The program has a very high policy priority for the GON, which has been forced by its dependence upon imported grain during the last two crop years to recognize the importance of increased cereal production and the damaging effect of the relative inattention given to cereals production in previous agricultural programming. The GON has now made increased cereal production a basic target of agricultural policy and resource allocation. The Government goal to attain self-sufficiency in cereals production entails meeting current consumption requirements, re-establishing on-farm, carry-over stocks and filling the emergency supply/market stabilization storage capacity of the GON credit organization and the national cereals marketing board. In response to this

request for assistance, and within the framework of the A.I.D. medium-term assistance program for the Sahel states, A.I.D. has designed a major project to promote increased cereals production in Niger. The purpose of the project is to achieve increased production and availability of cereals at prices within the reach of non-producing consumers through a sustainable agricultural production system. During the course of project implementation, A.I.D. will maintain an agricultural sector dialogue with the Government of Niger. Since April 1974 the GON has demonstrated its complete willingness to discuss agricultural policy with A.I.D.

The proposed grant will provide the core financing for the following interrelated components:

(a) An intensified adaptive research effort to develop improved varieties of millet for the specific conditions of Niger;

(b) A foundation seed farm which will multiply breeder seed released by the research station;

(c) A system of five seed multiplication centers producing improved seed directly and also selecting, training, and providing inputs for demonstration farmers, each of whose one-hectare plots will concurrently serve as a demonstration unit for the new varieties and for the recommended package of cultural practices;

(d) Expansion of the agricultural cooperative structure of Niger (the UNCC) to extend its coverage into areas where it is not now active; and

(e) Expansion and improvement of training centers for the instruction of personnel for extension staffing, for various functions in the cooperative system and for demonstration farmers.

The project is now planned to cover a four-year funding period at a cost to A.I.D. of approximately \$9.6 million. Slightly less than six million dollars is required for the first two years of project activity and will be obligated against the Africa drought appropriation. According to current estimates, approximately \$3,660,000 in regular program funds will be required for the third and fourth years of the project. Prior to the obligation of these additional funds, an in-depth evaluation and, if required, revision and review of the Project Paper will be made. Annual evaluations will be also carried out in conjunction with the preparation of annual work plans. This amount is complemented by French assistance program (FAC) funds of approximately \$570,000 and GON resources of \$1,065,000 equivalent in local currency. It should be noted that the GON will meet the requirement for a 25 per cent contribution to project costs in the third and fourth year of project activity. This level of contribution is not required for funds obligated against the Africa drought appropriation.

A.I.D. will finance the services of seven U.S. contract employees as technical advisors in plant breeding, agronomy, agricultural engineering, seeds, seed production, cooperatives and extension training. A.I.D. will also recruit 11 junior-level technicians (such as former Peace Corps Volunteers) for U.S.-Nigerien staff support. A direct-hire Project Manager and Assistant Project Manager will work closely with the GON in the administration of the project. Upon request from the GON, Peace Corps has also agreed to recruit additional volunteers for the project.

This cereals production program clearly meets the new criteria of the Foreign Assistance Act by directing assistance toward the poorest and least fortunate of the developing societies, while concurrently augmenting the production of food in this critically deficit area. In addition there will be a substantial spread effect in the distribution of the project benefits.

In addition to assisting the Government of Niger in coping with the effects of the drought, the following criteria were used in appraising this project proposal:

(a) An adequate institutional framework

The major portion of activities to be undertaken in this project are under the direction of the GON Ministry of Rural Economy. Activities of the cooperative and credit component are not within the management responsibilities of this ministry, but sufficient organizational linkages exist to insure the necessary alignment of objectives and implementation coordination. (See PP pages 14-17)

(b) Technical Soundness

A month-long study was completed by a ten-man A.I.D. design team in April-May 1974. Additional design work was completed by consultants in December 1974. The technical components of the project are of minimal sophistication and appear to be realistic for the social/environmental setting. (See PP pages 18-20)

(c) Financial Viability

The financial framework of the project has been set in such a way that A.I.D. assistance should help the GON establish a sustainable agricultural production system by the time of completion of the project activity. The primary operational costs will be progressively shifted to the credit and cooperative organization to be financed

from returns from marketing increased cereals production. The GON will also agree to make every effort to assume the salary costs during the fourth and fifth years of project activity of Nigerien personnel hired for the project.

(d) Economic Feasibility

The economic impact of the project depends upon the ability of the project components to influence the cultivation practices of Nigerien farmers. The economic soundness of the project has been studied and found to be acceptable for projects of this type. (See PP pages 21-31)

(e) Commodity Procurement

It is my view that compliance with normal A.I.D. procurement policies, i.e., restriction of procurement to U.S. sources, would, in the circumstances of this project, constitute a serious restriction against providing timely and beneficial assistance to the people of Niger. Section 639A(b) of the Foreign Assistance Act of 1961, as amended (which specifically authorized the funds with which this project will be carried out), expressly provides that assistance to the drought-stricken nations of Africa may be provided "notwithstanding any...restriction contained in this or any other Act."

The situation in Niger parallels that in the other Sahel states: with commodity imports entirely from France and the other EEC countries, U.S. equipment and commodities cannot be serviced or repaired in the event of breakdown. Spare parts are not available, and Africans are not trained in the maintenance of U.S. equipment. Audits and inspections of A.I.D. projects in this area which have included the provision of large amounts of U.S. equipment have been sharply critical of the difficulties of host governments in maintaining this equipment after project phase-out. An additional factor to be considered if procurement were to be restricted to the U.S. is the lead-time of up to one year for the delivery of commodity orders.

On the basis of the above circumstances, commodity procurement from Geographic Code 935 (Free World) is requested for this project. Nevertheless an attempt will be made prior to project implementation to maximize to the extent feasible U.S. source and origin procurement.

In addition to U.S. dollar costs, the attached Project Paper also authorizes the financing of local currency costs estimated at \$3,839,155. These costs include the procurement of the services of local contractors for certain construction elements of the project, procurement of locally produced commodities and other local cost items. A recapitulation of U.S. inputs is found on page 4 of the Project Paper.

This project has been reviewed and cleared by all of the concerned A.I.D. offices and has the approval of the AFR Executive Committee for Project Review (ECPR). Section 113 of the Foreign Assistance and Related Programs Appropriations Act of 1975 does not require Congressional notification prior to Agency authorization of the use of FAA Section 639A(b) funds.

Recommendation It is recommended that you approve the attached Project Paper for Niger Cereals Production.

Attachment - a/s

APPROVED: JEM

DISAPPROVED: \_\_\_\_\_

DATE: 5/14/75

Clearances: AA/AFR: SAdams Aek  
 GC:CGladson BTB/lu  
 AFR/CWR: FGilbert [Signature]  
 AFR/CWR: DShear [Signature]  
 AFR/DP: RHuesmann [Signature]  
 AFR/DS: PLYman [Signature]  
 PPC/DPRE: AHandly [Signature]  
 GC/AFR: EDragon [Signature]  
 AA/AFR: DBrown [Signature]  
 AFR/CWR: LPeek [Signature]  
 SER/COM: RZorn [Signature]