

08/15/80

ACTION MEMORANDUM FOR THE ASSISTANT ADMINISTRATOR FOR AFRICA

69p.

FROM: AAA/AFR/DR, ^{John W. Koehring} John W. Koehring

SUBJECT: Niger Cereals Production Project (683-0201) - Extension of Estimated Final Contribution Date (EFCD)

Problem: Your approval is necessary to extend the EFCD for subject project by one year with no increase in authorized funding.

Discussion: The subject project was authorized by the Administrator in 1975. It was amended by you in June 1978 to increase the LOP funding by \$4,964,000 to \$14,600,000 and extend the EFCD by one year from 3/31/79 to 3/31/80. Due to various implementation delays, the EFCD was extended an additional nine months to 12/31/80 by the Mission Director under his delegation of authority.

At the time of that extension, it was thought that not only would the subject project's outputs be achieved by 12/31/80, but also the Mission would be able to negotiate and design follow-on project activities in those areas where assistance continues to be needed and effectively utilized. In the process of those negotiations, it was decided that continuing support of the type provided by the subject project should be divided into two projects - one for research and another for production. In the area of research, a general outline of activities has been identified. The PID for Niger Cereals Research (NCR) (683-0225) was submitted to AID/W, reviewed and approved by you on July 23. Because it has been decided that the design and implementation of NCR will be performed collaboratively by a Title XII institution and the selection of such an institution requires more time than the selection of only a PP design team, a FY 80 obligation is no longer feasible.

In order to "bridge the gap" between the subject project and the NCR project and to continue to provide assistance to the National Agricultural Research Institute (INRAN) which is participating in the ongoing subject project and will be the implementing agency for the new NCR project, a one-year extension of the subject project is necessary. The remaining authorized funding for the subject project (\$588,000 - see attached budget) will be sufficient to fund this one-year extension; therefore, a project amendment is not required. Since the subject project was not included in the 1980 CP, a CN was forwarded to Congress on August 8. Upon the expiration of the 15 day waiting period on August 23, the \$588,000 will be obligated. The extension of the EFCD may be approved at this time.

Recommendation: That you approve the extension of the EFCD of the subject project by one year from 12/31/80 to 12/31/81.

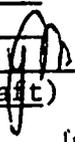
APPROVED Ray N. Stearns (initials)

DISAPPROVED _____

DATE Aug 15 1980

Attachment: Subject project budget table.

Clearances:

DAA/AFR:HNorth ^{QNS}
AFR/SWA:DMiller (draft)
AFR/SWA:GMacArthur (draft)
AFR/SWA:ECostello (draft)
AFR/SWA:YJohn (draft)
AFR/DP:RStacy (draft)
GC/AFR:NFrame (draft)
AFR/DR:NCohen
AFR/DR/SFWAP:JRMcCabe 
AFR/DR/ARD:QBenbow (draft)


Drafted by:AFR/DR/SFWAP:MGHuffman:fn:7/16/80

ACTION MEMORANDUM FOR THE ASSISTANT ADMINISTRATOR

3

FROM : AFR/DR, John W. Koehn 

SUBJECT: Niger Cereals Production Project (683-0201)

Problem: Your approval is required to authorize an additional four million nine hundred sixty four thousand dollars (~~\$4,964,000~~) from the Sahel Development Fund for a grant to the Government of Niger for the Niger Cereals project.

Discussion:

A. The purpose of this project is to improve the institutional capacity in Niger to (a) develop improved technology for cereals production; (b) communicate this knowledge to the small farmers and (c) strengthen the framework for the provision of agriculture inputs to encourage farmers to adopt higher yielding technology in cereals production. [The project consists of four interrelated components: (a) adaptive research to identify and develop improved varieties and production practices for small farmers; (b) seed multiplication and distribution to make improved varieties available; (c) expansion of the agriculture cooperative structure in Niger to include cereals producers; and (d) expansion and improvement of the agriculture service's extension program. AID inputs consists of (a) technical assistance and training in research, seed production, cooperatives, and agricultural extension; (b) construction of seed farms, research stations, and cooperative facilities; and (c) commodities and operating cost for project activities.

The project is consistent with the GON's primary goal in their three year development program and the strategy adopted by CILSS and the Club du Sahel. The GON has established food self sufficiency and food security as its major goal in its development plan and the primary vehicle for accomplishing this will be through increased production of cereals on small farms under rainfed conditions.

Increased funding for this project is required to cover increased costs resulting from errors in estimating technical assistance and construction cost in the original project paper, and additional cost required to extend the life of the project for one additional year. The need for increased funding of approximately \$2,500,000 to carry out the technical assistance and construction approved in the original project paper was identified in the early stages of project implementation and reported in the Niger ABS for 1978 and 1979.

The second annual project evaluation conducted in January of 1978 identified the need to extend the life of the project through 1979. The recommended one year extension of the project is required because of unforeseen delays in project implementation and the fact that project inputs will not now be complete before the third quarter of 1978. The extension of the project will also provide additional time and information enabling AID and the GON to jointly determine how AID can most effectively continue to support the GON's food production program.

In addition to the one year extension, other minor changes have become necessary in the process of project implementation. The adaptive research program has been modified slightly and only two of the three originally proposed SMC's will be constructed. Under the seed component, the National Seed Service that was to be established has been found to be infeasible for Niger at this time. The proposed responsibilities of this service will be carried out by the Agriculture Cooperative and research agencies under a permanent committee for seed policy, production and multiplication. Under the cooperatives component, a more intensive program has been implemented in the Dosso department to take advantage of the existing management structure of the ongoing FAC project which focused on increasing cowpea production through cooperatives. The proposed 150 grain silos were not built because they were determined to be inappropriate for Niger and non-essential for UNCC to carry out its marketing responsibilities.

Under the extension component, actions have been taken to augment and improve the extension service. However, due to the present policy of decentralizing planning and implementation of extension programs in Niger, the proposed strengthening of a national extension office has not been possible. An in-depth evaluation of various regional extension programs and the role of the national agriculture service in supporting the department programs is currently being undertaken to identify what type of support will be required in the future. The proposed short-term, non-academic training for extension personnel has not been conducted due to unavailability of personnel and restructuring of the extension program. The number of vehicles provided was reduced at the request of the Ministry of Rural Development and the proposed construction of arrondissement office complexes has not been necessary. (Additional explanation of changes is found on pages 8-10 of the attached PP amendment).

Beneficiaries of the project will be: first, the Nigerien farmers who will be assisted in increasing their production and will have a larger marketable surplus which will provide additional cash income; secondly,

non-grain producing consumers who will be assured an adequate food supply at reasonable prices; and thirdly, the Ministry of Rural Development personnel who will benefit from additional training and better support in carrying out their role in promoting increased production.

B. The financial requirements of this project are \$14,600,000 over the four year life of the project including an initial obligation of \$5,912,000 authorized from drought relief funds under the Foreign Disaster Assistance Act of 1974 and \$2,100,000 obligated in FY 1977 from Food and Nutrition Funds. In addition to the \$1,624,000 originally authorized for FY 1978 an additional \$2,571,000 is now required in 1978 and \$2,423,000 in FY 1979. The net amount remaining for your authorization at this time is \$4,964,000.

<u>Budget Item</u>	<u>FY 1978</u>	<u>FY 1979</u>	<u>LOP</u>
	<u>(\$000)</u>		
1. Technical Assistance			
a) Institutional Contract (CID)	700	700	2518.2
b) PSC's and local support staff	185	280	1029.8
2. Commodities	465	350	3520.0
3. Construction	1640	-	3344.8
4. Other Cost			
Project Management and COD Local Support	150	73	464.8
Support to GON Services	860	860	3071.4
5. Participant Training	<u>165</u>	<u>160</u>	<u>651.0</u>
TOTAL	4165	2423	14600.0

Although the 25 percent host country contribution required under Section 110(a) of the Foreign Assistance Act is inapplicable to projects funded under the Sahel Development Program, the GON contribution is estimated at \$3,239,000 which is greater than 25 percent of the project cost for years FY 1977 to FY 1979.

C. 1. The sociological constraints and incentives have been examined and the economic and other incentives are projected to outweigh the constraints. No factor of a sociological nature was found which would constitute an insurmountable obstacle to project success. The economic impact of the project will be positive for the Government of Niger (increased local food production at a lower cost than imported grain) and small farmers (increased yields and incomes).

2. The project will contribute to the basic human right to freedom from hunger. With respect to U.S. concerns for human rights there is no issue in Niger.

3. The project is technically feasible given the projected inputs and the requested one year project extension.

4. The activities for which funding is authorized herein for obligation in FY 1979, except possibly with respect to pesticides, will not have a significant effect on the environment since the funding is intended merely to continue financing for one year more activities that are presently being financed under the project.

Pesticides present a separate problem, however, as a result of recent revisions to the pesticide regulations which require, in effect, an IEE that provides a risk/benefit analysis of pesticides that are registered with the Environmental Protection Agency and an Environmental Assessment regarding those pesticides that are not so registered, if AID finances either the procurement or the use of pesticides. Since part of the funds authorized for obligation in FY 1979 will finance the use of pesticides in that the salaries of those who apply pesticides will be financed by A.I.D., it will be necessary to comply with the new pesticide regulations.

However, the pesticides that will be used are not presently identified with certainty. For that reason, the requirement for a IEE or EA regarding the pesticides will be satisfied, in accordance with Section 216.3(b)(v), of AID Regulation 16, after this amendment is authorized but before FY 1979 funds that will finance the use of pesticides may be obligated.

D. 1. The project committee met June 1 and June 8 to review the project and made the following recommendations:

That the project paper amendment be rewritten to show more clearly the differences in the project as originally approved and the project as amended, how the recommendations of the last evaluation have been taken into account in project implementation, how the economic analysis of the project is being further studied and revalidated as a part of project implementation, and how the Niger Cereals project is related to other food production projects currently being implemented in Niger.

The recommended changes have been made and are included in the attached project paper amendment.

2. As the FY 1978 funding will exceed the amount shown in the FY 1978 Congressional presentation by \$1,365,000 and the funding category has been changed from Food and Nutrition to Sahel Development Program, Congressional Notification is required. An Advice of Program change was sent to Congress on June 16, 1978 and the required waiting period will expire on June 30, 1978.

F. USAID/Niger Acting Project Manager is Norman Garner. The responsible officer in AFR/DR is Lewis Ortega.

Recommendations: That you approve the attached Project Paper Amendment:

- (1) increasing project funding by \$4,964,000 and an extension of the project for an additional year.

Approved _____

Disapproved _____

Date _____

- (2) a FY 1978 obligation of \$4,165,000 ^{1/}

Approved _____

Disapproved _____

Date _____

^{1/} This \$4,165,000 includes \$2,541,000 authorized under this project Amendment in addition to the \$1,624,000 which is already authorized.

- (3) a FY 1979 obligation of \$2,423,000 contingent upon satisfaction of current rules and regulations.

Approved PT

Disapproved _____

Date 6/26/78

AFR/DR/SFWAP:HDickherber:dmb:6/19/78:x26330

Clearances:

AFR/DR:JKelly JK
GC/AFR:STisa ST
AFR/DR:DDibble DD
AFR/DR:DFerguson DF
AFR/SFWA:DShear DS
AFR/SFWA:GMacArthur GM
AFR/DP:CWard CW
AFR/DR/SFWAP:JRMCCabe JR
SER/ENGR:JMMorgan JM

PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS

Part II

Country : Niger

Project : Niger Cereals Production Project Amendment

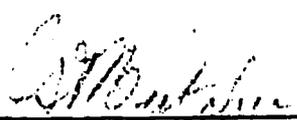
Project No.: 683-0201

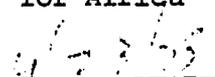
Pursuant to Part 1, Chapter 1, Section 121 of the Foreign Assistance Act of 1961, as amended, I hereby authorize a Grant to the Government of Niger (the "Cooperating Country") of not to exceed Two Million Five Hundred Forty-One Thousand United States Dollars (\$2,541,000), in addition to the amount previously authorized for fiscal year 1978, as an amendment to the above captioned project (the "Amendment") to assist in financing certain foreign exchange and local currency costs required for the project as amended.

The Amendment to the project shall consist of (a) financing the increases in the cost of the technical assistance contract and in the cost of construction of certain facilities originally approved for the project and (b) financing the activities previously approved in the project for an additional year.

I hereby approve the total amount of A.I.D. appropriated funding planned for the Amendment of not to exceed Four Million Nine Hundred Sixty-Four Thousand United States Dollars (\$4,964,000), including the amount authorized above and an additional increment of grant funding in fiscal year 1979 subject to the availability of funds and in accordance with A.I.D. allotment procedures.

I hereby authorize the initiation of negotiations and execution of the Grant Agreement Amendment by the officer to whom such authority has been delegated in accordance with A.I.D. regulations and Delegations of Authority.


Assistant Administrator
for Africa


DATE

BEST AVAILABLE DOCUMENT

AGENCY FOR INTERNATIONAL DEVELOPMENT				PROJECT PAPER FACESHEET				1. TRANSACTION CODE <input type="checkbox"/> A ADD <input checked="" type="checkbox"/> C CHANGE <input type="checkbox"/> D DELETE				PP			
3. COUNTRY ENTITY NIGER				4. DOCUMENT REVISION NUMBER 1				2. DOCUMENT CODE 3							
5. PROJECT NUMBER (7 digits) 683-0201		6. BUREAU/OFFICE A. SYMBOL AFR B. CODE 1		7. PROJECT TITLE (Maximum 40 characters) Niger Cereals Production Project											
8. ESTIMATED FY OF PROJECT COMPLETION FY 80				9. ESTIMATED DATE OF OBLIGATION A. INITIAL FY 75 B. QUARTER 4 C. FINAL FY 79 (Enter 1, 2, 3, or 4)											
10. ESTIMATED COSTS (\$000 OR EQUIVALENT \$) -															
A. FUNDING SOURCE		FIRST FY			LIFE OF PROJECT										
		B. FX	C. L/C	D. TOTAL	E. FX	F. L/C	G. TOTAL								
AID APPROPRIATED TOTAL		3127	2785	5912	8386	6214	14600								
(GRANT)		3127	2785	5912	8386	6214	14600								
(LOAN)															
OTHER U.S.															
HOST COUNTRY			231	231		3238	3238								
OTHER DONOR(S)		570		570	570	200	770								
TOTALS		3697	3016	6713	8956	9652	18608								
11. PROPOSED BUDGET APPROPRIATED FUNCS. (\$000)															
A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY 75		H. 2ND FY 77		K. 3RD FY 78							
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN						
(1) AD	210	144		5912											
(2) FN	210	144				2100									
(3) SH								4165							
(4)															
TOTALS				5912		2100		4165							
A. APPROPRIATION		N. 4TH FY 79		O. 5TH FY		LIFE OF PROJECT		12. IN-DEPTH EVALUATION SCHEDULED							
		P. GRANT	Q. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN								
(1) AD						5912									
(2) FN						2100									
(3) SH		2423				2423									
(4)															
TOTALS		2423				14600									
13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PIO FACESHEET DATA BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PIO FACESHEET.															
<input type="checkbox"/> 1 = NO <input type="checkbox"/> 2 = YES															
Original project Approved under PROP format															
14. ORIGINATING OFFICE CLEARANCE						15. DATE DOCUMENT RECEIVED IN AID/W. OR FOR AID/W DOCUMENTS. DATE OF DISTRIBUTION									
SIGNATURE Walter Sherwin						<table border="1" style="width: 100%; text-align: center;"> <tr> <td>MM</td><td>DD</td><td>YY</td> </tr> <tr> <td>1</td><td>2</td><td>78</td> </tr> </table>				MM	DD	YY	1	2	78
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PROJECT PAPER AMENDMENT

(Niger Cereals Project)

I. Recommendation

This Project Paper amendment recommends that the Niger Cereals Project (NCP), originally approved in July 1975 as a three-year project with a total AID contribution of \$9,636,000 be extended for a one-year period and that the AID contribution be increased to a total of \$14,600,000. This total includes \$8,012,000 obligated to date and an additional \$4,165,000 to be obligated in FY 1978 and \$2,423,000 to be obligated in FY 1979.

II. Rationale for Project Amendment

This amendment contains justification for the extension of the project for an additional year and for increased funding to cover errors in estimating technical assistance and construction cost in the original project paper.¹

A. Rationale for Project Extension

USAID/Niger has and continues to recommend further support to the development of cereals production in Niger and AID/W has tentatively supported this position with the approval of the Niger Cereals II PID. The major issue with regard to the extension of Niger Cereals I and beginning date for Phase II is how can AID most effectively provide this continued support. At the time the PID was written for Phase II it was still hoped that Niger Cereals I could be completed on schedule and that sufficient knowledge and experience would have been gained and time available for the AID and GON personnel currently involved in project implementation to design Phase II with a minimum of short-term assistance. It is now apparent that available knowledge and experience to date are not sufficient

¹The justification for increased funding is contained in the Revised Financial Plan, p.24-28.

at this point to design a Phase II project that would most effectively respond to the needs of Niger. An extension of Niger Cereals I through 1979 is therefore based on the following rationale:

- (1) Progress in development of facilities and delivery of commodities is such that full project inputs will not be complete before the third quarter of FY 1979.
- (2) CID technical assistance has been available through only one crop cycle. A one year extension will result in a total of three years assistance. This will substantially improve the basis for measuring the contribution of this component to the overall project objectives and for determining technical assistance requirements under Phase II.
- (3) A one year extension will permit action to be taken on recommendations made by the latest evaluation, the results of which will be instrumental in consideration of the Phase II design.
- (4) Given the substantial geographic coverage of the major grain-producing regions of Niger provided by the individual department productivity projects, including major support to the Agriculture Service, one of the crucial decisions to be taken during the design of Phase II is on the role of the extension component within the project. The analysis of Niger's extension service to be conducted by the project during 1978 will be essential for the formulation of this decision.
- (5) In keeping with the concept of collaborative project design between the AID and the GON, the postponement of Phase II design to June 1979 will provide time for more deliberative joint planning and data-gathering for the design effort including programming for required consultant services.

- (6) The third annual project evaluation will be in December 1978. The results of this evaluation will (a) be used in developing the work plan for the 1979 crop year - the final year of Phase I, and (b) provide additional data for Phase II design. In addition, it is planned to carry out an agricultural sector assessment beginning about October 1978. This will serve as the key basis for Phase II design. The achievements of Phase I will serve as the starting point for a broadened Phase II.

The continuation of NCP Phase I through 1979 rather than terminating Phase I at the end of 1978 and starting Phase II in 1979 will permit continued support for Cereals Development in Niger at approximately the same level as would have been possible if Phase II were to start earlier. The greatest advantage of proceeding in this manner will be that the Phase I purpose and outputs can be accomplished and the Phase II design will more accurately address the major possibilities and take into account the constraints in an implementation plan that is consistent with development realities in Niger.

B. Summary of Original Project

The Niger Cereals Production Project was originally designed in 1974 in the context of the special assistance requirements arising out of the Sahel drought. The food shortages resulting from the drought caused an increased awareness on the part of the GON and the donor community of the need for significant action to increase food production. This project was designed to achieve increased production and availability of cereals by improving the institutional capacity in Niger to identify improved technology, communicate this knowledge to the small farmers, and strengthen the framework for the provision of necessary agricultural inputs. The project consists of four interrelated components: applied research, seed multiplication, cooperatives, and agricultural extension.

The applied research component was designed to focus on a complete package of improved inputs and practices which are readily adaptable by the Nigerien farmers. Technical assistance programmed under this

component included a plant breeder, soil scientist/agronomist and agricultural engineer. [The plant breeding section was to identify and develop improved varieties of millet, sorghum, and cowpeas.] The soil management section was to identify soil deficiencies, effective use of fertilizer, and the effects of crop rotation and intercropping systems. [The agricultural engineering section was to identify soil structures and the availability of sub-surface water for irrigation. The agricultural engineer was also to assist in the design of irrigation systems and in project construction.] Infrastructure planned under this component included additional facilities for the central research station at Maradi and the construction of three research sub-stations. Also provided for were local and participant training and operating cost for the research stations.

The seed production component was designed to increase the quantity of seed of superior varieties and to train a corps of Nigerian technicians and farmer seed producers in the techniques required for the production, processing, and distribution of improved seed. Under this component a National Seed Service was to be established that would assume overall responsibility for the coordination, evaluation, and control of this component. Infrastructure under this component included a Foundation Seed Farm and a system of five Seed Multiplication Centers that would produce seed to be further multiplied by the contract seed growers.

The cooperatives component was designed to assist the National Union of Cooperatives and Credit (UNCC) to extend its coverage into areas where it had not previously been active. (Previous activity had almost totally been limited to cash crops.) In order to increase UNCC's capacity to deliver agricultural inputs and market farm output, training was programmed for top managers, cooperative agents and cooperative leaders and members. Physical infrastructure planned under this component included 12 regional office complexes and 150 grain silos. Also to be provided were commodities and support for operating cost.

The agricultural extension component was designed to expand and improve the extension division of the Agriculture Service. Technical assistance was to be provided to assist in resolving organizational

problems and in improving training of extension personnel. Participant training was to include long-term, non-academic training for five persons to form the nucleus of a national training division. An additional 20 persons were to receive short-term, third-country training. Vehicles and other commodity support was to be provided to increase the effectiveness of existing personnel and additional personnel were to be provided to reduce the geographic area of coverage at the lowest level of extension staffing. Arrondissement level office complexes were to be constructed and two Young Farmer Training Centers were to be improved to increase their training capacity.

C. Project Evaluation

The second annual project evaluation was held in January 1978 to assess the extent to which project goals referred to above had been met and to recommend changes or adjustments in the continuing implementation of this project. This was a joint evaluation conducted by representatives of all services of the GON involved in the project/ USAID/Niger, AID/W and the Consortium for International Development. The evaluation team members were divided into committees representing the various components of the project.

The major problem identified by the evaluation was that project implementation has not kept pace with the proposed schedule. This was due to unforeseen delays in ordering commodities and commencing construction and the fact that the CID technical assistance team arrived only in September 1976 thereby missing the entire 1976 production cycle. They have therefore only been operational during one complete crop cycle. In addition to this, further delays have been encountered in delivery of agricultural equipment that was financed in the original ProAg, and in commencing the second block of construction. It is now apparent that the seed processing buildings and equipment will not be fully operational until the 1979 crop cycle. For these reasons it was recommended that the life of the project be extended for one full year.

With regard to the extension component, it is felt that a great deal has been accomplished but unfortunately there has not been a systematic evaluation at the farmer level. There have also been major changes in the GON's approach to agricultural development. At the time the original PROP was written, primary direction and implementation of extension efforts was from the national offices of the services of the Ministry of Rural Development which are divided along commodities and functional lines with geo-political divisions being a secondary consideration. With the advent of the department productivity projects, the primary responsibility for coordination and directing extension activities has been shifted to the department geo-political level. The national services of the MRD have continued to provide support and personnel along commodity and functional lines and the Cereals Project has provided support to the Agriculture Service to enable it to provide this input and maintain extension activities in geographic areas which are not yet covered by the productivity projects. It is expected that each administrative department will soon have a department productivity project similar to the Niamey Department Project funded by AID. All of the departmental projects are of an experimental nature and there are considerable differences among them. Given this change since the Project Paper was written, the role of the national extension service vis-a-vis the departmental projects as well as the type of support that should be provided under the NCP has become less clear.

The evaluation recommended certain procedures be followed in the implementation of extension activities in 1978 and 1979 and that the activity be monitored and evaluated by the extension advisor with the assistance of an American project staff assistant. It further recommended that an in-depth analysis of extension activities in Niger be undertaken to identify gaps in structure and effectiveness and provide a basis for reaching a mutually agreed upon approach for further action.

Other problems identified and recommendations made include the following:

- (1) Problem: The PROP called for a National Seed Service and The Pro Ag calls for a National Seed Policy. The GON currently has a procedure for partially fulfilling these functions that involves the Agriculture Service, INRAN and UNCC carrying out their respective functions in Seed Multiplication and Distribution.

Recommendation: That a permanent committee be established in the Ministry of Rural Development (MRD) to establish seed policy and coordinate seed multiplication and distribution. That a seed testing laboratory be established.

- (2) Problem: The delays in identifying a suitable site for the FSF have handicapped the seed multiplication program.

Recommendation: That the FSF be made operational in 1978.

- (3) Problem: More field testing of plant varieties, cultural practices and soil management practices is required to determine their adaptability to different soil and climatic conditions.

Recommendation: That the Ouallam research sub-station be activated in 1978 and that more support for field testing be provided.

- (4) Problem: Additional material and equipment for the seed research and soils laboratories will be required but have not yet been ordered.

Recommendation: That the required equipment be ordered in time for arrival before the buildings are completed.

- (5) Problem: The technical training of UNCC personnel has been determined to be inadequate and support for training of farmers in cooperative techniques has been insufficient causing administrative difficulties.

Recommendation: That the technical training be expanded from 3 months to 5 months and support be provided to feed the farmers attending training.

- (6) Problem: Participant training for Extension has not kept pace with that planned in the PROP and Pro Ag and not met the GON's needs to improve the cereals extension program.

Recommendation: That a second participant be sent for Academic Training in extension and 5 participants receive non-academic training in extension planning implementation and training.

D. Project as Amended

It is proposed by this amendment that the project be continued essentially as designed and approved in 1975 except for the changes explained below. These changes are based on two year's experience in the implementation of this project and the evaluation of the project conducted in January 1978.

The adaptive research component has progressed substantially as programmed since the arrival of the technical assistance team, however the extension of the life of the project will be necessary to complete three full years of research. The soil management section has been augmented by assigning an American staff assistant to the national soils laboratory to assist in soil analysis and training of laboratory personnel in soil analysis. The research in availability of sub-surface water for irrigation has been dropped and studies of the effective utilization of rainfall under different cropping systems has been added. The construction of research sub-stations has been reduced from three to two due to the increased construction cost and the lack of personnel to staff a third station now and in the near future. In accordance with the evaluation's recommendation that field testing be increased, the Ouallam research station is being activated this year and more field testing is programmed in the villages surrounding the SMC's.

Under the Seed Multiplication component the National Seed Service called for in the PROP has been found to be infeasible for Niger at this point in time. Various aspects of the seed multiplication and distribution activities are currently divided between the Agriculture Service, INRAN, and UNCC. It was jointly agreed that this system has been adequate but that a permanent committee would be officially established under the Minister of Rural Development to establish seed policy and coordinate seed multiplication and distribution. All five SMC's and the FSF are in production in 1978 but building and installation of equipment will not be complete before June 1979. The extension of the project will insure the availability of technical assistance for the proper installation and operation of equipment in 1979.

The cooperative component has proceeded essentially as originally planned. Efforts have been more intensive in the Dosso department than was originally planned. The more intensive program in this area has been implemented to take advantage of the existing management structure of the ongoing FAC project which focused on cowpeas. The coordinated effort made possible by NCP has accelerated the adoption of recommended practices in millet and sorghum production in this area. Other changes in this component include the reduced focus on marketing by UNCC due to changes in official policy and the marketing situation. The number of cooperative office compounds constructed has been reduced from 12 to 8 but these have been adequate to meet UNCC's current needs. The proposed 150 grain silos have been dropped as inappropriate for Niger and unnecessary for UNCC to fulfill their marketing function. UNCC retains the grain for only a very short period of time during the dry season when storage problems are minimal.

It is in the area of the extension component that the greatest changes have taken place in the climate in which the project is being implemented. As explained earlier the responsibility for planning and implementation of agricultural extension is shifting from the national to the regional level. The regional programs however continue to rely on the national services for personnel and support and it is primarily in this area that the cereals project was planned to and continues to provide a major input. In order to improve the effectiveness of this input certain procedures were established during the last evaluation and they are currently being followed. In order to identify what type of support for the extension effort will be required in the future, an in-depth evaluation of existing extension efforts currently planned and being undertaken via the department productivity projects has been started and will be continued through the 1978 production campaign. During the past two years the extension advisor has been only half time due to his joint role as chief of party for CID and the GON's misunderstanding of his role and the subsequent rejection of the second, full time, extension advisor/trainer. In this amendment, a full time extension advisor is provided to strengthen this component. The participant training program originally proposed for this component has been changed significantly. The proposed third country

short course training has been dropped primarily due to the unavailability of candidates. The long term, non-academic training has been delayed and is now scheduled for 1978 and 1979. Two degree programs in agriculture extension not programmed for originally are included under this amendment. The increased manpower programmed for in the original PROP has been achieved by hiring additional personnel and providing them with annual training rather than transferring personnel from UNCC to the Agriculture Service as was originally proposed. The number of vehicles provided was reduced at the request of the Minister of Rural Development. The construction of arrondissement level offices was dropped from this project and has not been necessary. Improvements were made to only one young farmer training center (CFJA). In addition to the evaluation of the national extension system and its weaknesses, an evaluation of the effectiveness of the project supported village extension agents and the farm level impact of the recommended production practices will be undertaken in 1978 under this component of the project.

PROJECT SUMMARY DESCRIPTION AS AMENDED

(1) Project Goal: This project will contribute to strengthening the predominantly agricultural society of Niger, reducing its dependence upon donated external food supplies and improving the economic condition and performance of the farm community to support a viable and ecologically secure way of life for the Sahelian population.

(2) Purpose: This project will improve the institutional capacity in Niger to, (a) develop improved technology for cereals production; (b) communicate this knowledge to the small farmers; and (c) strengthen the framework for the provision of necessary agriculture inputs to encourage farmers to adopt higher yielding technology in cereals production.

(3) Project Outputs:

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

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

(c) A seed multiplication program consisting of five seed multiplication centers (SMC's) producing improved seed and selecting, training and providing inputs for contract seed growers whose plots will concurrently serve to multiply seed and serve as a demonstration unit for the new varieties and for the recommended package of cultural practices;

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

(e) Expansion and improvement of the Agriculture Service's training programs for the instruction of personnel and increased extension staffing to perform the various functions required in the promotion of increased cereals production.

4. Project Inputs:

(a) Technical assistance to the agencies responsible for research, seed multiplication, coop organization and agricultural extension;

(b) Commodities in the form of vehicles, agricultural equipment and supplies, seed processing equipment, laboratory and other research equipment, and supplies to support the agricultural extension program;

(c) Construction of research facilities, seed multiplication centers, and cooperative service facilities and repairs to a farmer training center;

(d) Local support to appropriate GON agencies to enable them to absorb the increased work load involved in the seed production effort and extension activities;

(e) Participant training in the U.S., third country short-term studies, and local on-the-job training.

III NCP Project Implementation Status

The Niger Cereals Project original ProAg was signed on 17 September 1975. Project implementation started early in Crop Year 1976 with the hiring of staff assistants and the arrival of consultants who developed more detailed implementation guidelines than were included in the Project Paper for the cooperative, seed production and extension components. A local expense budget was submitted in March 1976 and approved in sufficient time to begin limited project activities with the GON services and staff assistants for the 1976 crop season (June-November 1976). The CID Contract team arrived in September 1976 and their first year's plan of work was approved in December 1976. The following describe the component parts of the NCP activities to date, requirements for FY 78 and 79, and modifications and changes from the original Project Paper.

(1) Seed Multiplication Component:

Under this component, three seed multiplication centers (SMC) were established in 1976 at Guecheme in the department of Dosso, Doukoudoukou in the department of Tahoua and Magaria in the department of Zinder. Contracts for the initial construction activities at these centers, as listed in the revised financial plan below, were awarded and construction began. The first year's production output at these centers was unacceptable for seed purposes due to operational inexperience and insufficient technical guidance. In the second year (1977), production amounted to only 25 tons of millet and 4 tons of cowpea seed due to insufficient rains and the consequent early harvesting.

Sites have been selected at Hamadallaye in Niamey department and Tibiri in Maradi department for the two additional SMC's authorized under the project and they have begun operation during the 1978 crop season. In 1978, construction contracts will be let for the completion of construction and the installation of seed processing equipment at the three

original SMC's as well as the complete construction requirements for the two additional SMC's. Given the increased experience in the operation of SMC's over the past two years and the addition of the new SMC's it is expected that 100 tons of second-generation improved seed will be produced by the SMC's during the 1978 crop season utilizing first-generation foundation seed supplied by INRAN's Tarna Research Center at Maradi.

Given the availability of limited seed provided by Tarna, the SMC's have been able to operate to date without benefit of the foundation seed from the FSF as originally planned. However, the quantity availability has been insufficient. The establishment of the planned FSF has been delayed due to initial difficulties in deciding on a definite site followed by construction delays in the execution of another donor-financed irrigation system. The first of these difficulties has been resolved with the selection of Lossa as the site of the FSF and the second will be resolved by furnishing in FY 1978 NCP project funds for the completion of the irrigation system. Production activities will begin during the 1978 crop year and the first FSF foundation seed will be supplied to the SMC's for multiplication during the 1979 crop season. All construction activities for the SMC's and the FSF are expected to be complete by June 1979.

The inauguration of the system of contract farmer seed-producers as the final link in the seed multiplication chain has been delayed due to difficulties in defining an acceptable system of quality control and farmer contracting. These issues have now been settled to the agreement of the GON and AID and initial contract seed multiplication will begin during the 1978 crop season utilizing second generation seed produced by the SMC's in 1977. Given optimum conditions and success, a theoretical 8,000 tons of improved seed should be available for distribution to farmers in 1980 from the 100 tons of second-generation seed produced by the SMC's in 1978 and multiplied by the contract seed producers during 1979.

The National Seed Service (NSS) proposed by the original Project Paper has been deemed inappropriate for Niger at this point in time. A compromise alternative was agreed upon during the January 1978 project evaluation whereby the GON decree number 003/MER of December 1973 creating a "committee for the production and distribution of peanut seed" will be amended to extend the purview of the committee to other crop seeds and add appropriate NCP related GON services as committee members.

The project funded participants undergoing long-term U.S. academic training in seed technology are scheduled to return in January 1979. The Nigeriens who have been named as chiefs of the first three SMC's have received short-term training in seed technology in Cameroon and the chiefs of the two new SMC's will be provided this training in 1978.

(2) Research Component:

Under the plant-breeding section of this component a collection of germ plasm has been gathered from the U.S. (sorghum) and ICRISAT (millet). All available varieties were planted during the 1977 crop season and a preliminary selection of the most promising seed has been completed. Beginning in 1978 the CID plant breeder and his Nigerian counterpart will concentrate their research efforts on sorghum variety research and an ICRISAT funded researcher will concentrate on millet variety research. One project funded participant has returned from academic training in plant breeding at a U.S. university and a second is scheduled to return in December 1978.

Under the Agronomy/Soils section, fertilizer and varietal trials have been conducted to determine the relative performance of both improved and local varieties. A study of crop rotation and inter-cropping systems has been started which includes the introduction of new varieties and species of legumes.

Soils analysis and mapping of the research and seed centers is nearly complete. Support has been provided to the National Soils Laboratory in Niamey and equipment has been ordered for the Tarna Research Center's soils analysis laboratory. For the remaining crop years of 1978 and 1979 the CID agronomist will expand his studies on fertilization to include legumes and continue studies on the development of cultural techniques, crop rotation and yields. Research on soils and mineral deficiencies will become the responsibility of the pedology section of INRAN although the Tarna Research Center will retain responsibility for soil cartography. A project funded participant will be returning from long-term academic training in the U.S. in soils science in December 1978. A project funded participant in agronomy will be returning from long-term U.S. academic training in May 1978 and will be assigned to work with the CID agronomist. To the extent that trained Nigerian personnel are made available for the full staffing of the sub-research station at Ouallam, field testing of plant varieties and soil management practices will be expanded to determine adaptability under different soil and climatic conditions.

Under the Agriculture Engineering section, assistance has been provided by the CID agriculture engineer in the design and layout of the seed farms and research stations. Research has been initiated on the effective utilization of rainfall in the growing season using various cropping systems and on the minimum water requirements for millet production in the dry season. Soil conservation work has been commenced at the Tarna Research Center to prevent erosion. A participant will be selected in 1978 to commence academic training in agriculture engineering at a U.S. university.

The Crop Protection section envisaged in the original project paper has been dropped from the NCP due to the assumption of this role under the National Crop Protection project sponsored by CIDA. The Plant Physiology and Ecology section has been delayed as the plant physiologist who was to have been supplied by another donor has not materialized. If this position has not been filled by the end of project this section will be

recommended for inclusion under Phase II of the NCP with a U.S. funded technician filling the position. In March 1978 a Nigerian agronomist with specialization in biology and plant physiology returned from project funded long-term academic training in the U.S. This man will be assigned to the Tarna Research Center to work closely with both the Plant Breeding and Agronomy sections.

Construction of the Tarna Research Center facilities and the Ouallam sub-station has commenced and is progressing satisfactorily. All construction should be complete by June of 1979.

(3) Cooperative Component:

Under the Cooperative component, assistance has been provided by the CID credit and cooperative advisor in drafting legislation that will give legal personality to cooperatives as well as advice on improving the distribution system for agriculture inputs and related credit operations.

Eighty encadreurs received 9 months of training in 1976/77, forty are presently in training and 40 more are scheduled in 1978/79. The training curriculum for the encadreurs was evaluated at the end of the first two 40 student cycles in an effort to improve the theoretical portion of the programs which has now been extended from 3 to 5 months. Seventeen secretary/accountants have undergone refresher training. 1,043 cooperative leaders and 3,823 village mutual leaders have received 5 days of training each. In 1978 and 1979, additional arrondissement delegates of the UNCC and farmer-demonstrators will receive refresher training as well as the cooperative and village-mutual leaders for those cooperatives newly formed in those years.

Construction of the department or arrondissement administrative centers for the UNCC authorized by the Project Paper has been completed. Although the number of buildings were actually less than the 12 originally

authorized the construction of 8 centers and addition 2 others have been sufficient to meet the requirements of the UNCC based on their present rate of geographical expansion.

Sixty aide-encadreurs in 1976 and 90 in 1977 were hired and trained under the Dosso Productivity Project using NCP project local support funds and were successful in organizing the cultivation in those respective years of 3,000 and 8,000 hectares of millet utilizing improved seed and production techniques.

500 tons of project funded fertilizer were distributed on credit terms for the production of millet under the Dosso Productivity project. Collection of repayment is presently in process and the recovered funds will serve to constitute a revolving fund for the procurement of additional inputs.

(4) Extension Component:

The project has not had a full-time CID extension advisor as originally proposed in the Project Paper. ^{1/}The CID team leader, who is serving as extension advisor has only been able to devote half of his time to extension matters. During this time, he assisted the gon in the development of a guide for aide-encadreur (village extension agent) training which will serve as the basic document for subsequent training programs. 15 extension bulletins have been designed and mimeographed and a slide-series has been developed as a visual training aide. He has also developed a proposal for a Learning and Information Center which would be used to support extension work under Phase II of NCP for both agriculture and UNCC extension work.

The project provided funding for the hiring and training of 150 aid-encadreurs in 1976 and 1977 who conducted the NCP demonstrations at the village level. One Nigerian is presently engaged in long-term academic training in extension at a U.S. university. He is scheduled to return in

1/ The PROP and ProAg called for a 1 full time extension advisor but the contract negotiated between CID and AID called for a chief of party/extension advisor. Due to a misunderstanding concerning the roles of these 2 people the GON accepted only the chief of party/extension advisor resulting in this component being understaffed.

early 1979. Limited assistance in building rehabilitation was provided to the Young Farmer's Training Center (CFJA) at N'Dounga.

In 1978 a comprehensive analysis of the extension service in Niger will be conducted by the NCP. This analysis will enable the GON and USAID to mutually assess the gaps or weaknesses in structure and effectiveness as well as identify remedial actions that can be effected through joint GON/donor efforts. This analysis will also be instrumental in determining the most appropriate vehicle for future support to the extension service, i.e., at the national level through Phase II of the NCP; at the local level through the department productivity projects; or through a planned and coordinated combination of both.

Approximately 225 aide-encadreurs will be hired and trained for the 1978 crop season and an equivalent number for the 1979 crop season. The actual number will be based upon work plans developed by the agriculture service as detailed in the January 1978 evaluation report.

One additional Nigerien will be selected by the GON for long-term academic training in extension at a U.S. university. Enrollment is planned for September 1978.

One short-term consultant has been provided by CID to assist the extension service evaluate its extension training programs and recommend any changes that may be required.

The agriculture extension component has not completely followed the program strategy which was developed for the original project paper for a variety of reasons. Chief among these is the change that has taken place in assignment of authority and responsibility for extension work. At the time the original PP was written, primary direction and implementation of extension efforts was from the national offices of the services of the Ministry of Rural Development which are divided along commodities and functional lines with geo-political divisions being a secondary

consideration. With the advent of the department productivity projects, the primary responsibility for coordination and directing extension activities has been decentralized to the department level. The national services of the MRD continue to provide support and personnel along commodity and functional lines and the Cereals Project has provided support to the Agriculture Service to enable it to provide this support especially in geographic areas which are not yet covered by the productivity projects. The extension analysis which will be carried out by the project in 1978 will provide the basis for reaching a mutually agreed-upon approach for future action. Manpower constraints have been an additional factor in limiting the numbers of mid-level personnel available for the positions required for the extension service structure as proposed by the project paper. Budgetary constraints, occasioned by the original mis-estimates of construction costs, as well as changes in the training plans for extension workers, prevented the project from carrying out the extension improvements proposed for the CFJAs at N'Dounga and Ballande. The project paper's plan to send five Nigeriens to the U.S. for one year of non-degree, academic/observation training did not transpire due to the undesirability of participants and the structuring of training requirement priorities for the global project which were established during the course of project implementation. Training of five participants in extension is now planned for 1978 as is explained below.

(5) Training Component:

In 1976 and 1977 a total of ten participants were sent to the U.S. for long-term academic degree training as follows: Agronomy (2); Soils Science (1); Seed Technology (2); Statistics (1); Plant Breeding (2); Extension (1); and Agriculture Economics (1). Two of these participants have already returned and the remaining eight will be returning at various schedules ranging from mid-1978 to mid-April 1981. Eight participants were sent to ICRISAT in India for eight months (short-term) training in millet and sorghum crop improvement and three

were sent to the Cameroon for two months training in seed cleaning and processing. Five participants were sent to the U.S. for short-term seminars in small farmer credit, rainfed agriculture, and management (NCP project coordinator).

In 1978 two additional participants will be sent to the U.S. for long-term academic training in agriculture engineering and extension. Three participants will be sent for short-term training in seed technology and on an observation tour of seed services and processing facilities in neighboring African countries. Five participants will receive short-term, third-country training in extension followed by a study tour in the U.S.

In 1979 all new training initiatives will be short-term, non-academic similar to that scheduled in 1978 plus additional training in crop improvement at ICRISAT. With the exception of specific training proposed for the extension component no training schedule was defined by the Project Paper.

IV. Project Analysis

A. Technical Analysis

The project technical analysis for the extended project remains essentially unchanged from the original. The primary technical innovations remain, (1) to extend a relatively simple package of known improved production practices to increase production and create a favorable environment for change; (2) to develop a distribution channel by which future improvements in production technique can be delivered quickly and effectively to farmers; and (3) to improve the research capability to identify improved varieties and production techniques that will reduce unit cost of production through increased yields and increase land in cultivation by a reduction in the requirement for a period of fallow. The originally planned technical innovation, the possible use of local rock phosphate, has been dropped from the Phase I cereals project as this issue is currently being studied by the GON Ag Research Institute (INRAN) and tested under the FED-funded "3 M" project in Zinder.

The role of the individual department level productivity projects has and will become increasingly important in the implementation of the extension component at the village level. At the time the PP was originally prepared and approved, only one department level productivity project was operational (Zinder) and it was not known to what extent this activity would be increased. Since that time, productivity projects have been started in Maradi and Niamey and the Dosso cowpea project has been expanded along the lines of the productivity projects. With the advent of these projects, the GON has placed more responsibility at the department level for the direction and coordination of all the technical services in the implementation of integrated rural development effort. To this extent, the primary responsibilities for agriculture extension has shifted from the national offices of the technical services which are divided along commodity and functional lines. The national services still retain, however, a significant participating role and support function in the areas covered by the productivity project areas (approx. one half of all the arrondissements in the

crop production zone) and continue to play their traditional role in the production areas not yet covered by the productivity projects. As the role of the productivity projects has increased, the extension component of the cereals project has been adjusted to aid the Agriculture Service and UNCC in fulfilling their respective roles in the productivity project areas and provide minimum cereals extension in the areas not covered by the productivity projects.

B. Social Analysis

The social analysis for this project remains unchanged. There is no evidence available to dispute a FED study quoted in the original project paper which showed Nigerien farmers positively disposed toward extension guidance and a strong correlation between prior extension contact and current utilization of improved practices. Millet remains the preferred crop and farmers continue to desire support and guidance in millet culture. While there does not yet exist any quantifiable data to measure the social impact of the NCP project to date, reports from the Agriculture Service and UNCC indicate that results of project supported extension activities have been very satisfactory on the whole. They have increased the capacity of the GON services to be present at the village level and expanded their information and sensibilization activities among the farmers. Actual acceptance levels will begin to be measured during the 1978 production cycle.

C. Economic Analysis

The economic feasibility of this project remains essentially as presented in the original PROP and depends on the ability of the project components to significantly influence cultivation practices of small farmers. Assuming the project will achieve or exceed its production targets, and given the current deficit position in Niger in regards to cereals supply, one can reasonably compute the economic benefit of the project in terms of foreign exchange savings due to reduced grain import requirements. Using this technique, the original economic analysis of this project estimated the benefit cost ratio at 5:1. With an increased project cost of approximately 50% spread over an extended life of project,

the benefit cost ratio remains relatively high at 3.3:1.

The projections for increased profitability for the individual farmer are still very encouraging. While no detailed analysis has yet been completed, available data from on-farm demonstrations and from participating farmers under the Dosso Productivity Project indicate that use of currently available technology where applied, has increased production by 50% or 200 k/ha. The net return to the farmers over traditional methods is approximately 5,000 - 6,000 F CFA (\$25) per hectare. Current research indicates that greater increases are possible and that average production may be able to be increased by 400 - 500 k/ha or 100% above current yields.

In order to determine more precisely the economic benefits of this project a comparative analysis of production cost and returns under traditional cultivation practices and the cost and return using the proposed technology is being undertaken. The first part of the study was started in 1977 and involves a detailed socio-economic study of four families in each of 12 villages around each SMC (total 60 villages). Data from the first three SMC's is currently being compiled and data from the 4th and 5th SMC's is still being compiled. The data on results using the proposed technology will be compiled from the extension agents reports on the result of their one hectare demonstration plots and data collected in the Dosso area on production cost returns of farmers following the recommended practices. The results of this study will be compared with similar studies being undertaken in Niamey, Maradi, and Zinder departments under the productivity projects.

In addition to the micro-economic analysis of the proposed production package the total impact of the project will be examined as a part of the ongoing project implementation and evaluation efforts. This will include an analysis of the current and projected demand for seed, the demand for production inputs and the effectiveness of the UNCC inputs procurement and distribution systems and the analysis of the Agricultural Extension efforts. These studies will be coordinated with the Ag Sector Assessment scheduled to begin in October 1978.

D. Revised Financial Plan

The revised financial plan is based on actual project cost for 1976 and 1977 and projected activities for 1978 and 1979. The major cost increases in the project over the original PP estimates are in the technical assistance and construction components. Minor changes have also been made in the other components of the project to meet changing requirements of the project but these changes have had little effect on total project cost or outputs.

Technical Assistance Component

Six senior advisors have been provided to the project under contract with CID for the past 18 months at a cost of approximately \$100,000 per man year. (It was estimated in the original PP that these services would cost \$60,000 Per man year.) During the last two years of the project it is hoped that seven positions will be filled. FY 1975 and 1977 funds of \$1,047,000 will fund contract costs through 15 April 1978 leaving an additional requirement of \$1,400,000 for the last two years to fund CID personnel.

Nine staff assistants have been contracted with FY 1976 funds to provide support to the project manager's office and the CID advisors. One contract was short-term (\$8,500) and the other eight were two years each at approximately \$24,000 per man year for a total cost of \$378,000. Two staff assistants contracts have been renewed in March 1978 for two years and two others will be extended at the end of 1978 for one year at a cost of \$35,000/man year. Four additional staff assistants will be recruited to replace those whose contracts were not extended for two years each at a cost of \$30,000 per man year to assist with the additional SMC's. The additional cost will therefore be \$100,000 from FY 1977 funds and \$376,000 from FY 1978 and 1979 funds for 14 man years.

Local personnel costs for the project manager's office from 1976 to June 1978 are approximately \$86,800. These services are expected to cost an additional \$85,000 to carry operations until the project activity completion date.

Commodities

It was originally planned to order most commodities in the first year of the project, however, difficulties in developing acceptable specifications and delays in securing acceptable bids have resulted in some delays in this category. In other cases ordering of commodities was delayed to coordinate their arrival with the completion of facilities in which they would be used.

Commodities that have been purchased include: a limited number of vehicles that were purchased locally to make the project operational as soon as possible. These included 7 sedans, four 4 x 4 utility vehicles, 10 pick-up trucks and 10 motorcycles and 2 mobylettes. Total cost for these vehicles was \$160,624. An additional 53 vehicles (7 Scouts, 34 pick-ups and 12 trucks) were purchased from IHC for approximately \$651,000 CIF Niamey. These vehicles have been distributed to the Agriculture Service, UNCC, INRAN, Water Forest Service, the Seed farms, the GON project coordinator's office and the AID project office.

930 tons of Urea and Triple Super Phosphate fertilizer were purchased in 1976 for use on the Research Farm, Seed Multiplication Centers, demonstration plots and in support of the Dosso Department production project at a cost of \$239,844. An additional 1,000 tons (\$341,000) of fertilizer has been ordered in 1977 for the same purposes. In 1978 and 1979 an additional amount of 2,000 tons (estimated \$675,000) of fertilizer are planned to be ordered from FY 1978 and FY 1979 funds to continue to support this activity.

In 1976, 1,750 gallons (\$84,000) of insecticide was purchased for pest control on the seed centers, research station and demonstrations. Since this original purchase, all additional pesticides have been and will continue

to be provided by the CIDA plant protection project.

Fencing material for the Seed Multiplication Centers and Research Station during the first two years cost \$60,018. An additional \$77,000 will be required and has been ordered to complete the fencing of the SMC's, Research Stations and Young Farmer Training Centers.

Six portable sorghum/millet threshers, pest control equipment, and miscellaneous field equipment were purchased at a cost of approximately \$155,800.

During 1976/77, furnishings for the housing constructed under the project and office equipment and furniture were purchased at a cost of \$104,000. In 1978, it will be necessary to purchase additional office furniture and basic household furniture for the SMC's currently under construction. This furniture is estimated to cost approximately \$30,000.

Laboratory equipment, agricultural reference books and periodicals, and agricultural extension materials were purchased in 1977 at a cost of approximately \$65,000.

Seed cleaning and processing equipment and diesel generators were purchased at a cost of \$279,720.

Eight tractors with attachments are in the process of being ordered and are expected to cost \$486,600.

Construction

The construction component of the project contains the greatest cost increase over original PP estimates. This is due not to an increase in the amount of construction planned at the time of the PROP, but in errors by the project design team in estimating construction cost. The composition of the design team in the PROP does not show that there was an engineer on the team. In the first year of the project, contracts were let and construction was started on:

Housing & wells for the Research Sub-Station	\$ 56,000
Housing & wells for the first 3 SMC's	233,875
Water & electric systems	25,666
Housing for the Foundation Seed Farm	72,708
Housing, office and warehouses for the UNCC	390,959
Repairs to buildings for CFJA N'Dounga	54,792
Total construction the first year =	\$834,000

In the second year AID funded construction contracts have been entered into for completion of all operations buildings on 2 SMC's (Magaria and Doukoudoukou) at a total cost of \$859,200.

Project construction funded by the GON with counterpart funds include:

Completion of buildings on the Foundation Seed Farm (Office, laboratory, seed treatment, building, work hangar)	\$338,100 (77,760,000 FCFA)
Construction at INRAN Research Farm of laboratory, offices, conference room, library, workshop, warehouse	\$573,000 (131,800,000 FCFA)
Completion of the Research Sub-Station at Ouallam	\$113,000 (26,000,000 FCFA)
Construction of 2nd Research Sub-Station	\$171,500 (39,440,000 FCFA)
	<hr/>
	\$1,195,600 (275,000,000 FCFA)

Construction planned for the third year includes:

Completion of the 3rd SMC	\$485,000
Construction of the 4th and 5th SMCs	730,000
Diesel Fuel Storage for 5 Seed Centers	15,000
Water/electrical systems for 5 Seed Centers	280,000
Completion of the FSF irrigation system	50,000
Contingency	80,000
TOTAL CONSTRUCTION	\$1,640,000

The following table shows the difference between original PP construction cost estimates and revised construction cost estimates:

<u>CONSTRUCTION OF</u>	<u>ORIGINAL PP</u>	<u>REVISED PP</u>	(000) <u>DIFFERENCE</u>
SMC's	411.7	2,628.7	+ 2,217.0
FSF	92.0	460.3	+ 368.8
TARNA Research Station	86.9	573.0	+ 486.1
Research Sub-Stations	195.95	340.5	+ 144.5
UNCC (Coop) Facilities	587.65	391.0	- 196.65
Ag Extension Facilities	172.5	-	- 172.5
CFJA (Training) Facilities	204.0	54.8	- 149.2
Contingency		91.6	+ 91.6
	<u>\$ 1,750.7</u>	<u>\$4,540.4</u>	<u>\$ 2,789.7</u>

Local Support Costs

The local support cost component of the project budget represents additional cost incurred by the INRAN, Agriculture Service and UNCC, Rural Engineering and the Project Coordinator's office that are directly project related and could not be supported during this phase of the Cereals Project from their respective limited budgets. The budget for this part of the project is prepared and submitted by each Service and reviewed and approved by the GON project coordinators, AID project management and the Ministry of Rural Development on an annual basis.

Under the Rural Engineering component, \$41,500 was budgeted in 1976 to cover the costs of plans, specifications, bid documents, contracts and the supervision of project financed construction during 1976 and 1977. An additional \$16,500 will be required in 1978 and \$16,000 in 1979 to cover the same cost items for construction to be undertaken with FY 1977 and 1978 funds.

Under the Agriculture Service component, \$306,200 was budgeted in 1976 and 1977 to cover salaries, local training and support cost of village level extension agents (150 in 1976 and 195 in 1977). In 1978 and 1979 this

program will be expanded to approximately 225 agents. \$295,000 will be required in 1978 and \$295,000 in 1979 for their training, salaries and support cost.

In order to accelerate the agricultural development activities in the Niamey Department, \$56,000 was budgeted in 1977 for 10 village extension agents, cooperative organization efforts and base line socio-economic studies. The AID-supported Niamey Productivity Project has since started, therefore, there will no longer be a need for Cereals project support for these activities.

In order to support the development of cooperatives among cereal producers, support is being granted to the GON's cooperative development office (UNCC) under four separate categories. (1) \$43,533 in 1976 and \$48,680 in 1977 was budgeted for training of 160 new cooperative organizers. Activities scheduled in 1977 are still underway and \$45,000 will be required in 1978 to continue to support this local training. (2) For the Dosso productivity project, which is being implemented by UNCC, the cereals project provided \$51,063 in 1976 and \$91,939 in 1977 for village-level extension agents' training, salaries and support cost. Approximately \$130,000 will be required in 1978 to continue to support the cereals component of the Dosso productivity project. (3) For the promotion of increased cereals production through the adoption of animal traction, \$75,336 was budgeted in 1976 and \$91,914 in 1977 for UNCC procurement of animal traction equipment. This equipment will be sold to cooperative farmers and the proceeds will be placed in a revolving fund to continue the promotion of animal traction. (4) In 1977, \$30,233 was budgeted to finance the retraining of UNCC personnel and cooperative leaders. Approximately \$43,000 will be required in 1978 and \$43,000 in 1979 to expand the UNCC in-service training program. A primary focus in 1978 and 1979 will be to assist UNCC in the training of cooperative leaders and in the improvement of their commodity management and distribution operations.

In order to support training of young farmers in improved production practices, \$62, 727 was budgeted in 1976 and 1977 for the Young Farmers Training Centers (CFJA's) in Niamey and Dosso Departments. In 1978 an additional \$15,000 and in 1979 an additional \$15,000 will be required to continue support for local training of young farmers.

For the operation of SMC's, \$54,097 was budgeted in 1976 and \$80,846 in 1977 to pay salaries of seed center personnel and to finance a baseline socio-economic study in the area surrounding the seed centers. In 1976 and 1977, \$110,191 was budgeted for animals, animal traction equipment and operating expenses for the first two years. It is estimated that combined personnel and operations costs for the SMC's with two additional seed centers operating and all equipment operating at the first three centers will amount to \$186,500 in 1978 and \$150,000 in 1979.

For the research component, no money was budgeted for 1976 because the senior research advisors did not arrive in time for the 1976 crop year. In 1977, \$55,100 was budgeted for support personnel and operations costs for the project research. In 1978 and 1979, it is estimated that the research component will require \$57,000 and \$60,000 respectively, to continue the current research program. In addition the operation of the FSF and the Cereals research sub-station (Ouallam) will require \$14,000 in 1978 and \$30,000 in 1979.

For the GON project coordinator's office, \$35,000 was budgeted in 1976 and \$54,000 in 1977 for local personnel, vehicle maintenance, in-country transport of project commodities, warehouse for project commodities and miscellaneous expenses. It is expected that these operations will cost \$50,000 in 1978 and \$40,000 in 1979. In addition the coordinators office will fund the operation and maintenance of all project supplied US manufactured vehicles. This is expected to cost \$165,000 in 1978 and \$165,000 in 1979.

Participants

In 1976 and 1977, 10 participants were sent to the U.S. for long-term degree training. Sub-obligations to date to cover these participants were \$246,924. Eleven participants were sent to ICRISAT and the Cameroon for short-term training for a cost of \$47,199. Seven participants were sent to the U.S. for conferences or short courses for a cost of \$43,947.

An additional \$95,000 in 1978 and \$75,000 in 1979 will be required to enable the first 10 participants to continue and complete their programs, plus two additional long-term participants who are programmed to start training in FY 1978. In 1978 it is planned to send an additional three participants for short-term training in seed technology (\$30,000) and 5 participants for third-country, short-term training in extension followed by a study tour in the U.S. (\$40,000). In 1979 training will be limited to short-term training, both U.S. and third-country (\$95,000) and continuation of long-term participants started in 1978.

GON Contribution

The GON contribution in the original Project Paper was \$231,000 which was mostly for land for the SMC's, FSF and Research Station. In addition to this original amount, the GON is now contributing F CFA 275,000,000 (approximately \$1,200,000) from counterpart funds and \$57,850 for support to participants while in training. The total direct contribution therefore is now \$1,488,850.

In addition to this direct contribution to the project, the GON is providing considerably of its own resources for increased cereals production which might be considered an indirect support to the project as this effort is supportive of project inputs and has the same

purpose. In order to quantify the GON contribution in this area, it is necessary to make some rather rough estimates based on annual budget data for the Services that are involved in increasing cereals production. It is estimated that 75% of the Agriculture Service's budget, which for the four year life of project, is estimated at \$7,778,000 goes toward cereals production. The GON contribution through Agriculture then is approximately \$5,834,000. It is estimated that 25% of the UNCC's current activities are directed toward increased cereals production and/or assistance to cereals farmers. The UNCC budget for the four year life of project is estimated at \$7,045,000, therefore the GON contribution through UNCC is estimated to be \$1,761,000. The INRAN research budget identifies some funds that are for direct sorghum and millet improvement and INRAN also does considerable cereals related research under plant protection, agronomy and soils categories. It is estimated that GON contribution to cereals research and foundation seed production under INRAN is approximately \$1,148,000. Total indirect GON support towards the project purpose is approximately \$8,743,000.

It is felt by USAID/Niamey that a minimum of 20% of the total GON indirect contribution to the project purpose can be considered "in-kind contribution to the project". This amounts to approximately \$1,750,000. This \$1,750,000 when combined with the \$1,488,850 referred to above represents over 25% of total project cost in years 2 through 4 of the project. As the initial obligation for this project was from drought relief funds and not subject to the 25% contribution it is felt that the GON is now meeting the 25% contribution requirement for this project.

Other donor assistance to the project includes both direct and indirect support. Under direct support, FAC (France) is providing \$570,000 for additional researchers at the Tarna Research Station and \$200,000 for the irrigation system at the Foundation Seed Farm. Under indirect support, CIDA is supporting cereals production through the plant pest control program. Other indirect support came through the department productivity projects such as Zinder 3M supported by FED (\$4,583,000), the Dosso Productivity Project supported by FAC (\$3,292,000), the Badeguicheri valley project funded by FED (\$4,604,000) and the Maradi project funded by IBRD (\$10,700,000).

NIGER CEREALS PROJECT BUDGET

TABLE 1

Inputs by Year of Obligation (\$000) -
(Revision of January 1978)

<u>AID INPUTS</u>	<u>FY 76</u>	<u>FY 77</u>	<u>Projected FY 78</u>	<u>Projected FY 79</u>	<u>Projected TOTAL</u>
<u>Personnel</u>	<u>1,274.0</u>	<u>409.0</u>	<u>885.0</u>	<u>980.0</u>	<u>3,548.0</u>
CID Senior Advisor & support costs	738.0	309.0	700.0	700.0	2,447.0
Short-term consultants	71.2				71.2
Staff assistants (9)	378.0	100.0	140.0	236.0	854.0
Local staff for AID project office	86.8		45.0	44.0	175.8
<u>Commodities</u>	<u>2,364.0</u>	<u>341.0</u>	<u>465.0</u>	<u>350.0</u>	<u>3,520.0</u>
22 vehicles & 10 motorcycles	160.6				160.6
53 IH vehicles & parts	651.0		25.0	50.0	726.0
Fertilizer	239.8	341.0	375.0	300.0	1,255.8
Insecticide	84.0				84.0
Fencing material	137.0				137.0
Office equipment & supplies	48.0				48.0
Photographic equipment	4.0				4.0
Housing & office furnishings	56.0		30.0		86.0
Pest control equipment	35.6				35.6
Generators	91.0		25.0		116.0
Lab equipment	28.0				28.0

Commodities	FY 76	FY 77	Projected FY 78	Projected FY 79	Projected TOTAL
Books and periodicals	5.8				5.8
Ag Extension Materials	27.7		10.0		37.7
Tools	24.5				24.5
Drafting and survey equipment	12.1				12.1
6 Threshers	54.1				54.1
Seed Cleaning & Processing Equip.	188.7				188.7
8 Tractors with Attachments	486.6				486.6
36 Tarpaulins	29.5				29.5
<u>Operating Costs</u>	<u>131.8</u>	<u>110.0</u>	<u>150.0</u>	<u>.73</u>	<u>464.8</u>
Project Management Office	104.0		50.0	50.0	204.0
CID Local Support	27.8	110.0	100.0	23.0	260.8
<u>Construction</u>	<u>922.8</u>	<u>782.0</u>	<u>1,640.0</u>		<u>3,344.8</u>
SNC					
Housing	212.5		190.0		402.5
Wells	21.4		20.0		41.4
Shop/Storage		54.8	71.1		125.9
Senerator Shed		12.9	24.2		37.1
Seed Processing/Storage/Office	88.8	370.1	644.1		1,103.0

<u>CONSTRUCTION (cont'd)</u>	<u>FY 76</u>	<u>FY 77</u>	<u>Projected FY 78</u>	<u>Projected FY 79</u>	<u>Projected TOTAL</u>
Work Hanger		105.7	61.2		166.9
Stables		109.1	133.2		242.3
Thresher Shelter		7.4	4.0		11.4
Animal Equipment Storage		25.6	14.4		40.0
SNC					
Fuel Storage			15.0		15.0
Laterite Service Area		2.2	5.2		7.4
Drying Floor		73.1	42.1		115.2
Water and Electrical System			280.0		280.0
Toilets/shower		9.5	5.5		15.0
FSM					
Housing	72.7				72.7
Completion of Irrigation System			50.0		50.0
Research Sub-Station					
Housing	51.2				51.2
Well	4.8				4.8
UNCC					
Houses	221.2				221.2

CONSTRUCTION (cont'd)	FY 76	FY 77	Projected FY 78	Projected FY 79	Projected TOTAL
Office/Warehouse	169.8				169.8
CFJA					
Repairs	54.8				54.8
Contingency	25.6	11.6	80.0		117.2
<u>Local Support to GON Services</u>	<u>977.4</u>	<u>374.0</u>	<u>860.0</u>	<u>860.0</u>	<u>3,071.4</u>
Genie Rural	41.5		16.5	17.0	75.0
Ag Service (Extension)	198.7	167.4	263.0	295.0	924.1
UNCC	402.5	30.2	133.0	88.0	653.7
CFJA	52.4	10.7	15.0	15.0	93.1
Multiplication Centers	245.1		156.5	150.0	551.6
INRAN		55.1	71.0	90.0	216.1
Coordinator's Office	37.2	54.2	40.0	40.0	171.4
Niamey Productivity Support		56.4			56.4
Vehicle Operation/Maintenance			165.0	165.0	330.0
<u>Participant Training</u>	<u>242.0</u>	<u>84.0</u>	<u>165.0</u>	<u>160.0</u>	<u>651.0</u>
Long-Term U.S.	167.8	67.1	95.0	75.0	404.9
Short-Term U.S.	27.0	16.9	30.0	45.0	118.9

CONSTRUCTION (cont'd)	FY 76	FY 77	Projected FY 78	Projected FY 79	Projected TOTAL
Short-Term Third Country	47.2	-	40.0	40.0	127.2
<u>AID TOTAL</u>	<u>5,912.0</u>	<u>2,100.0</u>	<u>4,165.0</u>	<u>2,423.0</u>	<u>14,600.0</u>
<u>GON INPUTS</u>					
Land	231.2				231.2
Construction		1,200.0			1,200.0
Participant Salaries	5.0	13.8	39.0		57.8
Other In Kind Contributions			875.0	875.0	1,750.0
<u>GON TOTAL</u>	<u>236.2</u>	<u>1,213.8</u>	<u>914.0</u>	<u>875.0</u>	<u>3,239.0</u>
<u>FAC INPUTS</u>		770.0			770.0
<u>TOTAL PROJECT</u>	<u>6,148.2</u>	<u>4,083.8</u>	<u>5,079.0</u>	<u>3,298.0</u>	<u>18,609.00</u>

(U.S. \$1 equals 240 CFA 1976, 1977; \$1.00 equals CFA 225 1978,1979)

BEST AVAILABLE DOCUMENT

38

68-020 2/15/77 TO 1/15/78 Niger 76-1

Niger Cereals Project (NCP)

PROJECT DURATION: 76	START FY: 78	DATE LATEST PROP: 5/14/75	DATE LATEST RFP: -	DATE PRIOR PER: 2/28/77
12. U.S. FUNDING: a. Cumulative Obligation: 8,012		b. Current FY Estimated Budget: 4,165		c. Estimated Budget to completion After Current FY: 0

17. KEY ACTION AGENTS (Contractor, Participating Agency or Voluntary Agency)

a. NAME	b. CONTRACT, PASA OR VOL. AG. NO.
Consortium for International Development (CID)	Contract
Staff Assistants (Ex PCV's)	Contract
Afro-American Purchasing Center (AAPC)	Contract

18. NEW ACTIONS PROPOSED AND REQUESTED AS A RESULT OF THIS EVALUATION

A. ACTION ID	B. LIST OF ACTIONS	C. PROPOSED ACTION COMPLETION DATE
X	X (1) Make an in-depth study of the GCN extension systems including those in the Productivity Projects.	May 1978
X	X (2) Develop system for more effective collection of evaluative data and information for purposes of economic and social impact appraisal.	Apr 1978
X	X (3) Appoint staff assistant to oversee aide-encadreur program and to follow-up with them in collecting evaluation data.	Mar 1978
X	X (4) Develop and approve work plans for aide-encadreurs including provision for supervision and material support.	Feb 1978
X	X (5) Give more attention in the breeding program to improvement within local millet varieties.	continuing
X	X (6) Design sub-station and out-field research program to measure technical and economic impact on separate elements of the package of technology.	continuing
X	X (7) Expand research in soil fertilization, rotations (especially involving legumes), use of phosphate rock and water management under dry farming conditions.	continuing
X	X (8) Amendment to Decree 003/NER of 10 February 1973 to broaden scope to cover all seed.	Apr 1978
X	X (9) Take initial steps to establish a central seed testing laboratory.	late 1978
X	X (10) Redesign of project for a possible Phase II should carefully study the relationships between NCP and National Productivity Projects. This is especially important with respect to the extension component and	Phase II

19. REPLANNING REQUIRES: REVISED OR NEW PROP RFP PRO AG PRO/T PRO/C PRO/F

E. DATE OF MISSION REVIEW: 2/8/78

PROJECT MANAGER: TYPE NAME, SIGNED INITIALS AND DATE Norman L. Garner 2/8/78	MISSION DIRECTOR: TYPE NAME, SIGNED INITIALS AND DATE Jay P. Johnson 2/8/78
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Project No. 683-0201

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PAR -- Page 1a -- Continuation

<u>USAID</u>	<u>AID/W</u>	<u>HCST</u>	<u>List of Actions</u>	<u>Proposed Action Completion Date</u>
			should be done in relation to item number (1) above.	
X			(11) Redesign should focus on establishing a new log-frame with clearer input - output -- goal and realistic time frame.	Phase II

PAR - Page 2a - Continuation

A. Input or Action Agent

2. Staff Assistants have played a very useful role in getting projects underway, working far above capacity of positions since the initial crop cycle and construction program was almost entirely manned by these. A role more complementary to more senior CID personnel should be established in the future.

5. Commodities

This is the result of a unilateral decision of the GON to limit the number of vehicles. The IH vehicles have not been entirely satisfactory to the GON. Part of this problem is related to wrong specifications (8 cylinder engines with 3 speed transmissions). In part the problem is poor preparation for operation and maintenance by GON personnel. The IH company conducted a training program on operation and maintenance in January 1971. More of such training is needed.

6. Cooperating Country

Management of infrastructure development program has improved, after a slow start. The completion of construction is in phase with anticipated equipment delivery schedules. With few exceptions the entirety of projected facilities will be in place and equipped by the end of project Phase I.

Three elements of other donor participation have been important in effective project implementation: (a) Administrative support in MDR in negotiation on various processes. Canadian and French advisors cooperated effectively in this; (b) French assistance for providing personnel in the research program. This has been effective except for failure to provide one planned researcher. Close cooperation with PAC was also important to the implementation of the UNCC activities of NCP in Dosso Department; (c) the Canadian support for pest control makes a key contribution to the achievement of production objectives.

III. KEY OUTPUT INDICATORS AND TARGETS

A. QUANTITATIVE INDICATORS FOR MAJOR OUTPUTS		TARGETS (Percentage/Rate/Amount)					
		CUMULATIVE PRIOR FY	CURRENT FY 77		FY 78	FY 79	END OF PROJECT
			TO DATE	TO END			
Distribution of improved seeds (tons annually)	PLANNED	40	76	-	120	120	356
	ACTUAL PERFORMANCE	70	76.6	-	-	-	-
	REPLANNED	-	-	-	120	120	486.6
Demonstration of improved practices in farmer's fields (animal level)	PLANNED	1,500	3,450	-	2,000	2,400	9,350
	ACTUAL PERFORMANCE	2,200	2,800	-	-	-	-
	REPLANNED	-	-	-	-	-	-
Participant training (number trained and/or in training)	PLANNED	11	19	-	8	2	42
	ACTUAL PERFORMANCE	13	28	-	-	-	-
	REPLANNED	-	-	-	12	7	49
In-service training (numbers total)	PLANNED	190	270	-	290	310	1,060
	ACTUAL PERFORMANCE	300	320	-	-	-	-
	REPLANNED	-	-	-	290	310	1,240
B. QUALITATIVE INDICATORS FOR MAJOR OUTPUTS	COMMENT:						
1. Agriculture inputs delivery system	The capacity of UNCC to respond to farmer's needs for agricultural inputs as well as that for the Agriculture Service to respond to seed requirements has been expanded by installation of facilities.						
2. Functional and effective extension system	The project has contributed to expansion of Agriculture Service's capacity for reaching an increasing number of farmers. The quality to these services, however, must be improved substantially.						
3. Upgraded and expanded capacity for in-country training	In-service training has become an established practice. Quality of such training is being gradually improved.						

Data through FY 77 only since evaluation being made at end first quarter FY 78.

A. 1. Statement of purpose currently envisaged. 2. Submit as to PROPT YES NO

Short-term - Achieve a production and distribution capability providing sufficient cereals at reasonable prices to feed Niger's growing population even under adverse weather conditions, within five years.

Long-term - Provide sufficient food for a larger population with a smaller ratio of land to people in an ecologically sustainable production system, in order to free land and people for export production and non-agricultural activities.

3. 1. Conditions which will exist when above purpose is achieved. 2. Evidence to date of progress toward these conditions.

1. Cereal production increased by 200,000 tons over 12 year basis.
2. Carry-over storage both on farm and in GON warehouses sufficient to feed population for two months in event of emergency.
3. Division of 100,000 hectares of land formerly planted in millet to other crops while increasing total cereal production.
4. Release of labor to work in other agriculture production.
5. Returns to the farmer per unit of input will increase.

1. Measurable production from project inputs not yet obtainable.
2. In spite of essential self-sufficiency of production, supply of all sectors of the population is still deficient because of distribution problems and escape of grain to higher priced neighboring areas. Procurement by GON equals less than 1% of production since the official price is about 1/3 less than free market prices.
3. The potential for this diversion will depend upon the yield increase potential of a still untested package of technology. A second factor will be the measured incentive which the package will offer farmers as a function of input cost, labor inputs, grain prices and marketing opportunity.
4. Progress in this respect will not be measurable until a fully proven useful package of technology is adopted. Achieving this thru research and extension is a long-term effort.
5. The economic value of the technology package in the hands of the farmer is to be evaluated.

V. PROGRAMMING GOAL

A. Statement of Programmatic Goal
 Strengthen the predominately agricultural society of Niger, ending its dependence upon donated external cereal supplies except in years of extraordinary drought and improve the economic condition and performance of the farm community to support a viable and ecologically secure way of life for the Sahelian population.

B. Will the achievement of the project purpose make a significant contribution to the programming goal, given the magnitude of the national problem? Cite evidence.
 Increasing the country's capacity to produce cereals is a first step towards achievement of project goal. It is not a sufficient condition, however, to assure overall economic development nor a substantial improvement in the living standard of the rural population in the long run.

PROJECT APPRAISAL REPORT (PAR)

Project No. 683-0201

PAR No. 78-1

page 5 of 6

Comments on Last PAR's Recommended ActionsStatus of implementation of new action proposed in the last evaluation (2/15/77)

1. * Very little has been accomplished in the way of designing an effective national extension system. A variety of extension efforts are being tried in the Department Productivity Projects and the GOV rejects the idea of a major redesign of the existing system at this time. There seems to be a lack of detailed knowledge of the existing systems not only on the part of USAID and the contract team but also on the part of the different entities of the GOV itself. A thorough understanding of the existing systems should be developed before recommendations are made for change. The detailed study of the existing systems and of GOV policies both implicit and explicit would make far better use of the CID contract inputs in extension than efforts to develop a national extension system.
2. A national seed policy as such has not been explicitly developed, nor has legislation been adopted to define such a policy. A general scheme does exist and is practiced by INRAE, the Service d'Agriculture and UMCC which systematically allocates the responsibility for different phases of seed production to the services. Moreover, it is proposed that the decree of 1973 which created the Committee for Coordination of Programs for Production and Distribution of Seeds of Groundnuts be amended - specific modification of the text was proposed - which would charge the Commission with the responsibility for all seed rather than just groundnuts. This as a first step in the formulation of a documented national seed policy would seem to satisfy the intent of the Project Agreement in this respect.
3. This has not been done. INRAE is structured into sections or divisions in terms of areas of research, e.g., Agronomy, Economics, etc. Moreover, the Tarna station where the ICP is centered is likewise divided. Each section carries out the research in its area of interest. Coordination of research is assured by the Director. The research requirements of ICP have been defined and are being carried out. Coordination of INRAE activities with other elements of ICP through existing coordination among agencies appears to be adequate to assure that the research requirements of ICP are met without the necessity of a special coordination structure in INRAE.
4. The extension adviser has had only limited impact on extension work in ICP. Aside from being only part-time assigned to the extension functions, there are numerous

* Numbers refer to list of actions from page 1 of the evaluation of 15 February 1977 (PAR 77-1)

conceptual and philosophical differences which are beginning to surface. Effective intervention of the extension adviser depends upon an in-depth understanding of the GON extension systems, their philosophy of extension and their overall strategy for agricultural development. With such an understanding it should be possible to introduce elements of improvement. The GON will not accept suggestions or recommendations for massive overhaul of structure or strategies. The evaluation team has recommended that the last period of the extension adviser's tour be concentrated toward developing an in-depth understanding of the GON system (see #1). Until this is done there is no point to attempt to influence extension by UNCC.

5. The situation as far as Nigerian counterparts has remained virtually unchanged. A participant returning from training in 1978 will be assigned as counterpart agronomist. No counterpart has been identified for the agricultural engineer. INRAN proposes to nominate a participant for training in the U.S. for this post. The positions of Director of Extension and Chief of Seed Production in the GON continue to be held by one person.

6. No action has been taken on this.

7. The problem of integrating CID personnel into GON services and of coordination of CID team personnel in relation to the AID Project Manager, the WCP Coordinator and the several GON services has continued unresolved. Lengthy discussion during the evaluation resulted in a formula which was acceptable to all parties and which should resolve the main issues.

8 and 9. These were seen as actions for the second phase, FY 79. Some planning by the GON and the CID team has been made with respect to number 9. No action has been taken on point 8.

ANNEX B

B. NCP Financial Status

(1) Obligations

In the first year of project implementation, it became evident that the original \$9,636,000 approved would not be sufficient to implement the project as designed. This was reflected in the ADO/Niamey ABS submissions for both FY 1978 and FY 1979. It was recommended that the AID contribution be increased by \$2,541,000 to \$12,177,000 to meet the increased cost through the third year of the project. The extension of the project for an additional year will raise AID project cost by an additional \$2,500,000 for a total of \$14,677,000. The GON contribution has already been increased by approximately \$2,200,000 (27,000,000 FCFA), to meet part of the increased cost.

Funds obligated to date are:

AID Inputs:

\$5,912,000	1976 ProAg
2,100,000	1977 ProAg Amendment
<hr/>	
\$8,012,000	

GON Inputs:

\$ 231,200	1976 ProAg
1,200,000	1977 ProAg Amendment
<hr/>	
\$1,431,200	

(2) Project Expenditures and Pipeline Analysis

Of the \$8,012,000 obligated under the ProAg, the ADO/Niamey controller's U-203 report showed \$5,202,000 expended as of 31 March 1978 leaving a balance of \$2,860,000. Recently received information indicates that expenditures are actually higher than was estimated in that report. Expenditures that have been accrued for commodities, contract services and GON local expenditures have since been confirmed that were not definitely known at the time of the U-203 report, therefore were not included.

The status of the \$2,864,000 pipeline is:

PERSONNEL

\$165,000 will fund CID contract through April 1978;
\$135,000 will fund staff assistants through December 1978
\$ 38,000 will fund local support staff through December 1978

\$338,000 Total Personnel

PARTICIPANTS

\$ 90,000 will fund long-term participants now in training through
December 1978 and 1 short-term participants through
August 1978

\$ 90,000 Total Participants

COMMODITIES

\$169,000 will be expended by September 1978 for vehicles and
tractors that have been ordered and are now in transit;
341,000 will be expended by September 1978 for fertilizer that is
now in transit and expected to arrive in Niger by
May 31, 1978;
47,000 will be expended for miscellaneous commodities that have
been ordered and shipped or are soon to be shipped;
133,000 represents the estimated remaining balance in previously
issued PIO/C's and will be used to order project required
commodities in June and July of 1978 with final expendi-
ture by March 1979;

\$690,000 Total Commodities

OTHER COSTS

\$881,000 will be used to finance construction contracts for 8 oper-
ations buildings on each of 2 seed centers. Contracts are
expected to be awarded by May 20, 1978 with final expendi-
ture by March 1979;

\$733,000 will fund local expenses for support to GON cereals operations through July 1978. It is estimated that expenditures have been accrued by the GON services amounting to approximately \$500,000 through April 1978 for which reimbursement is now due. The additional \$233,000 is estimated to fund ongoing operations through July 1978;

132,000 is estimated to fund AID project office and CID logistic support through March 1979.

\$1,746,000 Total Other Cost

=====
\$2,864,000 Total Project Pipeline

RELATIONSHIP OF NIGER CEREALS PROJECT TO
OTHER FOOD PRODUCTION PROJECTS IN NIGER

The Niger Cereals project is both directly and indirectly related to and coordinated with a number of other National and Sahel regional projects. The bilateral projects most directly related to NCP are the department productivity projects of which four are in various stages of implementation (Niamey funded by AID, Dosso funded by FAC, Maradi funded by IBRD, and Zinder funded by FED). Three additional projects are in the planning stage for; Diffa department (CIDA), T.A. Houa department (FRG), and an expanded Dosso department project (IBRD). These integrated rural development projects, when fully operational, will have the primary responsibility for the Agricultural Extension efforts in their respective geographic areas. They will benefit from the research conducted under the cereals project and rely on the cereals project as a source of improved seed for dissemination to the farmers. They will benefit from increased manpower in UNCC and the Agriculture Service that have been trained under the Cereals Project.

The National Plant Protection project funded by Canada (CIDA) will also contribute to increase cereals production in Niger. The CIDA project is providing assistance to the Agriculture Services plant protection section to improve their surveillance for potential pest outbreaks and improve their pest control efforts. This project includes technical assistance in pest control, applied research for pest control in vegetable crops,

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commodities, and local training at various levels in plant protection and proper use of pesticides.

Regional projects that are related to and supportive of the Cereals project include; Africal Manpower Development (AMDP) Semi-Arid Food Grain Research and Development (SAFGRAD), and the Sahel Integrated Pest Management project. The AMDP project has provided training to GON personnel in millet and sorghum production. The SAFGRAD project will provide additional linkages between the National Cereals Research program supported by NCP and regional research in millet and sorghum production. Coordination of research trials and results through SAFGRAD expected to begin with the 1979 production cycle.

The Sahel Integrated Pest Management project (AID funded) will provide assistance to Niger for applied research in pest management. This research will strive to identify environmental sound integrated pest management systems that will contribute to increased cereals production and security from unnecessary crop losses.

The Entente Grain Stabilization project has and continues to provide assistance to the Government of Niger (OPUN) in Grain Marketing and storage. Support to OPUN through the Grain Stabilization project and UNCC through NCP are designed to assist the GON in developing their marketing system to insure a reasonable return to the farmers, and an adequate supply of grain at a reasonable price to the consumers.

ACTION MEMORANDUM FOR THE ASSISTANT ADMINISTRATOR FOR AFRICA

FROM: ^{JW Koehring} John W. Koehring, AFR/DR

SUBJECT: Environmental Threshold Decision

Environmental Threshold Decision Recommendation: "Negative Determination"

Problem: Your approval is required on an Environmental Threshold Decision before the obligation of FY 1979 funds that will finance the continuation of the Niger Cereals Production Project (683-0201), including the purchase and use of pesticides.

Discussion: The purpose of this project continues to be to improve the institutional capacity in Niger to (1) develop improved cereal production technology; (2) communicate production knowledge to small farmers; and (3) strengthen the framework for supplying agricultural inputs to encourage farmer adoption of higher-yielding cereal production technology. To achieve this purpose the project is funding four interrelated components: (1) adaptive research on improved cereal varieties and production practices; (2) seed multiplication and distribution activities; (3) agricultural cooperative structure expansion; and (4) agricultural extension service improvement and expansion.

The original Niger Cereals Production Project was approved in June, 1975, before an IEE was required by Agency regulations. When the project was amended on June 26, 1978, increasing total funding by \$4,964,000 and extending the life of the project one year, funding authorization for FY 1979 was granted contingent upon the fulfillment of environmental regulations regarding pesticide use.

Regulation 16, as amended in May, 1978, provides that for any project including assistance for the procurement or use (or both) of pesticides, the IEE must contain a special analysis of the risks and benefits likely to result from the use of the pesticides in question. Therefore, AID/W, in June 1978, sent a contractor to Niger to prepare the required analysis. The contractor's study, which has the concurrence of AID/W's staff responsible for the implementation of environmental procedures, concludes that the Niger Cereals Production Project is not a major Federal action likely to have a significant effect on the human environment, and that the

proposed pesticides will involve no risks and will probably result in increased yields. In accordance with the contractor's recommendations, the GON has consented to use Diazinon, which the USEPA has registered for general use without restriction, in place of the restricted pesticides BHC and Lindane. The contractor's study further indicates that neither an Environmental Assessment nor an Environmental Impact Statement will be required in connection with the continuation of the Niger Cereals Production Project, and that the recommended environmental action is a Negative Determination.

Recommendation: That you approve a "Negative Determination" on the Initial Environmental Examination, thereby permitting the obligation of FY 1979 funds.

Initial Environmental Examination

Project Location: Niger
Project Title: Niger Cereals Production
Funding for FY 1979: \$2,423,000
Life of Project: 1 year remaining of 4-year project.
IEE Prepared by: George A. Shaefers
NYS Agricultural Experiment Station,
Geneva, New York.
Benjamin A. Stoner, Sahel and Francophone
West African Projects Division

Benjamin A. Stoner

Environmental Action
Recommended:

Negative Determination Concurrence

Jim Kelly 11/8/78

Jim Kelly Director, Office of Sahel
and Francophone West African Affairs

Assistant Administrator's
Decision

Approved: [Signature]

Disapproved: _____

Date: 11/27/79

Clearances:

AFR/DR: J. Nixon [Signature]
AFR/SFWA: G. MacArthur [Signature]
DAA/AFR: WHNorth
GC/AFR: P. Scott [Signature]

IMPACT IDENTIFICATION AND EVALUATION FORM

Impact
Identification
and
Evaluation 2/

Impact Areas and Sub-areas 1/

A. LAND USE

- 1. Changing the character of the land through:
 - a. Increasing the population ----- N
 - b. Extracting natural resources ----- L
 - c. Land clearing ----- L
 - d. Changing soil character ----- L
 - 2. Altering natural defenses ----- L
 - 3. Foreclosing important uses ----- L
 - 4. Jeopardizing man or his works ----- N
 - 5. Other factors
-
-

B. WATER QUALITY

- 1. Physical state of water ----- N
 - 2. Chemical and biological states ----- L
 - 3. Ecological balance ----- L
 - 4. Other factors
-
-

1/ See Explanatory Notes for this form.

2/ Use the following symbols:

- N - No environmental impact
- L - Little environmental impact
- M - Moderate environmental impact
- H - High environmental impact
- U - Unknown environmental impact

IMPACT IDENTIFICATION AND EVALUATION FORM

C. ATMOSPHERIC

- 1. Air additives ----- N
- 2. Air pollution ----- L
- 3. Noise pollution ----- N
- 4. Other factors
-
-
-
-

D. NATURAL RESOURCES

- 1. Diversion, altered use of water ----- N
- 2. Irreversible, inefficient commitments ----- N
- 3. Other factors
-
-
-
-

E. CULTURAL

- 1. Altering physical symbols ----- N
- 2. Dilution of cultural traditions ----- N
- 3. Other factors
-
-

F. SOCIOECONOMIC

- 1. Changes in economic/employment patterns ----- L
- 2. Changes in population ----- L
- 3. Changes in cultural patterns ----- N
- 4. Other factors
-
-
-

G. HEALTH

- 1. Changing a natural environment ----- L
- 2. Eliminating an ecosystem element ----- L
- 3. Other factors
-
-
-
-

H. GENERAL

- 1. International impacts ----- N
- 2. Controversial impacts ----- N
- 3. Larger program impacts ----- N
- 4. Other factors
-
-
-
-

I. OTHER POSSIBLE IMPACTS (not listed above)

See attached Discussion of Impacts.

DISCUSSION OF
IMPACT OF PESTICIDE USAGE IN THE NIGER CEREALS
PRODUCTION PROJECT

By

George A. Schaefers, Ph.D.
NYS Agricultural Experiment Station, Geneva, NY 14456

Consultant to University of California AID Pest
Management Project

I. Project Background and Description

The Niger Cereals Production Project (683-0201) originated as a result of special needs arising from the Sahel drought. Food shortages resulting from the drought caused an increased awareness on the part of the GON and the donor community of the need for significant action to increase food production. This project was designed to achieve increased production and availability of cereals by improving the institutional capacity in Niger to identify improved technology, communicate this knowledge to small farmers, and strengthen the framework for the provision of necessary agricultural inputs. The project was originally approved for a three year period extending from FY 76 through FY 78. The present project ammendment recommends a one year extension through FY 79.

The project consists of four interrelated components: applied research, seed multiplication, cooperatives, and agricultural extension. Crop protection aspects are involved in the seed multiplication component for which USAID is a significant donor, although all pesticides, recommendations, applicator training, and application equipment responsibilities are assumed by the GON, National Crop

Protection Project which is sponsored by CIDA. Negligible amounts of pesticide are used for research and demonstration in the applied research and agricultural extension components.

Seed multiplication involves 5 centers (farms) located at Doukoudoukou, Gaecheme, Magaria, Karangousuo, and Hamdallay, and a foundation seed farm at Lossa. All are situated in departments (states) along the southern border of Niger. Each center occupies about 40 ha of cultivated land with about 30 ha in Millet, and about 5 ha each of Sorghum and Cowpeas. The Seed Multiplication Component (SMC) was designed to increase the quantity of seed of superior quality and to train a corps of Nigerian technicians and farmer seed producers in the techniques required for the production, processing and distribution of improved seed. Among other reasons, delays in construction and attainment of full operational capacity of the seed centers has necessitated a recommendation for a 1 year extension of the project.

The research component is the responsibility of INRAN (l'Institut National de Recherche Agronomique du Niger). Pesticides are used in limited quantity at the research station in Mæredi. These are used in small scale field evaluations and demonstrations under trained supervision.

Project Setting

The Republic of Niger is located in north-central Africa between 12° and 24° north latitude. The country occupies about 1.25 million Km², 80% of which is arid desert with the remainder being savannah suitable mainly for livestock and limited agriculture. Ninety percent of the 4.5 million population in Niger is concentrated in the narrow

band along the southern border which is suitable for cultivation. Water supply is restricted to a narrow band along the Niger River in the southeast, wells, and rainfall. Rainfall in the southern region, suitable for the cultivation of cereals consists of about 5-600 mm/year. The region has a marked dry season and rainfall occurs between the months of May to October. Temperatures range from a maximum of 45°C in April and May to a minimum of about 10°C in December and January.

The seed multiplication centers are located in 5 states in southern Niger and are isolated from any population centers by at least 5 kms. The total acreage potentially under cultivation will not exceed 300 ha. Total area under cultivation in Niger for the crops of concern here are ca. 3.5 million ha of millet, 0.6 million ha of sorghum and 0.8 million ha of cowpeas.

The southern region is characterized by long open 0-3% slopes and is subject to high wind erodibility. The soils, which have not been well characterized, are generally acid (PH5), and are recently developed from windblown siliceous sandstone sediments which overlay older Sahelian formations. Seed multiplication centers are selected in part for their constitution of loamy sand "Dune" soils. Vegetation throughout the region is characterized as being associated with moderately good to good agricultural land in Niger and consists of grasses, shrubs, and few trees.

Governmental Control of Pesticide Use in Niger

In Niger, importation, manufacture, sale and use of pesticides are under control of the Ministry of Agriculture. Materials are purchased by the government and application for pest control in outbreak

areas is accomplished by the government with trained personnel and application equipment. Crop protection in the seed multiplication component of the Niger Cereals Project is the responsibility of the National Crop Protection Project which receives CIDA support. Training of applicators, recommendations, and materials are provided through the crop protection project but application is made by farm workers. CIDA has provided one entomologist in advisory capacity to the National Crop Protection project, are bringing to Niger (Maradi) 2 additional entomologists for research, are currently training 5 Nigerians in Canada to the M.S. level, and anticipate a total of 20 scholarships.

Crop protection specialists spend one week annually in each department (state) for the purpose of training new applicators, and introducing previous trainees to new technology and materials. In this manner, it is estimated that about 250 people a year are trained in the use of pesticides.

While no means of residue monitoring is functioning in Niger, means of selection and recommendation of pesticides is attained through Niger's participation in CIP (Conseil Phytosanitaire Interafricaine) as well as an "Insecticide Commission" within Niger which is composed of representatives of different groups, i.e. INRAN, Agricultural Services, Ministry of Health, etc.

Integrated Pest Management

The pest control program as currently used and as proposed for the one year extension of the cereals project does not encompass an integrated pest management approach. However, CIDA supported entomologists, working under the National Crop Protection program

will become involved in research and development of such an approach. In addition, 20 scholarships are being supported by CIDA for training of Nigerians to the M.S. level in entomology in Canada and should provide expertise for development of IPM programs.

Further, Niger, as a member of C.I.L.S.S., is a participant under the F.A.O. program for crop protection in the Sahel. Within this program Niger has responded positively towards the USAID-supported program proposed for research and development of integrated pest management against enemies of major crop pests in the Sahel. Thus, while IPM is not actively practiced in Niger at this time, the vehicles are available for development of IPM programs. Of particular interest to the present project is the possible affect of the proposed pesticides on the natural enemies of the pests involved.

II. Requested Pesticides

Pesticides are used for the protection of seed at the seed multiplication centers. Such treatment is reportedly essential for protection against seed rotting organisms and against insects (primarily termites) which destroy or carry off the seed. The requested pesticide is Thioral^R which consists of undetermined proportions of the fungicide Thiram and the insecticide heptachlor. The dye-marked pesticides are pre-packaged in 25 gram quantities which are then hand-mixed with about 10 kg of seed (Millet, Sorghum, or Cowpea).

Treatment of the standing seed crop is periodically required for protection against a complex of grasshopper species early in crop growth. It has been the practice to use 25% BHC (HCH) dust at a rate estimated at 1-10 kg/ha. Application methods vary from simply throwing a handful on each plant (1 kg/ha) to dusting through

a coarse mesh cloth, and more recently through the use of gasoline-powered, back-pack dusters (10 kg/ha).

Lindane 20 EC (Gamma BHC) is apparently less commonly used on the standing crop, but is preferred over BHC against certain insect pests which occur on the maturing crops. Of primary concern are a complex of stem borers including Busseola sp., Sesamia sp. and Coniesta sp. It is estimated that about 300 grams of active ingredient per ha are applied with powered backpack sprayers.

The above pesticides are recommended and provided by the Nigerian Government through the Direction Du Service De L'Agriculture Section De La Protection Des Vegetaux. While no efficacy or yield data is available for the above materials in Niger, their selection has been based on several years of experience by the National Crop Protection project.

USEPA Registration Status and Toxicological Hazards

Thiram - Registered for use on sorghum and millet. On the basis of teratogenicity, this material has been accepted as a candidate for intensive scientific review under the rebuttable presumption against registration or continued registration (RPAR) program. The acute oral toxicity of this material to mammals is in the 385-865 mg/kg range, placing it in a moderate to low classification of acute toxicity.

Heptachlor - Registered for use as seed treatment on sorghum (same or similar use as millet). Registration on sorghum will be effectively cancelled or denied on July 1, 1983. Notice of intent to cancel is based on oncogenicity and reduction in non-target and endangered species.

BHC (Technical Grade) - Has received voluntary cancellation of re-registration on all crops based on oncogenicity, fetotoxicity, and reproductive effects in mice and rats. Acute oral toxicity is dependent on amounts of various isomers present. Most are with low acute toxicity but some with high chronic toxicity.

Lindane - Although registered for use on sorghum (same or similar use as millet), RPAR, or a rebuttable presumption against re-registration has been issued against Lindane. Criteria involved include oncogenicity, fetotoxicity and reproductive effects in mice and rats, as well as acute toxicity in aquatic and avian species. The acute oral toxicity of Lindane to rats is about 90 mg/kg, placing it in a moderately toxic classification.

III. Evaluation and Recommendation

The Thiram-Heptachlor treatment for seed treatment is used in extremely low dosages, i.e. 25 grams formulated material/hectare of seed with a maximum treatment area of 300 ha within the seed multiplication project. They are used on a product not immediately intended for consumption. Their use comes under the regulation of the CIDA supported National Crop Protection Project and their application is under trained supervision. Their use to date indicates no significant environmental impact and no significant effects are anticipated against non-target or endangered species within the area of concern. Thus it is apparent that the only potential risk occurs to the pesticide applicators and other immediate farm workers. Some risk of exposure occurs during seed treatment and hand planting of treated seeds. However, this risk will be mitigated upon the arrival of mechanical seed treatment equipment, and the use of gloves

or mechanical devices during the planting operation. RECOMMENDATION: In view of the registration status of these materials, i.e. registered for same or similar uses by USEPA without restriction it is recommended that their use in the seed multiplication component continue, at least through the one year extension of the NCP project. However, with respect to the pre-RPAR status of Thiram and the effective cancellation of Heptachlor in 1983, it is recommended that research be encouraged to find alternative treatments not possessing the risk criteria associated with these materials in order that more acceptable crop protection may be afforded the ongoing project in Niger.

BHC and Lindane for grasshopper and stem borer control on standing crops of millet, sorghum and cowpea are used at relatively low rates, 1-10 kg of 25% BHC and 1.5 l of 20% lindane EC/ha on less than 300 ha of crops within the seed multiplication project. BHC has been used extensively in Africa for many years and is a pesticide with which many agriculturalists are intimately familiar. Within the NCP both materials are used on products not immediately intended for consumption and are applied under supervision with adequate protective clothing. In view of the difficulties in assessing the chronic toxicity of technical grade BHC, and the risk criteria associated with Lindane, the greatest risk in its use will be to the applicators and to other immediate farm workers. RECOMMENDATION: In view of the USEPA regulatory status of BHC and Lindane it is recommended that alternative materials be used. Of a number of possible alternatives, Diazinon, registered for use on sorghum without restriction, is effective against grasshoppers,

moderately effective against stem borers, is readily available in Niger, and is only moderately toxic in terms of acute oral and dermal toxicity. Alternative materials suggested for investigation against stem borers include methomyl and endosulfan. Improved timing of applications of diazinon to coincide with periods of stem borer egg hatch, as well as destruction of stubble following harvest will markedly reduce the ravages of these pests. It is further recommended that some consideration should be given to the selection and development of stem borer resistant varieties of millet.

IV. Final Recommendation

Data substantiating the direct benefits (i.e. yield increases) gained from the use of pesticides in the seed multiplication component of the Niger Cereal Project are not available. The use of seed treatments over many years has led to the ready acceptance of this practice thus indicating that at least some benefits must be in evidence. An estimate of 25% reduction in standing crop has been attributed to insect attack. While these figures may not be supportable it is evident that any losses caused by insects and diseases are critical in the production of this valuable source of improved seed. Losses due to direct feeding damage as well as yield reductions resulting from delays in replanting can affect the quantity of seed produced.

There is some evidence that the use of improved quality seed, along with other improved cultural inputs can increase the yield of millet from the present level of 400 kg/ha to over 700 kg/ha. Such increases are vital to the nutritional well-being of the 4.5

million people in Niger, particularly in marginal drought situations. The use of Thiram and Heptachlor for seed treatment and the recommended use of Diazinon for protection of the standing crop undoubtedly play a contributory role in these yield increases. These materials are registered for general use without restriction by the USEPA. Based on the present examination, no significant adverse environmental impacts are reasonably anticipated from their use as prescribed in the Niger Cereal Project and as such a negative determination under AID Regulation 16 is, therefore, recommended for the project.

October 1978

