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NIGER APPLIED AGRICULTURAL RESEARCH PROJECT

(683-0256)

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ACTION MEMORANDUM FOR THE MISSION DIRECTOR

Date: May 28, 1987

Thru: D/DIR; R. Carey Coulter

From: PDO, Sidney Chambers *SC*

Subject: Niger Applied Agricultural Research Project (683-0256)

I. Problem: Your approval is requested for a grant of \$20,000,000 from the Sahel Development Program appropriation to the Government of Niger for the Niger Applied Agricultural Research Project (683-0256). It is planned that \$5,974,000 will be obligated in the third quarter of FY 1987.

II. Discussion:

A. Project Background

The Niger Applied Agricultural Research (NAAR) Project merges the Niger Cereals Research (NCR) Project (683-0225) with the Applied Irrigation Research and Coordination (AIRC) Project (683-0250). The NCR Project was authorized on March 18, 1982 in the amount of \$10,600,000 over a period of five years. The grant agreement was signed on July 20, 1982 with a PACD of March 27, 1987. Due to delays in fielding the technical assistance team, the PACD was extended to March 21, 1989 and the life-of-project funding was increased by 10% for a total of \$11,660,000.

The AIRC PID was reviewed and approved by AID/W on April 29, 1986. The mission was represented at the AID/W review by the Agricultural Development Officer (ADO). The ADO apprised the AID/W review committee that although the PID states that the mission intends to amend the AIRC Project in five years to combine it with phase II of the Niger Cereals Research (NCR) Project, the GON and USAID now wish to combine the two projects as soon as possible in order to field a new technical assistance team for the combined project before the current NCR technical assistance contract expires.

The ECPR recommended: 1) that activities planned under the AIRC PID be merged with the planned phase II of the NCR Project, with the assumption that the NCR phase II will be basically similar to phase I; and 2) that USAID/Niger update the June 1985 NCR Evaluation and submit it to AID/W for review. AID/W planned to delegate the mission the authority to approve both the PID-like document and the Project Paper (PP) for the combined project assuming satisfactory review of the evaluation.

The NCR Project Evaluation was updated by USAID in July 1986 and reviewed by AID/W in September 1986. On the basis of that review, AID/W delegated to the

Mission Director, USAID/Niger the authority to approve the PID-like document and the PP for the NAAR Project subject to the conditions listed in State 297323 dated September 22, 1986, as well as recommendations listed in the AIRC PID approval cable, State 147513, dated May 9, 1986. Whereas the AIRC PID proposed several possible interventions in applied irrigation research, the final design for the combined project includes research programs in irrigated crop agronomy and water management/engineering and on-farm trials in this area. Thus, some of the recommendations and issues raised are no longer applicable. The PID level recommendations and issues were addressed in the NAAR PID-like document approval package approved by you February 10, 1987. The remaining applicable recommendations and issues have been addressed in the PP as described in Annex B to the PP.

B. Project Description

The NAAR Project is designed as a five year effort to assist the Government of Niger to institutionalize a system of applied agronomic research characterized by strong functional linkages to extension. It is anticipated that there will be a phase II project. Building on the progress made under the NCR Project to date, phase I of the NAAR Project will place greater emphasis on strengthening the National Agronomic Research Institute's (INRAN) overall management capability. Institutional cross linkages with technical services cooperatives and other agricultural research organizations will be reinforced. The project will continue to support research programs initiated under NCR and to further develop research support services. Whereas NCR limited its research efforts to rainfed crops, this project will also develop INRAN's capacity to conduct applied research on priority problems in irrigated agriculture. The project will fund approximately 29 person-years of long-term technical assistance, 36 person-months of short-term technical assistance, approximately 94.5 person years of degree, non-degree and short-term training in the U.S., Niger and third countries, commodities, minor construction and other costs.

C. AID Country Strategy and Beneficiaries

The project conforms to the FY 1988 Niger Country Development Strategy Statement. It is the central component for implementation of the mission's long-term agricultural research strategy.

The direct beneficiaries of this project will be INRAN, the National Office for the Management of Irrigated Agriculture (ONAHA) and technical service officials of the Ministry of Agriculture who will receive long and short-term training in various aspects of irrigation research and the various areas necessary to carry out multidisciplinary agronomic research. Other direct beneficiaries of the project will be farmers and cooperative officers participating in on-farm trials and local technology transfer. Indirect beneficiaries of the project will be other farmers across Niger who will benefit from research results and improved technologies developed by the project. These indirect beneficiaries will be reached through the extension services of ONAHA and the Ministry of Agriculture.

D. Financial Summary

The total cost of the project is \$24,053,265. The A.I.D. contribution is \$19,998,697 and the GON contribution is \$4,054,568. The AID dollar breakdowns for the first increment and life of project are as follows:

	<u>First FY</u>	<u>LOP</u>
Technical Assistance	2,505	6,880
Project Administration	880	2,444
Commodities	333	712
Participants	537	2,359
Construction	308	308
Other Costs	556	2,303
Contingencies	855	4,992
Total	<u>5,974</u>	<u>19,998</u>

E. Evaluation for Project Financial Management Requirements

To monitor and evaluate the decentralization process, the project will finance an annual external audit which will cover local expenditures made by the implementing institution through its technical assistance team, local expenditures made by USAID and expenditures made by INRAN.

F. Socio-economic, Technical and Environmental Description

The USAID Project Committee has reviewed the project paper and determined that the project is socially, economically and technically feasible and clear of any issues pertaining to Human Rights. Engineering, financial and other plans, as well as a reasonably firm estimate of project costs have been completed. The Regional Legal Advisor has reviewed the authorization approval package.

The PP implementation plan has been carefully reviewed by the project committee which believes that the plan is realistic and establishes a reasonable time frame for carrying out the project.

The Initial Environmental Examination (IEE) was approved by USAID on February 19, 1987. The IEE recommends a categorical exclusion for some project activities and a negative determination for others. The Africa Bureau Environmental Officer concurred in the IEE recommendations on April 16, 1987.

G. Gray Amendment Considerations

USAID will compete the Procurement Service Agent contract among economically and socially disadvantaged enterprises and individuals. In addition, the RFP will encourage firms/institutions to subcontract with Gray Amendment entities.

H. Conditions and Covenants

In addition to the required conditions precedent, to facilitate project implementation, USAID is including conditions precedent concerning the value-added tax, petty cash accountants and the establishment of counterpart positions for long-term expatriate technical assistance positions. USAID is also including covenants concerning the stabilization of INRAN's annual budget, furnishing sufficient financial and human resources, reducing the number of university students being programmed for assignment to INRAN and evaluation.

I. Section 121 (d) of the FAA

On April 24, 1987, the AA/AFR signed a determination that section 121 (d) of the FAA, as amended has been satisfied.

J. Waivers

The waiver for vehicles (including motorcycles) is being addressed by an amendment to the Niger blanket source and origin waiver for vehicles. The request was made to AID/W April 1, 1987. In addition, a source and origin waiver will be prepared separate from this approval package for irrigation equipment (pumps and assessories) in the amount of approximately \$100,000.

K. Congressional Notification

The congressional notification expired on April 22, 1987, without objection.

L. Responsible Officers:

The USAID/Niger officer responsible for backstopping the project is Mr. Flynn Fuller. The officer responsible in AID/W is Mrs. Nancy McKay, AFR/PD/SWAP.

III. Recommendation: That you sign the Project Data Sheet and the Project Authorization thereby approving the proposed grant of \$20,000,000.

Attachments

1. Project Authorization
2. 121 (d) Determination
3. Project Paper

Drafted by: SChambers, 5/28/87 , WG1163h/SI

Project Committee

ADO:EGibson	Draft	Date 5/28/87
ADO:FFuller	Draft	Date 5/28/87
PROG:AFessenden	<i>[initials]</i>	Date 5/28/87
GDO:DMaxwell	<i>gwm</i>	Date
MO:DLockhart	Draft	Date 5/28/87
CONT:MSmith	<i>MS</i>	Date 5/28/87
D/ECON:FMartin	<i>DM</i>	Date 5/28/87
REDSO/RCO:MReynolds	Draft	Date 5/6/87

PROJECT DATA SHEET

1. TRANSACTION CODE

A = AID
 C = Challenge
 D = Direct

Amendment Number

DOCUMENT CODE

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COUNTRY/ENTITY Niger

3. PROJECT NUMBER 683-0256

4. BUREAU/OFFICE AFR 06

5. PROJECT TITLE Niger Applied Agriculture Research

6. PROJECT ASSISTANCE COMPLETION DATE (FACD) MM DD YY 05 28 92

7. ESTIMATED DATE OF OBLIGATION (Under 3. below, enter 1, 2, 3, or 4)
A. Initial FY 87 B. Quarter 3 C. Final FY 91

8. COSTS (\$1000 OR EQUIVALENT \$1 =)

A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	1. FX	2. LIC	3. Total	1. FX	2. LIC	3. Total
AID Appropriated Total	4,216	1,758	5,974	13,542	6,458	20,000
(Grant)	(4,216)	(1,758)	(5,974)	(13,542)	(6,458)	(20,000)
(Loan)						
Other: 1.						
U.S. 2.						
Host Country	--	395	395		4,055	4,055
Other Donor(s)						
TOTALS	4,216	2,153	6,369	13,542	10,513	24,055

9. SCHEDULE OF AID FUNDING (\$1000)

A. APPROPRIATION PURPOSE	B. PRIMARY CODE	C. PRIMARY TECH CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) SHX	211B	070				5,974		20,000	
(2)									
(3)									
(4)									
TOTALS						5,974		20,000	

10. SECONDARY TECHNICAL CODES (maximum 3 codes of 3 positions each)
020 050 870

11. SECONDARY PURPOSE CODE
121

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)
A. Code R/Ag TECH BS DEL
B. Amount

13. PROJECT PURPOSE (maximum 180 characters)

To institutionalize a system of applied agronomic research characterized by strong functional linkages to extension.

14. SCHEDULED EVALUATIONS

Interim MM YY 12 88 Final MM YY 10 90

15. SOURCE/ORIGIN OF GOODS AND SERVICES
 000 141 Local Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of 8 page PP Amendment)

17. APPROVED BY

Signature: Peter Benedict
Title: Mission Director, USAID/Niger
Date Signed: 05 30 87

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

Concurrence: Controller M. Smith *MDS* Date: 5/28/87

ACTION MEMORANDUM FOR THE ASSISTANT ADMINISTRATOR FOR AFRICA

FROM: AFR/PD, Carol Peasley

SUBJ: Niger Applied Agricultural Research Project (683-0256)

RE: Delegation of Authority No. 144

Problem: Section 121 (d) of the Foreign Assistance Act of 1961, as amended, (the "FAA") precludes any new obligation of Sahel Development Project funds for disbursement by a foreign government until the Administrator has determined "that the foreign government will maintain a system of accounts with respect to those funds which will provide adequate identification of and control over the receipt and expenditure of those funds". On January 6, 1982 the Administrator delegated the authority to make this determination to you in Delegation of Authority No. 144.

Discussion: At the beginning of FY 1982, the Africa Bureau initiated a process of "certification review" and "certification" by Mission Directors and office heads. In accordance with this procedure, USAID/Niamey has certified (February 26, 1987, Attachment A) that the accounting system at INRAN, the GON institution that will handle the AID-funded local currency accounts of this project, is adequate to meet the criteria outlined in 121(d). The Mission considered the following factors in its review of the accounting system in use by INRAN:

1. INRAN maintains separate accounts for the different funds and will be able to account for AID funds separately from other accounts;
2. INRAN has a capable financial management staff including a director of finance, a treasurer, four accountants and an inventory clerk. The Contractor will also have on board a financial management specialist to control contract expenditures and act as an assistant to INRAN.
3. USAID reviews 100 percent of invoices submitted for reimbursement, and disallowances are made to the account of INRAN when deemed appropriate.

Best Available Document

4. The Director of INRAN is authorized by the Government of Niger to commit funds and make disbursements. In the absence of the Director of INRAN the Deputy Director will be authorized by the Government of Niger to commit funds and make disbursements. This makes the initial approval procedure of INRAN much more flexible. The final step in the process of payment to creditors requires the approval of the Ministry of Planning, which accounts for all national investment expenditures no matter what the source of financing. Time required in this final step is one work day. The AID vouchers are handled rapidly and kept on a current basis which enhances accounting control.

5. USAID/Niger will assist in setting up a sub-system for disbursement by authorized line items of the project agreement and will review INRAN's internal controls related to cash payments, gasoline purchases and control of inventories. USAID/Niger will require INRAN to use the same degree of care for AID funds as they use with their own Government of Niger funds. Their current procedures and controls are adequate to meet AID/W requirements as well as other requirements of the Government of Niger and USAID/Niger.

6. Payments to remote locations are limited in the new project, but will be controlled by INRAN's current system and all other controls are maintained at INRAN's central headquarters.

Recommendation: That based on the Mission's review and findings and the Mission Director's certification, the AA/AFR make a determination that the Government of Niger has a system of accounts with respect to these funds which meets the requirements of Section 121(d) of the FAA, as amended.

Approved: State 124329-----

Disapproved: -----

Date: 4/24/37-----

CLEAR: AFR/PD/SWAP: JHradsky -----
GC/TR: -----
DAA/AFR: -----
AFR/TR: -----
AFR/SWA -----

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PROJECT AUTHORIZATION

COUNTRY: REPUBLIC OF NIGER

PROJECT_NAME: Applied Agricultural Research

PROJECT_NUMBER: (683-0256)

1. Pursuant to Section 121 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Applied Agricultural Research Project for the Republic of Niger ("Cooperating Country"), involving planned obligations of not to exceed Twenty Million U.S. Dollars (\$20,000,000) in grant funds over a five-year period, subject to the availability of funds and in accordance with the A.I.D. OYB/allotment process, to help in financing the foreign exchange and local currency costs for the project. The planned life of project is five years from the date of initial obligation.

2. The project will assist the Government of Niger in the institutionalization of a system of applied agronomic research. The project combines A.I.D.'s efforts in the Niger Cereals Research Project (NCR) (683-0225) with those planned for the proposed Applied Irrigation Research Project (683-0250). Building on the progress made under the NCR Project, this project places emphasis on strengthening the overall management capability of the National Agronomic Research Institute. Institutional cross linkages with technical services cooperatives and other agricultural research organization also will be reinforced. The project will continue to support rainfed crops research programs initiated under NCR and will also assist the Government of Niger in developing its capacity to conduct applied research on priority problems in irrigated agriculture.

3. The Project Agreement which may be negotiated and executed by the officers to whom such authority is delegated in accordance with A.I.D. regulations and delegations of authority, shall be subject to the following essential terms and covenants and major conditions together with such other terms and conditions as A.I.D. may deem appropriate:

A. Source and Origin of Commodities, Nationality of Services.

- 1) Commodities financed by A.I.D. under the project shall have their source and, except for motor vehicles, their origin in the cooperating country or in countries included in A.I.D. geographic code 941.
- 2) Except for ocean shipping, the suppliers of commodities or services financed by A.I.D. under the project shall have the cooperating country or countries included in A.I.D. geographic code 941 as their place of nationality.

- 3) Ocean shipping financed by A.I.D. under the project shall be financed only on flag vessels of the cooperating country or the United States.

B. Conditions Precedent.

1. Prior to the first disbursement of U.S. Dollars under the Grant, or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made, the Grantee will, except as A.I.D. may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(a) A statement of the names of the persons holding or acting in the office of the Grantee specified in Section 8.2., Section 4.1.1. (b) and of any additional representatives, together with a specimen signature of each person specified in such statement;

(b) Evidence that a Nigerian Project Director and Assistant Project Director have been assigned and delegated all necessary authorities required to implement the Project, including the delegation of full implementation authority to the Assistant Project Director in the absence of the Project Director; and

(c) Evidence that the Grantee has established an accounting system for the control of Project funds which meets with standards as described in Section 121 (d) of the Foreign Assistance Act.

2. Prior to the disbursement, or the issuance of any commitment documents pursuant to which disbursement of any local currency will be made available under the "Other Costs" line item of the Project budget contained in Annex I of the Project Agreement, the Grantee shall furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(a) Evidence that the Ministry of Finance has agreed that the value-added tax (VAT) will not be applicable to any project expenditures, or evidence that any such tax or surcharge incurred on any project expenditure will be paid or reimbursed to the project by the Grantee from a fund specially established for that purpose as provided in Standard Provision B.4 of Annex 2 to the Project Agreement

(b) Evidence of nomination by the Ministry of Finance of petty cash accountants for each department and research station of INRAN; and

(c) Evidence that host country counterpart positions have been formally designated for each expatriate technical assistance position funded under the project.

3. Disbursement for Construction Costs

3.1. Prior to any disbursement, or to the issuance of any commitment documents pursuant to which disbursement will be made, for the construction of buildings or other construction services, the Grantee shall, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(a) Evidence that sites for construction, satisfactory to A.I.D., have been made available to the Project; and

(b) Plans and specifications, bid request documents, cost estimates and a construction contract(s) with firm(s) acceptable to A.I.D. Prior to advertisement for construction bids, the Grantee shall submit to A.I.D. for its review and approval the "plans de masse" of all construction sites, and other plans and specifications clearly showing all elements of construction to be undertaken or construction services to be performed.

C. Special Covenants

1. INRAN'S Annual Budget

The Grantee covenants to maintain INRAN's annual recurrent budget for FY 1988 at the same levels as FY 1987 and in subsequent years to maintain at least the current ratio of support costs to personnel costs.

2. Provision of Financial and Human Resources

The Grantee covenants to furnish sufficient financial and human resources necessary for the effective and permanent functioning of INRAN during the life of the project. Assignments of personnel will be for a period of no less than three years.

3. Assignment of Participant Trainees

The Grantee covenants to make available qualified candidates for long-term academic and technical training in the U.S. and third countries, and agrees to ensure that these persons subsequently are assigned to appropriate positions within their parent institutions (or other suitable positions as mutually agreed upon with the Ministry of Agriculture) for a period equal to at least twice the period of training.

4. Project Evaluation

The Parties agree to establish an evaluation program as part of the project. Except as the Parties otherwise agree in writing, the program will include mid-project and end-of-project evaluations (years 2 1/2 and 5 of the Project) as well as process evaluations (years 1 and 3 1/2 of the Project).

As these evaluations will recommend future levels of A.I.D. support to INRAN, the expected level of Government of Niger support to INRAN will have to be ascertained. The Grantee covenants to make this information available in a timely manner during the evaluations.

Programming_of_University_students

The Grantee covenants that the programming of university students for assignment to INRAN will be reduced to no more than four per year for each year of the project.

Date: MAY 30, 1987



Peter Benedict
Mission Director, USAID/Niger

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ACRONYMS AND ABBREVIATIONS

APS	-Agricultural Production Support Project
CDSS	-Country Development Strategy Statement
CNRA	-Center for National Agronomic Research - Tarna Station
CILSS	-Permanent Interstate Committee for Drought Control in the Sahel
COP	-Chief-Of-Party
CRSP	-Collaborative Research Support Program
CRV	-Research Extension Liaison Unit
DECOR	-INRAN's Rural Economics Division
DEF	-INRAN's Training Division
DEP	-INRAN's Program and Studies Division
DEPP/MP	-Division of Evaluation and Program Planning/ Ministry of Plan
DEP/SA/MOA	-Division of Evaluation and Planning/Agriculture Science/Ministry of Agriculture
DOC	-INRAN's Documentation Center
DRA	-INRAN's Division of Agronomic Research
DRE	-INRAN's Divisions of Ecological Research
DSI	-INRAN's Statistical Division
EMOFT (OFT)	-Extension Managed on Farm Trials (on-farm-trials)
FAO	-Food and Agriculture Organization of the United Nations
FWM & T	-Farm Water Management and Technology

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GTZ	-German Agency for Technical Cooperation
GON	-Government of Niger
IARC's	-International Agricultural Research Centers
ICRISAT	-International Crops Research Institute for the Semi-Arid Tropics
IDA	-International Development Association
IITA	-International Institute of Tropical Agriculture,
INRAN	-National Agronomic Research Institute
INTSORMIL	-International Sorghum/Millet Research Program
ISNAR	-International Service for National Agricultural Research
MOU	-Memo of Understanding
MP	-Ministry of Plan
VAAR (P)	-Niger Applied Agricultural Research (Project)
NCP (PCN)	-Niger Cereals Project - (National Cereals Project)
NCR	-Niger Cereals Research Project
NCU	-Nigerien Cooperative union
ONAMA	-Irrigated Perimeter Management Parastatal
PACD	-Project Assistance Completion Date
PID	-Project Identification Document
PID & M UNIT	-Perimeter Irrigation Diagnosis & Management Unit
PP	-Project Paper
REDSO/WCA	-Regional Economic Development Support Office/ West & Central Africa

SAF -INRAN's Administrative & Financial Section
TA -Technical Assistance
TVA -Value Added Tax
UNC -Nigerien Cooperative Union
URC -Regional Cooperative Union
USDA -United States Department of Agriculture
WA -Work Agreement
WMS II -Water Management Synthesis II Project

I. Recommendations and Summary

A. Recommendations

1. Size of Grant: \$20,000,000
2. Waivers: Transportation requirements for researchers (expatriate and national) will be satisfied by non-U.S. vehicles (including Code 935 motorbikes for use by trial executors/extension agents) procured under USAID/Niger's blanket waiver for the purchase of non-US vehicles. All other waivers for 935 commodities can be approved by the Director, USAID/Niger pursuant to the authorities delegated by OOA 551.

B. Summary Findings

1. Achieving the project's goal of increased agricultural production and diversified sources of rural income require a system of applied agronomic research characterized by strong functional linkages to extension. Such a system can only occur by developing productivity increasing technologies which can be made available to the Nigerian farmer in a form that is acceptable and easily adaptable to their particular circumstances. The research and research derived research technology necessary to achieve the GON's and AID's sector goals of long-term food self-sufficiency are, at present, inadequate to pace with Niger's population growth, and thereby improve standards of living for rural people.
2. The current GON projects in the agricultural sector being supported by AID and other donors with emphasis on production inputs extension delivery systems and credit, face considerable risk of being less productive than they otherwise might be unless improved and expanded research results are forthcoming.
3. The Institute National de Recherches Agronomiques du Niger (INRAN) is the appropriate official organization to provide the critically important research input into the program described herein.
4. In order for INRAN to fulfill this role, not only is an increased amount of research necessary, but considerable institution-building from within will be required.
5. INRAN can benefit substantially by outside technical assistance both to increase the quality and quantity of agronomic research and to augment the institution-building effort.

Accordingly, a project has been designed, described below, which will require a grant of 20 million U.S. dollars for an initial five-year period

beginning in the third quarter of FY 1987. The GON contribution to the project will amount to U.S. Dollars equivalent of 4,054,568 or approximately 17% of the total project cost (24,053,265). This contribution represents primarily in-kind contributions for GON-paid Nigerian personnel, the operation and maintenance of office and research facilities, irrigation rehabilitation and participant trainee support.

The PID for this project was submitted February 9, 1987. State 147613/01 authorized the Mission to approve the PID-like document and PP. By signing the PID face sheet, the Director USAID/Niger thereby approved the PID-like document. An initial Environmental Examination (IEE) prepared by the Regional Environmental Officer, REDSO/WCA 23 May 1986 was modified by USAID/Niger 15 December 1986, resulted in a negative determination for some components and a categorical exclusion for others. The IEE was signed by the Director, USAID/Niger of February 9, 1987. The Africa Bureau Environmental Officer signed the IEE on April 16, 1987. All the issues raised in AID/Washington, during its review of Niger Applied Irrigation Research and Coordination (AIRC) PID (683-0250) and Niger Cereals Research Project Evaluation (683-0225) have been satisfactorily resolved during the final project design.

The project has been determined to be economically, financially and technically feasible. The GON agencies responsible for project execution, with the support of project - provided technical assistance, have been found to be adequate to provide the necessary administrative capacity for project administration. The Director, USAID/Niger has certified that full consideration has been given to potential involvement of economically and socially advantaged enterprises and individuals as well as registered and unregistered PVO's whose board of directors or similar governing body is more than 50% Black, Hispanic or Native Americans, women, or other members who are economically and socially disadvantaged.

The project is in conformance with and supports both the GON's Development Plan and Mission's Country Development Strategy Statement. The Social Soundness and Economic Analysis indicate that the beneficiaries of this project will ultimately be the rural population of Niger who are among the poorest people of the world. Thus this project also conforms to the Congressional Mandate.

The project meets all other applicable statutory criteria. The statutory checklist can be found in Annex C.

C. Summary Project Description

The Niger Applied Agricultural Research Project (NAAR) is designed as phase two of the Niger Cereals Research Project (683-0225), authorized in 1982 and scheduled to be completed in 1988. The purpose of the Niger Cereals Research Project (NCR) is to develop the Nigerian National Agronomic Research Institute's (INRAN) capacity to undertake cereals research programs whose results can be effectively disseminated to farmers through existing extension and cooperative systems. NCR activities focus on three broad areas: (1) growth and development of INRAN's capacity to manage its research programs,

resources and linkages to other institutions; (2) growth and development of INRAN's ability to support its research efforts through support service functions, i.e., soil and plant analysis, food grain quality analysis, data handling and statistical analysis, library and documentation services; and (3) growth and development of specific activities oriented toward the development of a comprehensive, integrated and systematic approach to research. With NCR support, INRAN has begun to develop the strong foundation upon which an effective national research institute must be built.

This project, Niger Applied Agricultural Research (NAAR), merged the Niger Cereals Research (NCR) Project (633-0225) with the Applied Irrigation Research and Coordination (AIRC) Project (633-0250). The AIRC PID was reviewed and approved by AID/W on April 29, 1986. In approving the AIRC PID, the ECPR recommended that the activities planned under the AIRC PID be merged with the planned phase II of the NCR Project, with the assumption that the NCR phase II will be basically similar to phase I. AID/W also delegated authority to Director, USAID/Niger to approve both the PID-like document and the Project Paper (PP) for the combined project.

The purpose of the Niger Applied Agricultural Research Project is to institutionalize a system of applied agriculture research with strong functional linkages to extension. NAAR will continue NCR efforts, building directly on progress made during the past five years. Under NAAR, greater emphasis will be placed on strengthening the Institute's overall management capability. Institutional cross linkages with technical services, cooperatives and other agricultural research organizations will be reinforced. The creation of strong linkages with extension services will be a major objective. The project will continue to support research programs initiated under NCR and to further develop research support services. Whereas NCR limited its research efforts to rainfed crops, this project will also develop INRAN's capacity to conduct applied research on priority problems in irrigated agriculture.

During the first five years, project activities will focus on the following three areas:

(1) Development of INRAN's capacity to design, administer, manage and carry out applied agricultural research programs through the development of improved planning and management practices, carefully programmed human resource development and further strengthening of research support services. Objectives under this rubric include the establishment of research priorities, refinement of staffing and training plans, budgeting by program, decentralization of financial management, improvement of infrastructure and equipment management, increased reliability of laboratory analyses and the development of a sound capability for data management. Included throughout this section is an underlying objective of addressing the question of recurrent costs, which if left unattended, will render Niger's agriculture research program permanently dependant on external assistance.

(2) Development of specific multidisciplinary research programs designed to address priority constraints on production of Niger's principal rainfed and irrigated food crops. Technical themes will fall within these four interrelated areas:

- a. Crop Improvement. Multidisciplinary team research will build upon ongoing research efforts to explore classical plant, soils, water, climate relationships for the principal rainfed and irrigated crops grown in Niger. Breeders, entomologists, agronomists, agro-economists, and cereals quality experts will work to clarify constraints to expanding productivity in each crop and develop knowledge and plant materials designed to overcome these constraints. These efforts will be coordinated by the Division of Agronomic Research (DRA) and will be concentrated at the two research stations of Tarna and Kolo, but will aggressively pursue a program of on-farm testing.
- b. Production Systems. Multidisciplinary team research will develop crop and site specific systems of cultural practices and appropriate technological innovations for dryland and irrigated crop production in at least three distinctive agro-ecologic zones. Work will focus on the development of recommendations for crop rotation, intercropping, fertilizer use, time of planting, seeding techniques, plant density and spacing, weeding, pest control, and will include agro-economic analyses of cost and efficiency. Work will originate at Tarna and Kolo stations, but will also be conducted at INRAN sub-stations and support points. Eventually components and packages will enter the on-farm research program (point c below).
- c. On-Farm Research. A modified on-farm research program which builds on the considerable work of the Rural Economics Department (DECOR) will become an increasingly important part of project activities. Cooperation with Ministry of Agriculture Extension Service and the irrigated perimeter management parastatal, ONAMA will be strengthened. While diagnostic surveys will remain important, greater focus will be placed on on-farm testing of specific interventions and technologies to determine their acceptability and impact upon the farm, and the need for modification of these interventions through further research. This research will be carried out in different agro-ecological zones, represented by the Filingue, Kollo, Madaroumfa (Maradi), Tillaberi and Maggia regions.
- d. Water Management. DECOR and the Irrigation Section of the Division of Ecological Research (DRE) of INRAN will work closely with ONAMA's Applied Research Unit and the Rural Engineering Service to initiate a multi-disciplinary attack on the priority problem areas of irrigation water quantity and quality control, water application methods and water application efficiency. Systems and farm level efficiencies in each of these areas will be a central focus of research. In addition, cost-benefit and cost-effectiveness analyses of small and

medium-scale irrigation, and studies of marketing potentials of irrigated crops will be carried out. Geographical areas of concentration will be the Niger River, Maggia Valley, and small systems of Central Niger.

(3) Development of functional linkages between INRAN, Extension and other Agricultural Services by promoting increased participation of the extension services in the planning and execution of research and in the development, delivery and evaluation of technical recommendations. The project will develop the capacity of INRAN's Research-Extension Liaison Unit to provide extension services with timely, acceptable and useful information. This unit will develop critical institutional linkages to market INRAN's research results, conduct training programs for farmers, extension agents, field trial monitors and perimeter managers, and develop new site-specific written extension modules for dryland and irrigated farming techniques.

For this five year period, project funds will support 29 person years of long-term technical assistance in the following disciplines: a research management specialist, a crop breeding coordinator, a dryland cereals agronomist, an irrigation agronomist, a soils agronomist specialized in irrigation, an irrigation engineer, a research-extension specialist, an economic anthropologist and an agricultural economist. Thirty-six person months of short-term technical assistance will be provided in technical disciplines, computer science/data management, agricultural machinery repair and maintenance, planning and updating INRAN's long-term training program, marketing studies and for interim and final evaluations.

The project will provide funds for short-term training to upgrade the skills of each of INRAN's field and laboratory assistants and technicians. Advanced professional training will be provided for up to 17 INRAN personnel, 2 ONAHA personnel and 2 personnel from the Rural Engineering Service. Funding will also be provided for specialized non-degree training of personnel from INRAN, ONAHA, Rural Engineering and the extension services.

The project is conceived as a ten year effort with the beginning of project activities timed to coincide with the end of the technical assistance contract for NCR. Funding has been programmed for the first five years. A project evaluation in year four will serve as a roll forward review; at that time, if project objectives are being satisfactorily met, funding will be requested for the next five year phase.

D. Alternative strategies

The project design team considered a number of alternative strategies in preparing the project paper. None of the strategies offered equivalent advantages to the approach finally selected. The rejected options are summarized below.

1) Classical station approach to agronomic research

The pure station approach to agronomic research, with all trials carried out on station, is less costly and more easily controlled than an on-farm or mixed station/farm strategy. However, a purely on-station research program has strong disadvantages in the Nigerian situation, where extension of research results to farmers is already weak. Total separation of research and dissemination of results hampers market acceptance of new breeds and techniques, and may reduce applicability of findings.

2) Classical on-farm research approach

Purely on-farm or on-perimeter research is also not appropriate in Niger. On-station research under controlled conditions is a necessary part of the research process, because scientific and statistical precision are difficult to ensure in strictly on-farm research. Applying resources currently applied to on-station research to an expanded intensive off-station program would strain INRAN's manpower and technical capacities. Neglect of INRAN's station and sub-station infrastructure would also be a short-sighted economy.

3) Increase funding to existing international research centers

Reliance on international research centers for country-specific applied agronomic research is not realistic, as the IARCs are regional in focus, and would have difficulty adding a Niger-specific research component (with Nigerian staff) to their programs. Radically changing AID's approach to agronomic research in Niger after a ten year investment of resources in INRAN is certainly inadvisable. Closer coordination between Nigerian research institutions and their international counterparts (in particular ICRISAT) is to be fostered under NAAR.

4) Institutional development of INRAN without research assistance

Previous reviews and evaluations of INRAN have noted a variety of management problems and institutional and manpower weaknesses. The project could have been defined as simply institutional development, without involvement in the agronomic research activities of INRAN. This approach would have resulted in a smaller, less complex project featuring management advisors to INRAN and academic and on-the-job participant training. However, such a project would be of considerably less interest to the Government of Niger and to USAID, as it would do little to advance agronomic research in Niger. AID has a long-term commitment to development of improved plant stock and agronomic techniques in Niger as a major part of the overall goal of increasing agricultural production and income.

5) Selected strategy

The strategy finally chosen for NAAR combines elements of the above-mentioned alternatives. On-station research will continue to be supported, with emphasis placed on adoption of a multidisciplinary approach.

On-farm and on-perimeter research will be increased over time, and special efforts made to improve ties with extension agents and farmers. A major emphasis of NAAR will be improvement of INRAN management capacity and manpower base, to prepare for gradual reduction in external technical involvement over the ten year program period.

E. Project Issues

Full achievement of project objectives will require that some actions outside of the project domain take place. These are:

(1) Development of a national agricultural research policy: IDA Structural Adjustment Credit terms call for the GON to define by priority its overall research orientation according to needs identified jointly by researchers and users of research results. In late 1986, the GON created a group of interministerial working committees to begin deliberations. While failure of the GON to formulate such a policy will not prevent INRAN or the project from developing clearly defined research program objectives and ensuring that activities within programs contribute to the achievement of these objectives, INRAN's commitment to these processes would be reinforced, even mandated by the existence of an official Nigerian agricultural research policy.

(2) Delegation of disbursement authority to INRAN department and station chiefs in order to begin decentralization of financial management: Improved financial management requires a degree of decentralization of authority to disburse funds. Progress is dependent upon the enactment of a change in INRAN's statute which would provide explicit authority to the Director General to delegate financial authority to department and station chiefs. The twelve month review of the project should determine the extent of progress made toward this reform. If insufficient progress has been made to facilitate realization of project goals, then a re-evaluation of the feasibility of the project should be made. If a positive change in status has been achieved but reform remains insufficient to assure effective project implementation, an effort should be made to bring in a local or third country management consulting firm to aid INRAN in meeting project objectives. Concrete reform of financial management is essential to the achievement of project objectives. It should be a focus of the mid-term evaluation and should be made a condition to funding a second phase of the project.

(3) Development of appropriate civil service statute governing career advancement of researchers: One of the objectives of the NAAR project is to assist INRAN in developing evaluation criteria for researcher performance and to provide opportunities for rewarding superior performance. The efficacy of an evaluation system is tied to promotion of researchers within the civil service system.

(4) Recurrent cost levels: INRAN needs to seek regular increases in its budget so that its financial resources are not entirely absorbed by salaries. The recurrent cost analysis shows that this risk is real, posed by staffing increases which are already programmed. This problem must be addressed during the life of the project. The mid-term evaluation should attempt to establish that progress has been made towards assuring a better balance between GON expenditures on salaries and its expenditures on research operations. Progress in this area should be a CP to funding of a second phase of NAARP.

II. Project Rationale

A. Background of the Sector

Niger's Agriculture/Rural Development Sector, comprised of crops, livestock, forestry and fishing, provided from 42.5 to 47.1 percent of GDP at current market prices between 1980 and 1985. Crop production, which is closely correlated to the quantity and spacing of rainfall, has ranged from 22.5 to 29.4 percent, peaking in 1985. This sector provides employment for approximately 90 percent of the labor force.

The Government of Niger (GON) has long accorded top priority to increasing agricultural production toward a level approaching food self-sufficiency. Yet the productivity of the agriculture sector is low. While the traditional food production systems are well adapted to the physical characteristics and resource limitations in Niger, they are inadequate in the face of rapidly expanding population. Increases which have occurred have been through crop production expanding into the fragile livestock zone just north of the main rainfed agricultural areas. Per capita production is declining and productivity is decreasing. Since the great drought ended in the early seventies, favorable weather and the GON's policy to expand the area under production yielded steady increases in food crop production (except for the 1984-85 crop year which was afflicted by a serious drought.) At present, Niger's food grain production and normal commercial imports are in balance with total domestic consumption in good years. Unfortunately, the rate of population increase (3.1 percent) is expanding faster than the long-term average annual increase of 1.5 percent in food crop production. Without major advances in agricultural productivity in the next decade or two, the gap between domestic production and consumption needs will widen considerably.

GON strategy has long focused on increasing dryland agricultural production, with the difference between food needs and production levels to be made up through rice and other irrigated production. However, the 1984 drought dramatically underscored the need to increase the area and productivity of irrigated lands and to pay greater attention to the potentially important role of small-scale irrigation in national food production. Irrigated food crop production has become increasingly important as a means of modifying risks from drought, providing additional sources of income for farmers, and increasing potential foreign exchange earnings.

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The GON development strategy for 1985-1990 recognizes that increased agricultural productivity requires investment in agriculture research. There is a new emphasis on the development of techniques that improve the productivity and efficiency of farm level systems. While continuing to support the major cereals/legumes crops (millet, sorghum, rice, cowpea and groundnut), research will be diversified to take into account improvement of horticultural and other high value crops, and, moreover, to integrate information on the physical environment and the evolution of farming systems into the research program. Areas of research include improving the productivity of both rainfed and irrigated crops, improving livestock production systems, forestry, and vegetable, fruit and forage crop development. Finally, the GON is committed to accelerating the training of research specialists in order to obtain within a decade the critical mass necessary for effective development of the agriculture sector.

The GON has agreed to the IDA structural adjustment credit terms, which require that Niger take certain agricultural research policy actions, in addition to other reforms in the agriculture and other sectors of the economy. The research reform program calls for the GON to:

- 1) Define and rank by priority overall research orientation according to needs identified jointly by researchers and users of research results;
- 2) Define and rank by priority the research programs within the major research areas;
- 3) Determine accurately the cost of each research program and;
- 4) Determine recurrent cost level.

3. Conceptual Setting

A strong national agricultural research system is essential for the development of technological solutions to the constraints faced by Niger's agricultural producers. Creation of a sustained national capacity to conduct agricultural research requires adequate human, material and financial resources and the ability to mobilize, allocate and manage them effectively and efficiently.

Fundamental steps in this institutional development process are (1) the establishment of well defined research priorities followed by (2) the development of programs or strategies for addressing the priority problems. It is then necessary to have the human, physical and financial resources to execute research programs. Sufficient numbers of well trained personnel are central to the ability of the institution to perform its function. Research requires policy makers and planners, administrators, managers, and researchers trained in a variety of disciplines. The institution should provide opportunities for professional development and incentives for superior performance. Peer review and evaluation of research programs encourage professionalism and high quality work.

A research institution requires physical infrastructure that reflects research needs, the ability to financially support it and the level of available human resources to staff it. Services such as laboratory analysis, statistical analysis, equipment management etc. provide essential support to the research effort.

To achieve the goal of improving agricultural production, research must provide recommendations which are acceptable to the farmer in the context of the total production environment. Sociological and economic factors must be considered along with physical and climatic factors. Only a multidisciplinary approach to research provides the broad scope needed to address problems at the farming systems level.

Strong linkages with extension services are essential. The product generated by research is information, which has a number of users, the most important being extension services and ultimately farmers. (Other users might be other research institutions, agribusiness industries, government services, etc.) The information is packaged in a way that renders it useful and understandable to both extension agent and farmer, a process necessitating the joint participation of research and extension institutions. Effective two-way communication between research and extension also helps identify important research topics and provides a feedback mechanism through which research recommendations can be evaluated.

Efficient use of resources also means taking advantage of knowledge and services available from other agricultural research institutions. National agricultural research institutions rarely have the resources or institutional capacity to conduct all kinds of research. A large network of universities, international research centers and other institutions conduct basic and applied research that can be adapted by national institutions to fit local needs.

C. The Nigerian Agronomic Research Institute (INRAN)

1. Description

In 1975, the Government of Niger created the National Agronomic Research Institute (INRAN) as the single successor of several branches in Niger of French colonial research institutes: IRAT, the Institute of Tropical Agronomic Research; IEMVT, the Institute of Animal Husbandry and Veterinary Medicine; CTFT, the Center for Tropical Forestry, etc. INRAN's overall mandate is to provide technical and scientific solutions to rural development problems through the conduct of research in ecology, agriculture, forestry, animal husbandry and rural economics. INRAN is also charged with coordinating applied agronomic research activities in Niger.

An examination of INRAN's organizational chart shows that the Institute is composed of a General Directorate, three administrative/planning divisions -- Administration and Finance, Studies and Programming, and Teaching and Training; a Research-Extension Unit, the Documentation Center, and six

research departments -- Agriculture, Ecology, Rural Economics, Statistics, Forestry, and Veterinary and Animal Sciences.

Currently, INRAN's national staff consists of approximately 25 researchers, 75 technicians and 425 support staff. (Another 40 students are now in long-term training programs; most will return to INRAN in 1988-89.) Most researchers have the "Ingenieur Agronome" degree; several have M.S. degrees; four hold doctorates (three are veterinary doctors). The agriculture and related divisions have received by far most of the resources allocated to the Institute. Fully one half of INRAN's research staff (researchers plus technicians) is assigned to the Agronomic Research Division (DRA).

2. Agricultural Research, Niger Cereals Research Project

During the past decade, INRAN's agricultural research program has received substantial USAID support. The Niger Cereals Project (1976 - 1980) funded construction of research facilities, long-term training of researchers and adaptive crop improvement research. The core of INRAN's current agricultural research program is the Niger Cereals Research Project (NCR). Authorized in 1982, NCR was planned as a ten year follow-on effort to develop within INRAN a sustained capacity to undertake cereals research programs whose results would be disseminated to farmers through the extension and cooperative systems.

Project efforts have focused on three major areas: (1) development of INRAN's capacity to manage its research program, resources and linkages to other institutions; (2) development of INRAN's ability to support its research efforts through support service functions, i.e., soil and plant analysis, data handling and statistical analysis, etc.; and (3) development of a comprehensive, integrated and systematic approach to research.

During the first five years of NCR, INRAN has (1) conducted research in three priority areas: production systems, crop improvement and farming systems; (2) established linkages with international agricultural research organizations; (3) improved support services to research in the areas of data management and statistical analysis, cereal quality analysis, soil analysis and in-service training; (4) provided long and short term training; (5) procured laboratory equipment, field equipment and vehicles; (6) upgraded laboratory facilities; and (7) achieved modest improvements in INRAN's capacity to administer and manage its research programs and resources.

Researchers have begun to accept the multidisciplinary approach to research, the value of on-farm trials, the importance of farmer participation in research and the significance of economic analyses. Administrators and policy makers recognize the critical need for prioritization of research activities, financial management reforms, decentralization of program management, strong linkages to extension and better overall management of resources.

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3. Constraints

While considerable progress has been made in a short time, the Institute's capacity to fully carry out its mission is constrained by a number of factors: (1) INRAN needs more and better trained personnel at all levels. Training in agronomy and irrigated crop research is especially important; (2) the absence of satisfactory statutes covering researchers has created a situation providing few incentives for superior performance. Similarly, there does not exist a system for evaluating researchers' performance, the quality of execution of programs or the appropriateness of technical themes; (3) resource management and planning are sub-optimal due to a combination of factors, among which are the absence of clearly defined research priorities, shortages of trained personnel, inadequate supervision and inefficient systems; (4) interdisciplinary research efforts are few; (5) the Institute has a very limited capacity to conduct research on irrigated crops; (6) support to research in the areas of laboratory analyses, library services, input supply, etc. has improved but further strengthening of these areas is needed; (7) linkages to extension and other agricultural services are weak.

III. Project Description

A. Purpose and Goal

The purpose of the Niger Applied Agricultural Research Project is to assist the Government of Niger to institutionalize a system of applied agronomic research characterized by strong functional linkages to extension. Achievement of the project purpose will, by developing productivity increasing technologies, contribute to the attainment of the goal of increasing agricultural production and diversifying sources of rural income in Niger.

B. Relationship to CQSS and AID Policy Guidelines

USAID/Niger's agricultural development strategy continues to be based on increasing food production leading towards food self-reliance and increased rural incomes. It emphasizes food production and diversification through community based development, with a programmatic focus on local management, private (and cooperative) sector participation and research on and utilization of improved technical packages. Due to a limited resource base often plagued with drought, and a population growth rate of 3.1%, irrigation development (especially small and micro scale undertakings) has become particularly important in providing alternative food sources for the populace and income for the farmers. One of USAID's four agriculture strategy objectives is the development of a national capacity for sustained efforts in agricultural research followed by technology transfer. The major constraints to reaching this objective are limited knowledge of appropriate technologies, institutional weaknesses and the the lack of effective research-extension linkages.

The Niger Applied Agricultural Research Project will continue efforts begun under NCR, building directly on progress made during the last five years. Consistent with the Agency's "Plan for Supporting Agricultural Research and Faculties of Agriculture in Africa", greater emphasis will be placed on developing INRAN's ability to manage effectively its research programs and resources. Long-term participant training will focus on increasing the numbers of M.S and Ph.D. level scientists. Short term and in-country training will aim to strengthen skills of research support staff. The project will continue to support multidisciplinary team research on Niger's principal food crops and to strengthen relationships with other agricultural research organizations. At the end of this first five year phase of the NAAR, INRAN will have begun the process of institutionalizing sound management practices and will have acquired the human and material resources needed to build a strong national applied research institute.

C. Project Components

The project is comprised of three major components: (1) organizational development, (2) strengthening of research programs and (3) development of strong research-extension linkages. Objectives have been identified whose achievement will indicate sound planning and management practices, better control of resources and development of solid core research programs.

1. Component No. 1: Organizational Development

a. Output: Strengthening of INRAN's institutional capacity to design, administer, manage and carry out agricultural research programs.

b. Indicators of Achievement: (this phase unless otherwise indicated)

i. Planning and Management

- a. Existence and use of refined long-range research, staffing and training plans.
- b. Annual budgeting done by program.
- c. Decentralization of program and financial management begun (this phase); completed (middle of phase II).
- d. Existence of evaluation criteria for researchers and research programs; peer review process operating.
- e. INRAN's recurrent budget remains constant relative to 1937 levels during 1988, & increases in proportion to personnel costs for the rest of NAARP.

ii. Human Resource Development

- a. 17 INRAN researchers are trained at the end of the project in the following areas:
irrigation, cereals and legumes agronomy, crop improvement, soil physics, soil chemistry, irrigation engineering, data analysis and research management.

- b. All B and C level INRAN personnel complete short-term and/or in-country training.
- c. 4 ONAMA and Rural Engineering personnel upgrade professional training in irrigation engineering, management and technology.
- d. Extension agents and trial managers receive in-country technical training to explain trial execution/technical recommendations.

iii. Strengthening of Support Services to Research

- a. Effective systems operating for management of vehicles, farm equipment, field and laboratory equipment, agricultural inputs and supplies. Systems will cover maintenance, distribution, inventory and procurement.
- b. INRAN technicians can process and interpret statistical data.
- c. Increased reliability of laboratory analyses; shorter turn-around time.

c. Background:

One of the objectives of the NCR project was to strengthen INRAN's capacity to administer and manage its research programs and resources. While most project efforts were devoted to the research component and technical support services, some progress has been made in this area. One important development has been the creation of administrative and technical working committees. These groups have made decisions on commodity purchases, short term technical assistance, training, construction and on the irrigated crop research component of this project. However, meetings are held infrequently, usually on an ad-hoc basis. The NAAR project will encourage the committees to meet regularly and take active roles in INRAN's management. A second important area of progress concerns training. NCR has funded more than twenty long-term degree programs for INRAN researchers. Other donors support an additional twenty participants. These scientists will return to INRAN over the next two to three years.

With support from NCR, INRAN has developed many of its technical support services. Microcomputer systems have been installed in the Rural Economics Divisions at Niamey and Tarna and at the Soils Laboratory. INRAN technicians have gained a foundation in descriptive statistics, analysis of variance and budgeting. The cereals quality laboratory plays an important role in INRAN's sorghum breeding program. The soils laboratory is re-orienting its activities to better support the Institute's agronomic research program. A new library/documentation center is being constructed. Research technicians have received training in these areas and in plant breeding, farming systems research and data collection techniques.

Most important, administrators recognize the critical need for financial management reforms, decentralization of program management and overall better management of resources. INRAN has begun to execute actions outlined in the IDA Structural Adjustment Program. During September and October 1986, ISNAR conducted an evaluation of Niger's overall research capacity in preparation

for the development of a comprehensive resource management plan for INRAN. The evaluation report will be presented to the GON in March 1987. ISNAR will begin working on the management plan following distribution of the report. In late 1986, the GON began the process of elaborating a national agricultural research policy which will define the priority research problem areas to which resources will be channeled.

INRAN has identified other areas requiring attention. At the March 1986 annual meeting of agriculture personnel, the Director General cited these important actions that must be taken to improve INRAN's effectiveness: a scientific review committee should be established to evaluate researcher performance, quality of execution of programs and appropriateness of research themes; performance evaluations using established criteria should serve as the basis for promotion; appropriate statutes governing researchers' career advancement must be developed.

NAAR will enter its implementation phase during a critical period in INRAN's institutional development. During the first years of the project, the GON will be in the process of developing major policy actions regarding agricultural research. INRAN will be evaluating the breadth and orientation of its research programs, along with the distribution and utilization of its resources. In addition, INRAN will be developing a personnel policy and designing a performance evaluation system. Moreover, INRAN will acquire some 40 additional scientists during the life of project, more than doubling its research capacity, and placing a real strain on its recurrent budget.

d. Course of Action:

To give implementors the flexibility they will need to adapt to/take advantage of changes in the project environment, internal evaluations will be conducted at the end of year one and between years three and four. One objective of the evaluations will be to assess the impact of internal and external developments on project implementation. Recommendations will focus on ways of improving implementation by adapting to the changing environment.

i. Planning and management: A major responsibility of the NAAR technical assistance team will be to actively assist INRAN in implementing GON policy actions and ISNAR management recommendations. At the request of the Director General, during the first three years of the project the team leader will be a research management specialist who will act as consultant to the U.G. ~~The team leader will aid the Director General in developing a long term~~ institutional development plan that takes into consideration projected GON funds likely to be available for financing the recurrent costs of research. This plan should cover up to the year 2000 and should include program priorities, objectives, personnel and budgetary requirements for each of the components of the plan. Staffing and training plans must consider INRAN's future need for administrators and managers as well as full-time researchers.

The research management specialist will also assist the Director General in clarifying INRAN's management structure and operations through elaboration of an explicit organizational plan to accompany the institutional development plan. This plan should include a detailed organizational chart of each division, section and station and a timetable for filling the positions. The plan should spell out the lines of authority and functional relationship between each part of the organization. It should include formal job descriptions for each position from A through D level, against which the work of individuals can be evaluated. The job descriptions should carefully distinguish between administrative and scientific responsibilities.

The research management specialist will guide preparation of annual activity or work plans by INRAN researchers. Under the direction of the D.G. of INRAN, and in conjunction with the heads of research stations and departments, division chiefs and their U.S. counterparts, the research management specialist will prepare an annual evaluation of the previous year's research program and research operations. This will enable INRAN to modify intermediate objectives and responsibilities as a function of the results obtained. These reports will also provide documentation for interim and final project evaluations.

Within INRAN, the integrated work group approach to activities will be encouraged. Under the supervision of the Director General and with assistance of the team leader, these groups will conduct studies of specific problems of concern to INRAN, develop detailed plans for using project inputs and recommend courses of action to achieve interim and long-term INRAN and project goals. Working committees already established under the NCR Project will be encouraged to continue their activities. The technical assistance team will seek to orient these groups toward carrying out concrete tasks and to minimize additional associated administrative tasks.

Where appropriate, the project will assist INRAN to develop internal evaluation criteria for researchers and research activities. While the statutory issue regarding researchers' status within the civil service system falls outside of the project domain, progress made by the GON/INRAN toward resolving this issue will receive as far as possible project support.

ii. Budget Process: To provide better research management, more adequately funded research programs, and to give individual researchers more certainty with respect to available resources, the research management specialist will assist INRAN to design and install a program-based system of budgeting. This process will allow INRAN to determine the costs of individual research programs, as well as overall recurrent cost levels to present to GON in support of yearly budget requests. Three months of a management consultant are provided to help introduce this system.

iii. Financial Management: Directors of INRAN research departments do not have expenditure authority, nor do they have their own petty cash funds. All expenditures must be approved by the Director General. The centralized procurement procedures are cumbersome; an inordinate amount of researchers' time is spent trying to speed urgent requests through the system. Similarly, the Director General must take time away from more important strategic

planning and programming responsibilities to review and approve all small procurements. The project will assist INRAN to introduce financial management decentralized to the level of department heads for modest expenditures and petty cash purchases. It appears that any decentralization of financial management must be preceded by a change in the INRAN delegation of authority to disburse public funds and that managers of petty cash funds must be appointed or approved by the Ministry of Finance. Where appropriate, the project will assist INRAN in obtaining the modifications and approvals prerequisite to decentralization actions. Then the research management specialist will work with INRAN to set up and monitor the new systems.

The project will significantly reinforce the Administration and Finance Section (SAF). In addition to a short-term management consultant, the project will increase the number of accounts clerks. The research management specialist and management consultant will work with the SAF to establish a system for providing the D.G. with quarterly reports on the state of expenditures by research program and the amounts of outstanding advances, both balances and petty cash funds. They will assist the D.G. to establish guidelines for expenditures allowed to be approved by the heads of INRAN's research departments, stations and sub-stations. They will assist the SAF in installing procedures for ex post facto review of such expenditures. They will review expenditures of the various research programs and assist the D.G. in setting guidelines for ensuring that active programs receive adequate funding for doing quality research.

To monitor and evaluate the decentralization process, the project will finance an annual external audit which will cover local expenditures made by the implementing institution through its technical assistance team, local expenditures made by USAID and expenditures made by INRAN. The audit will be conducted within the first quarter following completion of each year of the project. Results will be communicated to the Director General of INRAN, the technical Assistance Team Leader and the USAID Director. At the end of each year the research management specialist will prepare a report for the D.G. of INRAN and the USAID Director, reviewing the progress and effectiveness of financial management procedures. The report will indicate what corrective actions are required and by whom. The USAID Controller and Director of SAF will each prepare a written response to the report, noting what actions, if any, are being taken to resolve the problems identified by the research management specialist.

iv. Management of physical resources: Major physical facilities are located at Tarna and Kolo. Generally, buildings are adequate. NAAR will fund construction of storage facilities at three sub-stations, open air hangars for storage of field equipment at Tarna and Kolo and rehabilitation of strategic irrigation sites (Tillabery, Kolo, Maradi and Birni N'Konni). Field and laboratory equipment at stations are adequate but in an extremely poor state of maintenance and repair. They will be inventoried, diagnosed and repaired or replaced. The research management specialist will be responsible for supervising a materials management system, and for ensuring that it is updated regularly. He will work with the farm equipment specialist and department heads to refine a system for determining equipment requirements for the

execution of the research program. During the first five years of the NAAR, major efforts will be devoted to the design and institution of effective systems for management of vehicles, farm equipment, field and laboratory equipment, agricultural inputs and supplies and physical facilities. These management systems will cover maintenance, distribution, inventory and procurement and will provide the basis for determining procurement needs over the life of the project.

v. Technical Support Services: NAAR will continue to reinforce INRAN's technical support services mainly through the provision of short and long-term technical assistance and training. Priority attention will be directed toward (1) developing sound data management and statistical analysis capability and (2) increasing the reliability and timely delivery of laboratory analyses. Laboratory equipment and supplies will be purchased following completion of a full-scale inventory of INRAN commodities. Support to other services will be provided as identified by INRAN and project staff.

vi. Human Resource Development: Role of Technical Assistance: The purpose of NAAR is to institutionalize a system of applied research. Therefore all members of the technical assistance team will have Nigerian counterparts throughout their entire contract periods. The expatriate scientists will work in their disciplines as coordinators and consultants for all crops, rather than as functionaries in a specific commodity area. The J.S. staff will be involved in on-the-job training to help build INRAN staff capability. It will be the responsibility of each expatriate scientist to work in collaboration with Nigerian scientists in their disciplines to prepare a detailed research agenda. Expatriate staff will interact continually with their INRAN colleagues to support their research, encourage them and help resolve problems. Data from each experiment will be analyzed statistically and reported scientifically in a published INRAN Annual Report. Statistically sound research results will be reported to the national extension service and submitted to international journals and symposia.

Training for Research Support Staff: Each Nigerian researcher will be assigned a research assistant. These research assistants will be sent, as soon as possible, to a short-term training course in their disciplines at an international center. (Refer to Annex J for a listing of centers and disciplines.) Experiment station field managers will be appointed to Tarna and Kolo and sent immediately for short-term training in Experiment Station Development.

Training in agricultural and vehicle mechanics and maintenance is required. Full-time mechanics and assistants employed by INRAN and retrained by the project will be placed at Tarna and Kolo.

Academic Training for Researchers and Managers: Scholarships for additional academic training will be provided to present INRAN staff members, jointly selected by INRAN and technical assistance team members, as they are reinforced by returning students or newly appointed staff. Scholarships to study irrigation topics will also be awarded to ONAMA and Rural Engineering personnel.

2. Component No. 2: Strengthening of Research Programs

a. **Output:** Development and execution of specific multidisciplinary research programs designed to address priority constraints on production of Niger's principal rainfed and irrigated food crops.

b. **Indicators of Achievement:** (this phase unless otherwise indicated)

i. Research Policy

- a. Research programs are consistent with stated research priorities.
- b. Activities within programs contribute to the achievement of program objectives.

ii. Research Programs: Rainfed Cereals/Legumes

- a. Crop improvement program emphasizes adaptive research; less basic research being conducted; INRAN takes more advantage of germplasm available from other sources (IARCs).
- b. Crop improvement program employs multi-disciplinary approach.
- c. Production systems research underway in 5 ag. zones.
- d. On-farm testing program expanded to 5 ag. zones.
- e. Recommended production practices for at least two zones delivered to extension (work begun under NCR).

iii. Research Programs: Irrigated Crop Agronomy

- a. Diagnostic studies have identified the principal agronomic constraints to production on the inland perimeters and micro schemes of Central Niger; priority crop, soil and water management research themes identified.
- b. Multi-disciplinary agronomic research program on priority themes designed and being executed.
- c. Studies of in-country and regional market potentials for contre-saison crops conducted.
- d. Cost-benefit studies of medium and small/micro-scale irrigation in Niger conducted.

iv. Research Programs: Water Management/Engineering

- a. Diagnostic studies have identified critical water management issues and constraints to improving the economic and productive efficiency of irrigated agricultural production on the inland perimeters and micro schemes of Central Niger; priority research themes identified.
- b. Multidisciplinary action research programs designed and being carried out to improve water management on jointly managed perimeters and micro schemes of Central Niger.

v. On-farm_research_program

- a. On-farm trials expanded to five rainfed agricultural zones. Rapid survey techniques used.
- b. If irrigation research enters on-farm trials in year 5, then extension-managed model described in Annex E will be used.
- c. INRAN technical recommendations are generated from results of successful on-farm trials.

c. Background

Between 1975 and 1980, INRAN, supported by NCP, concentrated its research efforts on developing commodity improvement programs for the three staple cereal/legume crops -- millet, sorghum and cowpea. During that period the Institute began major programs in breeding and plant protection (entomology and plant pathology). Smaller programs were developed in general agronomy, vegetable culture and animal husbandry. Research was mainly discipline-oriented. While scientifically sound, few research results benefitted the farmer. Although part of the problem was due to an ineffective extension service, the nature and relevance of the research was also at fault. Considerable emphasis was placed on basic research. Technical recommendations were not adapted to Niger's different agro-ecological zones.

Since 1982, INRAN, with support from the Niger Cereals Research project, has begun to change its orientation toward applied research that is defined by farmers' needs. Three principal research programs have been initiated: (1) multidisciplinary_commodity_research to develop improved varieties of acceptable quality, which provide potential to increase productivity of the crop; (2) cereals_production_systems_research to develop and test economically sound production practices specific to agricultural production zones of Niger; and (3) farming_systems_research to characterize the socioeconomic aspects of traditional production systems, identify the factors which favor or impede adoption of improved technologies, and finally to identify and test needed improvements to technical packages which will make them more acceptable to farmers.

While considerable progress has been made toward developing these programs, they are not yet established in an institutional sense. The multidisciplinary approach has yet to be accepted by all researchers. The concept of team research to provide a solution to a particular problem is not fully appreciated. Scientists do not always take advantage of resources available to them from other organizations, particularly germplasm. In addition, INRAN does not yet have scientists in all the necessary disciplines; for example, much agronomy work is done by expatriate technical assistance. This situation will change dramatically over the next three years as participants return from long-term training.

d. Course of Action

NAAR project support will build on progress made during the NCR project in the areas of crop improvement, production systems, and farming systems research. These research programs will be expanded gradually to include irrigated crops. In addition, the project will develop INRAN's capacity to conduct research on water management problems. Emphasis will be placed on proper planning, design and execution of research. Expatriate staff will assist Nigerian researchers and their staffs in determining research topics, setting priorities for addressing them, developing objectives, designing experiments, establishing procedures for evaluating progress, listing required inputs complete with budget, and insuring submission to the department head for approval well in advance of the sowing period. They will then assist as needed in implementation and consultation, organize interdisciplinary field visits, oversee harvests, data summary and analysis and publication of results. Meetings of research staff (technical committees) will be organized to discuss results and to determine which results should be transferred to cereal production and/or farming systems trials. On-farm trials will continue, with modifications, and in some cases simplification. It is presently envisioned that relationships with CRSPs will continue. The project will actively promote the development of stronger relations between INRAN and other agricultural research organizations, such as ICRISAT, IITA, IRRI and relevant centrally funded U.S. programs by demonstrating to INRAN scientists the benefits of using these resources to further national research goals.

Research programs will concentrate on the following four interrelated areas:

- i. Crop Improvement. Multidisciplinary team research will build upon ongoing research efforts to explore classical plant, soil, water and climate relationships for the principal rainfed and irrigated crops grown in Niger. Breeders, entomologists, agronomists, agro-economists, and cereals quality experts will work to clarify constraints to expanding productivity in each crop and develop knowledge and plant materials designed to overcome these constraints. These efforts will be coordinated by the Division of Agronomic Research (DRA) and will be concentrated at the two research stations of Tarna and Kolo, but will aggressively pursue a program of on-farm testing.
- ii. Production Systems. Multidisciplinary team research will develop crop and site specific systems of cultural practices and appropriate technological innovations for dryland and irrigated crop production in at least three distinctive agro-ecologic zones. Work will focus on the development of recommendations for crop rotation, intercropping, fertilizer use, time of planting, seeding techniques, plant density and spacing, weeding, pest control, and will include agro-economic analyses of cost and efficiency. Work will originate at Tarna and Kolo stations, but will also be conducted at INRAN sub-stations and support points. Eventually components and packages will enter the on-farm research program (point c below).

- iii. **On-Farm Research.** A modified on-farm research program which builds on the considerable successes of the Rural Economics Division (DECOR) will become an increasingly important part of INRAN activities. Cooperation with Ministry of Agriculture and ONAHA Extension Services will be strengthened. While diagnostic surveys will remain important, greater focus will be placed on on-farm testing of specific interventions and technologies to determine their acceptability and impact upon the farm, and the need for modification of these interventions through further research. This research will be carried out in different agro-ecological zones, represented by the Filingue, Kollo, Madaroumfa (Maradi), Tillaberi and Maggia regions.
- iv. **Water Management.** DECOR and the Irrigation section of the DRE Division of Ecological Research) will work closely with ONAHA's Applied Research Unit (Division Mise en Valeur) and the Rural Engineering Service to initiate a multi-disciplinary approach to the priority problem areas of irrigation water quantity and quality control, water application methods and water application efficiency. Systems and farm level efficiencies in each of these areas will be a central focus of research. In addition, cost-benefit and cost-effectiveness analyses of small and medium-scale irrigation, and studies of marketing potentials of irrigated crops will be carried out. Geographical areas of concentration will be the Maggia Valley, Niger River and small systems of Central Niger. (see Annex .)

3. Component No. 2: Strengthening of Research-Extension Linkage

a. Output: Development of functional linkages between INRAN, Extension and other Agricultural Services.

b. Indicators of Achievement: (this phase unless otherwise indicated)

i. Research planning and execution

- a. Extension services participate in research working group meetings to identify research themes, plan off-station and on-farm trials.
- b. Memoranda of Understanding between INRAN, Agricultural Extension Services, ONAHA and Rural Engineering detail the roles and responsibilities of each institution participating in research.
- c. Working Agreements between research, extension and farmers govern jointly-executed, individual research activities.
- d. Extension-managed on-farm trials underway in at least two dryland zones and on irrigated perimeters .
- e. The quality of execution of, and reliability of data from extension-managed trials is improved.

ii. Development, Delivery and Evaluation of Technical Recommendations

- a. INRAN's existing collection of technical recommendations has been thoroughly reviewed by INRAN and Extension Services for technical validity and farmer acceptability; useful recommendations updated where needed; inapplicable recommendations removed.
- b. Extension services participate in INRAN working group meetings to review research findings and discuss new technical recommendations.
- c. New technical handouts developed by INRAN Research-Extension Unit (REU) are generated from successful results of on-farm trials.
- d. New technical handouts developed by INRAN REU present sets of options that farmers can employ according to their needs and abilities.
- e. New technical handouts developed by INRAN REU are reviewed by Extension Services for clarity of presentation.
- f. INRAN REU and extension services jointly develop extension materials suitable for use by field agents.
- g. INRAN has developed program with extension services to jointly evaluate performance of extended recommendations. (Development of this program will depend on progress made by agricultural extension services and may not be achieved until the next phase.)
- h. Farmers adopt recommendations and technologies.
- i. INRAN has developed a program with Extension Services to jointly evaluate performance of extended recommendations (Development of this program will depend heavily on progress made by the Agricultural Extension Service and may not be achieved until the next phase.)

iii. Documentation

- a. Documentation Center maintains full inventory on all research being conducted in Niger (begun this phase).

c. Background:

INRAN's Research - Extension Unit (REU), was created in the late 1970s with support from the Niger Cereals Project. It was planned that the unit would work closely with a similar unit to be established in the Agricultural Extension Service with funding and technical assistance provided by VCR's companion project, Agricultural Production Support (APS). Together these two liaison units would establish strong operational linkages to ensure that research programs reflected farmers' needs. However, because of difficulties in filling the technical assistance positions, the APS-sponsored unit is only now getting under way. This factor combined with the fact that INRAN's unit

is staffed by a single person, has placed severe limitations on the amount of work able to be accomplished. Currently, there is little contact between research and extension institutions outside of the annual agricultural meetings.

INRAN's unit is charged with the following responsibilities: (1) collection of research results; (2) synthesis of research recommendations into technical recommendation handouts; (3) delivery of handouts to extension services for diffusion; (4) monitoring of farmers' applications of recommendations; (5) organization of seminars with extension service personnel to review research activities; and, (6) maintenance of relations with other agricultural research organizations in order to be informed of results of relevant research programs.

To date, the unit has focused most of its efforts on the preparation of technical recommendation handouts, using as resources the results of INRAN research or information collected from third country institutions. The staff member, who has a B.S. in seed technology, has also participated heavily in the seed multiplication program, although this activity does not properly fall within REU's scope of work.

Many technical recommendations issued by INRAN were prepared before the Institute reoriented its research programs to reflect Niger's different agro-ecological zones and initiated its farming systems research program, which incorporates social and economic factors into criteria for assessing the acceptability of recommendations. Often these recommendations are not technically appropriate for an agricultural zone, or they do not consider the cost or availability of agricultural inputs required to make the recommendations work. Also, recommendations are usually presented as total packages rather than sets of options which can be employed according to the user's needs or capacity. Extension services find that the style and content of the recommendations is too complex for many of their agents who have little formal technical training.

Two important factors must be considered when designing a plan to strengthen R-E linkages: (1) the respective roles of Nigerian research and extension institutions vis-a-vis the research-extension linkage have not been clearly defined; and (2) there is not just one national extension service in Niger serving all clients -- the National Extension Service of the Ministry of Agriculture prepares and delivers recommendations for rainfed and garden (ganacasson) crops. The productivity projects have also developed extension systems for dryland crops. The Rural Engineering Service extends information on micro-irrigation perimeter design. ONAHA agents extend recommendations for ONAHA-managed irrigated perimeters. These services have different capacities for development and delivery of extension materials and for monitoring the application of extension themes.

Thus, the first action is to outline INRAN's responsibilities vis-a vis the research-extension linkage. The second is to assign these responsibilities to appropriate sections within INRAN and to describe the interactions between research and extension required to fulfill these responsibilities. Section 3.d., below describes INRAN's role in the relationship. This model is intended to function as a point of departure in clarifying the Institute's responsibilities. It is expected that, as both extension and research institutions develop, some responsibilities may change.

d. Course of Action.

INRAN's role in the research-extension linkage is :

- to become informed of important constraints to production expressed by farmers;
- to develop and execute research programs that provide farmer-acceptable solutions to production problems;
- to synthesize technical recommendations into a format usable by extension services;
- to deliver technical recommendations to extension services;
- to evaluate the performance of extended recommendations and modify them when necessary.

Within INRAN, responsibility for carrying out these actions is shared by the REU, the training division and research departments. The MAAR project will help INRAN carry out these actions and develop strong R-E linkages by encouraging increased participation of extension services in the planning and execution of research, and in the development, delivery and evaluation of technical recommendations.

i. Planning Research: INRAN/REU will draft formal Memoranda of Understanding between INRAN and participating institutions, i.e., the Ministry of Agriculture and ONAHA Extension Services, the Rural Engineering Service, Cooperatives, which will clearly outline the purpose of jointly conducted research activities and the respective roles and responsibilities of INRAN and each participating institution.

Following up on research themes identified by extension, other agricultural services and INRAN at the annual meeting of the agricultural services; INRAN/REU will organize working group sessions between researchers and agriculture/extension service personnel to finalize plans for research activities, on-farm and multi-locational trials.

REU will assist researchers to draft annual working agreements governing specific jointly conducted research activities. Working agreements describe the objective of the research, identify the individuals involved, specify each individual's role and responsibilities, inputs required, location, and any other pertinent information.

ii. Execution of Research: Extension-managed on-farm trials: Classical FSR methodology describes two major approaches to conducting on-farm trials (OFTs): researcher-managed and farmer-managed OFTs. Both approaches tend to overlook or underutilize a valuable field-based technical and human resource: the agricultural extension agent. In recent years, agronomic researchers based in West African national programs have developed and refined extension-managed approaches to OFTs which combine the best of both classical approaches.

The objectives of classical FSR approaches are generally to analyze socio-economic or combined agronomic-economic effects of research-generated technologies on the farm level. Research-managed trials test treatment effects in the bio-physical environment of the farm, while farmer-managed trials test treatment effects by farmer management interactions without benefit of extension agent advice and guidance. Extension-managed OFTs include the influence of the latter to test (technical treatment) x (farmer x extension agent effects) x (bio-physical farm environment effects). Thus the method inherently tests the extendability of the technical treatments and identifies technical constraints which will need to be addressed if and when a treatment is proposed for extension through the same service. NAAR will introduce extension-managed on-farm trials as an alternative to (not a replacement for) the researcher-managed trials currently used in DECOR's farming systems research program. The active participation of extension services in the execution of research should provide a concrete mechanism for strengthening the R-E linkage.

iii. Execution of Research: Multilocational Trials: These trials are executed primarily by extension agents at research posts. They are usually requested by extension services during the annual agricultural meetings. INRAN researchers prepare the protocols which are sent to provincial level extension service branches for execution. The quality of results from these trials varies widely: the extension agents may not receive adequate briefing on how to execute the trial and receive insufficient supervision during the course of the trials; required inputs are not always available; often the agents simply have too many other responsibilities to correctly execute the trial. The NAAR will assist INRAN to evaluate the multilocational trial program with an eye to obtaining better results from it. Actions to take will include training extension agents (See item vi., this section), and perhaps some reductions in the number of trials to enable closer monitoring and support of them.

iv. Review of Existing Recommendations: In cooperation with extension services and researchers, REU will thoroughly review INRAN's existing collection of technical recommendations for technical validity, farmer acceptability and clarity of presentation of information. Useful recommendations will be revised where necessary. Inapplicable recommendations will be removed.

v. Synthesis of New Research Recommendations: REU will organize working group sessions or seminars with researchers and extension personnel to review research findings and discuss new technical recommendations. Once research recommendations are ready for extension, they are synthesized by REU into technical recommendations handouts (fiches techniques). The resultant materials are reviewed by researchers for technical accuracy. REU will develop extension materials to be used by extension and other agricultural services as basic technical references which can, in turn, be modified by extension services to suit a particular media, extension technique, or user group. REU's responsibility is to deliver to extension services the essential technical information -- clearly described, technically complete, unambiguous. Users of REU documents might include departmental or arrondissement agricultural chiefs and extension methodologists. REU's responsibility is not to develop extension materials geared to peasant farmers or village level agricultural agents; this responsibility properly falls within the domain of extension services. However, REU will collaborate with extension services in the preparation of these materials to verify that they are technically sound. Similarly, REU will work with the extension services to ensure that INRAN documents present their information clearly. MOUs will be drawn up between INRAN and extension services to clearly describe their respective roles and responsibilities.

REU will ensure that only recommendations that have been proven technically and economically viable through on-farm testing will be delivered to the extension services. Where applicable, new technical recommendations developed by INRAN will present sets of options that farmers can employ according to their means.

vi. Technical Training for Extension Agents: In cooperation with extension services and INRAN's training division, REU will organize in-service technical training for extension agents to provide clear explanations of recommendations and how to execute them. REU will also coordinate specialized training for agents participating in irrigated OFTs and multi-locational trials, and upon request from DECOR, will assist with training of DECOR-selected rainfed OFT executors. Training will cover agronomic techniques, trial methodology and data collection.

vii. Development of a Program to Evaluate the Performance of Technical Recommendations: INRAN will develop a program with extension services to monitor and evaluate the performance of technical recommendations.

viii. REU will Maintain Information on Research being Conducted in Niger: This activity will be conducted jointly with INRAN's Documentation Center. After updating the inventory of INRAN-sponsored research, REU will compile a data base on non-INRAN research. (Fournier's report can be used as a starting point.) This information will provide a valuable resource for researchers and will form the basis of a structure through which INRAN can eventually coordinate research in Niger.

ix. REU will Maintain Linkages with IARCs and other agricultural research institutions to keep researchers informed of relevant research carried out by other institutions.

The project will provide a long-term research-extension expert as counterpart to the REL director. Project inputs will include short-term technical assistance, support for in-service training of extension agents, in-service and/or short-term training for the REL personnel and operating funds. During the life of project, Nigerian staff assigned to the unit will increase from one to two "A" personnel and will include two new "B" personnel.

D. Inputs

1. AID

Project funds will support 29 person years of long-term technical assistance in the following disciplines: 1 research management specialist, crop breeding coordinator, 1 dryland cereals agronomist, 1 irrigation agronomist, 1 soils agronomist specialized in irrigation, 1 irrigation engineer, 1 research-extension specialist, 1 social economist and 1 agricultural economist.

Thirty-six person months of short-term technical assistance will be provided as follows: 10 person months in technical disciplines and computer science/data management; 5 person-months in agricultural machinery repair and maintenance; 7 person-months for planning and updating INRAN's long-term training program; 6 person-months for marketing studies, and 8 person months for interim and final evaluations.

The project will provide funds for short-term training to upgrade the skills of each of INRAN's field and laboratory assistants and technicians. Up to 200 person-months of coursework at IARCs and African institutions will be funded, along with 10 person-months of short course work in the U.S. The project will fund participation of 12 individuals at international conferences. In addition, up to seven person-months of short-term technical assistance will be made available for in-service training.

Advanced professional training will be provided for up to 17 INRAN personnel, 2 ONAMA personnel and 2 personnel from the Rural Engineering Service. Long-term INRAN scholarships will be used for advanced degree studies of current personnel. Preference will be given to senior researchers needing the M.S. or DEA degrees and to study related to irrigation (soil, water and crop management, engineering) and dryland agronomy. Up to 3 persons (at 3 years each) will be sponsored for Ph.D. studies in the U.S. All courses of study will clearly strengthen INRAN's capacity to execute priority applied research programs as described in this project paper. Funding will also be provided for specialized non-degree training in the U.S. and Africa. This training will be available to personnel from INRAN, ONAMA, Rural Engineering and the extension services.

Open air equipment sheds will be constructed at Tarna and Kolo research stations. Smaller storage sheds will be built at three support stations (points d'appui).

Commodity procurement will be limited initially to vehicles for researchers (expatriate and national), motorbikes for trial executors/extension agents and field and laboratory equipment for irrigation research. Following the completion of a full-scale inventory, funds will be provided for repair and rehabilitation of equipment and machinery now in disuse.

Finally, the project will support operating expenses generated by the project.

2. GON

The GON inputs will consist of salaries for researchers and auxiliary staff; office facilities for the technical assistance team and counterparts at the INRAN headquarters and the Kolo and Tarna research stations; and research facilities including laboratory and field equipment, infrastructure and research plots.

IV. Financial Plan

A. Cost Projections

The budget projections for this project reflect the estimated cost of inputs required to achieve the three project outputs described in the project summary. The total AID five year project costs amount to \$ 19,993,697. The initial FY 87 funding obligation will amount to \$ 5,974,000. The GON will contribute \$ 4,054,563, or approximately 17% of total project costs. The GON contribution consists primarily of personnel and support costs of INRAN and its principal research stations, including irrigation rehabilitation. Physical contingencies have been estimated at 5% of all costs; price contingencies have been estimated at 6% per annum applied to all direct costs. Devaluation contingency amounts to 16% of local costs subject to devaluation and reflects an expected average exchange rate of 280 FCFA/\$US over the five year life of project versus the present rate of 325 FCFA/\$US.

Table I

Niger Applied Agricultural Research Project
Costing of Project Outputs
(000 U.S. Dollars)

Cost Category	#1	#2	#3	Total

USAID:				
Technical Assistance:	1144	4959	777	6880
Project Administration	300	1944	200	2444
Training	236	2123	0	2359
Commodities	67	645	0	712
Construction	121	187	0	308
Other Costs	595	1061	647	2303
Contingencies	794	3652	546	4992
Subtotal USAID	3,157	14,672	2,170	19,999

Host Country:				
Other Costs	0	2480	0	2480
Irrigation Rehab.		660	0	660
Contingencies	0	914	0	914
Subtotal Host Country	0	4,054	0	4,054

Totals	3,157	18,726	2,170	24,053

Table II

Niger Applied Agricultural Research Project
Summary Cost Estimate and Financial Plan
(U.S. Dollars)

Cost Category	USAID		Nigac		Total
	EX	LC	EX	LC	
Technical Assistance:					
Long-term	4,898,538	888,595	0	0	5,787,133
Short-term	1,092,823	0	0	0	1,092,823
Project Administration	1,533,154	910,950	0	0	2,444,104
Training	2,299,100	60,000	0	462,500	2,821,600
Commodities	667,160	45,000	0	0	712,160
Construction	0	308,000	0	0	308,000
Irrigation Rehab.	0	0		660,400	660,400
Other Costs	2,220,000	2,083,000	0	2,017,850	4,320,850
Subtotal	10,710,775	4,295,545	0	3,140,750	18,147,070
Physical Contingencies (5%)	535,539	214,777	0	157,037	907,353
Price Contingencies (6%)	1,933,358	1,095,363	0	651,117	3,679,838
Devaluation Contingency *	361,235	361,225	0	195,664	1,322,124
TOTAL COSTS	13,541,487	6,457,210	0	4,054,568	24,053,265

* For detail on devaluation contingency as applied to foreign exchange costs, see Table L-5b. The contingency is applied to only those foreign exchange costs likely to be determined by non-dollar currencies or likely to be purchased from non-U.S. sources.

Note: The design team budgeted \$96,000 for evaluations. However, Mission feels an additional \$100,000 will be needed. The additional will come from contingencies.

Table III

Niger Applied Agriculture Research Summary Budget
(U.S. dollars)

Expenditure Categories	Project Year					Total
	Y1	Y2	Y3	Y4	Y5	
I. TECHNICAL ASSISTANCE						
A. Long Term Tech. Assistance	586	1,364	1,638	1,446	752	5,787
B. Short Term Tech. Assistance	178	223	89	245	357	1,093
Subtotal	764	1,587	1,727	1,692	1,109	6,880
II. PROJECT ADMINISTRATION						
A. In-Country Office	90	205	223	211	183	911
B. On-Campus/Cont. Support	143	143	143	143	143	714
C. Other	136	171	172	171	168	819
Subtotal	370	518	538	525	495	2,444
III. TRAINING						
A. Long Term	387	87	285	253	571	1,584
B. Short Term	59	106	126	126	126	544
C. Travel for Trainees	31	34	41	50	76	232
Subtotal	477	228	452	429	773	2,359
IV. COMMODITIES	163	266	116	128	38	712
V. CONSTRUCTION	308	0	0	0	0	308
VI. OTHER COSTS						
A. INRAN	221	316	380	365	370	1,654
B. ONAHA/MOA	0	17	35	52	70	175
C. Miscellaneous Costs	40	41	71	71	71	294
D. Financial Management	60	30	30	30	30	180
Subtotal	321	405	516	519	541	2,303
SUBTOTAL ALL DIRECT COSTS	2,404	3,004	3,350	3,292	2,955	15,006
Physical Contingencies (5%):	120	150	167	165	148	750
Price Contingencies (6%): (a)	144	371	540	864	999	3,019
Devaluation Contingency: (b)	203	246	257	275	241	1,223
TOTAL PROJECT COSTS	2,872	3,772	4,415	4,596	4,343	19,999

Footnotes:

(a) Price adjustment factor applied to all direct costs. Factors are .06, .1236, .1910, .2625 and .3382 for years 1 through 5 respectively.

(b) Local costs subject to devaluation amount to the following:

1,271 1,539 1,603 1,717 1,506 7,643

The devaluation contingency amounts to .16 of such costs, reflecting an expected average exchange rate of 280 FCFA/\$ over the five year life of the project versus the present rate of 325 FCFA/\$US.

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B. Method of Implementation and Financing

Method of Implementation	Method of Financing	Approximate Amount (U.S. \$)
Technical Assistance: (USAID Contract)	Direct Payment	6,879,956
Project Administration	Direct Payment	2,444,104
Construction (USAID Contract)	Direct Payment	308,000
Commodities (IQC/PSA & Mission)	Direct Payment	712,160
Training (TA contract)	Direct Payment	2,359,100
Other	Direct Payment	2,303,000
Contingencies	Direct Payment	4,992,377

The Project conforms to the mission's general assessment entitled Mission Financing Policy and Procedures updated as of December 31, 1985. There are no departures from the general assessment.

V. Project Implementation

A. General Approach to Implementation

Analyses of INRAN, USAID, U.S. Title XII contractors, and other organizations implicated in the agricultural research process, have clarified the need for a serious reorganization of management of the project in order to achieve project goals. Institutional constraints on project implementation have been identified in the annexes. The upcoming ISNAR study of INRAN operations should provide detailed recommendations for improving management and the research agenda. The process evaluation to be conducted after year one of the project will determine how these recommendations should modify NAAR implementation plans and procedures. Recommendations which summarize and develop the salient management implications of the technical annexes are offered here as management and implementation guidelines for the project implementation team.

B. Technical Assistance: Method of Selection and Contracting

The present Niger Cereals Research project is being implemented through collaborative assistance agreement between the GON and a Title XII institution. In view of the generally mediocre management performance under this project, competition for implementation of the NAAR will not be limited

to Title XII institutions. The experience of Title XII institutions in conducting agricultural research, the resources at their disposal and their linkages with international agricultural research institutions may give them a comparative advantage in satisfying evaluation criteria related directly to the research and research-extension components of the project. However, in view of the importance placed by the project on developing INRAN's overall management capabilities, up to thirty percent of contractor selection criteria will evaluate bidders' abilities to execute planning and management activities described in section III.C. Other criteria will evaluate the contractor's ability to work within a national agricultural research institute in a collaborative fashion to develop/strengthen the research programs and institutional linkages described in section III.C, and in how they include Gray Amendment firms and institutions as sub-contractors in their proposals for implementation of the project. Competition will be full and open.

The project will be implemented through an AID Direct Contract. INRAN does not have at this time sufficient staff or resources to attend to all aspects of contract administration. However, INRAN should and is capable of maintaining its authority and responsibilities in the substantive areas of project management and execution. Therefore the contract will clearly stipulate that INRAN retain, with USAID, its present co-approval authority for all major actions pertaining to contractor selection, approval of work plans, evaluation of contractor performance, financial management, execution of project implementation orders, project evaluation, modification of project objectives, inputs or outputs. In short, INRAN will continue to exercise, with USAID, joint authority and responsibility for project implementation but will not be burdened with administration of the technical assistance contract or providing logistical support to the technical assistance team.

C. Project Management

1. USAID Project Management, Monitoring Plan

The Agricultural Development Officer has assigned the agricultural research portfolio to an experienced direct hire project manager and Nigerian assistant. Presently this portfolio consists of one major research program (the current Niger Cereals Research Project) and three centrally funded collaborative research programs. ~~As the NAAR Project will merge phase II of the NCR project with an irrigation component, these officers will have essentially the same workload when the NAAR Project is approved. The officers will be supported as necessary by the NAAR Project Committee composed of representatives from other USAID/Niger support offices. Technical review or input (legal, contracting, engineering) will be provided by REDSO/WCA.~~

Under the supervision of the Agricultural Development officer, the project officer will have direct responsibility for project administration and implementation. He will execute or coordinate all actions which USAID must take to support implementation, receive all correspondence and documents relating to the project and prepare (or assure preparation by appropriate offices) USAID correspondence and documents required for USAID supervision and administration of the project.

Financial Management

The project officer will see to it that all the actions required to mobilize and employ the financial resources to be made available to the GON under the Project Grant Agreement are executed in a timely, efficient manner. Included are the establishment and operation of: detailed budgets, financial plans and expenditure forecasts by time period; payment procedures and financing instruments for both GON and AID funds; a project accounting system; disbursements of funds to suppliers of goods and services; and all related actions.

Contracting

USAID will be charged with the task of contracting for the technical assistance (TA) team. The project officer (with support from MO, and PDO) will develop in collaboration with the GON the scope of services and specifications for the TA team. He will also be responsible for coordinating the required competitive procurement process. The RFTP and resulting contract will be issued by USAID/REDSO/W.

Monitoring

The project officer will be responsible for monitoring this project activity. He will establish a monitoring system which will satisfy the following general needs:

- oversee GON compliance with aid policies, procedures and regulations;
- ensure the timely and coordinated provision of USAID financing, inputs and approvals;
- support the GON's efforts to improve effective utilization of resources and accurate forecasting of future problems;
- identify implementation issues and activities not performing satisfactorily;
- collect data and information for subsequent USAID project analyses and ~~develop an historical record of implementation for the official USAID project files;~~
- prepare periodic reports for the mission and AID/W review.

The methods which will be used to monitor the project include project implementation reports, contractor reports, site visits, consultation with project participants, semi-annual project reviews with the GON, audits and internal and external evaluations.

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2. GON Project Management

The NAAR Project will not be placed under the Program Management and Coordinating Unit (PCMU) of the National Cereals Program. This unit was created in 1982 to handle overall management of the USAID financed Niger Cereals Research and Agricultural Production Support Projects, which were designed as successors to the original Niger Cereals Project. The PCMU was not conceived as a permanent liaison structure between the Agriculture Service and INRAN, but rather as a temporary unit to coordinate project activities as they got underway. During this next phase of assistance to INRAN, coordination at the technical level will take place directly between INRAN and Ministry of Agriculture personnel through their existing liaison units.

During implementation, the Director General of INRAN will serve as Project Director. An Assistant Director, probably the Director of Administration and Finance (SAF) will oversee day-to-day operations of the project. The Director of the SAF will also be responsible for processing local currency expenditures, excluding those strictly related to support of technical assistance. The project will, if necessary, provide additional staff for this purpose.

3. Relationship between Lead and Participating Agencies

INRAN will be the lead executing agency for the GON. Principal participating agencies include the Agriculture Service of the Ministry of Agriculture, the National Office of Irrigated Perimeter Management (ONAMA) and the Rural Engineering Service. The Ministry of Plan will participate in evaluations. Other agencies/organizations that will play a role in the project include the National Crop Protection Service and the Sub-regional Cooperative Unions (USRC).

The relationship to be established between INRAN and participating agencies is that of collaborative identification of research topics and joint conduct of research activities. As lead agency, INRAN will fund the costs of research through the project, provide equipment and supplies and lead the design of research protocols. INRAN will also train trial executors and will co-monitor trial execution. INRAN will prepare and distribute reports of research results to all participants, including field level personnel. ONAMA will provide research sites on its perimeters and its extension agents to manage on-farm trials. ONAMA will facilitate the selection of participating farmers. Rural Engineering will assign one or two irrigation engineers to participate full-time in research activities throughout the life of project, or until an INRAN participant returns to fill this position. Initially the engineer will be part of DECOR's new Perimeter Irrigation Diagnosis and Management Group. When research topics have been identified, he will also work with the DRE's Irrigation/Farm Water Management section. The Agricultural Extension Service will make available its agents to conduct on-farm and multi-locational trials on rainfed crops and will assist in the selection of participating farmers. Identification of research topics, selection of research sites and elaboration of work plans for jointly conducted research will be a collaborative effort.

Establishment and maintenance of horizontal relationships with ONAHA, Genie Rural, and the Agricultural Services will be delicate. Creation of a smooth inter-organizational climate will be facilitated by clarification of, and respect for the domains of operational autonomy of each partner, and as a point of departure, acceptance of the preferred self-image of each unit.

The modality to be used to formally establish institutional linkages among agencies is the Memorandum of Understanding (MOU). The MOUs will outline the purpose of the research and the roles and responsibilities of the respective institutions vis-a-vis the joint conduct of research. They will be signed by agency directors.

INRAN will be encouraged to establish, through MOUs, formal working groups with representatives of participating institutions and clients. At the highest level, support will be provided by the project to make operational a recently formed interministerial committee on agricultural research.

Annual Working Agreements (WAs) will govern the execution of individual research activities. They will be drawn up between the researcher and participants and will spell out research plans, identify sites, detail budgets, identify necessary inputs and assign responsibility for particular tasks. In some cases responsibility for execution of on-farm trials will be assigned to DECOR enumerators, in other cases to Extension Service agents or to carimeter personnel following terms worked out in the WA. In each case, INRAN will arrange to provide the necessary resources, information and supervision for the correct execution of the trial or experiment.

The Research Extension Liaison Unit will participate in the establishment or development of these formal linkages. This unit will also draft formal and informal MOUs and WAs with counterpart units in the Ministry of Agriculture, (DPV) with ONAHA, and with major agricultural productivity projects.

4. Role and Responsibilities of Technical Assistance

During the first three years of the project the research management specialist will also serve as leader for the technical assistance team. (The Director General established this time frame.) He will advise the project director on overall project management, realization of project goals, AID project management procedures and institutional contractor requirements. He will assist the D.G. of INRAN to install a system of research planning and program-based budgeting. His responsibilities will also include monitoring project implementation guidelines and developing an internal information system to enable the D.G. to make informed decisions pertaining to project implementation.

In order to avoid wasting valuable technical assistance time in the management of logistical support for the T.A. team, the chief of party will engage local private firms to provide such support to the greatest extent possible. Bookkeeping, administrative support, monitoring procurement, maintaining expatriate housing and providing logistical support are examples of such functions now being successfully handled for other USAID projects by local Nigerian firms.

The contractor will name a project coordinator to oversee stateside management of the project. This will include providing support to the technical assistance team for documentation, data processing, timely shipping of personal effects and project materials, arranging for GON personnel and trainees to participate in stateside training, field trips or professional meetings, etc.

The technical assistance team will work primarily within the DRA, the DRE, DECJR and the Research-Extension Liaison Unit of INRAN. Their work assignments will entail activities at INRAN headquarters as well as on many of the stations and research sites operated by INRAN. Team members involved in irrigated agricultural research will, with their INRAN counterparts, undertake collaborative research with ONAHA and Rural Engineering personnel. Each team member will have a formally designated counterpart and technical support team. Counterparts will be drawn from the ranks of division heads or station chiefs, to the extent possible. Prior to the arrival of the U.S. team, INRAN and USAID will jointly agree on each person's status and responsibilities and INRAN will name each person's Nigerian counterpart.

Team members will be directly responsible to the Director General of INRAN (to whom they will report through heads of departments or division heads) and to the Team Leader (for administrative purposes). They will work directly with division heads and/or counterparts, with whom they will stand in a collaborative professional and technical relationship. Technical assistance will work with their co-team members and with various research departments and staff to improve the overall research and institutional performance of INRAN.

All members of the technical assistance team will want to collaborate in reinforcing improvement in the following areas: first, general management, including planning, personnel management, financial management, and process evaluation; and, secondly, execution of multidisciplinary research programs aimed at producing extendable results.

5. Participant Training

Candidates for training funded by the NAAR project will be selected jointly by the involved GON agency (i.e., INRAN, ONAHA or Rural Engineering), the technical assistance contractor and USAID. The GON agency and the contractor will furnish to USAID substantive information required for the PIO/P: participant biographical data; a description of the training to take place; the rationale for selection of the participant; a discussion of how the training furthers the achievement of INRAN and NAAR project long-term institutional development objectives; and verification that the training conforms to the Project Training Plan. USAID/Niger will issue the PIO/P.

The technical assistance contractor will be responsible for the identification of appropriate training opportunities, placement of the participant, and handling of all logistical arrangements prior to departure of the trainee. The contractor will ensure that arrangements are made for lodging, payment of support allowance, etc. and will monitor trainee performance throughout the period of training.

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For long-term participants, progress reports will be furnished to USAID and INRAN, (or other GON agency) following the end of each academic period. These progress reports will provide the name, institution, course of study, date of enrollment, expected date of completion and grade point average of each participant.

Reports on short-term training funded by the project will be prepared every six months and will be submitted as a standard element of joint USAID-GON six month project reviews. These reports will summarize training completed during the period and will outline training planned for the next six month period.

Refer to Annex J for specific information on the Training Plan.

6. PROCUREMENT

Initial project procurement will be handled by USAID/Niger, with the collaboration of the REDSO/WA or AID/W procurement office, through an IQC Procurement Service Agent. This procurement will include household furniture and appliances for the technical assistance team, and the initial lab/field equipment and supplies required for the irrigated agriculture research activities.

It is anticipated that once the the contractor is identified and the technical assistance team is in Niger, the contractor will be responsible for all offshore procurement of commodities under this project, with the exception of the vehicles (to be procured in-country with a standard source and origin waiver), and office furniture and equipment (to be paid for from the local currency budget). INRAN and in-country contractor team staff will prepare annual procurement plans for commodities to be purchased by the contractor which will be submitted to USAID for approval. After such approval, the contractor may proceed without further USAID approvals as long as any deviations from the plan do not exceed 10 per cent of the dollar values presented in the procurement plan. Particular attention will be given to electrical equipment to ensure it is compatible with the electrical system of Niger. IN-country staff will inspect commodities upon delivery to ensure compliance with specifications. As a policy, air freight will be used for all ~~but the heaviest or lowest priority items.~~

For commodities to be purchased in Niger; INRAN will be responsible for arranging purchases of office and other supplies using local currency provided by this project. As with purchases of imported commodities, approval of USAID will be by means of an annual procurement plan. Regular INRAN suppliers will be utilized in order to take advantage of discounts available to government services. INRAN is aware (because of the NCR project) these commodities must be procured in accordance with USAID's Handbook 1 supplement 3, chapter 18 procedures.

Inappropriate and unservicable vehicles have been a problem in projects in Niger. Therefore, 15 non-U.S. vehicles and 100 non-U.S. motorcycles will be procured under USAID/Niger's blanket waiver for the purchase of non-US vehicles. The mission procurement office will arrange for this procurement.

Following the PACD, all USAID project procured commodities will become the property of the GON. However, where appropriate (and agreed upon by both parties), the GON will make the commodities available for future USAID funded development efforts.

The Mission will be responsible for contracting for the refurbishing and/or construction of project facilities to be financed by this project. Local construction contractors will be used for the work. Plans for this will be reviewed and approved by the mission or REDSO engineer.

Long-term leases reimbursable under this project for the housing of the expatriate staff will be signed by the contractor team leader. Housing will be equivalent in size quality and cost to those provided to equivalent AID direct-hire personnel. In-country expatriate staff will be reimbursed by the contractor for basic utility costs.

The TA contractor will, where possible, engage a management support contract with a local firm to handle house utilities installation and payment, house maintenance, appliance maintenance, guard duty, social securities payments to domestic staff, some accounting functions and routine office support. Sub-contracting for these activities will greatly increase effective time for project activities.

D. IMPLEMENTATION SCHEDULE

ACTION TO BE TAKEN	ACTION PARTY	DATE
Project Paper Approved	USAID/GON	May 87
Project Grant Agreement Signed	USAID/GON	May 87
RFP Issued	USAID	June 87
Conditions Precedent prior to dollar expenditures met	GON	July 87
Initiate procurement for support of the TA Team (vehicle/furniture)	USAID	Aug. 87
Irrigation Research site determination and Rehab Technical Review (Procurement list)	USAID	Aug. 87
Short term TA to develop manpower training profile	USAID/GON	Aug. 87
Responses from RFP received/reviewed and submitted to RCO	USAID/GON	Aug. 87
Infrastructure rehab. initiated	INRAN	Sept. 87
Issue IQC for final design of irrigation sites and equipment sheds	USAID	Sept. 87
Initiate US procurement of lab. and irrigation equipment	USAID	Sept. 87
Contractor selected	USAID	Sept. 87
Submission of project's annual local operating costs budget to USAID for consideration and approval	INRAN/USAID	Sept. 87
COP/Management Specialist arrives	Contractor	Jan. 88
Engage local management support	Contractor	Jan 87
Develop local procurement plan	COP	Jan. 88
Finalize TA homologues at INRAN	COP/INRAN	Jan. 88
Initiate INRAN management review and long term planning	COP/OG	Feb. 88

Arrival of Dryland Agronomist, Breeding Coordinator, Agricultural Economist and Research/Extension Specialist	Contractor	March 88
Dryland Agronomy program procurement initiated	COP/USAID	March 88
Initiate improvements in management stemming from management review	DG/COP	March 88
Irrigation procurement arrives	USAID	April 88
Update implementation schedule	Contractor	April 88
Issue contract to develop irrigation sites and construct equipment sheds.	USAID	May 88
New TA finalize workplans	Contractor	May 88
Selection and training of extension agents for implementation of on-farm and on-perimeter trials	REL Unit	April 88
Year 5 Dryland on-farm trials (year one for NAARP)	INRAN	May 88
REL completes review of extension programs and technical materials being extended	REL Unit	June 88
Drylands diagnostic work begins for modification of program	INRAN	August 88
Arrival of Irrigation Agronomist, Soils Agronomist, Irrigation Engineer and Economic Anthropologist	Contractor	August 88
Submission of projects annual local operating costs budget to USAID for consideration and approval	INRAN/USAID	Sept/Oct 88
Execution of INRAN/ONAHA MOU	INRAN/ONAHA	October 88
Evaluation of research year and identification of new extendable themes	REL Unit	December 88
Twelve month process evaluation	INRAN/USAID	December 88
Completion of management, personnel policy review and recommendations	INRAN	December 88

Begin irrigated agriculture and water management diagnostic studies	Contractor	January 89
Irrigation research station and sub-station operating	INRAN	January 89
Dryland procurement order arrives	Contractor	February 89
Development of annual work plan	Contractor	March 89
Update implementation schedule	Contractor	March 89
Review EMOFT program with ONAHA	INRAN/ONAHA	April 89
Year 6 dryland on-farm trials	INRAN	May 89
Year one of irrigation station trials and continuation of diagnostic	INRAN	June 89
Submission of project's annual local operating costs budget to USAID for consideration and approval	INRAN/USAID	Sept/Oct 89
In-country training in on-perimeter trial methods and station research	Contractor	October 89
Review of dryland research for the purpose of identifying extendable Agricultural themes	REL Unit	December 89
Identifiatiion of new dryland on-farm sites	INRAN	January 90
Long term management plan reviewed and updated	DG/COP	January 90
MOUs and WAs updated	INRAN	January 90
Development of annual work plans	Contractor	March 90
Update of implementation schedule	Contractor	March 90
Year 7 of on-farm dryland trials	INRAN	May 90
Year 2 of irrigation station trials continuation of diagnostic studies	INRAN	June 90
Submission of project's annual local operating costs budget to USAID for consideration and approval	INRAN/USAID	Sept/Oct 90

Mid term evaluation	USAID/GON	October 90
Review of research year, for the purpose of identifying extendable agricultural themes	REL Unit	December 90
Long term management plan reviewed and updated	DG/COP	December 90
Research manager departs, and new COP identified	Contractor/GON USAID	December 90
Development of annual work plans	Contractor	March 91
Update of implementation schedule	Contractor	March 91
Dryland Agronomist, Breeding Coordinator, and Agriculture Economist depart	Contractor	March 91
Year 8 dryland on-farm trials	INRAN	May 91
Second process evaluation	USAID/GON	May 91
Year three of irrigation station trials; year one of irrigation on-farm trials; and continuation of diagnostic studies	INRAN	June 91
Final Evaluation	USAID/GON	October 91
Economic Anthropologist departs	Contractor	Sept. 91
Submission of project's annual local operating costs budget to USAID for consideration and approval	INRAN/USAID	Sept/Oct 91
Review of research for the purpose of identifying extendable agricultural themes	REL Unit	December 91
Irrigation Agronomist, Soils Agronomist, and Irrigation Engineer depart	Contractor	December 91
Long term management plan reviewed and updated	DG	January 92
Research/Extension Specialist departs	Contractor	March 92
PACD	USAID/GON	May 92

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E. Evaluation Plan

Careful monitoring and evaluation are essential for the project to adapt itself to expected changes in both external and internal project environments. The long term nature of institution building and the research process require a commitment of resources beyond the five year planning and financing horizon. Thus evaluation should be both retrospective and prospective in nature, determining where the project has been (NCR evaluation and end of contract reports) and where it should be going (NAAR PP and appropriate annexes). It should update the planning horizon and amend the implementation schedule to accommodate changes in circumstances and improved institutional capabilities. For example, major commitments of expatriate research time under NAAR make no sense unless decentralized and streamlined financial management practices and improved equipment management are implemented.

1. Process Evaluations

In light of the above comments; in addition to standard mid-term and final evaluations, process evaluations will be conducted at 12 and 40 months. The focus of these assessments will be on project implementation and the development of necessary linkages between project inputs and outputs.

Process evaluations will target three areas. The first is the environment of the project, including:

a) The internal environment of the project and INRAN itself, but not necessarily the magnitude of project outputs, and

b) The impact of changes in the institutional environment on project implementation. Recommendations will focus on improving implementation through adaptation to the changing institutional environment.

Secondly, the process evaluations will focus on:

a) Research performance;

b) The development of institutional relationships;

c) The barriers encountered in building collaborative working relationships between INRAN units, and between INRAN units and other organizations, and

d) The lessons being learned from these experiences.

Thirdly, evaluation of the process components of the project, i.e., improved quality of staff, innovations in management, increased internal and external communications, etc., will assess:

a) Improvements in institutional performance resulting from project inputs, and

b) The effects of improved institutional performance, rather than project outputs, on the intended project beneficiaries (INRAN staff, extension agents, farmers, etc.).

Results of the first process evaluation will condition the procurement of additional dryland research-related commodities, the arrival of the irrigation technicians, programming of additional training in drylands agriculture, and other implementation actions scheduled for years two and three. This evaluation will also determine whether the progress made in reforming the financial management system is sufficient to assure timely funding of on-going drylands and on-farm research programs and new planned irrigation research programs. If progress regarding appropriate financial reforms is unsatisfactory, the evaluators will recommend the intervention of a management consulting firm to develop appropriate procedures.

The second process evaluation, to take place at the middle of year four, should re-examine the issues discussed above. In addition, it should determine the feasibility of phasing out some technical assistance slots as high level staff return from long-term participant training, or perhaps adding others. A serious attempt should be made to decrease the extent of long-term in favor of short-term technical assistance over the life of the project. Technical assistance should be evaluated on the extent to which it is developing counterpart competence. Merely carrying out research activities is not a measure of successful technical assistance.

2. Mid-Term and End-of-Project Evaluations

The mid-term evaluation of the project will be conducted during the agricultural season in the third year of the project, i.e., late August-early October, 1990. The quality of research can only be evaluated satisfactorily during the grain filling period when crops are still in the field. Proper evaluation of the impact of the training component of the project requires that trainees, both long and short-term, have had occasion to return for field work or to active duty at INRAN. Trainees are scheduled to begin returning in 1989.

Evaluation of institution building, conduct of the training program, administration and budgeting is less critical here. Updating process evaluations of these activities should be carried out concurrently with evaluation of the outputs of crop research, farming systems, and research extension liaison activities.

A final external review of the project will take place during year five of the project. The full five years will be needed to allow for research to proceed from the diagnostic to the experimental stage, and for extendable results of dryland research to be tested in on-farm situations and marketed through the extension services. Implementation over the full five year span of the project is required before an output evaluation is warranted. It cannot be expected that the new irrigation research component of the project will produce extendable results by the PACD. However, this program should have been carried to the on-farm testing stage by this time.

Both mid-term and final evaluations will assess the progress of the project in achieving its purpose. A set of benchmarks has been included in the section on End of Project Status and in the Log Frame. These evaluations will identify areas of progress and constraints. The mid-term evaluation will suggest modifications in evaluation criteria to permit a more effective end of project evaluation. Both evaluations will be major determinants for the continuation and modification of project activities.

The final evaluation will also serve as a roll-forward review. If proposed objectives are being satisfactorily met, the Mission will request additional funding for a second five-year phase of the project. The final review will identify those areas of INRAN which require continued support. Priority areas of support will be funded under the second phase. It is clear that the irrigation component, which is programmed to get under way only in the third year of the project, will require second phase funding to achieve research objectives. It is likely that the training and drylands technical assistance component will be scaled down in a second phase. Additional infrastructure, as well as replacement of lab and field equipment are also likely to become necessary by the PACO.

The external evaluation teams should consist of at least three persons each; an agronomist, an institutional specialist, and an economist or agro-economist. GON members should consist of representatives from the DEPP/MP and DEP/SA/MOA. The expatriate team members should have broad experience evaluating agricultural projects in West Africa, particularly agricultural research projects. Experience in implementation of such projects is also a priority characteristic of evaluation team members.

Process evaluations should be conducted by USAID in collaboration with a representative of the DEPP/MP. The USDA or REDSO evaluation units could be requested to furnish the expatriate technician required. This technician should be an institutional specialist with a strong background in evaluation research and methods. A two person team is envisioned.

VI. Summary Analyses

A. Program of Research in Irrigation Agronomy

In the dryland sector a specialized commodity improvement approach to breeding has dominated INRAN's research strategy. The NAAR Project will promote a cropping systems approach to improving the overall productivity of irrigated crops. The timeliness of this approach is marked by the entry of INRAN's Ecological Research Department into irrigation research from its base in soil and environmental sciences.

The principal rice perimeters of the Niger River will be supported by strengthening INRAN's existing rice breeding program. Funds will be provided to enable the INRAN rice breeder to develop strengthened collaborative relations with IRRI and IITA for the exchange of germplasm, attendance at short term training courses designed to strengthen technical competence, site visits by IRRI and IITA specialists, and reinforcement of technical support staff in rice technology.

The needs of the micro-irrigation systems, call first for support to research on methods to assure the supply and distribution of water through appropriate well and pump technologies as well as research on the varietal and horticultural aspect of the dry season gardening systems. The latter activity will be receiving more attention as the project evolves. The former activity will be handled by the new irrigation pumping and water management unit to be created within DRE with the guidance of the expatriate irrigation engineer. In the first phase of NAAR, varietal and horticultural issues will be addressed primarily by providing short-term technical assistance in horticulture, long and short term training for INRAN staff in horticulture and related disciplines and by strengthening institutional relationships with institutions such as the Asian Vegetable Research and Development Center (AVRDC). The latter will be addressed by the provision of short-term technical assistance, long and short term training for INRAN staff, and by strengthening institutional relationships.

Of the four major irrigation systems types in Niger, the cropping systems approach is most applicable to the multi-cropped surface irrigated perimeters of the Ader-Doutchi-Maggia (ADM) where water is supplied by surface reservoirs and those of the Maradi regions where water is supplied by groundwater pumping.

While providing support to research related to the other systems types through the role of the breeder/coordinator, and the irrigation agronomist, and the provision of training and research support, the NAAR Project will also deliver its technical assistance to applied research addressing the needs of farmers and water managers of multi-cropped "inland" perimeters of central Niger. An irrigation agronomist and a soils agronomist specializing in irrigation will both be posted at or near the major INRAN research center at Tarna, near Maradi. These two research agronomists will initiate a program of applied research in water, soil, and crop management to address the major constraints to productivity and water economy on the ONAHA-managed perimeters of the ADM-Maradi region.

Using a multi-disciplinary team approach the irrigation agronomists will begin by studying the details of current water, soil and crop management practices in representative perimeters to identify these constraints and refine hypothetical solutions to solve them. Perimeter diagnostic work will continue over the life of the project. Concurrently, in a second step, the team will test these hypotheses in a network of irrigation research station facilities. Technologies which have proved most promising in terms of yield, economy, or ease of management will then be tested in extension managed on-farm trials to be conducted jointly by INRAN and ONAHA. On-farm testing will probably begin in year five of the present project.

Because INRAN will be starting afresh in irrigation agronomy research in the ADM-Maradi region, both human and physical resources will be furnished to INRAN to execute research programs conceived under the project and build for future research programs. NAAR funding will be used to develop both the human and physical resources necessary to carry out a vigorous program of applied irrigation research.

B. Program of Research on Water Management

Under the NAAR project, INRAN's Rural Economy Unit (DECOR) and the Irrigation Section of the Division of Ecological Research (DRE) will work closely with ONAHA's Division of Applied Research (Division Misa ad Yalzur) and the Rural Engineering Service to initiate a multi-disciplinary approach to the priority problem areas of irrigation water quantity and quality control, water application methods and water application efficiency. System and farm level efficiencies in each of these areas will be a central focus of research.

The project will develop within DECOR a "Perimeter Irrigation Diagnosis and Management" (PID&M) Unit. At the outset this unit will be charged with diagnosing the performance of the jointly managed storage and groundwater irrigation schemes. The diagnosis will concentrate on the critical water management issues and constraints to improving the economic and productive efficiency of irrigated agricultural production. The unit will then select, prescribe and test (through action research) appropriate improved (both hardware and software) water management systems for better perimeter performance. An interdisciplinary approach will be used to study and find solutions for the perimeters selected. A "bottom-up" focus will be used.

Prescribed solutions will include water allocation decision theories, hydraulic operation procedures, and recommendations for repair, maintenance and upgrading of the systems.

In addition, the PID&M Unit will carry out a set of applied research studies (both desk and field). These will be designed to provide the knowledge base necessary for developing prescriptions for improving water management on the jointly operated schemes. Insights for selecting these studies will be gained from the diagnostic activities.

The project will initiate research activities within the Irrigation Section of the DRE. These activities will address problems in "Farm Water Management and Technology" (FWM&T). This Section will be charged with micro scheme management; on-farm (field channels and application) irrigation techniques for both micro and jointly managed schemes; small scale pumping plant technologies; and mini tube and dry well construction techniques and hydrology.

A multidisciplinary field study approach will be used to identify successful indigenous and other irrigation and small water lifting techniques being used in Niger. The field studies will also diagnose the constraints to improving agricultural production at the farm/field level of jointly managed perimeters and micro schemes. The irrigation scheduling, management, pumping and application techniques which appear most successful will be analytically described and codified so that where possible they can be extended. Furthermore, field research will be carried out to improve on current practices and discover new ones.

The basic division of tasks between the two sections is: the PID&M Unit will deal with the civil, financial, and institutional issues which are specific to jointly managed perimeters; the Irrigation/FWM&T Section will deal with the agronomic, engineering, micro economic and social issues faced by the individual irrigation farmers on the perimeters as well as those who own/operate their own micro systems. The Irrigation Section will work closely with the PID&M Unit in diagnosing, solving and testing at the field irrigation level on the jointly managed perimeters. An expatriate agricultural/irrigation engineer based in the DRE will provide technical assistance to both the PID&M Unit and the Irrigation/FWM&T Section.

The purpose of these sections' activities is to find practical solutions to existing problems and to put these solutions at the disposal of those in a position to implement them. The emphasis is on synthesis, implementation, testing and referring solutions. Most work will not include discovery or invention of new knowledge or technology, but will draw upon what exists around the world and is practical for the situations encountered in Niger.

C. Cereals Research

The purpose of the NCR Project is to develop INRAN's capacity to undertake cereals research programs whose results can be effectively disseminated to farmers through existing extension and cooperative systems. NAAR will continue NCR efforts, building directly on progress made during the past five years.

1. Strengthening of Human Resources

Staff members must be increased, particularly in some of the high priority research areas. The U.S. expatriate scientists will work in their disciplines as coordinators and consultants for all crops, rather than as functionaries in a specific commodity area. The US staff will be involved in on-the-job training to help build INRAN staff capability. It will be the responsibility of each expatriate scientist to work in collaboration with each scientist in their discipline to prepare a detailed research agenda. The research agenda, complete with requested budget, will be approved by the Department Head prior to initiation of the research activity to insure the land, supplies and finances. Expatriate staff will continually interact with their INRAN colleagues to support their research, encourage, help resolve problems, but not to do their work for them. Data from each experiment will be analyzed statistically and reported scientifically in a published INRAN Annual Report. Statistically sound research will be reported to the national extension service and submitted to international journals and symposiums.

Each project leader in a given discipline will have an assigned research assistant. These research assistants will be sent, as soon as possible, to a short-term training course in their discipline at an international center. Experiment station field managers will be appointed at Tarna and Kolo and sent immediately for short-term training in Experiment Station Development at CIMMYT.

Scholarships for additional academic training will be provided to present INRAN staff members, jointly selected by INRAN and expatriate leaders, as they are replaced by returning students or newly appointed staff. Present INRAN research leaders must either be freed of heavy administrative responsibilities or a new full-time research leader appointed.

2. Strengthening of Physical Resources

Major physical facilities are located at Tarna and Kolo. Generally, they are adequate buildings and they are in good repair. However, open-air hangars for field equipment are needed at Tarna and Kolo and strategic irrigation sites (Tillaery, Kolo, Maradi and Birni N'Konni) require rehabilitation. Field equipment at most stations is adequate but in an extremely poor state of maintenance and repair. Laboratory equipment is also adequate but poorly maintained. Short-term technical assistance will be provided immediately to INRAN to:

- 1) Inventory all existing field and laboratory equipment and vehicles for the main experimental stations & sub stations;
- 2) Develop and order the spare parts required to repair the equipment;
- 3) Supervise repair of the equipment;
- 4) Develop a schedule and techniques for maintenance and service;
- 5) List additional equipment required for the new project period.

Training in mechanics and maintenance is required. Full-time mechanics will be employed at Tarna and Kolo.

Project funds will be provided to continue purchase of supplies and equipment for approved research projects.

3. Strengthening Technical Services Capabilities

Success of applied experimental research is strongly dependent on support services in soil and plant analysis, quality analysis, statistical analysis, germplasm storage and library resources. All of these services presently exist within INRAN but are at various stages of development. A summary of each service is presented in Annex C, Section II. A, B, C and D. Organization, effective management, motivation and neatness are general needs of the technical services. Project funding will be provided to purchase needed supplies, maintain equipment and support additional staff training for these technical services. Some short-term technical assistance will be provided.

4. Strengthening Capabilities in Research

Future support will build directly on progress made during the NCR Project. Much more stress will be placed on proper planning, designing and implementing of research. Expatriate staff will assist each project leader and their staff in determining research topics, setting priorities for addressing them, developing objectives, designing the experiment, establishing a procedure for evaluating progress, listing required inputs complete with budget, and insuring submission to the Department Head for approval well in advance of the sowing period. They will then assist as needed in implementation, consultation, organize interdisciplinary field visits, assure provision of needed inputs, oversee harvest, data summary and analysis and publication of the results. Meetings of all research staff will be organized to discuss results, determine which resulting technology should be transferred to cereal production and/or farming systems trials. The on-farm trials will be continued, but modification, and in some cases simplification, will be required.

D. The Research Extension Liaison Unit

Poor communication between research, extension and farmers has contributed to the paucity technically and economically viable extension recommendations which have been made available to Nigerian farmers. In addition, dissemination to farmers of available extension recommendations and technologies through the existing extension delivery services has been inadequate.

In order to address this problem, the existing Research Extension Unit (REL) of INRAN will be strengthened through provision of technical assistance, manpower training and financial support during the life of the NAARP. The purpose of the REL will be to assure that research recommendations of proven technical and agro-economic viability are made available to extension delivery and public media services.

Primary beneficiaries of REL activities will be extension workers and researchers through improvements in professional competence, efficiency, status and pride. The secondary beneficiaries will be Nigerian farmers engaged in dryland and/or irrigated agriculture thanks to the increased availability of sound agricultural recommendations and technologies.

The underlying objectives of all activities undertaken by the Unit are:

- 1) To release for extension only those recommendations which have proven to be technically and economically viable through on-farm trials and which are adapted to agro-ecological conditions of Niger;
- 2) To ensure that feedback from farmers and extension workers is used to help define research programs;
- 3) To ensure that the extension and public media services have access to information on agricultural recommendations and technologies ;
- 4) To convince extension workers and their supervisors of the value and extension worthiness of agricultural recommendations and technologies;
- 5) To ensure that the extension materials used to inform extension workers of recommendations and technologies are presented clearly and are adapted for their intended purpose.

The services with which REL will work most directly are the national extension services, located in the Direction of Agricultural Production of the Ministry of Agriculture, and the extension services of ONAMA.

Extension provided by agents of both services is plagued by inadequate numbers, training, support and supervision, and exacerbated by lack of prioritization in tasks assigned to field workers. These defects are being addressed by USAID and the Ministry of Agriculture through the extension component of the Agricultural Production Support Project (APS or PAPA). NAARP will complement the activities of the APS project by exerting greater control

over the content and quality of recommendations released for extension. Considerable emphasis will be placed on convincing the extension services of the value of recommendations, through demonstration of their performances when properly applied, and by integration of the extension services into research activities.

Specific activities undertaken by REL to achieve its objectives include the following.

1) Diagnostic reviews of recommendations released for extension and of extension materials prepared for information dissemination by INRAN or the extension services. Based on these reviews, REL will suggest action to verify the technical, economic or social viability of themes identified as needing such verification. It will also recommend revision of extension materials so that they are better adapted for use by extension workers as reference materials or training aids. In addition, it will recommend that demonstrations of certain themes be conducted to convince extension workers of their value.

2) Initiate ideas and provide technical information to the Extension services and their Documentation units for production of new or revised extension materials based on INRAN research recommendations.

3) Seek the participation of extension services and local farmers in research activities, through arranging visits to research sites and facilitating their participation in on-farm and multi-locational trials. REL will assist in negotiations with the extension services, participate in training and training evaluations and in review sessions of on-farm and multi-locational trials.

4) Formalize liaison activities between INRAN and non-INRAN researchers. This would include sharing of protocols and research results, visits among researchers and attendance of non-INRAN researchers at professional meetings held in Niger.

The unit should be staffed by 2 class A and 2 class B professionals from INRAN, assisted by 4.25 person years of technical assistance, starting at the end of project year 1. A total of twenty-six person months of training in African and national institutes will be provided for the INRAN staff.

E. Financial Analysis Summary

The NAAR project will have several obstacles to surmount in developing and approving budget plans and in expending funds. It will however, place much more emphasis on strengthening INRAN as a research management institution than did the NCR project. An objective of the project is to leave behind an institution that can plan, execute and evaluate agriculture research programs with maximum effectiveness. Toward this end, this project is providing resources for strengthening internal research and financial management and is encouraging essential administrative reform.

Recurrent Cost Situation

Data reported by INRAN to the GON for accounting purposes indicate that the proportion of INRAN's budget that goes to salaries has increased from 58% in 1978 to 70% in 1986.

However, an audit of INRAN operations in 1981 revealed over 555 million FCFA in purchases made over the 1973-81 period that had not been paid by INRAN. Most of these went to non-salary expenses.

To restore INRAN to financial health and to impose a certain financial discipline, the GON increased the recurrent budget allocation for INRAN by over 45% in 1983 but held INRAN responsible for paying its overdue bills. The sharply increased budgetary allocation has permitted INRAN to create a reserve for retiring its old debts. About 310 million of these repayments are included in reported expenditures for the period 1982-1985.

INRAN has severely restrained expenditures on research operations in order to raise a reserve fund to cover remaining bills, interest and penalties amounting to 271 million as of June 1986.

The situation at INRAN has markedly improved since 1984. The NCR and the ASDG have provided much needed operating support. Moreover, now that it has paid, or fully funded its arrears, INRAN will have another 175 million FCFA for research operations each year, provided of course, that the Government of Niger does not reduce its recurrent budget allocation. This will alleviate its operating resource constraints for the immediate future. However, new fiscal problems will arise toward the latter part of this decade, as large numbers of researchers now in training return to INRAN to begin research programs.

INRAN Staffing

Data provided in Annex H shows that the number of in-country active research staff at INRAN will grow from 30 in 1986 to 66 in 1991 as persons currently in training return to take up their posts. From 1991 to 1996 the growth rate declines to a more sustainable and supportable 5% per year, reaching 39 by 1997. Nonetheless, this growth, which is already set in motion by current and past policies and projects, will impose enormous recurrent costs on INRAN if the researchers are to work effectively.

Partly to minimize these impending recurrent cost problems and partly to continue the upgrading of INRAN's research staff, the NAARP will concentrate its training program on upgrading existing INRAN researchers. To this end, it will seek to build a strong Masters level cadre that can assume sole responsibility for Niger's National Research Program. During this Phase, the project will provide only enough Ph.D. and 3me Cycle training to replenish the attrition expected from those being trained to this level by the NCRP. From 1993 onward, INRAN will have sufficient Ingénieurs Agronomes and Masters level staff that additional Ph.D. training should be possible without crippling ongoing research programs. Any training done at that time would help restrain demand for research operating expenses as researchers shift to an inactive status while in training.

The most important issue with respect to recurrent costs is the number of researchers assigned to INRAN. Each researcher requires a supporting staff averaging one B level technician and 1 C level technician. In addition, they need transportation, secretarial support, research materials, auxiliary staff and temporary labor to support their research activities. These costs swamp the modest recurrent cost effects of the limited increases in base salary brought on by the training program.

Programming the training as proposed in the NAARP will save INRAN over 540 million FCFA in personnel costs over the first 10 years following project initiation. This flow has a present value of over 250 million FCFA using a 12% discount rate. The additional savings that will occur as a result of a reduced need for operational resources to carry out the research will raise the total net present value of the savings to 500 million FCFA or \$1.5 million at today's exchange rate (325 FCFA/\$ US). The cost of increased base salaries for the researchers who are trained will amount to an insignificant one million FCFA more than if training is provided. In effect, the savings in recurrent costs will completely pay for the cost of the training.

The analysis provided in Annex H demonstrates the need for recurrent cost financing for INRAN over the 1987-1997 period, while the Institute adjusts to the tremendous increase in research personnel currently in training. Over the period of the NAARP, virtually all of these trainees will return to INRAN to begin research programs. The growth in staffing that will occur from 1990 onward will require increases in Government of Niger recurrent financing for INRAN, as well as continued donor support, if those researchers are to operate effectively. By the end of Phase II of the NAARP, Niger will have had ample opportunity to bring resources and manpower into better balance. At that time the need for donor support for operating costs will arise only from new programs beyond those now anticipated under the NAARP.

Summary

Most of the financing provided by the project covers expenses that will not continue after the project ends. Technical assistance will provide a temporary resource for strengthening junior researchers and for beginning research programs in selected new areas pending the return of Nigerians from

training. Both the junior researchers and the future trainees are already either on the INRAN payroll, or programmed to go on it whether or not there is a NAARP. Thus, all technical assistance and project administration costs do not effect INRAN's recurrent budget after the project.

Less than half of the 2.4 million dollars provided for training will finance degree training. The bulk of the training will be non-degree and short-term. This will serve to keep salary increases to a minimum while strengthening the supporting staff essential for effective research. The total increase in salaries due to the project's training program will amount to about one million FCFA per year. This compares with INRAN's FY 1986 expenditures on personnel amounting to 300 million FCFA (See Annex H Section 4.3.).

Of the commodities provided by the project, about half of the four wheel drive vehicles will be used by the technical assistants and half will replace INRAN's existing fleet. They should actually reduce INRAN's recurrent costs by reducing maintenance and repair expenses on the older vehicles.

The rising level of recurrent expenditures funded by the project represents, in part, a drop from NCRP levels of funding by the initial years. It also provides a cushion to give the Government of Niger time to adjust to the tremendous expansion in the country's research capacity that is about to take place. By the end of Phase I of the NAARP, such funding will still be less than current recurrent cost funding under the NCR Project. Moreover, the Government of Niger be able to provide real hope that it can fully fund INRAN's recurrent budget at effective levels by the end of the second phase of the Niger Applied Agriculture Research Project in 1997.

The following are two things the GON must do now to help address the issue of INRAN's recurrent costs during the life of NAARP.

1) The GON must make a commitment to a rigid policy of fully funding research programs and keeping the number of researchers and research programs in line with available recurrent financing. Under no circumstances should the ratio of non-personnel expenses to personnel expenses in the official recurrent budget fall below the .75 level included in the FY1987 budget. Moreover, the GON should commit itself to achieving a ratio of 1.0 by the end of the Phase II of the NAARP.

2) The GON must reduce the programming of university students for assignment to INRAN to no more than four per year over the 1987-1990 period. This is about half the number currently being assigned each year. The timing should be such that this cutback reduces the number of researchers on the INRAN payroll from 34 in 1997 to 72.

In return for these commitments from the GON, The Project will provide shortfall recurrent funding over the life of the NAARP. This will amount to 321 thousand Dollars in the first year of the project, rising to 541 thousand Dollars in the last (other cost line item in the budget).

This commitment to provide recurrent costs may seem excessive to persons not familiar with the need to build a critical mass of researchers as quickly as possible, in order to realize the payoff from research. This necessarily requires concomitant expenditures for recurrent costs to allow the researchers to operate effectively. There is little possibility of Niger absorbing these costs in the short run. Yet, with the biggest part of a critical mass of researchers now in training, one can look to the future with optimism. The key will be to begin now taking measures to reduce the growth in the number of researchers that will otherwise occur beyond 1992, and to reduce the number of research programs, in order to make it possible for remaining researchers to do effective research. By 1997, if these kinds of problems are faced now, Niger will have a large enough research cadre to be able to conduct effective research on most critical problems facing the country's agriculture.

F. Economic Analysis Summary

It is generally accepted that a strong national agricultural research system, integrated with the rural development program, oriented towards identifying and seeking solutions to the needs of the farmer, and the subsequent adoption of these prescriptions can make a major contribution in improving the productivity and welfare of the rural population. While research results do not, in general, have a market value, research is a recognized area of necessary investment by governments and donors.

Most of the fairly rigorous analyses of the returns to research so often cited in the literature relate to crops which have a demonstrated high yield potential, in instances where other production inputs are not limiting. Moreover, such crops often cover millions of acres of relatively homogeneous cropland. In such cases, research breakthroughs have immediate applicability to a large production base that can amortize the costs quickly. None of these situations prevail in Niger. As a consequence, the economic analysis provided as Annex I has attempted to critically review the question of return to research, in order to provide a clearer view of the research environment in Niger.

It has been noted that the two greatest constraints to crop production are the level of soil fertility and low and irregular rainfall. These two factors are related and severely constrain the range of technological choices which researchers have for developing better crop varieties. Wind blast, the scarcity and high cost of inputs such as fertilizer, pesticides and herbicides, and public policies that impede the ability of markets to move surplus production all operate to reinforce the generally inhospitable environment for agricultural production in Niger.

Within relatively narrow limits, research should be able to identify more drought tolerant varieties of key crops. But such varieties often yield less than existing varieties under more favorable growing conditions. Indeed, this is the rationale for conducting research on shorter season varieties or other varieties more able to resist drought. But researchers will probably not find varieties that produce two tons of grain per hectare on 200 millimeters of rainfall with few soil nutrients. Even under more favorable circumstances than these, progress will be slow where researchers must push the limits of the physiological structure of plants as they must in Niger.

Little progress should be expected from breeding programs to increase yields for the drier arable regions, since existing local varieties may already be optimally suited by natural selection for survival in extreme years but having sacrificed the genetic potential to maximize production in good years. Breeding programs in Niger currently emphasize the selection and purification of local varieties and their return to their zone of adaptation, but little increase in yield has been achieved to date.

Cultural practices are a different story. In most cases the same practice can benefit all varieties of a particular crop. Although adoption rates may be slower than for improved varieties for reasons explained below, ultimate adoption levels should be higher. This presumes an effective extension capability for showing farmers how to properly utilize the new technology and for demonstrating its benefits.

One of the strengths of the existing Niger Cereals Research Project is the on-farm trials program. Though not intended as such, this program demonstrates that when those persons responsible for explaining to farmers how to apply a given technology are properly trained and motivated, adoption of improved technologies can be surprisingly swift, not awaiting the analysis of the results of the trial. Some of the more successful trials concern techniques that have been pushed by researchers for years. Yet, only with the advent of the kind of training and discipline necessary to conduct valid on-farm trials have these innovations caught on with farmers. The challenge to the NAAR Project will be to extend this program over a much wider area at a reduced cost and to take these lessons to assist Niger in building an effective extension program.

The eventual economic returns to the NAARP will be highly dependent on the extent to which complementary programs and policy changes occur, since they will have a profound effect on diffusion and adoption rates. The project analysis assumes that most essential improvements will take place over the life of the project, i.e., by the end of NAAR Phase I the institutional structure necessary to capitalize on the project's outputs will be in place. Without the development of such improvement, there is little chance for success.

Annex I summarizes the economic benefits of the various potential technologies that NAAR is likely to develop. These benefits grow slowly, primarily because of the amount of time required to perfect and test promising technologies before extending them to farmers. Once extension begins, the small number of extension agents and the vast areas to be covered operate to retard the speed of adoption. Even with 50-100% increases during the first few years, the small base grows to a measurable impact only after 3-4 years of successful extension efforts. By the 15th year following introduction to farmers, the project will be generating approximately 500 million FCFA in benefits net of farm level costs per year. This rises to 750 million FCFA by year 20 following introduction. Returns essentially plateau at this level.

Almost 73% of total benefits arise from the two technologies aimed at rainfed farming--use of row seeders and diffusion of improved varieties. The relatively small contribution of the irrigated subsector arises from its small size relative to the rainfed sector. The second phase of NAAR should do more for this subsector since, unlike the first, it will devote attention to agronomic issues in irrigated perimeters. The first phase will concentrate on gathering a better understanding of agronomically related problems in the perimeters as a basis for preparing a sound second phase. Its focus on improved water management reflects the general recognition that, whatever other problems plague the perimeters, water management is certainly one that deserves immediate attention.

The economic analysis of the project has identified a range of IRR's varying between 2.4% and 10.5%. The lowest rate of return comes from the analysis of costs and benefits along the lines already discussed in this annex. The 2.4% rate of return reflects what are described in Annex I as a moderately conservative set of assumptions, given much of the recent history of agricultural development in West Africa.

Stretching the benefit period out by 10 years causes the IRR to increase from 2.4% to 4.5%. Reducing the cost of technical assistance and eliminating project administration increase the return to 6.2%. Doubling rainfed adoption rates from a maximum of 12.5% by year 20 following introduction, to 25% over the same period, increases the IRR to 5.1%. Combining the higher adoption rate with the removal of technical assistance and related costs raises the rate of return to 9.1%. And finally, lengthening the benefit period by ten years on top of this gives an internal rate of return of 10.5%.

Under all these assumptions the project is marginal from the point of view of direct returns on investment. This is not surprising in light of the research environment in Niger and constraints to adoption of proven research recommendations. What these returns say about appropriate investment policy is another matter, however.

Niger does not enjoy a very optimistic horizon with respect to the agricultural sector. Natural constraints severely limit what government can do to improve the sector's productivity. Yet millions of people will continue to make their livelihoods in agriculture. Improving the availability of more productive technologies and the associated inputs is one of the few ways the GON can provide productive solutions to their problems. The alternative is to continue to rely on external aid to feed the country's urban and rural populations in periods of stress.

The returns to this project are not cast in iron. Most importantly, the analysis is indicative only. We can only speculate what researchers will concentrate on and what they will find. The more we allow our imaginations to run free, the easier it is to find sufficient benefits to justify the project. Secondly, USAID can do a great deal to increase the returns to this project by acting on the factors that influence the assumptions used in the analysis. The most dramatic would be to increase the attention it is giving to extension, since the effectiveness of extension is the single most

important factor influencing adoption rates under the project. Although the analysis already presumes considerable improvement in extension services, a twenty year adoption period for the improved varieties of sorghum and millet is no great accomplishment. The more this can be shortened, the higher will be the returns to the project.

It will take more than a change in assumptions to reduce this adoption period or to increase the overall adoption rates. It will require donors to search for, and to test new approaches to extension. It will require an infusion of incentives and discipline into whatever system works. Indeed, incentives and discipline may be all that is missing in the present system. The bottom line, however, is that placing more attention on those aspects of the innovation delivery system that fall outside of the domain of research, may do more to increase returns for the project than anything that can be done from within. From this perspective, the marginal economic rate of return of the project could end up being a greater stimulus to agricultural development in Niger than a project demonstrating returns twice as high.

G. Institutional Analysis

The executing agency for NAAR is INRAN, with ONAHA and Genie Rural as support agencies.

Since this is essentially an institution building project, institutional analysis is contained throughout this document and especially in Annex A. The institutional constraints to agricultural research and production in Niger are explained in detail in the Annex, with descriptions of the institutions receiving assistance and their short comings, and the improvements that will result from the project.

1. Administrative Structures

Nigerien administrative structures have in the past proven to be relatively ineffective in managing research and delivering extension themes, including those agencies whose primary mission is research and/or extension. Whether within the Ministries of Agriculture or Plan, at INRAN or ONAHA, researchers have often found it difficult to mobilize logistical support and personnel within optimal research time frames. Administrative distrust of research, inertia, and unnecessary complicated management procedures have sometimes compromised even the best research agendas.

Neither ONAHA, Genie Rural, nor the UNC presently have the capability to set in motion or sustain a program of applied agricultural research on irrigated systems, and the institutional mechanisms by which such programs might be organized are equally lacking. ONAHA for its part has attempted to

initiate limited applied research activities to answer its own needs and has responded well to research activities conducted under the auspices of the WMSII program. Cooperatives too have been able to vocalize their felt needs.

INRAN however has demonstrated a capability to conduct dryland research, thanks in large part to the sustained commitment of USAID to developing its human resources, infrastructure and the institutional dialogue necessary to bring about a more dynamic system of communication between research, extension and the farmer.

To summarize, the following general points can be made about Nigerian administrative structures.:

-Personnel Relations

Norms about hiring and firing are partially enforced. Recruitment may occur through personal influence, although formal recruitment procedures such as competitive examinations are now commonly employed. Security of employment is generally accepted. A monolithic conception of authority prevails which promotes a reluctance towards openly voicing disagreements.

The occupational hierarchy reinforces status distinctions observed in the larger society. In place of open competitive channels for advancement, great stress is placed on formal qualifications.

Evaluation and promotion within individual services are governed by rules laid down by the civil service which apply to all agents across the board. There is no distinction made between researchers and administrators, or line or staff positions in this regard. Agents are graded by degree of educational attainment and years of service. "A" level personnel have the greatest educational attainment for example. Within each grade, there are levels and scales. Advancements between levels depends upon years of service and the results of yearly performance evaluations. As with most large bureaucracies, the best hope for advancement is through dogged maintenance of the status quo; initiative is discouraged. A promotional change in grade is influenced above all by educational attainment. Clients of the government services are seldom requested to provide input in the evaluation of agents.

-Planning

There is a flexible attitude towards planning and scheduling. Reluctance to execute policy, as scheduled, is reinforced in those cases where there is uncertainty about jurisdiction. Lack of position descriptions have constrained attempts to identify areas of authority and responsibility.

-Decisionmaking

Expertise in modern organizational theory and organizational behavior is lacking; institutional memory is virtually nil due to the high frequency of turn-over in personnel. Reassignment every two to three years is common with

government directives limiting time in position to a five year maximum. Decision-making techniques are highly personalized. Consequently, effective and dynamic management is weakly institutionalized.

-Control

The Ministry of Agriculture, INRAN and ONAHA tend to be divided into small units controlled by individual top managers. Distrust of ones associates and subordinates is common, and many managers routinely employ protective strategies towards subordinate staff. Downward communication is facilitated and expected, while upward and lateral communications, especially between administrative units, are under developed. Formal channels of communication are completely clogged with routine reports, many of which bear little relation to performance or organizational goals.

The predominance of vertical hierarchical linkages and communications channels within individual rural development services, over horizontal, integrative linkages between services, often results in patterns of routine program implementation in which minimal information is shared by service representatives in the field. Systematic exchange of information is limited to formal, institutionalized encounters between services.

-Materials Management

Resources destined for specific purposes are frequently diverted to meet urgent needs in other sectors. It is impossible to count upon the availability of special equipment, let alone vehicles. Maintenance of existing materials is poor because the prime effort is directed towards acquiring new capital, and mechanisms for allocating responsibility for material are weakly developed.

2. Suitability of INRAN as the Executing Agency for NAAR

INRAN is a young institution, having been created in 1975 to succeed IRAT (French Colonial Institute for Tropical Agronomy Research).

As the National Institution responsible for the conduct of research throughout Niger, INRAN has a modest record of success, for which it can be proud. It has conducted national germplasm inventories, and developed a number of improved varieties of dryland crops. It has produced purified strains of local varieties of some of these, and has purified rice seed for multiplication. It has developed a series of technical recommendations both for cereals and garden crops and has translated some of these into national languages. INRAN carries out station, in field and interactive on-farm trials in many areas. INRAN has carried out its own soils analyses under contract to funding agencies and ONAHA, and a beginning has been made in the areas of cereals quality analyses, entomology, plant tissue analysis, and pathology.

A conclusion of the Institutional Analysis of INRAN performed by Painter (July 1986) for the NCR project, is that "We are of the opinion that INRAN has the capability to implement anticipated applied research programs related to irrigated production in addition to those currently carried out by the Institute in the area of rainfed agriculture".

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The project will need to develop management and implementation strategies to overcome the constraints to effective implementation discussed in detail in Annex A, and the text of the project paper. While these are spelled out in the section on implementation arrangements, the following general principles should be followed:

1. Agreements should be formalized;
2. Performance incentives must accompany innovations in program implementation;
3. Efforts to strengthen horizontal linkages must build in clear benefits to the contracting parties;
4. Conscious efforts must be devoted to ensuring information transfer and exchange;
5. All relevant agencies must be involved in planning and evaluating research programs if results are to be accepted;
6. Programs must be developed which accommodate inevitable slippages between planning and execution;
7. Institutionalization of management systems will require formalization of responsibilities and a constant effort to monitor and reinforce innovations

-Staff Levels and Distribution

INRAN currently employs 31 Nigerian researchers (A1 and A2 cadre), 44 technicians at the B through D levels (with education levels ranging from junior high school to three or four years of technical training in agriculture) and 424 support staff composed of secretarial and clerical staff, and skilled and semi-skilled laborers. Skill levels of lower level personnel (B through D) and support staff are modest. Staff levels are not yet sufficient to carry out research in all areas of the Institute's responsibility.

The heavy emphasis given by INRAN to programs in rainfed agriculture is apparent in the distribution of researchers and technicians. The Division of Agronomic Research (DRA) accounts for half of all the Institute's A and B level personnel. The rest are distributed across all other divisions.

Personnel are concentrated in Niamey and at the Kolo and Tarna research stations. Staff levels are most adequate in the area of drylands cereals selection, production systems, and crop protection. These activities are localized at the Tarna and Kolo stations. The Rural Economy Division (DECOR), situated primarily in Niamey, is quite effective in running its program of on-farm research.

The Division of Ecological Research (DRE) is the division most concerned with irrigated agriculture. INRAN currently has one newly trained hydrologist as head of the water economy section and one rice breeder. Within the DRE there is an irrigation studies group charged with the development and

monitoring of irrigation research activities. Initiation of proposed project irrigation research activities will require more personnel than are currently available to the concerned divisions. Some forty INRAN personnel are now in university programs. Of those returning to the Institute in 1988, perhaps two soil scientists and one agronomist will be assigned to irrigation research. An agricultural/irrigation engineer is essential; this position could be filled through secondment of a Rural Engineering Service personnel to INRAN while an INRAN participant is in training. DECOR economists should be able to devote part time to perimeter diagnostic activities. If irrigation activities begin slowly as planned, these staff levels will be sufficient to begin activities. By the fourth year of the project, NAAR participants should have returned to strengthen the program.

The Research Extension Unit is responsible for the coordination of research activities and the creation of a tripartite dialogue between itself, researchers and extension services. With only one non-specialist person currently assigned to the unit, it is inadequately staffed (and under funded). Development of this unit is a key project objective and essential to improving INRAN's impact upon Nigerian farming.

-Planning and Management

NCR made modest progress in strengthening INRAN's capacity to administer and manage its research programs and resources. However, the NAAR project still sees INRAN's managerial capabilities as its major institutional weakness, and has made strengthening of INRAN's capacity to design, administer, manage and carry out agricultural research as a main objective of the project. This is emphasized throughout the PP, and elaborated on in great detail in the "Project Description" section.

All members of the technical assistance team will collaborate in reinforcing improvement in general management, including planning, personnel management, financial management, and process evaluation. One of their major responsibilities (especially the team leader) will be to actively assist INRAN in implementing the management recommendations expected from the ISNAR studies. As a result and/or in addition to these studies, the team will assist in developing a long term institutional development plan through the year 2000, including program priorities, objectives, personnel and budgetary requirements for each of the components of the plan. To accompany the institutional development plan, an explicit organizational plan will be developed.

As stated earlier, this is an institutional building project. As such, considerable emphasis is placed on strengthening management.

3. Support Agencies

-Rural Engineering (Genie Rural)

Genie Rurale is charged with the conception and execution of small and large irrigation projects. The service has executed any number of school and village garden projects, and has worked effectively with INRAN-Agadez in testing new irrigation techniques. Many agents have diplomas from a regional engineering school in Burkina. Relations between Genie Rural and ONAHA are good.

Genie Rurale's role in irrigation is presently limited by a lack of resources and limited numbers of qualified personnel. However, the rural engineering training program at IPDR provides its graduates with the technical elements necessary to conceive and execute small scale irrigation infrastructure. Graduates from this program will soon begin to be placed at Genie Rurale, and will be a key point of articulation with the Research-Extension Unit of INRAN.

Although within Genie Rural many seem to have the technical qualification to design and execute irrigation systems, only a limited effort has been made to extend or to experiment with available technical innovations in irrigation. There is ample scope for the intervention of skilled expatriate technical assistance to work with Genie Rural and INRAN to develop and test innovative technologies of water extraction and distribution, incorporating both traditional and modern approaches.

Genie Rural will be a source of cadre for INRAN. Students with engineering training will be detached to INRAN, and sent for further training in the U.S. to the masters level. Those already holding an Ms. will be sent for further supplementary training and/or serve as counterparts to engineers serving in the irrigation research units to be created within INRAN.

-ONAHA

ONAHA, created in 1979, manages and maintains irrigation infrastructure and provides training and extension services to farmers. ONAHA manages perimeters in which the state, in cooperation with the donors, is the major investor.

National authorities tend to see ONAHA's role as primarily technical. Perimeter personnel, especially on smaller perimeters, find themselves called upon to play a wide range of coordination, training and management roles which they are often poorly prepared to carry out.

The role of ONAHA's Division of Infrastructure overlaps with the functions generally attributed to the service of Genie Rural and the Ministry of Agriculture. As part of its on-going policy dialogue with the Ministry of Agriculture and ONAHA, USAID will encourage the trend in direction of giving Genie Rural responsibility for the execution of projects entailing indirect state investment, i.e. the small scale well and irrigation projects, leaving ONAHA with the overall responsibility for projects entailing direct GOV investment, i.e. the perimeters.

The Division of "Mise en Valeur" and of "Infrastructures" are the key contact points for INRAN within the national directorate of ONAHA. The latter contains a monitoring and evaluation unit which has also been the division which has coordinated donor-funded applied research and extension activities within ONAHA. As the division charged with developing and monitoring perimeter production systems, it is a key focus for the production systems research component of the NAAR. Perimeter specific research protocols will be designed cooperatively by INRAN's Research/Extension Liaison Unit and ONAHA's Applied Research Unit.

The Director General of ONAHA indicates that he would welcome the opportunity to involve some of its agents in long term training in conjunction with that received by INRAN cadre. The project will explore the opportunity to develop improved collaboration between the two institutions by means of complementary and overlapping training in U.S. and this country. The WMSII training program in Morocco might provide one mechanism for instigating joint short-term training for technicians from INRAN and ONAHA.

H. Social Soundness Analysis

The Niger Cereals Research Project is designed as an institution-building project intended to strengthen INRAN's ability to undertake cereals research programs responsive to small farmers circumstances. Consequently, it is envisioned that with the achievement of the above, contributions will be made toward the attainment of food self-reliance in Niger and the improvement of the rural standard of living.

The anticipated beneficiaries of the project include; (1) INRAN's professional and technical staff, and recipients of the training that will be made available through this project; and (2) the Nigerian farmers who are the ultimate beneficiaries of the improved research efforts of INRAN. Indirectly, the Nigerian urban consumers will benefit from increased food supplies. Likewise, other institutions and projects involved in agriculture and/or users of INRAN's research output will also be affected.

If INRAN is to meaningfully achieve its goal of contributing to attainment of food self-reliance in Niger and to the improvement of the rural standard of living, it cannot ignore the critical role which women play in food production. A more thorough and local-specific understanding of women's role in the farming systems must be gained, including a better knowledge of the constraints that women face as farmers. Under this project, sex and age-disaggregated data will be gathered through the farming systems survey and included in the technology packages developed by INRAN.

The NAAR project will build on NCR progress to date. An indepth review of the progress indicates that what is needed in the framework of the Niger Applied Agriculture Research Project is to inject more diversity into INRAN's farming systems research program and into the extension recommendations which result from it. This can best be accomplished by installation of an information loop between farmers and researchers through a reinforced program of on-farm research. However, the notion that analysis of logic of peasant production systems could be a positive input in to research is a novel one, and one that will have to be reinforced by the social scientists and their natural science colleagues working within the framework of NAAR.

Niger's current and planned irrigated perimeters and dry season gardening sites touch virtually all of the main ethnic groups in the country, and include a variety of imported and indigenous water management systems and cropping techniques. Developing any unified program of applied irrigation research thus seems not only wrong but doomed from the start as well. A more successful approach will be to adopt a decentralized program specified to the needs of different "type" sites. Thus extension of a modified program of on-farm research such as that developed by DECOR, and devoted to identifying "types" sites, recommendation domains and researchable solutions to local problems seems warranted.

Among the critical socio-economic issues identified by previous research which have impinged upon the adoption of agronomic themes and the success of irrigated perimeters are land tenure, ethnic complexity, local political relationships, labor scheduling, including the division of labor by gender, household economic strategies, access to markets, and access to inputs including credit. These are the major socio-economic variables which need to be addressed in the design and development of new farm research programs for the study of both dryland and irrigated agriculture systems, and in designing extension recommendations.

The social analysis in Annex 3, reviews the more important issues concerned with developing INRAN's capability to function as a research institution.

ethnicity

ethnic variables enter into the agronomic picture at three levels:

1. Experiential;
2. Internal social characteristics;
3. Ethnic boundary maintenance.

ethnic groups in Niger vary in their degree of commitment to and interest in agriculture. At one extreme are nomadic pastoralists, whose commitment to agriculture as a livelihood is tenuous.

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At the other end of the continuum, are ethnic groups who have extensive experience with both dryland and irrigated agricultural production, and also have well-defined preferences in terms of crops grown and crops consumed, such as the Wogo river people, the Zarma in the "Dallol" system, the Aderawa Hausa, and the Manga of Diffa among others.

The very richness of their experience sometimes makes it difficult to introduce new crops or techniques to these groups, especially given the weak comparative performance of many modern methods and the low level of technical expertise of extension agents. However, such people should be used as a resource in developing the research agenda for irrigated agriculture and for extending time-tested methods into areas with untapped irrigation resources.

The structure of ethnic groups also plays a role in agricultural research and extension. The Zarma have a legitimate reputation as highly independent farmers and, when it comes to land tenure, for litigiousness. These characteristics complicate development of irrigation land, since this usually entails both modification of land tenure arrangements and acceptance of more collective work habits. Such behavior poses special problems for extension since resources and information are rarely pooled above the household level.

Conflict between pastoralists and agriculturalists over scarce pasture/garden land near watering points is another unresolved problem. Competition for resources will inhibit investment in unproven horticultural practices and well development. In this context, it would be worth determining whether pasturing, fodder production, vegetable gardening, or some combination of these strategies makes the "better" economic and socially sound use of these lands.

There are groups, though, with a certain tradition of ethnic homogeneity, without a warrior tradition, and who are secure in their land tenure arrangements. These groups are often easier to work with in developing new agricultural practices than those groups which lack these characteristics.

Land Tenure

Inter-ethnic land tenure relationships are an important factor in determining the success of extending new irrigation techniques.

Land Tenure and land use patterns are one of the fundamental factors which enter into production decisions on family farms in Niger.

Land tenure is ultimately vested in the state, but farmers enjoy use rights of virtually indefinite duration on dryland parcels. Supposing that they obey the rules set down by ONAHA and/or the local cooperatives for their exploitation, tenure on irrigated parcels is also of indefinite duration. Cooperatives have the right to allocate empty parcels, but in practice, they try to respect the wishes of deceased parcel holders, and of neighboring parcel holders as far as new allocations are concerned.

When the state appropriates land for perimeter construction, installation of research plots, or training centers, etc., the real fragility of peasant tenure is made apparant to all. It is these incidents that stick in the memory. This situation discourages farmers from making capital improvements on lands in which the state exerts outright control, or displays an interest.

On "contre-saison", or dry-season gardening sites, land disputes have arisen where the government services have intervened to improve infrastructure. In these areas even careful sociological surveys may not preclude future disputes.

It will be more difficult to introduce productive innovation in areas where land tenure is a problem, than in areas and on perimeters where land tenure relations have been worked out. It may well be that agronomic research cannot mitigate tenure-related constraints on production, but to avoid falsely compromising their research, scientists will need to build recognition of these factors into their on-farm research protocols and extension recommendations.

Economic Strategies

In considering the economic benefits of irrigated rice production, everything depends upon the other resources available to the household. Where floating rice or millet production is possible or when commerce is an important activity as at Konni, earnings from irrigated agriculture sometimes provide a lower return to labor than these activities.

In transforming proven research results into extension recommendations, calculations will need to be developed which take into consideration not only the value of recommendations for increased productivity of agriculture endeavors, but also the opportunity costs related to other economic activities. Cost benefit analyses must relate these opportunity costs to the increased labor or input requirements imposed on farmers by the recommend practices.

Another factor which has been identified is the fact that returns to labor per day and/or per unit of household labor employed are in some cases more favorable for dryland than irrigated crops. The underlying problems here include overall poor use of water resources with a consequent increase in charges, and poor performance of the degraded or inappropriate crops or crop varieties used on some perimeters.

These facts have been contested however, and it is clear that the nature of the impact of irrigated perimeter development on household economic well-being remains an unresolved issue.

Dry season gardening on micro-irrigation schemes is a crucial part of household economic strategies in many areas. However, the radical increase in output due to the new impetus given these crops has had a negative effect on some producers due to market price declines. Monopsonistic market conditions, and limited storage technologies depress farm gate prices for dry season onion in the Maggia region for example. Farmer recognition of the effect on prices of distance to market, competition with Nigerian produce, and problems associated with preservation and transportation may constrain intensified production in areas as diverse as Agadez (potatoes), the Dallos (sugar cane and sweet potatoes), and the Maggia (tomatoes). Lack of markets definitely limits the potential of wheat production, and may be a constraint to the development of innovative oil and cash crops like sesame, sunflower, and soy. Lifting of such constraints will require a conjoint agronomic, sociological and agro-economic research and extension effort.

Labor Scheduling

Labor scheduling problems at periods of peak agricultural activity are severe everywhere in Niger. The overlap between planting and first weeding on rainfed parcels, which is one of the critical bottlenecks, becomes especially severe when the rains fall homogeneously over a large area. On the rice perimeters, where transplanting may conflict with seeding and weeding of rainfed parcels, the problems are magnified. Labor scheduling problems are less severe on the small scale-gardening sites which are exploited mainly in the agriculturally slack dry season. Here the labor scheduling problems are related to timely delivery of water over a given surface from traditional or cement wells with limited recharge. There is no absolute shortage of household labor in most cases, but most recent research has shown that recourse to paid labor to mitigate periodic shortages is very common. Research devoted to identifying major bottlenecks in particular regions, and identifying labor saving cultural practices or irrigation technique should pay off in increased productivity.

On the new "contre-saison" sites, it seems the expansion of the dry season gardening most often represents a mere intensification of prior practices through improved access to technology. Hence, there is less of a labor scheduling problem. For women however, their interest in gardening is constrained by their duty to perform other daily household chores before they can engage in gardening.

Political Issues

The stated objective of the SOCIETE DE DEVELOPPEMENT is to elicit the voluntary and active participation of the population in national development activities, and it is ostensibly through this organization that many of the dry season gardening sites are to be initiated and executed.

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The Société de Développement is however, very young. Among the general populace and cadre alike, there is considerable uncertainty about its roles and prerogatives, and evident reticence to take much initiative within this new institutional framework. The risk of its becoming yet another directive bureaucratic agency are considerable: local CVD and CSRD positions tend to be manned by retired fonctionnaires, "traditional" authorities, wealthy merchants, and the like, who threaten to stifle the popular voice. The dynamism of the various organs of the Société de Développement remains to be determined in particular contexts.

Applied research programs developed through NAAR, should, however attempt to work with these bodies to strengthen their popular content and decision-making ability, while at the same time seek to determine the impact of local political structures upon the agronomic and agro-economic performance of irrigated sites.

Arrangements for inter-institutional cooperation are few, and cadre have little motivation to build inter-institutional linkages. The only existing structure of inter-institutional adjudication is the administrative authority whose interference (being unpredictable) in local matters, cadres, customary authorities, the cooperative officers, and farmers seek to avoid.

In general, conflicts occur when the goals of interested parties in the perimeters or sites conflict, or when the operation of constraints on one group threatens the realization of goals held by other groups. Conflict can be avoided by careful attention to resource allocation, economic returns, and respect for local systems of authority and decision-making. Site specific on-farm research should seek to clarify and find solutions for these problems, as the result of the absence of inter-institutional linkages and litigation resolution mechanisms can have unpredictable impact on agronomic practices and even with the best programs of applied research and extension.

VII. CONDITIONS AND COVENANTS

A. Conditions Precedent

Prior to any disbursement, or the issuance of any commitment documents under the project, the Grantee shall, except as the parties may otherwise agree in writing, furnish to A.I.D., in form and substance satisfactory to A.I.D. a statement of the names and titles, together with specimen signatures, of the Nigerian Project Director and Assistant Project Director, including a statement that these individuals have been assigned and delegated all necessary authorities required to implement the project, and that the Assistant Project Director has been delegated full implementation authority in the absence of the Project Director.

2) Prior to the disbursement, or the issuance of any commitment documents pursuant to which disbursement of any local currency will be made available under the "Other Costs" line item of the Project Budget contained in Annex I of the Project Agreement, the GON shall furnish to A.I.D. in form and substance satisfactory to A.I.D.

(i) evidence that the Ministry of Finance has agreed that the value-added tax (TVA) will not be applicable to any project local currency expenditures, or evidence that any such tax or surcharge incurred on any project expenditure will be paid or reimbursed to the project by the GON from a fund specially established for that purpose as provided in Standard Provision B.4 of Annex 2 to the Project Agreement;

(ii) evidence of nomination by the Ministry of Finance of petty cash accountants for each department and research station of INRAN; and

(iii) evidence that host country counterpart positions have been formally designated for each expatriate technical assistance position funded under the Project;

B. Covenants

1. The GON agrees to stabilize INRAN's annual recurrent budget for FY 1983 at the same levels as FY 1982, and in subsequent years to maintain at least the current ratio of support costs to personnel costs.

2. The GON covenants to furnish sufficient financial and human resources necessary for the effective and permanent functioning of INRAN during the life of the project. Assignments of personnel will be for a period of no less than three years.

3. The GON agrees to make available qualified candidates for long-term academic and technical training in the U.S. and third countries, and agrees to ensure that these persons subsequently are assigned to appropriate positions within their parent institutions (or other suitable positions as mutually agreed upon with the Ministry of Agriculture) for a period equal to at least twice the period of training.

4. The GON agrees to participate actively in mid-project and end-of-project evaluations (years 2 1/2 and 5 of the project) as well as process evaluation (years 1 and 3 1/2 of the project). As these evaluations will recommend future levels of A.I.D. support to INRAN, the expected level of GON support to INRAN will have to be ascertained. The GON covenants to make this information available in a timely manner during the evaluations.

5. The GON agrees the programming of university students for assignment to INRAN will be reduced to no more than four per year for each year of the project.

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Project Title & Number: Niger APPLIED AGRICULTURAL RESEARCH PROJECT (683-0256)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
A. Program or Sector Goal	A. Measures of Goal Achievement	A. Goal	A. Goal
To increase agricultural production and diversify sources of rural income.	Increased production of principal rainfed and irrigated crops; increase in quantity and variety of crops marketed; reduced seasonal migration; improved nutrition.	<ol style="list-style-type: none"> 1. Production data 2. Market price and volume data 3. Positive balance of trade in basic food items 	<ol style="list-style-type: none"> 1. CON commitment to achieve food self-sufficiency continues 2. Ecological conditions do not deteriorate dramatically 3. Pricing policies and marketing systems do not discourage production
B. Project Purpose	B. Conditions that will indicate that purpose has been achieved: End of Project Status	B. Purpose	B. Purpose
To help the National Agronomic Research Institute of Niger (INRAN) to institutionalize a system of applied agronomic research characterized by strong functional linkages to extension.	<ol style="list-style-type: none"> 1. Multi-disciplinary team research programs on principal rainfed and irrigated crops designed, directed and conducted by national researchers on the basis of refined long-range research, staffing and training plans. Joint research activities conducted on the basis of memoranda of understanding between INRAN, Agricultural Extension Services, ONAHA, Rural Engineering and farmers. 	<ol style="list-style-type: none"> 1. INRAN, ONAHA, and Ministry of Agriculture reports and records. 2. Research publications 3. Extension publications 4. Contractor reports 5. On-site inspections 6. Evaluations 	<ol style="list-style-type: none"> 1. INRAN budget levels do not drop 2. INRAN and extension services remain committed to development of solutions to production constraints faced by small farmers 3. Administrators, managers and researchers cooperate to improve resource management and

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**PROJECT DESIGN SUMMARY
 LOGICAL FRAMEWORK**

Project Title & Numbers: Niger APPLIED AGRICULTURAL RESEARCH PROJECT (68J-0256)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
	<p>Research efforts supported by sound planning, management, evaluation and personnel policies and practices.</p> <p>2. Diagnostic studies have identified the agronomic constraints to production and critical water management issues and constraints to improving the economic and productive efficiency of irrigated agricultural production on the inland and Niger River perimeters and micro schemes of central Niger. Multidisciplinary research programs designed and being carried out to address these constraints.</p> <p>3. Established programs underway in crop improvement, production systems, on-farm research and water management.</p> <p>4. Technical themes of proven technical, social and economic viability developed.</p> <p>5. The Research Extension Liason Unit coordinating and facilitating the transmission and marketing of research results to the extension services who then disseminate the technologies to farmers. The RELU also serving as the coordination point to direct requests for assistance in resolving problems or prospective research needs coming through the farmers or extension services.</p> <p>6. Effective systems operating for the management of vehicles, farm equipment, field and laboratory equipment, agricultural inputs and supplies.</p>		<p>planning practices.</p>

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Project Title & Number: Niger APPLIED AGRICULTURAL RESEARCH PROJECT (683-0256)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>The systems will include maintenance, distribution, inventory and procurement.</p>			
C. <u>Outputs</u>	C. <u>Magnitude of Outputs</u> (Indicators of Achievement)	C. <u>Outputs</u>	C. <u>Outputs</u>
<u>Output No. 1</u>			
1. Strengthened INRAM institutional capacity to design administer, manage and carry out applied agricultural research programs.			
<u>a. Planning and Management</u>	<u>a. Planning and Management</u>		
1. Development of refined long-range research, staffing and training plans.	1. Long-range research, staffing and training plans developed by year 2 and refined annually.	1. INRAM, ONARA and Ministry of Agriculture reports and records.	1. Personnel are made available for training records.
2. Annual budgets prepared on the basis of research programs to be conducted	2. Beginning year 2 of the project and annually thereafter.	2. Contractor reports	2. INRAM and extension services are motivated to work together with farmers.
3. Decentralized system of financial management developed	3. System developed and operational during phase I; completed by the middle of phase II.	3. On-site inspections	3. Researchers accept multidisciplinary approach to conducting research.
4. Development of evaluation criteria for researchers and research programs; peer review process operating.(this phase)	4. Criteria developed by year 3 and peer review process operational by year 4.	4. Field surveys	4. Administrators, managers and researchers accept the need for improved resource management and planning practices.
		5. Evaluations	5. Research sites are representative of major agro-ecological zones.
			6. Extension services and farmers follow INRAM technical recommendations

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PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Project Title & Number: Niger APPLIED AGRICULTURAL RESEARCH PROJECT (683-0256)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
b. <u>Human Resource Development (HRD)</u>	b. <u>HRD</u>		
1. INRAN researchers upgrade their professional training in irrigation, cereals and legumes agronomy, crop improvement, soil physics, soil chemistry, irrigation engineering, data analysis and research management.	1. 17 by end of phase I.		
2. B and C level INRAN personnel complete short-term and/or in-country training.	2. 100% by end phase I		
3. ONAHA and Rural Engineering personnel upgrade professional training in irrigation engineering, management and technology.	3. 4 by end of phase I		
4. Extension agents and/or trial managers receive in country training to explain technical recommendations and trial execution of same.	4. By end of phase I		
c. <u>Strengthening of Support Services to Research (SSSR)</u>	C. <u>SSSR</u>		
1. Systems established for management of vehicles, farm equipment, field and laboratory equipment, agricultural inputs and supplies.	1. Operational during phase I		

**PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK**

Project Title & Number: Niger APPLIED AGRICULTURAL RESEARCH PROJECT (683-0256)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
2. INRAN technicians trained to process and interpret statistical data.	2. Five technicians trained by end of phase I.		
3. Increased reliability of laboratory analyses	3. Max. 2 week to receive lab result		
Output No. 2			
2. Development and execution of specific priority multi-disciplinary research programs on Niger's principal rainfed and irrigated food crops.			
a. <u>Research Programs (RP): rainfed cereals & legumes</u>	a. <u>RP: rainfed cereals & legumes</u>		
1. Crop improvement program modified to emphasize adaptive research	1. Less basic research being conducted; INRAN takes more advantage of germplasm available from other sources (IARC'S)		
2. Production systems research underway	2. In 3 ag zones by end of phase I.		
3. Expansion of on-farm testing program	3. From - zones to 5 zones by the end of the phase I.		
5. Recommended production practices further developed and delivered to extension.	4. For 2 zones by end of first phase		
b. <u>Research Programs (RP): irrigated crop agronomy</u>	b. <u>RP: irrigated crop agronomy</u>		
1. Diagnostic studies conducted which identify the principal agronomic constraints to production on the	1. An intensive study will be carried out during the 2nd and 3rd years. On-going activity		

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**PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK**

Project Title & Number: Niger APPLIED AGRICULTURAL RESEARCH PROJECT (683-0256)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Inland and Niger River perimeters and micro schemes of Central Niger; priority crop, soil and water management research themes identified.</p>			
<p>2. Multi-disciplinary agronomic research program on priority themes designed and being executed.</p>	<p>2. Agronomic research program designed by year 3; execution begun during year 3.</p>		
<p>3. Marketing research studies identified and some carried; results being used to focus research activities.</p>	<p>3. Three studies identified and carried out by end of phase I.</p>		
<p>c. <u>Research Programs (RP): water management engineering</u></p>	<p>c. <u>RP: water management engineering</u></p>		
<p>1. Diagnostic studies conducted which identify critical water management issues and constraints to improving the economic and productive efficiency of irrigated agricultural production on the inland and Niger River perimeters and micro schemes of central Niger; priority research themes identified.</p>	<p>1. An intensive study will be carried out year 2. Stemming from this study, a set of applied research studies will be conducted during remaining LOP</p>		
<p>2. Multidisciplinary action research programs designed and being carried out to improve water management on jointly managed perimeters and micro schemes of Central Niger.</p>	<p>2. Research programs designed by year 3; execution begun during year 3.</p>		

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PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Project Title & Number: Niger APPLIED AGRICULTURAL RESEARCH PROJECT (683-0256)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>d. <u>On-farm research program</u></p> <p>On-farm trials expanded.</p> <p><u>Output No. 3</u></p>	<p>d. <u>On-farm research program</u></p> <p>From _____ zones to 5 rainfed ag. zones by year 3.</p>		
<p>3. A functioning, coordinating research extension unit</p> <p>Development memoranda of understanding (MOU) between INRAN, Agricultural Extension Services, ONAHA and Rural Engineering and farmers detailing the roles and responsibilities of each institution participating in research.</p>	<p>3. REU marketing research results to INRAN clients; serving as coordination point to direct requests for assistance in resolving problems coming through farmers or extension services; advising on preparation of teaching materials; maintaining documentation center and maintaining linkages with IARC's and other agricultural research organizations.</p> <p>MOU developed by year 2;</p>		
<p>D. <u>Inputs</u></p> <p>1. Long-term technical assistance 2. Short-term technical assistance</p>	<p>D. <u>Implementation Target</u> (Type and Quantity)</p> <p>1. 29 person-years 2. 36 person months</p>	<p>D. <u>Inputs</u></p> <p>1. USAID records 2. Contractor reports,</p>	<p>D. <u>Inputs</u></p> <p>1. COM meets CEs and covenants</p>

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B. PID/PP Guidance

~~SECRET~~
UNCLASSIFIED

STATE 297323/71

ACTION: AID INFO: AMJ DDM

683-0250

OEC VZCZCNM0753
PP RUEHNM
DS RUEHC #7323/71 2551739
ZNR UUUUU ZZ4
P R 221737Z SEP 86
FM SECSTATE WASHDC
TO RUEHNM/AMBASSY NIAMEY PRIORITY 3593
INFO RUEHAB/AMBASSY ABIDJAN 7411
BT
UNCLAS SECTION 01 OF 02 STATE 297323

207: 57
25 SEP 86 17:5
3: 11211
CICG: AID
DIB: AID

ACTION: ADO
INFO: DIR
DD
PDO
PROG
CEROM

AIDAC

E.O. 12356: N/A

TAGS:

SUBJECT: NIGER APPLIED AGRICULTURAL RESEARCH (NAAR) PP
GUIDANCE (683-0250)

OUR DATE: 9-29-86

REF: STATE 147613

1. BASED ON THE AID/W PROJECT COMMITTEE REVIEW OF THE UPDATED EVALUATION OF THE NIGER CEREALS RESEARCH (NCR) PROJECT, THE ASSISTANT ADMINISTRATOR FOR AFRICA HEREBY DELEGATES TO THE MISSION DIRECTOR, USAID/NIGER THE AUTHORITY TO APPROVE THE REVISED PID AND PP FOR THE SUBJECT PROJECT, SUBJECT TO THE CONDITIONS OUTLINED IN THIS CABLE. THE AUTHORITY TO AUTHORIZE THE PROJECT SHALL BE EXERCISED IN ACCORDANCE WITH AFRICA BUREAU DELEGATION OF AUTHORITY 14U, AS REVISED.

2. ON SEPT 11, 1986, REPRESENTATIVES FROM AFR/S/A, AFR/PD, AFR/DP, AFR/TR, PPC/PB AND BIFAD REVIEWED THE UPDATED EVALUATION OF THE NCR PROJECT AS OUTLINED IN THE REFTEL. VARIOUS CONCERNS WERE RAISED BY THE PROJECT COMMITTEE.

A. AS RECOMMENDED BY THE MISSION EVALUATION COMMITTEE, QUOTE FUTURE ACTIVITIES SHOULD PLACE MUCH MORE EMPHASIS

ON IMPROVING ADMINISTRATION AND MANAGEMENT CAPABILITIES, ACHIEVING FINANCIAL MANAGEMENT REFORMS AND DECENTRALIZING PROGRAM MANAGEMENT UNQUOTE. THE NEW PROJECT SHOULD PROMOTE IMPROVEMENT OF THE NATIONAL AGRICULTURAL RESEARCH INSTITUTE'S (INRAN) ADMINISTRATION AND MANAGEMENT INCLUDING FINANCIAL MANAGEMENT PRACTICES AS A MEANS TO FACILITATE THE LONG TERM VIABILITY OF AGRICULTURAL RESEARCH.

B. THE EVALUATION DOES NOT DISCUSS THE LINKAGE BETWEEN THE NCR AND THE AGRICULTURAL PRODUCTION SUPPORT (APS) PROJECT, PARTICULARLY THE AGRICULTURE EXTENSION ACTIVITIES OF BOTH PROJECTS. ATTENTION IS NEEDED IN THE PP ON WHAT RESEARCH FINDINGS WILL BE EXTENDED AND HOW EXTENSION SERVICES OF THE TWO PROJECTS WILL INTERFACE.

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7. THE EVALUATION NOTES THE GOV SIGNED THE STRUCTURAL ADJUSTMENT PROGRAM (SAP) WITH THE WORLD BANK FORMALIZING ITS COMMITMENT TO AGRICULTURAL RESEARCH POLICY REFORM. ALSO, THE INSTITUTIONAL ANALYSIS OF THE INRAN NOTES THAT A COMPREHENSIVE STUDY OF INRAN IS BEING PLANNED FOR SEPT 1986 TO HELP INRAN DEVELOP A LONG-TERM NATIONAL AGRONOMIC RESEARCH PROGRAM. HOWEVER, THE EVALUATION DOES NOT MENTION A NIGER RESEARCH STRATEGY OR LONG-TERM COUNTRY RESEARCH PLAN. SUCH A PLAN OR STRATEGY WOULD ASSURE COORDINATED DONOR EFFORTS THAT DO NOT END WHEN AN INDIVIDUAL DONOR'S PROJECT ENDS AND SERVE AS AN INDICATOR OF RECURRENT COSTS. ENCOURAGEMENT FOR THE DEVELOPMENT OF A LONG-TERM PLAN OR STRATEGY SHOULD BE INCLUDED IN THE NEW PROJECT.

L. THE INSTITUTIONAL ANALYSIS OF INRAN DISCUSSES IN SOME DETAIL THE NEED FOR IMPROVED INCENTIVE STRUCTURE AND ADVANCEMENT POTENTIAL OF ITS STAFF AS WELL AS THE NEED TO RECRUIT TRAINED PERSONNEL. HOWEVER, BOTH THE ANALYSIS AND THE EVALUATION ARE SILENT ON THE NCR EXPERIENCE WITH INRAN RETAINING THE SERVICES OF RETIRED PARTICIPANTS. THIS ISSUE SHOULD BE EXAMINED MORE FULLY IN THE PROJECT PAPER.

2. THE EVALUATION WAS ALSO SILENT ON HOW TO AVOID DUPLICATING THE EARLY IMPLEMENTATION DIFFICULTIES OF PHASE I OF THE NCR PROJECT. EVALUATION RECOMMENDATIONS PROVIDED NO INSIGHTS OR LESSONS LEARNED FROM THIS EXPERIENCE. THE PP SHOULD EXAMINE MORE FULLY HOW TO AVOID THESE IMPLEMENTATION DIFFICULTIES.

3. WHILE THE PROJECT COMMITTEE RECOMMENDS THAT THESE CONCERNS BE MORE FULLY ADDRESSED IN THE PP FOR THE NAAR.

THE COMMITTEE'S RECOMMENDATION IS THAT THE AA/APR DELEGATE AUTHORITY TO USAID/NIGER FOR REVISED PID AND PP APPROVAL, SUBJECT TO THE FOLLOWING CONDITIONS:

A. THE PP WILL ADEQUATELY ADDRESS THE ISSUES OUTLINED IN PARA 2 ABOVE.

B. PHASE II OF THE NCR COMPONENT WILL BE BASICALLY SIMILAR TO PHASE I OF THE NCR.

C. THE THRUST OF THE APPLIED IRRIGATION RESEARCH AND COORDINATION (AIRC) COMPONENT OF THE NEW PROJECT WILL BE ESSENTIALLY AS INDICATED IN THE PID APPROVED BY THE PROJECT COMMITTEE IN MAY; I.E., FOCUSED ON APPLIED AGRONOMIC RESEARCH.

D. THE IEE WILL BE REVIEWED AND APPROVED BY THE AFRICA BUREAU ENVIRONMENTAL OFFICER.

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- 1. THE TOTAL COST WILL NOT EXCEED DOLS 23 MILLION.
- 2. THE APPROVED PROJECT BUDGET WILL BE IN ACCORD WITH AID BUDGET REALITIES SO THAT ADEQUATE FUNDING WILL BE AVAILABLE AS REQUIRED TO PROPERLY IMPLEMENT THE PROJECT.
- 3. ALTHOUGH INRAN HAS SUBMITTED A PLAN TO USAID FOR ADDITIONAL LONG- AND SHORT-TERM TRAINING, THE TRAINING PLAN FOR THE CURRENT NCR PROJECT SHOULD BE REVISED TO ASSURE THERE IS ADEQUATE PROVISION FOR ADMINISTRATIVE/MANAGEMENT AND IRRIGATION RESEARCH TRAINING FOR RESOLUTION OF THE PROBLEMS OUTLINED ABOVE. ALSO, TO THE EXTENT POSSIBLE, WATER MANAGEMENT TRAINING BEGINNING NOW WOULD FACILITATE A SMOOTH TRANSITION TO THIS PROPOSED NEW PROJECT WHICH IS TO COMBINE NCR AND AIRC.
- 4. WHEN APPROVED, PLEASE PROVIDE COPIES OF BOTH THE REVISED PID AND THE PP TO AFR/PD/SWAP FOR DISTRIBUTION, AS APPROPRIATE. WHITEHEAD

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SUBJECT: NIGER APPLIED IRRIGATION RESEARCH AND
COORDINATION (AIRC) PROJECT, 683-0250, P.P. GUIDANCE

DUE DATE: 5-19-86

1. SUMMARY: ECPR FOR SUBJECT PROJECT, CHAIRED BY CAROL PEASLEY, AFR/PD, MET ON APRIL 29, AND APPROVED PID. HOWEVER, THE ECPR RECOMMENDED THAT THE SUBJECT PROJECT BE INCORPORATED INTO PHASE II OF THE NIGER CEREALS RESEARCH (NCR) PROJECT. MISSION, THEREFORE, SHOULD UPDATE JUNE 1985 NCR EVALUATION ASAP AND SUBMIT IT TO AID/W FOR REVIEW. AID/W PLANS TO DELEGATE MISSION AUTHORITY TO APPROVE PP FOR THE COMBINED PROJECT ASSUMING SATISFACTORY REVIEW OF UPDATED NCR EVALUATION INCLUDING MISSION'S PES. WE WOULD LIKE TO COMMEND MISSION FOR A WELL PREPARED PID. END SUMMARY.

2. THE ISSUES, DISCUSSION OF THEM AND ECPR RECOMMENDATIONS ARE OUTLINED BELOW.

3. ISSUE NO. 1: SHOULD THE AIRC BE MERGED WITH PHASE II OF THE NIGER NATIONAL CEREALS RESEARCH PROJECT?

THE ECPR DISCUSSED PROS AND CONS OF COMBINING THE SUBJECT PROJECT WITH THE PLANNED PHASE II OF NCR. IT NOTED THAT:

(A) THE AIRC PROJECT FOCUSES ON FOUR AREAS - AGRONOMY, WATER MANAGEMENT, MARKETING AND PUMPING, AND INRAN WOULD BE GON'S EXECUTING AGENCY FOR ALL THE COMPONENTS EVEN THOUGH ACTIVITIES UNDER THE WATER MANAGEMENT AND MARKETING/PUMPING COMPONENTS MAY BE IMPLEMENTED BY OTHERS. MISSION REPRESENTATIVE CLARIFIED THAT MAIN TERUST OF THE PROJECT IS APPLIED RESEARCH IN AGRONOMY.

(B) THE PURPOSE OF THE AIRC AND THE ONGOING NCR PROJECTS IS BASICALLY SIMILAR, I.E. TO STRENGTHEN INSTITUTIONAL CAPABILITIES OF INRAN.

(C) IN MANY PARTS OF NIGER FARMERS PRACTICE BOTH DRYLAND AND IRRIGATED AGRICULTURE AND SPREAD THEIR LABOR OVER BOTH ACTIVITIES IN THEIR FARMING SYSTEM.

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(D) BY COMBINING THE TWO PROJECTS, THE NUMBER OF MANAGEMENT UNITS WILL BE REDUCED IN BOTH USAID AND INRAN. THE LATTER IS IMPORTANT BECAUSE INRAN WILL HAVE TO DEAL WITH ONLY ONE TECHNICAL ASSISTANCE CONTRACTOR AND MAINTAIN FINANCIAL RECORDS FOR ONE PROJECT ONLY.

(E) IN ORDER TO AVOID INTERRUPTION IN THE TECHNICAL ASSISTANCE NOW BEING PROVIDED BY PURDUE UNIVERSITY, IT IS VITAL THAT NCR PHASE II PROJECT IS DESIGNED IMMEDIATELY TO ALLOW SUFFICIENT TIME (9 TO 12 MONTHES AFTER AUTHORIZATION) TO CONTRACT WITH AN ORGANIZATION FOR TECHNICAL SERVICES REQUIRED UNDER NCR PHASE II.

RECOMMENDATION: THE ECPR RECOMMENDED THAT (XGL THE AIRC PID BE APPROVED BUT THE ACTIVITIES PLANNED UNDER THE AIRC BE MERGED WITH THE PLANNED PHASE II OF THE NCR PROJECT WITH THE ASSUMPTION THAT THE NCR PHASE II WILL BE BASICALLY SIMILAR TO PHASE I, AND (B) THE MISSION UPDATE THE 85 NCR EVALUATION WITH THE ASSISTANCE OF ONE OR TWO OUTSIDE CONSULTANTS AND SUBMIT THE EVALUATION AND PES TO AID/W FOR REVIEW. THE EVALUATION COULD ALSO INCLUDE RECOMMENDATIONS FOR THE DESIGN OF PHASE II. AID/W PLANS TO DELEGATE MISSION AUTHORITY TO APPROVE BOTH PID AND PP FOR THE COMBINED PROJECT ASSUMING SATISFACTORY REVIEW OF EVALUATION.

4. ISSUE NO. 2: IS THE INSTITUTIONALIZATION OF AGRICULTURAL RESEARCH IN NIGER VIABLE, GIVEN THE RELATIVELY LOW STATUS OF RESEARCHERS WITHIN THE GON CIVIL SERVICE STRUCTURE?

DISCUSSION: PRESENTLY, THERE IS NO INCENTIVE FOR UNIVERSITY TRAINED PEOPLE TO PURSUE RESEARCH IN NIGER SINCE SALARIES AND JOB STATUS IN RESEARCH AGENCIES SUCH AS INRAN ARE SIGNIFICANTLY LOWER THAN AT THE UNIVERSITY OF NIAMEY. IN FACT, ABOUT ONE HALF OF ALL THE RESEARCHERS AT INRAN ARE EXPATRIATES AND MOST OF THE NIGERIENS HAVE BEEN SECONDED FROM OTHER GON AGENCIES.

RECOMMENDATION: THE ECPR RECOMMENDED THAT IN ORDER TO BETTER UNDERSTAND CAUSES OF THE PROBLEM, THE PROPOSED NCR EVALUATION SHOULD ANALYZE THE STAFF SITUATION AT INRAN AND MAKE APPROPRIATE RECOMMENDATIONS WHICH COULD BE INCLUDED IN THE PROJECT DESIGN. MISSION SHOULD CONSIDER INCORPORATING NECESSARY CORRECTIVE STEPS AS CONDITIONS PRECEDENT OR COVENANTS.

5. ISSUE NO. 3: WHAT IS THE ROLE OF THE OFFICE NATIONAL DES AMENAGEMENTS HYDRO-AGRICOLES (ONAHA) THE NATIONAL IRRIGATION AGENCY, IN THE PROPOSED AIRC PROJECT AND SHOULD THE PROJECT PROVIDE ASSISTANCE TO THIS ~~AGENCY~~

THERE IS SOME OVERLAP OF FUNCTIONS BETWEEN ONAHA AND OTHER GON AGENCIES E.G. GENIE RURAL, THAT IS DESIGNATED TO HANDLE DESIGN AND IMPLEMENTATION OF SMALLER PERIMETERS (NOT EXPLICITLY DEFINED); ALSO THERE IS SOME FUZZINESS ABOUT THE ROLE OF CERTAIN "SERVICES" WITHIN THE MINISTRY OF AGRICULTURE VIS-A-VIS ONAHA AND GENIE RURAL WITH RESPECT TO AGRICULTURAL STUDIES. THIS OVERLAP OF FUNCTIONS FURTHER COMPLICATES DEFINITION OF ONAHA'S ROLE AND WOULD MAKE COORDINATION BY THE PROPOSED EXTENSION LIAISON UNIT IN INRAN DIFFICULT. THE PID NOTES THAT ANY OVERLAPPING OF THE FUNCTIONS AMONG ONAHA, GENIE RURAL, INRAN AND THE MINISTRY OF AGRICULTURE WILL BE ADDRESSED THROUGH MEMORANDUM OF UNDERSTANDING (MOU) BETWEEN INRAN AND VARIOUS AGENCIES.

PRIVATE SECTOR OPPORTUNITIES ARE NOT ADDRESSED IN THE PID. THERE IS THE POSSIBILITY THAT SOME OF ONAHA'S FUNCTIONS SUCH AS EXTENSION AND EXTENSION TRAINING,

MAINTENANCE AND MAINTENANCE TRAINING COULD BE HANDLED BY THE PRIVATE SECTOR, ALTHOUGH ON THE SURFACE IT LOOKS DOUBTFUL, GIVEN THE LOW LEVEL OF TECHNICAL SKILLS THAT EXIST IN NIGER.

RECOMMENDATION: THE ECPR RECOMMENDED THAT: (A) THE MISSION UNDERTAKE A STUDY, AS RECOMMENDED IN THE JULY 1984 IRRIGATION SUBSECTOR ASSESSMENT, WHICH FOCUSES ON INSTITUTIONAL ARRANGEMENTS AND THE DEGREE TO WHICH SOME ONAHA'S FUNCTIONS CAN PRIVATIZED. THE STUDY COULD BE IN TWO PARTS: THE FIRST PART COULD BE UNDERTAKEN AS PART OF THE PROJECT DESIGN WHICH WOULD INCLUDE AN OVERVIEW IDENTIFYING POLICY CONSTRAINTS AND ANY REFORMS WHICH NEED TO BE IMPLEMENTED IMMEDIATELY AS PART OF THE PROJECT, IF APPROPRIATE, AND THE SECOND PART WOULD BE MORE DETAILED IDENTIFYING POLICY REFORMS TO BE INCLUDED IN THE PROPOSED AGRICULTURE SECTOR GRANT II PROGRAM. THE LATTER COULD BE UNDERTAKEN DURING THE IMPLEMENTATION STAGE OF THE PROJECT BUT BEFORE THE DESIGN OF AGRICULTURE SECTOR GRANT II.

B) THE MISSION SHOULD WORK CLOSELY WITH OTHER DONORS, ESPECIALLY THE WORLD BANK, TO SEEK AGREEMENT ON PRIVATIZING SELECTED ONAHA FUNCTIONS AND MAKING ONAHA FINANCIALLY VIABLE; AND

(C) THE PRINCIPLES TO BE ENCOMPASSED IN THE MOU'S SHOULD BE DESCRIBED IN THE PP. THE DESIGN TEAM SHOULD INCLUDE THE OPTION OF INRAN SIGNING MOU'S DIRECTLY WITH INDIVIDUAL COOPERATIVES AND/OR AN ASSOCIATION OF COOPERATIVES THAT HAVE DEMONSTRATED BOTH AUTONOMY AND SOME DEGREE OF EFFICIENCY.

6. CONCERNS AND BRIEF DISCUSSION OF THEM ARE DESCRIBED BELOW. THE DESIGN TEAM SHOULD PAY CLOSE ATTENTION TO THESE CONCERNS DURING PP PREPARATION.

A. DONOR COORDINATION: THERE SHOULD BE A CLEAR STATEMENT IN THE PP OF THE COLLABORATION AND COORDINATION EFFORTS PLANNED BY DONORS TO ENSURE THAT THE VARIOUS PROJECTS WILL DOVETAIL TO RESULT IN THE ACCOMPLISHMENT OF THE OVERALL GOAL OF IMPROVED AGRICULTURAL PRODUCTION.

B. WATER SUPPLY AND MANAGEMENT: THE PP SHOULD ADDRESS HOW MONITORING AND TESTING OF GROUNDWATER AQUIFERS, AT LEAST FOR THE LARGER PERIMETERS WOULD BE CARRIED OUT TO PROPERLY REGULATE WATER USE AND ENSURE WATER SUFFICIENCY.

C. POLICY DIALOGUE: THE ECPR NOTED MISSION'S PLAN TO ADDRESS POLICY REFORM ISSUES CONNECTED WITH THIS PROJECT IN PHASE II OF THE AG SECTOR DEVELOPMENT GRANT IF PRIOR DISCUSSION OF THE ISSUES HAS NOT BEEN UNDERTAKEN WITH THE GON. HOWEVER, IT IS HIGHLY DESIRABLE THAT POLICY REFORMS WHICH WOULD HAVE IMPLICATIONS IN MEETING THE OBJECTIVES OF THE PROJECT SHOULD BE INCLUDED IN THIS PROJECT, E.G. REFORMS RELATED TO INCENTIVES NEEDED TO ATTRACT RESEARCHERS TO INRA.

D. OTHER RESEARCH ISSUES: THE IRRIGATION ANNEX TO THE FY 1988 CDSS INDICATED THAT MANY OF THE CONSTRAINTS TO INCREASE PRODUCTION ON IRRIGATED PERIMETERS WERE NOT STRICTLY AGRONOMIC, BUT RELATED TO THE FACT THAT IRRIGATED AGRICULTURE IS PRACTICED AS A PART OF A LARGER FARMING SYSTEM THAT INCLUDES DRYLAND CROPS AND ANIMAL HUSBANDRY. THE PP DESIGN SHOULD PROVIDE FOR APPROPRIATE AMOUNTS OF SOCIO-ECONOMIC AND BIOLOGICAL RESEARCH TO ADDRESS THE IDENTIFIED CONSTRAINTS. THE ECPR SPECIFICALLY DISCUSSED TWO SUCH CONSTRAINTS: LABOR AND ANIMAL FORAGE.

E. EVALUATION/REVIEW MECHANISM: BENCHMARKS AND SCHEDULES FOR PERIODIC EVALUATION/REVIEWS SHOULD BE INCLUDED IN THE PROJECT PAPER. DURING THESE REVIEWS,

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THERE SHOULD BE A FULL DISCUSSION OF THE DIRECTION OF THE RESEARCH PROJECT AND THE PERCEIVED USEFULNESS OF ACQUIRED DATA TO USERS. AID, GON, USERS AND OTHER DONORS INVOLVED IN COMPLEMENTARY PROJECTS SHOULD ALL PARTICIPATE IN THESE REVIEWS.

F. RECURRENT COSTS: THE PP SHOULD INCLUDE AN ANALYSIS OF RECURRENT COSTS AND SHOULD SHOW, IN ACCORDANCE WITH THE AGENCY'S POLICY, HOW GON WILL GRADUALLY ASSUME THE RECURRENT COST BURDEN.

G. IRRIGATION INFRASTRUCTURE COST: THE PID ALLUDES TO THE HIGH COST OF IRRIGATION INFRASTRUCTURE IN NIGER. IT IS RECOMMENDED THAT THE PROJECT LOOK INTO DESIGN OF IRRIGATION INFRASTRUCTURE TO LOWER THE COST.

H. GRAY AMENDMENT: THERE WAS DISCUSSION ON THE MODALITY OF CONTRACTING FOR THE TECHNICAL ASSISTANCE CONTRACT IN CONFORMANCE WITH GRAY AMENDMENT REQUIREMENTS. THE MISSION WOULD LIKE TO SEE A TITLE XII UNIVERSITY CONTRACTOR. THE ECPR AGREED THAT USE OF 1890 SCHOOLS (HBCU'S) EITHER AS PRIME CONTRACTOR OR IN A JOINT ENTERPRISE ARRANGEMENT WOULD SATISFY THE GRAY AMENDMENT REQUIREMENTS. THE BIFAD REPRESENTATIVE MENTIONED THAT SEVERAL OF THESE JOINT ENTERPRISE ARRANGEMENTS HAVE ALREADY BEEN TRIED SUCCESSFULLY WITHIN THE USAID/NIGER MISSION. PARTICIPATION BY MINORITY PVO'S WOULD ALSO BE IN ACCORD WITH GRAY AMENDMENT REQUIREMENTS. IT WAS RECOMMENDED THAT THE PRECISE MODE OF CONTRACTING WHICH WOULD CONFORM TO GRAY AMENDMENT REQUIREMENTS BE SPELLED OUT IN THE PROJECT PAPER.

I. INITIAL ENVIRONMENTAL EXAMINATION: THE IEE INCLUDED IN THE PID IS INADEQUATE FOR THE FOLLOWING REASONS:

SINCE THE USE OF PESTICIDES IS PROPOSED, SPECIFIC NAMES OF THE PESTICIDES AS WELL AS MITIGATION MEASURES TO COUNTER ADVERSE EFFECTS ON SURFACE OR GROUND WATER MUST BE STATED. ALSO, A RISK BENEFIT ANALYSIS IS REQUIRED. NOTE THAT THESE REQUIREMENTS ARE IN ACCORDANCE WITH THE GOVERNING REGULATIONS VIZ; AID REGULATION 16 APPENDIX 2D, HANDBOOK 3, NOT NEPA OF 1974 AS STATED IN THE PID.

IT IS ALSO NOTED THE IEE DOES NOT DISCUSS THE IMPACT OF IRRIGATION ON HEALTH AND HOW THIS WOULD BE ADDRESSED, IF AT ALL, DURING THE IMPLEMENTATION OF THE PROJECT.

THE ECPR RECOMMENDED THAT MISSION REQUEST ASSISTANCE OF REDSO ENVIRONMENTAL OFFICER TO PREPARE THE IEE. PLEASE SUBMIT THE IEE TO AFR BUREAU ENVIRONMENTAL OFFICER FOR REVIEW AND APPROVAL AS SOON AS POSSIBLE.

7. ECONOMIC ANALYSIS: AS STATED IN THE PID, IT IS DIFFICULT TO ESTIMATE EX ANTE BENEFITS FROM THE PROJECT. WITHIN THE PROJECT AREA THE IRRIGATED AREA IS RELATIVELY SMALL AND THE SOIL QUALITY AND THE IRRIGATION SYSTEMS VARY. ACCORDINGLY, ANY ATTEMPT TO QUANTIFY THE BENEFITS OBTAINABLE AS A RESULT OF INCREASED

AGRICULTURAL PRODUCTS IS SUBJECT TO WIDE VARIATION AND BIAS, DEPENDING ON THE ASSUMPTIONS MADE ABOUT INCREASE IN PRODUCTIVITY OF AGRICULTURAL PRODUCTS. AID AND OTHER

DEVELOPMENT AGENCIES LIKE THE WORLD BANK HAVE MADE NO ATTEMPT QUANTIFY THE ECONOMIC RETURN OF SIMILAR RESEARCH PROJECTS. THE PP MAY AVOID CONDUCTING ECONOMIC ANALYSIS IN CONVENTIONAL TERMS (NPVS, IRRS, ETC).

AS AN ALTERNATIVE APPROACH, THE WORLD BANK USED A BREAK-EVEN ANALYSIS TO COME TO SOME JUDGMENT REGARDING THE SOUNDNESS OF A PROPOSED PROJECT IN MALAWI (SEE STAFF APPRAISAL REPORT: NATIONAL AGRICULTURAL RESEARCH PROJECT, REPORT NO: 5295-MAI, JANUARY 24, 1985). THIS APPROACH ESTIMATES REQUIRED INCREASE (PER CENT PER YEAR) IN AGRICULTURAL PRODUCTS FOR THE LIFE OF THE PROJECT (20 YEARS FOR EXAMPLE) TO BREAK-EVEN IN ECONOMIC TERMS (I.E., FOR THE LEVEL OF ADDITIONAL RESEARCH EXPENDITURE TO YIELD A MINIMALLY SATISFACTORY ECONOMIC RATE OF RETURN OF SAY 10 PERCENT). THIS APPROACH REQUIRES ESTIMATION OF AGRICULTURAL PRODUCTS (IN THE AREA COVERED BY THE PROJECT) BEFORE THE INTRODUCTION OF THE PROJECT, AND DETERMINATION OF THE LIFE OF THE PROJECT AND SOCIAL DISCOUNT RATE, ETC.

THE DECISION ON QUOTE WHETHER THIS APPROACH SHOULD BE ADOPTED IN THE PP OR NOT UNQUOTE MAY BE MADE AFTER A CAREFUL CONSIDERATION OF AVAILABILITY OF DATA AND OTHER RESOURCES LIKE TIME AND MANPOWER REQUIRED FOR DOING THIS. HOWEVER, THE PP SHOULD ATTEMPT TO QUANTIFY THE FOLLOWING BENEFITS:

A. BENEFITS RESULTING FROM INCREASED COORDINATION, I.E., RECURRENT COST SAVINGS OBTAINABLE AS A RESULT OF REDUCED OVERLAP OR THE INTRODUCTION OF EXISTING TECHNOLOGY BECAUSE OF IMPROVED RESEARCH/EXTENSION LINKAGES.

B. BENEFITS FROM REPLACING EXPATRIATE RESEARCH STAFF WITH NIGERIENS TRAINED UNDER THE PROJECT. IT SHOULD BE NOTED THAT EVEN IF THE COSTS OF HIRING EXPATRIATES ARE COVERED BY THE DONORS AND DO NOT INCUR ANY COSTS TO THE GON, THEY CONSTITUTE SOCIAL/OPPORTUNITY COST FOR THE COUNTRY. THIS IS BECAUSE IF THE DONORS DO NOT HAVE TO PROVIDE ASSISTANCE IN TERMS OF EXPATRIATES, THEY COULD HAVE PROVIDED ASSISTANCE IN OTHER WAYS.

ESTIMATION OF THE PROJECT COST SHOULD INCLUDE, IN ADDITION TO THE DIRECT COSTS OF TRAINING, COMMODITIES, AND EQUIPMENT, ETC, THE OPPORTUNITY COSTS OF THE TRAINEES DURING THE TRAINING PERIOD. THESE OPPORTUNITY COSTS MAY BE MEASURED IN TERMS OF SALARIES AND WAGES TO THE EXTENT THAT THEY REFLECT THE SOCIAL COST OF WORK FOREGONE DURING THE TRAINING PERIOD. ARMACOST

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Annex B.

ECPR Issues, Concerns and Recommendations

The following is a list of the issues, concerns and recommendations raised at the AIRC PID ECPR and the AID/W project committee review of the updated NCR Evaluation to be addressed in the PP. The list was compiled from (86) State 297323, which gives USAID Niger authority to approve the PID-like document and the PP subject to the conditions contained therein, and the AIRC PID approval cable, 86 State 147613.

I. State 147613

A. Issues and Recommendations

1. **ISSUE:** Is the institutionalization of agricultural research in Niger viable given the relatively low status of researchers within the GON civil service structure?

RECOMMENDATION: That the update of the June 1985 NCR Evaluation analyze the staff situation at INRAN and make appropriate recommendations which could be included in the project design. Mission should consider incorporating necessary corrective steps as conditions precedent or covenants.

ACTION TAKEN: An institutional analysis of INRAN was conducted as part of the NCR evaluation update. The analysis concluded that the most appropriate approach to the problem of the status of researchers is policy dialogue with the GON. The analysis also recommended that the PP design team: (a) secure detailed, up-to-date information on current developments relative to researcher status; and (b) that possible scenarios be considered for promoting effective policy dialogue on the issue and its potential impact on plans to develop a national capacity for applied agronomic research. These recommendations have been incorporated in the PP design.

2. **ISSUE:** What is the role of ONAHA in the proposed AIRC project and should the project provide assistance to this parastatal.

RECOMMENDATIONS:

a) That the mission undertake a study, as recommended in the July 1984 irrigation subsector assessment, which focuses on the institutional arrangements and the degree to which some ONAHA's functions can be privatized. The study could be in two parts: the first part could be undertaken as part of the project design which would include an overview identifying policy constraints and any reforms which need to be implemented immediately as part of the NAAR Project, if appropriate, and the second part would be more detailed identifying policy reforms to be included in the proposed Agriculture Sector Development Grant II Program. The latter could be undertaken during the implementation stage of the project but before the design of the Agriculture Sector Development Grant (ASDG) II.

ACTION TAKEN: See 2A above under Action Taken.

4. Other Research Issues: The irrigation annex to the FY 1988 CDSS indicated that many of the constraints to increased production on irrigated perimeters were not strictly agronomic, but related to the fact that irrigated agriculture is practiced as a part of a larger farming system that includes dryland crops and animal husbandry. The PP design should provide for appropriate amounts of socio-economic and biological research to address the identified constraints. The ECPR specifically discussed two such constraints labor and animal forage.

ACTION TAKEN: The PP includes provision for socio-economic and biological research. This work will be carried out by INRAN's Rural Economic Division (DECOR) as part of the farming systems research program.

5. Evaluation/Review Mechanism: Benchmarks and schedules for periodic evaluation/reviews should be included in the project paper. During these reviews, there should be a full discussion of the direction of the research project and the perceived usefulness of acquired data to users. AID, GON, users and other donors involved in complementary projects should all participate in these reviews.

ACTION TAKEN: The descriptions of benchmarks and schedule for periodic evaluation/reviews are included in the logframe and in sections III and V D and E of the PP.

6. Recurrent Costs: The PP should include an analysis of recurrent costs and should show, in accordance with the agency's policy, how GON will gradually assume the recurrent cost burden.

ACTION TAKEN: The recurrent costs analysis is included in Annex H of the PP. Most of the financing provided by the project covers expenses that will not continue after the project ends. Technical assistance will provide a temporary resource for strengthening junior researchers and for beginning research programs in selected new areas pending the return of Nigerians from training. Both the junior researchers and the future trainees are already either on the INRAN payroll, or programmed to go on it whether or not there is a NAAR project. Thus, all technical assistance and project administration costs do not affect INRAN's recurrent budget after the project.

7. Irrigation Infrastructure Cost: The PID alludes to the high cost of irrigation infrastructure in Niger. It is recommended that the project look into design of irrigation infrastructure to lower the cost.

ACTION TAKEN: Not Applicable. This is beyond the scope of the project as designed.

8. Gray Amendment: See Gray Amendments considerations, section II F of the action memorandum.

9. IEE: See section II E of the action memorandum.

10. Economic Analysis: PP should attempt to quantify following benefits.

a. Benefits resulting from increased coordination, i.e., recurrent cost savings obtainable as a result of reduced overlap or the introduction of existing technology because of improved research/extension.

b. Benefits from replacing expatriate research staff with Nigeriens trained under the project.

Estimation of the project cost should include, in addition to the direct costs of training, commodities, and equipment, etc. the opportunity costs of the trainees during the training period. These opportunity costs may be measured in terms of salaries and wages to the extent that they reflect the social cost of work foregone during the training period.

ACTION TAKEN: a) The economic analysis is included as Annex I. Benefits resulting from increased coordination are not the basis on which the project is justified since these benefits are uncertain and, at this point not quantifiable.

b) The benefit of the trained Nigerian staff is captured by the increases in output that result from these research. The replacement itself does not yield a benefit since it was not envisaged by the GON that long-term expatriate research will continue outside the project.

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The authority to approve the PID-like document and the PP for the NAAR Project are subject to the following conditions:

A. Future activities will place much more emphasis on improving administration and management capabilities, achieving financial management reforms and decentralizing program management. The new project will promote the improvement of INRAN's administration and management including financial management practices as a means to facilitate the long term viability of agricultural research.

ACTION TAKEN: These are major objectives of the project.

B. The PP should describe how the extension services of the NAAR Project and the Agricultural Production Support Project will interface.

ACTION TAKEN: Strengthening the research/extension linkage is a major component of the project. However, the NAAR Project does not include an extension service. Instead it will work with, support and strengthen the existing extension service system, including the Ministry of Agriculture Extension Service, which the APS Project currently supports.

C. Encouragement for the development of a long-term plan or strategy should be included in the new project.

ACTION TAKEN: This is a major objective of the project.

D. The PP should examine the NCR experience with INRAN retaining the service of returned participants.

ACTION TAKEN: This has not been a problem to date. Further, since most participants under the NCR Project are still in training, it is too early to determine if this will be a problem.

E. The PP should examine more fully how to avoid duplicating the early implementation problems of phase I of the NCR project.

ACTION TAKEN: To avoid these problems USAID plans to use full and open competition in contracting for technical services as described in section V C of the PP.

F. Phase II of the NCR Component will be basically similar to phase I of the NCR Project.

ACTION TAKEN: The NCR Component of NAAR is similar to phase I.

G. The thrust of the AIRC component of the new project will be essentially as indicated in the approved PID i.e., focused on applied agronomic research.

ACTION TAKEN: The AIRC component is focused on applied agronomic research.

H. The LOP cost will not exceed \$20 million.

ACTION TAKEN: The LOP cost is \$20 million.

I. Although INRAN has submitted a plan to USAID for additional long and short-term training, the training plan for the current NCR project should be reviewed to assure there is adequate provision for administrative management and irrigation research training for resolution of the problems outlined in State 297323. Also, to the extent possible, water management training beginning now would facilitate a smooth transition to this proposed new project which is to combine NCR and AIRC.

ACTION TAKEN: The NCR Project did not schedule additional participants for long-term training because of timing limitations regarding the PACO and budget limitations. The NAAR Project will fund participants in administrative management and the various aspects of irrigation research as soon as possible following project obligation.

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00 AVR 1987

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Monsieur le Directeur de l'USAID

TRÈS URGENT

NIAMEY

O B J E T : Projet Recherche agricole appliquée au Niger

Référence : V/L USAID N° 0196 du 3 avril 1987

Monsieur le Directeur,

Me référant à votre lettre sus-visée transmettant le document de projet en objet, j'ai l'honneur de vous informer que celui-ci est actuellement soumis à l'examen des autorités nigériennes compétentes.

Toutefois, compte tenu de l'importance particulière qu'accorde le Gouvernement du Niger à la recherche agricole, je vous serais reconnaissant de bien vouloir d'ores et déjà intercéder auprès des Autorités compétentes de votre Agence en vue d'obtenir le financement du projet. Je vous communiquerais incessamment les observations éventuelles des services techniques concernés sur le document que vous m'avez soumis.

Veillez agréer, Monsieur le Directeur, les assurances de ma haute considération./.

SANI BAKO

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5C(1) - COUNTRY CHECKLIST

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

A. GENERAL CRITERIA FOR COUNTRY ELIGIBILITY NO

1. FAA Sec. 481(h)(1); FY 1987 Continuing Resolution Sec. 526. Has it been determined or certified to the Congress by the President that the government of the recipient country has failed to take adequate measures or steps to prevent narcotic and psychotropic drugs or other controlled substances (as listed in the schedules in section 202 of the Comprehensive Drug Abuse and Prevention Control Act of 1971) which are cultivated, produced or processed illicitly, in whole or in part, in such country or transported through such country, from being sold illegally within the jurisdiction of such country to United States Government personnel or their dependents or from entering the United States unlawfully?

2. FAA Sec. 481(h)(4). Has the President determined that the recipient country has not taken adequate steps to prevent (a) the processing, in whole or in part, in such country of narcotic and psychotropic drugs or other controlled substances, (b) the transportation through such country of narcotic and psychotropic drugs or other controlled substances, and (c) the use of such country as a refuge for illegal drug traffickers? NO

3. FAA Sec. 620(c). If assistance is to a government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) the debt is not denied or contested by such government? NO
4. FAA Sec. 620(e)(1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities? NO
5. FAA Sec. 620(a), 620(f), 620(D); FY 1987 Continuing Resolution Sec. 512 and 541. Is recipient country a Communist country? If so, has the President determined that assistance to the country is important to the national interests of the United States? Will assistance be provided to Angola, Cambodia, Cuba, Laos, Syria, Vietnam, Libya, or South Yemen? Will assistance be provided to Afghanistan or Mozambique without a waiver? NO
6. FAA Sec. 620(j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction by mob action of U.S. property? NO

7. FAA Sec. 620(l). Has the country failed to enter into an agreement with OPIC? NO
8. FAA Sec. 620(o); Fishermen's Protective Act of 1967, as amended, Sec. 5. (a) Has the country seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters? NO
- (b) If so, has any deduction required by the Fishermen's Protective Act been made?
9. FAA Sec. 620(q); FY 1987 Continuing Resolution Sec. 518. (a) Has the government of the recipient country been in default for more than six months on interest or principal of any AID loan to the country? (b) Has the country been in default for more than one year on interest or principal on any U.S. loan under a program for which the appropriation bill (or continuing resolution) appropriates funds? NO
10. FAA SEC. 620(s). If contemplated assistance is development loan or from Economic Support Fund, has the Administrator taken into account the amount of foreign exchange or other resources which the country has spent on military equipment? (Reference may be made to the annual "Taking Into Consideration" memo: "Yes, taken into account by the Administrator at time of approval of Agency OYB." This approval by the Administrator of the Operational Year Budget can be the basis for an affirmative answer during the fiscal year unless significant changes in circumstances occur.) N/A

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11. FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?

NO

12. FAA Sec. 620(u) What is the payment status of the country's U.N. obligations? If the country is in arrears were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget? (Reference may be made to the Taking into Consideration memo.)

The GON is not in arrears in its obligations to the U.N.

13. FAA Sec. 620A; FY 1985 Continuing Resolution Sec. 521. Has the President determined that the country (a) grants sanctuary from prosecution to any individual or group which has committed an act of international terrorism, or (b) otherwise supports international terrorism? Has the government of the recipient country aided or abetted, by granting sanctuary from prosecution to, any individual or group which has committed or is being sought by any other government for prosecution for any war crime or act of international terrorism?

(a) NO

(b) NO

NO

14. ISDCA of 1985 Sec. 552(b). Has the Secretary of State determined that the country is a high terrorist threat country after the Secretary of Transportation has determined, pursuant to section 1115(e)(2) of the Federal Aviation Act of 1958, that an airport in the country does not maintain and administer effective security measures?

NO

15. FAA Sec. 666. Does the country object, on the basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. who is present in such country to carry out economic development programs under the FAA?

NO

16. FAA Sec. 669, 670. Has the country, after August 3, 1977, delivered or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements or safeguards? Has it transferred a nuclear explosive device to a non-nuclear weapon state, or if such a state, either received or detonated a nuclear explosive device? (FAA Sec. 620E permits a special waiver of Sec. 669 for Pakistan.)

NO

17. FAA Sec. 670. If the country is a non-nuclear weapon state, has it, on or after August 8, 1985, exported illegally (or attempted to export illegally) from the United States any material, equipment, or technology which would contribute significantly to the ability of such country to manufacture a nuclear explosive device?

NO

18. ISDCA of 1981 Sec. 720. Was the country represented at the Meeting of Ministers of Foreign Affairs and Heads of Delegations of the Non-Aligned Countries to the 36th General Assembly of the U.N. of Sept. 25 and 28, 1981, and failed to disassociate itself from the communique issued? If so, has the President taken it into account? (Reference may be made to the Taking into Consideration memo.) NO
19. FY 1985 Continuing Resolution. If assistance is from the population functional account, does the country (or organization) include as part of its population planning programs involuntary abortion? N/A
20. FY 1987 Continuing Resolution Sec. 528. Has the recipient country been determined by the President to have engaged in a consistent pattern of opposition to the foreign policy of the United States? NO
- B. FUNDING SOURCE CRITERIA FOR COUNTRY ELIGIBILITY
1. Development Assistance Country Criteria N/A
- FAA Sec. 116. Has the Department of State determined that this government has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, can it be demonstrated that contemplated assistance will directly benefit the needy?

2. Economic Support Fund
Country Criteria

FAA Sec. 502B. Has it been determined that the country has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, has the country made such significant improvements in its human rights record that furnishing such assistance is in the national interest?

N/A

FY 1987 Continuing Resolution

N/A

Section 553. Has the President determined that the country has not taken adequate steps to halt illicit drug production or trafficking?

5C(2) PROJECT CHECKLIST

Listed below are statutory criteria applicable to projects. This section is divided into two parts. Part A. includes criteria applicable to all projects. Part B. applies to projects funded from specific sources only: B.1. applies to all projects funded with Development Assistance loans, and B.3. applies to projects funded from ESP.

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

A. GENERAL CRITERIA FOR PROJECT

1. FY1987 Continuing Resolution Sec.523 ; FAA Sec. 634A. Congressional Notification

Describe how authorizing and appropriations committees of Senate and House have been or will be notified concerning the project.

2. FAA Sec. 611(a)(1). Prior to obligation in excess of \$500,000, will there be (a) engineering, financial or other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance? (a) Yes (b) Yes

3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance? Further legislative action is not required.

4. FAA Sec. 611(b); FY 1987
Continuing Resolution Sec.
501. If for water or
water-related land resource
construction, has project met
the principles, standards,
and procedures established
pursuant to the Water
Resources Planning Act (42
U.S.C. 1962, et seq.)? (See
AID Handbook 3 for new
guidelines.) N/A
5. FAA Sec. 611(e). If project
is capital assistance (e.g.,
construction), and all U.S.
assistance for it will exceed
\$1 million, has Mission
Director certified and
Regional Assistant
Administrator taken into
consideration the country's
capability effectively to
maintain and utilize the
project? N/A
6. FAA Sec. 209. Is project
susceptible to execution as
part of regional or
multilateral project? If so,
why is project not so
executed? Information and
conclusion whether assistance
will encourage regional
development programs. NO
7. FAA Sec. 601(a). Information
and conclusions whether
projects will encourage
efforts of the country to:
(a) increase the flow of
international trade; (b)
foster private initiative and
competition; and (c)
encourage development and use
of cooperatives, and credit
unions, and savings and loan
associations; (d) discourage
monopolistic practices; (e)
improve technical efficiency
of industry, agriculture and
commerce; and (f) strengthen
free labor unions. A major objective of the project
is to address priority constraints
on production of Niger's principal
rainfed and irrigated food crops.
Resolving, or at least minimizing
major constraints will result in
increased production for not only
consumption in Niger, but also
for export to neighboring West
African countries. Constraints to
production are not only agronomic,
but economic as well, and
innovative means of the farmer
addressing these will be encourag-
ed.
Regarding this section, major
impact will result from project
activities under item (e). The
project will also encourage
efforts of the country under items
(a), (c) and (d). Items (b) and
(f) are N/A to this project.

- | | |
|---|--|
| <p>8. <u>FAA Sec. 601(a)</u>. Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).</p> | <p>This project will neither encourage nor discourage private U.S. trade and investment except to the extent that the project requires U.S. goods and services to implement :</p> |
| <p>9. <u>FAA Sec. 612(b), 636(h); FY 1987 Continuing Resolution Sec. 507</u>. Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars.</p> | <p>The GON will pay personnel costs for Nigeriens associated with the project plus much of the local support costs for project activities amounting to about 14% of total costs. Gon budget constraints will require that a portion of grant funds be used to meet local currency costs.</p> |
| <p>10. <u>FAA Sec. 612(d)</u>. Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?</p> | <p>NO</p> |
| <p>11. <u>FAA Sec. 601(e)</u>. Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?</p> | <p>Yes</p> |
| <p>12. <u>FY 1987 Continuing Resolution Sec. 521</u> . If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity?</p> | <p>N/A</p> |

13. FAA 118(c) and (d). Does the project comply with the environmental procedures set forth in AID Regulation 16. Does the project or program take into consideration the problem of the destruction of tropical forests? Yes. N/A
14. FAA 121(d). If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditure of project funds (dollars or local currency generated therefrom)? Yes, it is being made in connection with the authorization of the project.
15. FY 1987 Continuing Resolution Sec. 532. Is disbursement of the assistance conditioned solely on the basis of the policies of any multilateral institution? NO
16. ISDCA of 1985 Sec. 310. For development assistance projects, how much of the funds will be available only for activities of economically and socially disadvantaged enterprises, historically black colleges and universities, and private and voluntary organizations which are controlled by individuals who are black Americans, Hispanic Americans, or Native Americans, or who are economically or socially disadvantaged (including women)? N/A

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B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance
Project Criteria

a. FAA Sec. 102(a), 111, 113, 281(a). Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status, (e) utilize and encourage regional cooperation by developing countries?

(a) The project involves the rural poor in development by increasing their access to appropriate agricultural research and resources and by increasing the yields from labor intensive food production.

(b) The project will provide cooperatives with technical recommendations to increase their agricultural productivity.

(c) Any self-help project which aims to increase agricultural production will benefit from the technical recommendations to be developed under this project.

(d) Technical recommendations developed under the project will benefit women by increasing food crop productivity thereby improving family food supply and nutrition.

(e) Technical recommendations to increase production of cowpeas will encourage cross-border trade with Nigeria.

- b. FAA Sec. 103, 103A, 104, 105, 106. Does the project fit the criteria for the type of funds (functional account) being used? Yes, 103A
- c. FAA Sec. 107. Is emphasis on use of appropriate technology (relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor)? Yes
- d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed country)? No. Section 110(a) requirement not applicable to Sahel funds. However, country is providing approximately 14 percent of project costs.
- e. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth? Yes

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f. FAA Sec. 128(b). If the activity attempts to increase the institutional capabilities of private organizations or the government of the country, or if it attempts to stimulate scientific and technological research, has it been designed and will it be monitored to ensure that the ultimate beneficiaries are the poor majority?

Yes

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

The project is designed to help satisfy Niger's expressed need for self-sufficiency in food production on a self-sustaining basis. It utilizes a self-help rural development model based on individual and community effort and emphasizes farmer training, literacy and access to production

2. Development Assistance Project
Criteria (Loans Only)

a. FAA Sec. 122(b).
Information an conclusion on capacity of the country to repay the loan, at a reasonable rate of interest. N/A

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

3. Economic Support Fund Project
Criteria

a. FAA Sec. 531(a). Will this assistance promote economic and political stability? To the maximum extent feasible, is this assistance consistent with the policy directions, purposes, and programs of part I of the FAA? N/A

b. FAA Sec. 531(c). Will assistance under this chapter be used for military, or paramilitary activities? N/A

c. ISDCA of 1985 Sec. 207. Will ESF funds be used to finance the construction of, or the operation or maintenance of, or the supplying of fuel for, a nuclear facility? If so, has the President certified N/A

that such country is a party to the Treaty on the Non-Proliferation of Nuclear Weapons or the Treaty for the Prohibition of Nuclear Weapons in Latin America (the "Treaty of Tlatelolco"), cooperates fully with the IAEA, and pursues nonproliferation policies consistent with those of the United States?

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

N/A

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5C(3) - STANDARD ITEM CHECKLIST

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

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

A. Procurement

1. FAA Sec. 602. Are there arrangements to permit U.S. small business to participate equitably in the furnishing of commodities and services financed? Yes, CBD, AID Small Business Bulletin
2. FAA Sec. 604(a). Will all procurement be from the U.S. except as otherwise determined by the President or under delegation from him?? Yes
3. FAA Sec. 604(d). If the cooperating country discriminates against marine insurance companies authorized to do business in the U.S., will commodities be insured in the United States against marine risk with such a company? N/A
4. FAA Sec. 604(e); ISDCA of 1980 Sec. 705(a). If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? (Exception where commodity financed could not reasonably be procured in U.S.) Yes

5. FAA Sec. 604(g). Will construction or engineering services be procured from firms of countries which receive direct economic assistance under the FAA and which are otherwise eligible under Code 941, but which have attained a competitive capability in international markets in one of these areas? Do these countries permit United States firms to compete for construction or engineering services financed from assistance programs of these countries? NO
6. FAA Sec. 603. Is the shipping excluded from compliance with requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S. flag commercial vessels to the extent such vessels are available at fair and reasonable rates? NO
7. FAA Sec. 621. If technical assistance is financed, will such assistance be furnished by private enterprise on a contract basis to the fullest extent practicable? If the facilities of other Federal agencies will be utilized, are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs? Yes

8. International Air Transportation Fair Competitive Practices Act, 1974. If air transportation of persons or property is financed on grant basis, will U.S. carriers be used to the extent such service is available? Yes
9. FY 1987 Continuing Resolution Sec. 504. If the U.S. Government is a party to a contract for procurement, does the contract contain a provision authorizing termination of such contract for the convenience of the United States? yes

B. Construction

1. FAA Sec. 601(d). If capital (e.g., construction) project, will U.S. engineering and professional services be used? N/A
2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable? Yes
3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed \$100 million (except for productive enterprises in Egypt that were described in the CP)? N/A

C. Other Restrictions

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

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

3. FAA Sec. 620(h). Do arrangements exist to insure that United States foreign aid is not used in a manner which, contrary to the best interests of the United States, promotes or assists the foreign aid projects or activities of the Communist-bloc countries? Yes

4. Will arrangements preclude use of financing:
 - a. FAA Sec. 104(f); FY 1987 Continuing Resolution Secs. 525; 540. (1) To pay for performance of abortions as a method of family planning or to motivate or coerce persons to practice abortions; (2) to pay for performance of involuntary sterilization as method of family planning, or to coerce or provide financial incentive to any person to undergo (1) Yes (2) Yes

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- sterilization; (3) to pay for any biomedical research which relates, in whole or part, to methods or the performance of abortions or involuntary sterilizations as a means of family planning; (4) to lobby for abortion? (3) Yes
(4) Yes
- b. FAA Sec. 488. To reimburse persons, in the form of cash payments, whose illicit drug crops are eradicated? Yes
- c. FAA Sec. 620(g). To compensate owners for expropriated nationalized property? Yes
- d. FAA Sec. 660. To provide training or advice or provide any financial support for police, prisons, or other law enforcement forces, except for narcotics programs? Yes
- e. FAA Sec. 662. For CIA activities? Yes
- f. FAA Sec. 636(1). For purchase, sale, long-term lease, exchange or guaranty of the sale of motor vehicles manufactured outside U.S., unless a waiver is obtained? Yes

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- g. FY 1987 Continuing Resolution, Sec. 503. N/A
To pay pensions, annuities, retirement pay, or adjusted service compensation for military personnel?
- h. FY 1987 Continuing Resolution, Sec. 505. Yes
To pay U.N. assessments, arrearages or dues?
- i. FY 1987 Continuing Resolution, Sec. 506. Yes
To carry out provisions of FAA section 209(d) (Transfer of FAA funds to multilateral organizations for lending)?
- j. FY 1987 Continuing Resolution, Sec. 510. Yes
To finance the export of nuclear equipment, fuel, or technology or to train foreign nationals in nuclear fields?
- k. FY 1987 Continuing Resolution, Sec. 511. NO
Will assistance be provided for the purpose of aiding the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights?
- l. FY 1987 Continuing Resolution, Sec. 516. Yes
To be used for publicity or propaganda purposes within U.S. not authorized by Congress?
- M. FY 1987 Continuing Resolution, Sec. 558. Yes
To conduct any testing or breeding feasibility study, variety improvement or introduction, consultancy, publication, conference, or training in connection with the growth or production in the country for export which would compete with a similar commodity grown or produced in the United States.

INITIAL ENVIRONMENTAL EXAMINATION

Project Country: Niger

Project Title: Niger Applied Agricultural Research Project (083-0250)

Funding: FY (s) 1987-1992 \$19,855,075

IEE Prepared by: Jeffrey W. Goodson, Regional Environmental Officer, REDSO/WCA 23 May 1986 and modified by USAID/Niger 15 December 1986

Environmental Action Recommended:

Positive Determination _____

Negative Determination _____ X _____

A negative determination is recommended for construction, and commodity and supply acquisition activities, with the exception of procurement and use of pesticides. Procurement and use of pesticides is recommended for exception pursuant to 22 CFR 216.3 (b) (2) (iii), with USAID and GON commitment to the requirements of that regulatory section as detailed in Paragraph 5, Section 3.0, of the attached IEE.

Categorical Exclusion:

The organizational development, research extension liaison, applied agricultural research, technical assistance, and training components and activities meet the criteria for categorical exclusion in accordance with 22 CFR 216.2 (c) (2) (xiv), (v), (ii), (i) and (1), respectively, and are excluded from further review because they will not have a significant adverse environmental effect.

Date of IEE Preparation: 23 May 1986; modified 15 December 1986

Concurrence: _____ Date: _____

Bureau Environmental Officer

APPROVED: J. P. Benadict

DISAPPROVED: _____

DATE: _____

Clearance: REDSO/RLA W. H. Mitchell

DATE: 19 February 1987

1987

INITIAL ENVIRONMENTAL EXAMINATION

1.0 PROJECT DESCRIPTION

Phase I of the Niger Applied Agricultural Research Project (083-0256) is a five year, \$19.9 million effort designed to institutionalize a system of applied agronomic research characterized by strong functional linkages to extension. It combines phase II of the Niger Cereals Research (NCR) Project 683-0256 with an irrigation component. Working primarily with INRAN, the project will consist of three components: 1) organizational development; 2) development of applied agricultural research programs; and 3) research extension linkage. These components will be effected through the provision of long and short-term technical assistance, long and short-term training, and acquisition of certain commodities and supplies.

The organization development component is designed to further strengthen INRAN's capacity to administer and manage its research programs and resources. The primary output under this component of the project will be a long-range institutional development plan which will include research program directions, human resource and budgetary requirements and a training plan for researchers and support staff. Support services to research will also be strengthened by helping INRAN to develop systems for the management of vehicles, farm and laboratory equipment, agricultural inputs and supplies and physical facilities. In addition, long and short-term training will be provided for INRAN researchers and support staff to upgrade their training in such areas as research management, agronomy, irrigation engineering, experiment station development, data analysis, etc.

The applied agricultural research component will focus on agronomic, soils, fertilizer, crop selection and water management activities. This research will be conducted on the research stations and on farms. The research will be carefully monitored, with a view towards development of technical recommendations adapted to local conditions. These technical recommendations will be designed to maximize the productive use of local natural resources and minimize existing adverse effects resulting from less than optimal resource management. Within this framework, the project will concentrate on applied research programs in cropping systems, production systems, farming systems research and water management.

The objective of the research extension linkage component of the project is to further develop the functional linkages between INRAN, extension and other agricultural services. The project will reinforce the existing INRAN Research Extension Unit (REU) through the provision of technical assistance, training and operating funds. The REU will establish formal working agreements with the Ministry of Agriculture and ONAHA Extension Services, the Rural Engineering Service, and cooperatives. These memoranda of understanding will clearly outline the roles and responsibilities of INRAN and participating organizations for cooperative research activities. The REU will actively involve extension services in the program of on-farm and multi-locational trials by providing logistical support and training to help them to extend useful research results to end users more effectively. The REU will also coordinate and facilitate the transmission and marketing of research results to the extension services who will then disseminate the recommendation to farmers.

The technical assistance (TA) inputs will include about 29 person-years of long-term TA and about 36 person months of short-term TA. Training will include long-term training for about 17 individuals, and short term training for approximately 500 research technicians, field agents and, farmers. Commodities and supplies to be acquired under the project include vehicles, research equipment, office furniture and supplies, limited amounts of fertilizers and pesticides to be used strictly for research purposes under controlled conditions, and limited building construction and associated materials.

2.0 ISSUES

2.1 Building Construction

The project will construct storage facilities at three substations and open air hangars at Tarna and Kolo. Because the construction will be of such a limited nature, and will occur on lands already affected by agricultural or other development, significant adverse impact is not expected to result.

2.2 Extension and Secondary Project Impacts

Although the project will not be involved in technology extension per se, it will develop appropriate and applied technologies for rainfed and irrigated agriculture and train extension agents to understand technical material in order to help them to extend useful research results to end users more effectively. Therefore, there exists the probability and there is the intent that the project will result in substantial adoption of project-developed recommendations by virtue of the subsequent work performed by project-trained extension agents.

While it is currently impossible to define with precision the actual technical recommendations which will be ultimately developed for dissemination, these recommendations can be seen to fall into several broad categories: water management, mixed cropping systems, new variety introduction, and fertilizer use. To the extent that the final recommendations are actually adopted, they will affect the environment. The purpose and intent of the project, however, is to develop recommendations which will improve and enhance environmental quality by assisting farmers to improve current resource management techniques. Among the improvements envisioned are better water conservation; increased soil fertility; increased crop yields; increased sustainability of soil use; decreased evaporation and salinization rates; and potentially decreased water-related human health problems as a function of reduced water exposure resulting from implementation of mixed double cropping systems and better water management. While it is currently impossible to predict the extent to which these positive effects will materialize, or the extent to which potential adverse effects may result, the research and training activities are oriented towards evaluation of technical recommendations and their effects on the target farmers. Thus, as the project moves into later stages, it will be possible at that time to elucidate the environmental effects, both positive and adverse, which result from adoption of the project-developed recommendations. As usual, research is expected to utilize this feedback to maximize the positive effects while minimizing the negative effects, if any, which result.

2.3. Pesticides

Pesticides will be procured and used in this project only for research and limited field evaluation purposes by or under the supervision of project personnel. The project will ensure that the manufacturers of the pesticides provide toxicological and environmental data necessary to safeguard the health of research personnel and the quality of the environment in which the pesticides will be used. Furthermore, treated crops will not be used for human or animal consumption unless appropriate tolerances have been established by EPA or recommended by FAO/WHO, and the rates and frequency of application, together with the prescribed preharvest intervals, do not result in residues exceeding such tolerances.

3.0 RECOMMENDED ENVIRONMENTAL ACTION

The organizational development component of the project is recommended for categorical exclusion pursuant to 22 CFR 216.2 (c) (2) (xiv), since this component is intended to develop the capability of INRAN to engage in a form of development planning. The research extension linkage component of the project is recommended for categorical exclusion pursuant 22 CFR 216.2 (c) (2)(v), since this component is intended to coordinate and facilitate the transfer of information and documents. The applied agricultural research component, including on-farm trials, is also recommended for categorical exclusion pursuant to 22 CFR 216.2 (c) (2) (ii), since it constitutes controlled experimentation exclusively for the purpose of research and field evaluation which will be confined to small areas and carefully monitored. The technical assistance activities and training activities are further recommended for categorical exclusion pursuant to 22 CFR 216.2 (c) (2) (i), since they will not include activities such as construction of facilities which would directly affect the environment.

Construction is recommended for negative determination, since it will be of an extremely minor nature and take place at locations previously affected substantially by agricultural or other activities.

The commodity and supply acquisition activities are, with the exception of pesticides, recommended for negative determination since they are directly related to the research activities and will neither have, nor be used to result in, significant adverse environmental impact.

The procurement and use of pesticides under this project is recommended for exception pursuant to 22 CFR 216.3 (b) (2) (iii), since that procurement and use will be strictly for research or limited field evaluation purposes by or under the supervision of project personnel. USAID and the project commit to ensuring that the manufacturers of the pesticides provide toxicological and environmental data necessary to safeguard the health of research personnel and the quality of the local environment in which the pesticides will be used. Furthermore, treated crops will not be used for human or animal consumption unless appropriate tolerances have been established by the EPA or recommended by FAO/WHO, and the rates and frequencies of application, together with the prescribed preharvest intervals, do not result in residues exceeding such tolerances, per 22 CFR 216.3 (b) (2) (iii).

ANNEX //
ENGINEERING ANALYSIS

1. Project Description,

1.1. Location

The project will evolve through the activities as outlined in the Project Paper and Technical Annexes. The Project effort will be supported by existing and new facilities and equipment. The major project sites and/or facilities are located as follows:

- 1) INRAN headquarters in Niamey
- 2) Main Station at TARNA, near Maradi
- 3) Main Station at KOLLO, near Niamey
- 4) Soils Lab near Niamey
- 5) DECOR offices in Niamey and Tarna
- 6) Substation at KONNI, near Birni N'Konni

1.2. Technical Assistance Personnel

The T.A. team consists of nine individuals who will normally work in Niamey and the main stations, and occasionally visit the substations where Nigerian technicians will be in charge.

The T.A. team members and their counterparts will be stationed as follows:

POSITION	NIAMEY	TARNA	KOLLO
Team Leader/Research Management	X		
Dryland Agronomist			X
Irrigation Agronomist		X	
Soils/Water Mgmt. Specialist		X	
Irrigation Engineer		X	
Breeder/Coordinator			X
Extension/Research Specialist	X		
Economic Anthropologist (Nigerian)		X	
Agricultural Economist	X		

Best Available Document

1.3. Equipment

The major items of equipment, located in the main stations and which need be parked and protected from the weather, are the following:

ITEM	TARNA	KOLLO
Tractors	5	2
Plows	9	5
Thrashers	5	2
Planters	2	2
Harvesters	3	2

A quantity of miscellaneous small equipment and piping material will also be stored in the main stations.

1.4 Needs for Physical Infrastructure

During the first year of the project six expatriate technicians will arrive in Niger where they will begin their activities with respective counterparts. Three more people will complete the T.A. team during the second year. They will also have Nigerian counterparts. Housing and office space, including meeting/research rooms, libraries, and computer rooms will be available to all the expatriates and their Nigerian counterparts.

Project vehicles need be considered for maintenance capability. Also, the existing and new equipment provided for T.A. team support will need parking and maintenance facilities in the form of work yard and covered sheds.

In order to make the main stations more functional and useful to the over all project effort, each must have a considerable amount of rehabilitation work done to their irrigation systems. Although irrigation facilities already exist, they are inadequate. The project, as conceived, will provide funding for design of the irrigation systems through the AID financing, while the funds for construction and supervision of construction will be financed by the Government of Niger's contributions to the project effort.

2. DESCRIPTION OF PROJECT SITES

The Technical Assistance team will live in the houses rented and furnished for the present VCA, Tropsoils and other INRAN TA staff as they depart and/or plus other housing that may need to be acquired. Housing for TA staff has not been a problem for the expatriate community in Niger since the decline in the uranium industry. Counterparts to the TA team will live on or near the research sites at Maradi, and Kolo, or in Niamey near the INRAN headquarters and JECOR offices. As with the TA team, locating housing for the INRAN staff has not posed a problem to date, nor is it likely to during the life of NAAR. (INRAN does want to build their own staff housing, but they have been told that such an effort is out of the scope of this project.)

It has been determined by the design team that INRAN has or will have sufficient office space, conference rooms, research facilities, libraries, and computer space to accommodate the NAAR effort. In fact, as with the housing, the NAAR will take advantage of the efforts of present and previous INRAN projects by utilizing research facilities already in place and/or being completed prior to the NAAR starting. INRAN facilities are distributed as follows:

FACILITY	INRAN Hq	DECOR	DECOR	Soils Lab	Tarna	Kolo
		Tacoua	Viamey	Viamey		
Offices	17	2	6	6	3	4
Conference Rooms				1	1	
Research Rooms				7	3	3
Document. Center				1	1	
Library			1			
Computer Room	1		1	1	1	

As stated in the Institutional Analysis (see ANNEX A), INRAN has already developed plans for some new facilities. These and others may be considered under USAID counterpart funding activities. However, the design team determined that additional construction (other than that described here in) is not essential to the success of the project, and is therefore considered outside the project scope.

Presently, routine maintenance of vehicles and equipment is done by INRAN staff in Tarna and Kollo. Private firms in Maradi and Viamey undertake the more serious repair work. In Tarna, with the newly completed mechanical repair shop, the project plans to train mechanics to strengthen the maintenance and repair capability for the station fleet. A program of equipment and machinery rehabilitation is underway in the Niger Cereal Research Project for the whole INRAN set-up.

The design team has visited the private garages and interviewed their respective owners/managers to verify their capabilities. The ability to maintain and service exists for Toyota, Nissan, Peugeot and Mercedes, among others. The project will therefore purchase vehicles of these makes, under the mission's blanket waiver. The ability to maintain and service exists for John Deere tractors, and INRAN is trying to standardize on this make.

Since the fleet is or will be standardized, its maintenance is thus simplified and, the facilities being in place, no additional consideration will be given by this project to the subject of vehicle/equipment maintenance.

The following subsections describe the sites which are all located on INRAN property as assigned by the Ministry of Agriculture of the Government of Niger.

2.1. Tarna

The Tarna Research Station is located at the southern outstretch of Maradi and is equipped with offices, laboratories, a library with documentation center as well as other essential service buildings. The total area of the station is about 260 hectares, and is divided into zones by barbed wire fence. Irrigated fields are located on several parts of the station.

The 260 hectare site varies from sandy hills to low lying alluvial soils adjacent to a stream bed which dries up after the rainy season. The building construction site is on the higher, well drained, soils. Most of the irrigated area is on the flat alluvial soils and uses a surface distribution system. Some sprinkler irrigation, using portable pipe, is done on the sandy hills. Future water supply for irrigation will be from wells in the shallow aquifer below the station. Old wells exist but do not provide adequate yield. Electricity and potable water are adequately available from the Maradi city supply.

2.2 Kollo

The Kollo Research Station is south-west of Niamey connected by 30 km of good black-top road. The station is on laterite rock formation with good natural drainage and is located on a cliff overlooking the Niger River and adjacent to the Kollo Agricultural Training School (IPDR). The station already has in place offices, laboratories, houses and storage buildings which were built or renovated under the Niger Cereals Research Project. Extra office accommodation at Kollo and Niamey is desirable, but not essential, to the success of this project. As stated earlier, IRAN has already developed plans for some new facilities. These and others may be considered under USAID counterpart funding activities. However, the design team determined that additional construction (other than that described here in) is not essential to the success of the project, and is therefore considered outside the project scope.

Between the building area and the Niger River lie the irrigated experimental fields on fairly heavy soil on a siltbank or an extinct channel. The present system of gravity canals is in disrepair and the pumping station and intake canal are inoperable during low water. Electricity from Niamey and potable water from Kollo are available.

2.3 Konni

At Konni irrigation water is delivered to the station from an ONIWA - controlled turnout on the large reservoir/gravity system. During the rainy season there is sufficient water for supplemental irrigation, but during the winter months there is not sufficient water to irrigate the total eleven hectare experimental plot.

3. JUSTIFICATION FOR ADDITIONAL CONSTRUCTION

3.1 Main Stations

At the Tarna and Kollo main stations, farm machinery and equipment are presently left in the open air at the mercy of rain and hot climate. Consequently they have rusted and the rubber and elastic components badly deteriorated. Open-side sheds will be constructed to provide shelter. They will reduce maintenance cost and increase the life of the equipment.

Because of the physical dimensions of the main equipment (tractors), the sheds will be proportioned with multiple bays measuring 5m x 3m. Thus, the safe maneuvering and parking of as many as four tractors in one bay will be possible. Bumper guards will be installed around columns to protect them from being accidentally hit.

In addition to the equipment, the shed in Tarna will be provided with an area for storage of irrigation pipes and other equipment, presently scattered all over the area. Six bays will constitute the 233 sq.m. shed floor area. This area will satisfy the present and expected acquisitions as well as provision for circulation area. An additional wash platform for the equipment (a properly drained slab on ground measuring 5m x 3m) will also be built.

At Kollo, where a limited quantity of equipment needs be stored, the shed will consist of only three bays for a total area of 144 sq.m. A wash platform, similar to the main station in Tarna, will also be constructed.

3.2 Substations

The three INRAN substations (Konni, Bando and Tillaberi) lack proper storage facilities for harvested trial produce. Storage room is needed to protect farm produce against the weather and permit fumigation. Eight tons of produce storage is anticipated for each station requiring 30 square meters. Two offices are also needed for the station technician and his assistant. An atrium will serve as sampling, weighing and bagging area. Thus, the estimated covered area for each station is 30 sq.m.. By inspection of the REDSO Engineers, access roads are already in place and site drainage will not present any problem. Water will be obtained from existing sources: mostly dug wells. Electricity will not be required or provided.

3.3. Irrigation Systems

In order to conduct much of the proposed project research, it will be necessary to have ready access to adequate supplies of irrigation water on selected experiment stations. At present, the infrastructure to deliver the required water is inadequate or nonexistent. Stations selected for upgrading are Kollo, near Niamey, Tarna, near Maradi, and Konni, near Birni N'Konni. Selection of these stations was based on soil and topography, water supply and logistics.

In order to meet the requirements of an experiment station, an irrigation system must be more flexible, and usually more expensive, than a crop production type system. This is due primarily to the small plot sizes, highly varied crops and calendars, and labor constraint in hours per day of operation.

4. DESIGN AND CONSTRUCTION

4.1. Design

4.1.1. Buildings

The Rural Engineering Section of the Ministry of Agriculture (MINAG/RE) will prepare the final building plans and bid documents.

The machinery and equipment storage sheds will be open on two sides. The structure will consist of roof steel trusses supported by concrete columns, braced at the top with the roof trusses on one direction and reinforced concrete beams or spandrel steel trusses on the other. Aluminum roof and a concrete floor will cover the horizontal surfaces, while masonry blocks and walls will complete the shed. Finally, a well drained 5m x 3m concrete wash rack will be installed in each site.

The storage/office building in the substations will be one storey with integrated column and beam frame with concrete block masonry. The roof will be corrugated aluminum sheet supported by steel purlins, and plywood false ceiling over the offices and an atrium will be used. The floors will be reinforced concrete slab on ground.

The design for both types of structures should take into consideration maximum wind velocity of 150 km per hour and the footings dimensioned according to the allowable soil strength determined by the soil laboratory test.

Preliminary design has already been done by the MINAG/RE which will also undertake the completion of bid documents. REDSO/Engineer approval of the design and bid documents, prior to their being advertised for tendering, will be required.

4.1.2. Irrigation Systems

INRAN, through the Rural Engineering Section of the Ministry of Agriculture will assist a consultant engineer, engaged through an indefinite quantity contract (IQC), or other appropriate order, to provide the topographical surveys for the irrigation sites. The consultant engineer will prepare detailed design drawings, specifications, material and equipment lists, bid documents and scope of work for construction supervision. The design drawings will include site mapping. Four months of work is anticipated to prepare the complete package. The scope of work of the consultant engineer is elaborated in Appendix 3 of this Annex.

It is anticipated that the design of the irrigation systems will be tailored after the following parameters:

At Kollo, the new irrigation system will include an electric powered pumping station at the river delivering water into a buried pipe line. The pipe will convey water about 1400 meters to a concrete reservoir with about 40 cubic meters of live storage, and elevated several meters above the field level. The pump will be switched on and off by linked automatic controls in the reservoir. The reservoir will feed a buried pipe network under the station by gravity. A riser and hydrant from the buried pipe network for each hectare will serve each of about twelve hectares. Water will be conveyed from the hydrants to surface channels, basins or furrows in portable irrigation pipe and/or portable gated pipe. Enough gated and ungated portable pipe will be supplied to cover four of the twelve hectares at one time (400 meters of each).

At Tarna, based on other wells in the area, it is believed that about five drilled wells on site will be required to supply adequate water. These wells will be fitted with electric submersible pumps and deliver water into a common buried pipe network similar to Kollo (above). Again, water will be delivered to each hectare through a riser, hydrant and portable pipe. The pumps will be switched manually and individually. Open standpipes will be used to alleviate excess pressure, surge and air locks.

At Konni, field distribution on the station is by unimproved earth channels and siphon tubes into furrows or borders. Upgrading will consist of designing about 1400 meters of concrete lined channel, and water measurement and control devices.

4.2 Construction of Buildings

Most country contracting procedures will be followed with an open bidding process after advertisement in the public media of Niger. The value of the work is not enough to merit advertisement in the United States since it is fairly certain that American contractors will not be interested in such a small contract, considering the high cost of mobilization and demobilization into and out of Niger. Small or middle size local Nigerian contractors, with adequate supervision provided by RE/MIWAG, should be able to satisfactorily construct the buildings.

4.3 Construction of Irrigation Systems

Immediately following completion of design and other documents, as explained in Section 4.1.2 of this Annex, host country contracting procedures will be initiated to engage a construction firm to undertake the work. As with the building construction, RE/MINAG will supervise construction. The project will also have an irrigation engineer to assist with the supervision. The construction firm will be required to procure all materials and equipment needed for the systems. It is anticipated that one year will be required to complete construction of the three systems. The contractor will be instructed to follow AID procedures and regulations in procurement. A source/origin waiver will be necessary for the pumps, which will be of European origin and procured locally or in Abidjan. This is necessary because service and spares are not available for U.S. pumps. All piping and fittings are manufactured in Abidjan and may be procured without a waiver.

REDSO/WCA will also review the design of the bid documents for the irrigation systems prior to their being advertised for bid.

5. ESTIMATED COSTS

5.1 Buildings and Design of Irrigation Systems (AID Financing)

Using average cost per unit area obtained from similar facilities in Niger, and based on 1967 rates, \$230 per square meter will be used for the open side shed and \$350 per square meter for the storage/office block. The slabs on ground for the wash platforms are estimated to cost \$100 per square meter.

Construction of the buildings is programmed to be completed in the first year. Considering physical contingencies (about 10%), the cost estimate for the various buildings is detailed as follows:

- <u>Wash-Sheds:</u>		
	- Tarna 233 S.M	\$30,640
	- Kollo 144 S.M	40,320
- <u>Wash-Platforms:</u>		
	- Tarna 40 S.M	4,000
	- Kollo 40 S.M	4,000
- <u>Seed-Storage/Office-Buildings:</u>		
	at 3 substation - 3 x 30 S.M	34,200
	SUBTOTAL (CONSTRUCTION)	\$212,960
	Design of research field irrigation systems	43,000
	SUBTOTAL (CONSTRUCTION AND ENGINEERING)	260,960
	Physical Contingencies (10%)	26,040
	<u>GRAND TOTAL ESTIMATED CONSTRUCTION</u>	<u>\$287,000</u>
	<u>AND CONTRIBUTION, 1937 RATES</u>	
	(inflation and exchange rate contingencies to be added in the project budget)	

5.2 Construction of Irrigation Systems (Government of Niger Financing)

The project anticipates that the construction of the irrigation systems will start during the second year of the project and continue for one full year. RE/MINAG will be responsible for inspecting the work and assuring quantity and quality control. The following estimate will use 1937 average construction and material cost rates applicable to Niger. Because of limited presently known data affecting both design and construction of the systems, a physical contingency of about 15% will be considered.

Best Available Document

ITEM	QUANTITY	COST
Construction (Kallu)		
Field preparation (earthwork)		\$ 8,000
Electric Pump	50 1/sec	\$ 17,000
Pump House/Intake		\$ 10,500
Main Pipeline	250mm Dia x 1500m	\$ 77,500
Reservoir		\$ 14,000
Electric Controls		\$ 2,000
Buried Pipe Network/ risers/hydrants/valves	200mm Dia x 1400m	\$ 34,700
Electricity hook up & Transformer		\$ 57,000
Portable surface pipe	150mm Dia x 400m	\$ 19,500
Portable gated pipe	150mm Dia x 400m	\$ 23,500
Water Meter	1 x 50 1/sec	\$ 1,200
SUBTOTAL (1)		\$ 324,700
Construction (Iacca)		
Field preparation (earthwork)		\$ 8,000
Drilled wells	Five	\$ 34,000
Submersible pumps/controls	Five	\$ 42,000
Buried Pipe Network/ risers/valves/gates	150mm Dia x 1400m	\$ 59,000
Portable surface pipe	150mm Dia x 400m	\$ 19,500
Portable gated pipe	150mm Dia x 400m	\$ 23,500
Water Meter	4 x 15 1/sec	\$ 2,000
SUBTOTAL (2)		\$ 238,000
Construction (Kannal)		
Field preparation (earthwork)		\$ 8,000
Lined Canal	30 L/S x 1400m	\$ 39,700
Water Control Structures	Five	
Water Measuring Flumes	Four	\$ 1,200
SUBTOTAL (3)		\$ 97,700
SUBTOTAL (1)+(2)+(3)		\$ 660,400
Physical contingencies		33,020
Price contingencies		92,376
Devaluation contingencies		105,664

GRAND TOTAL ESTIMATED CONSTRUCTION \$ 891,460
 Government of Niger Contribution, 1987 Rates

26%

o. IMPLEMENTATION SCHEDULE

The time required after the signature of project agreement for the various stages of contracting and construction of the buildings is estimated as follows:

* Detail design and preparation of bid documents	1.5 months
* Invitation for bids	1.5 months
* Bid analysis and contracting	2.0 months
* Construction	7.0 months
TOTAL TIME REQUIRED	12.0 months

The construction of the irrigation systems will be done under most country contract, or contracts, and they are programmed to begin during the month of August 1933, and to continue for one full year thereafter.

A_N_N_E_X...E

Certification of Section

611 (e)

of the FAA of 1961

as amended

I, Peter Benedict, the Principal Officer of the Agency for International Development in Niger, do herewith certify that in my judgement, Niger has both the financial capability and human resources to maintain and utilize effectively the goods and services procured under this project entitled the Niger Cereals Research Project.

This judgement is based upon a thorough review of the GON's administrative and financial accountability procedures, the extensive consultations with the GON during the preparation of this project, and the past good record of implementation support of other AID projects carried out in Niger.



Peter Benedict
Director
USAID/Niger

Date: MAY 30, 1987

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ANNEX E
GRAY AMENDMENT

I Peter Benedict, Director, USAID/Niger hereby certify that during the development of the Niger Applied Agricultural Research Project, full consideration has been, and will continue to be given to potential involvement of economically and socially disadvantaged enterprises and individuals as well as registered and unregistered PVOs whose board of directors or similar body has more than 50% black, hispanic or native americans, women, or other members who are economically and socially disadvantaged. USAID/Niger will compete among economically and socially disadvantaged enterprises and individuals the Procurement Service Agent (PSA) contract (valued up to \$300,000).

USAID/Niger's staff considered the possibility of setting the technical assistance portion of the project aside for an HBCU or socially and economically disadvantaged firm. This approach was ruled out because no single "Covered Organization" was thought to individually be able to implement all elements of the project. HBCU's would not be able to provide the strong management necessary for implementation of the project. Similarly, socially and economically disadvantaged firms would not be able to provide the technical personnel needed for the project from In-House staff. Setting the project aside would only frustrate and delay contracting. Further, USAID's staff concluded that breaking up the technical assistance into parts, was not acceptable from a management point of view. Consequently, the RFP will include a statement that all proposers are encouraged to reflect the participation of Historically Black Colleges and Universities (HBCU), economically and socially disadvantaged enterprises and individuals and Private For Profit firms in the provision of long/short term technical consultants, training and overall management of the project. The proposals will be reviewed on how creative they are at successfully incorporating covered organizations as subcontractors .


Peter Benedict
Director
USAID/Niger

Date : MAY 30, 1987

Drafted: NCR:FFuller:pg:1163p

Clearance:

PDO, S. Chambers SC
ADO, E. Gibson EG