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621-0107

TANZANIA

Agriculture Research

PP

Revision 2

FY80

PP file

AGENCY FOR INTERNATIONAL DEVELOPMENT PROJECT DATA SHEET		1. TRANSACTION CODE <input checked="" type="checkbox"/> C A = Add C = Change D = Delete	Amendment Number <u>II</u>	DOCUMENT CODE <u>3</u>
2. COUNTRY/ENTITY <u>TANZANIA</u>		3. PROJECT NUMBER <u>621-0107</u>		
4. BUREAU/OFFICE <u>AFRICA</u> <u>06</u>		5. PROJECT TITLE (maximum 40 characters) <u>AGRICULTURE RESEARCH</u>		
6. PROJECT ASSISTANCE COMPLETION DATE (PACD) MM DD YY <u>0</u> <u>9</u> <u>3</u> <u>0</u> <u>8</u> <u>2</u>		7. ESTIMATED DATE OF OBLIGATION (Under 'B' below, enter 1, 2, 3, or 4) A. Initial FY <u>7</u> <u>1</u> B. Quarter <u>I</u> C. Final FY <u>8</u> <u>1</u>		

8. COSTS (\$000 OR EQUIVALENT \$1 = T.Shs8.25)

A. FUNDING SOURCE	FY 80			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
AID Appropriated Total						
(Grant)	(935)	(365)	(1,300)	(8,050)	(446)	(8,496)
(Loan)	()	()	()	()	()	()
Other U.S.						
1.						
2.						
Host Country		698	698		4,283	4,283
Other Donor(s)						
TOTALS	935	1,063	1,998	8,050	4,729	12,779

9. SCHEDULE OF AID FUNDING (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) ARDN	111	080		5,851		2,645		8,496	
(2)									
(3)									
(4)									
TOTALS				5,851		2,645		8,496	

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)	11. SECONDARY PURPOSE CODE
12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)	
A. Code RA/G XII	
B. Amount	

13. PROJECT PURPOSE (maximum 480 characters)

Develop the capacity to plan, organize, and administer an agricultural research system for maize, sorghum, millet and food legumes.

14. SCHEDULED EVALUATIONS	15. SOURCE/ORIGIN OF GOODS AND SERVICES
Interim MM YY MM YY Final MM YY 0 7 8 0	<input checked="" type="checkbox"/> 000 <input checked="" type="checkbox"/> 941 <input checked="" type="checkbox"/> Local <input type="checkbox"/> Other (Specify) _____

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a _____ page PP Amendment.)
 Mission is requesting funds authorized in FY 81 and 82 to be allotted and reprogrammed in FY 80 and 81 for land development, village trials, farm budget surveys, and planning for the construction of research facilities.

17. APPROVED BY	Signature Dr. H.J. Stevenson <i>H.J. Stevenson</i>	18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION MM DD YY
	Title Director, USAID/Tanzania	

AGRICULTURE RESEARCH (621-0107)

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I. Project Amendment Summary and Recommendations

A. Background

Since 1971 USAID/T has been committed to assist the Ministry of Agriculture (MinAg) in food crops research through the Agriculture Research project (621-0107). This project has supported the Ilonga Agricultural Research Institute (Ilonga ARI) which is responsible for all good crop research in Tanzania. As recently as 1977 this commitment was further demonstrated in the form of Amendment No. 1 to increase the funding level from \$2,699,000 to \$8,496,000. A more recent amendment intended to provide an additional \$2,000,000 to increase LOP authorization to \$10,496,000. However, this amendment was not approved and AID/W recommended that the Mission rather submit a new PID which would specify all new crop components and the total scope of AID's planned long-range involvement in agriculture research.

A Farming System Research PID was submitted in August 1979 that addressed the recommendations.

USAID/T anticipated that the current project would end in September 1980 and the new project would start in October of the same year.

B. Problem

The Mission does not have the allotments necessary to fund either:

- (1) a smooth transition to adequately prepare for the new project should it be approved and authorized; or
- (2) an orderly phase-out of the current project if the new project is not approved.

The cause of the problem was a decision during the preparation of the FY 1981 ABS not to request for the remaining FY 1981 and FY 1982 allotments to fully fund LOP authorizations. The decision was made on the basis that the new project would commence in October 1980. However, due to the delay in approval of the Farming Systems Research PID and initiation of PP design, the new project cannot commence until October 1981. The allotments are now required to continue critical activities at the Ilonga Agricultural Research Institute (ARI) for an additional year and completion before September 30, 1981.

C. Solution

In this proposed PP Amendment No. II the Mission is requesting the remaining authorized FY 1981 and FY 1982 allotments. These funds will be reprogrammed in FY 80 and FY 81 to finance the following critical activities at Ilonga ARI:

- (1) the continuation of village trials, demonstrations and farm management surveys for an additional year so that sufficient data is collected and analyzed to finalize and publish recommendations for use by the extension service.
- (2) the continuation of land development and the 15 months services of an agricultural engineer so that this activity can be completed by September 1981. This will include the development of research plots, irrigation facilities, and the drilling of two deep wells for domestic and irrigation purposes.
- (3) the initiation of designs and planning for the research facilities so that construction can begin when and if the new project is approved and authorized or when other funds become available to complete construction at Ilonga ARI.

D. Recommendations

It is recommended that \$2,645,000 of project funds originally authorized be allotted for reprogramming in FY 80 and FY 81 as summarized below in Table I.

TABLE I (\$000)

<u>Item</u>	<u>Planned Programming Under Amendment I</u>	<u>Proposed Programming Under This Amendment II</u>
Technical Assistance	\$ 3,412	\$ 3,560
Training	1,790	1,046
Commodities	661	2,273
Other Costs	1,779	1,014
Contingency	228	363
Inflation	566	240
Totals	<u>\$ 8,496</u>	<u>\$ 8,496</u>

E. Issues

1. The Ministry of Agriculture must obtain clear land use rights to the Ilonga ARI. The Chama Cha Mapinduzi (CCM) Training Institute has a cattle corral on 50 hectares of land now designated for the Ilonga ARI. The problem has been discussed with the Minister of Agriculture and the Director of Crop Research. The USAID Director has received letters (See Attachments,) from the Minister assuring AID that the Ministry will resolve the problem and the area under dispute will be made available to the station.

* Authorized for FY 81 and FY 82.

2. Since the approval of the PP revision in 1977 the Government of Tanzania contributions for development of the Ilonga ARI have not been fully forthcoming. USAID recognizes the problem as being primarily caused by the budget restrictions placed on all government projects as part of a savings and cost cutting effort. The economic crisis, resulting from the war in Uganda, falling export crop production have been contributing factors. However, the Tanzania Government (TanGov) policy is that food crop production and research is a national priority. The Ministry of Agriculture assured the USAID Director in writing that the TanGov will provide the necessary funds to support the development of the Ilonga ARI. (See Attachments)

3. The audit report No. 3-621-80-7 dated February 8, 1980 on the review of AID program in Tanzania recommended that the contract staff develop a plan for the transfer of increased project responsibilities to TanGov counterparts. It has been the policy of the MinAg and contractor to place increased project responsibilities on Tanzanians who returned from long- and short-term training. However, there is no written detailed plan outlining their responsibilities but in fact the participants are placed in the various commodity sections (i.e., maize, legume, sorghum, millet, economics, etc.) where they have received specialized training. The Mission will request an amendment to IITA's contract requiring a detailed plan, to be fully implemented by September 1981, to transfer increased project responsibilities to the Tanzanian counterparts.

4. The Farming Systems Research project (621-0156) is expected to provide continued assistance to the Ilonga ARI. Will this proposed amendment still be viable if the new project does not materialize?

Food crops research in Tanzania is concentrated and coordinated at the Ilonga ARI which has the proven capability and technical capacity to serve as the National Center for Food Crops Research. However, Ilonga ARI lacks the facilities to adequately improve genetic material, produce, sufficient germ plasma, and to maintain the plant material. Funds provided under this amendment will fully develop the land facilities and develop architectural and engineering design plans for the future construction of buildings. Whether AID approves or disapproves the new project, the developed land will provide for a smooth phase-out of the project to enable the Tanzania research staff to conduct research on a year around basis.

Similarly, the project amendment is designed, and the contract will be amended, so that the research results will be complete and documented. This will allow for a smooth phase-out of research activities, if necessary, but at the same time have the technicians on board for continuity should the new project emerge.

5. Will the TanGov provide the necessary local currency to fully develop the Ilonga ARI facilities? The TanGov's current budget crisis and foreign exchange shortages preclude the MinAg from obtaining the necessary funds to develop the facilities. The limited foreign exchange is being allocated to short-term impact projects rather than to long-term development activities.

USAID and MinAg agree that appropriate facilities are necessary to achieve the objectives of the new Farming Systems project and to provide for on-going research activities. However, given the inability of the TanGov to provide the local currency required to develop the facilities, the Mission recommends that the costs be assumed by AID through this proposed amendment.

II. Detailed Description of Project Amendment

A. Background

The Tanzania Agricultural Research project was initially authorized in FY 1971 with a 5-year life of project cost of \$2,699,000. The purpose was to increase the Government of Tanzania's (TanGov) capability to (1) determine agriculture research priorities and implement programs in maize and edible legumes; (2) improve crop varieties; (3) provide breeder seed; and (4) recommend suitable agricultural practices to farmers. The project, later amended to a ten (10) year life, was to lead to the development of a well-trained, experienced and competent corps of Tanzanian scientists to staff and maintain an on-going research program in food crops.

The first project paper amendment was approved on December 15, 1977 which provided \$5,797,000 additional funds for technical assistance in sorghum/millet breeding/agronomic research, agricultural economics, administration of information and training, and short-term consultancies. In addition, funds were allocated for participant training, commodities, and other costs. The PP Amendment extended the life-of-project to FY 1982 and the authorization was increased from \$2,699,000 to \$8,496,000. The technical positions, training, and specialized commodities were added to the IITA contract and the expiration date of that contract was extended to September 30, 1980.

The purpose of the revised project was "to develop the capacity to plan, organize and administer an agricultural research system for maize, sorghum, millet and food legumes." One output (refer to PP Revision I Section II.B. "Project Background and Detailed Description," Item No. 7a, Page 14 and the logical framework, Appendix II) considered critical to achieving this purpose was a "fully developed research station and sub-stations including appropriate equipment and facilities to permit quality food crop research programs to be carried out." However, this was to be provided by the TanGov, hence the project authorizations did not provide the funding to achieve the output.

A second amendment was submitted to AID/W in June 1978 requesting a root and tuber breeding/agronomic component. Amendment II requested the project funding level to be increased from \$8,496,000 to \$10,496,000 with the same PACD. The amendment was not approved by AID/W. AID/W guidance cable (78 STATE 299131) recommended the Mission consider submitting a new PID which would specify all new crop components and the total scope of AID's planned involvement in agriculture research. In addition, the Washington project committee expressed the following concerns:

(a) the need to incorporate an extension component which relates research to the problems identified by farmers, and (b) include more on-the-job training. The Mission accepted these recommendations and submitted a PID for a new project to address these concerns. The Farming Systems Research PID was submitted to AID/W in August 1979.

1. Authorization and Funding

The total authorized for the project (refer to Schedule A for a detailed analysis) was \$8,496,000. However, allotments received to date total \$5,851,000. The Project Agreements obligated \$3,390,000 for technical assistance, \$1,046,000 for participant training, \$998,000 for commodities, \$349,000 for other costs, and \$68,000 for contingencies. The total amount earmarked under PIOs is \$5,223,000 which leaves \$628,000 unearmarked as of April 30, 1980. The project plans to utilize \$400,000 during the remaining period in FY 80 to purchase commodities.

2. Contractor

The major inputs of the project are provided through a contract with the International Institute of Tropical Agriculture (IITA) which cooperates with the TanGov Ministry of Agriculture (MinAg) and is responsible in administering the project and providing technical assistance. Funds earmarked for the current contract with IITA total to \$3,498,000 of which \$2,045,000 is for technical assistance, \$970,000 for long- and short-term training, and \$483,000 for specialized research commodities and other costs.

The original contract between USAID and IITA was from November 1, 1973 to September 30, 1976. A second contract with IITA has been in effect since October 1, 1976 and is due to expire on September 30, 1980. USAID will extend the contract for one year to provide ongoing research activities and continuity until the new project commences in FY 81. Under this amendment USAID proposes to increase contract level to \$3,618,000 to include 15 additional person-months of technical assistance.

3. Current Status of Project Achievements

The achievements of the agriculture research project are as follows:

a. **Research Facilities:** The development plans for completion of the research facilities (i.e., land development and buildings) at Ilonga was completed in December 1979 by IITA and CIMMYT. The development plans have been accepted by the Ministry of Agriculture and USAID. The TanGov has released \$366,000

(T.Shs. 3 million) for development costs (i.e., fuel, labor, and transportation) for irrigation facilities and for construction of fence posts. However, funds have not been released for building construction and land development.

b. Commodity research plans, budgets, administrative and management techniques have been developed and are functioning well within the National Coordinating Committees. The TanGov budget to support food crop research in FY 79/80 totalled \$645,000. However, the project had a shortfall of \$25,000 of the total budget. The shortfall would have affected the village trials and demonstration program which are critical in developing technological packages and recommendations for the Extension Service. Therefore, the project provided the \$25,000 to continue the village trials during the current planting season.

c. Training: A total of 13 long-term participants have been trained, an additional 14 are being trained, and 9 new participants will begin training in 1980. The PP indicated that 70 long-term participants would be trained by the end of September 1982. However, only 36 will have been trained. The lack of University graduates and qualified secondary school graduates has contributed to the lack of trained personnel available to research. Short-term training in maize, sorghum, millet, legumes, root and tuber and rice was initiated in 1973. A total of 55 have been sent to the various international research centers for in-service courses. An additional 12 participants will be sent in FY 80. The PP called for 64 participants to be trained by September 1982, thus the project will surpass its objective in the area of short-term training.

d. The feedback system from farmers and villages through the annual village trials program is still developing. The purpose of the trials is to test and verify research results off the station before demonstrations can be replicated by the extension service or farmers.

e. Agronomic packages for maize, legumes, and sorghum based on the Village Trials Program are being developed by the agricultural economist and agronomist and released to the central extension unit of the Ministry of Agriculture by September 1981.

f. Staffing: The project has 7 expatriate technicians on board including an agricultural economist which was recruited in 1979 to begin work on the agronomic packages. The PP amendment calls for 8 technicians but contractor could not recruit an American millet breeder. Subsequently, the contract was amended changing the position to a technical officer. Thus, the proposed amended project will require an agriculture engineer for 15 months to complete the land development.

4. Reorientation of Agriculture Research and Support

Although much progress has been made in developing a core capability in basic/applied research for food crops, senior policy makers in Tanzania recognize that many recommendations now coming from research are not always relevant to farmers. Second, there is a great need for researchers and extensionists to develop meaningful work programs to coordinate their efforts in the attainment of a common objective -- more useful recommendations that will be more readily adopted by farmers. This need stems from the sluggish performance of agriculture over the past decade.

To assist with these difficulties USAID's support to agriculture research in Tanzania will be expanded under the proposed Farming Systems Research project (621-0156). The components (refer to Schedule B) will be basic and applied research in maize, sorghum, millet, legumes, rice and root and tubers; adaptive research linking the continued basic and applied research more closely to farmers through extension; and the upgrading of the Ministry of Agriculture Central Extension Unit to disseminate research findings for use by farmers in various agro-ecological zones. A major component of the project will be an extension liaison unit which will address the need for linkages between farmers, extension agents, and researchers.

B. Problem

1. Background

USAID/T has received inadequate allotments to fund the completion of the current project so as to allow for a smooth transition and adequately prepare for the new Farming Systems Research project should it be approved and authorized; and to enable an orderly phase-out and completion of the current project whether or not the new project is approved.

The cause of the problem was a decision not to request for the remaining FY 81 and 82 allotments and full LOP authorizations. This decision was made in April 1979 on the basis that the new project could be started in October 1980. Due to the delay in approval of the Farming Systems Research PID and slippage in the fielding of a PP design team, the new project cannot commence until FY 1981. However, the allotments previously authorized (refer to Schedule C) are now required to continue and complete critical activities at the Ilonga ARI during FY 80 and 81.

The Ilonga ARI has the proven research capability and technical capacity to be called the National Center for Food Crops Research. However, Ilonga lacks the facilities to adequately improve

genetic material, produce sufficient germ plasm, and to maintain plant material necessary to sustain a national agriculture research program.

For the past seven years the project has concentrated on the development of a research program to provide new maize, legume, and sorghum varieties, to test research results through village trials, and to train a core Tanzania research staff. However, any expansion beyond the present scope of activities and to promote a national research program necessitates the need to develop the physical facilities at Ilonga.

Tanzania's current budget crisis and foreign exchange shortages preclude the MinAg from obtaining the necessary funds from the TanGov to develop the facilities. The limited foreign exchange is being allocated to short term impact projects rather than to long-term development activities. Also, the MinAg has requested AID to develop a Farming Systems Research project, which is national in scope, using the Ilonga ARI as the center for the development of these activities. USAID and the MinAg feel that appropriate facilities are required to achieve the objectives of the new project and to provide continuity in research being conducted under the current project.

2. Need for Fully Developed Research Station

With the concentration and coordination of all food crop research in Tanzania at Ilonga ARI, it becomes justifiable and necessary to fully develop the facilities so that research can become more productive and efficient.

In 1978 the in-depth evaluation of the project stated that the Ilonga ARI facilities were probably the most inadequate of the agriculture research institutes visited by the team, and that "the much needed development of the Ilonga should be placed in high priority for completion by the end of 1981." (Refer to "Evaluation of Tanzania Agricultural Research Project," AID/AFR-C-1142, W.O. No. 68, August 1978, p. 5.)

It is recognized that one of the major constraints of the project, causing ineffective use of the project team, is inadequate land and physical facilities. This has been cited on a number of occasions by the TanGov officials and project evaluators. The effectiveness of the U.S. and Tanzania research technicians currently at Ilonga ARI is hampered by the lack of office space, commodity work areas, laboratory facilities, storage, water, electricity and repair and maintenance of equipment facilities. The project is currently sharing facilities with the Ministry of

Agriculture Training Institute (MATI) and the Crop Development Division. In addition, all technicians are hampered by the slow rate of land development and irrigation facilities to allow intensification of research activities.

With the construction of the buildings and the development of land into properly laid out research plots and supported by irrigation facilities, the research staff will be able to conduct quality food crop research. In addition, the staff will be able to utilize the full year in genetic improvement activities rather than the typical 3 to 4 months period of the regular growing season. Production of valuable germ plasm can easily be tripled. Waterways and borders along with levelled land necessary for research will protect valuable plantings from destruction by flooding waters. This will ensure uniformity in trials so that results can be precisely interpreted.

Once efficiency is achieved in the field activities the physical facilities need to be developed to handle the increased production of plant materials (i.e., seed testing, screening, handling, and storage), data collection and analysis. On-station research can be more effectively coordinated and managed by project staff and off-station research trials will be centrally coordinated. In addition research linkages can be established with the University Faculty of Agriculture on variety trials, soil management, weed control, and integrated crop protection programs as well as linkages with U.S. universities that can enhance food crops research in Tanzania. Also, linkages can be established with the MinAg Central Extension Unit to disseminate research results into packages of practices for use by farmers. To accomplish this latter objective, farm management surveys in areas covered by the Ilonga ARI village trials and demonstration program will be critical to test and demonstrate the profitability of technological packages.

3. Tanzania Government Contribution

The TanGov contribution to the current research project from 1971 to 1979 was approximately \$2.3 million (T.Shs. 18.7 million) of which \$2.1 million (T.Shs. 16.8 million) was for recurrent costs and \$222 thousand (T.Shs. 1.8 million) was for Ilonga ARI development costs (refer to Schedule D). During the next 3 fiscal years (1980-82) the TanGov plans to disperse \$2.0 million (T.Shs. 16.4 million) of which \$1.4 million (T.Shs. 11.5 million) is for recurrent cost and \$635 thousand (T.Shs. 5.2 million) will be for the development of the Ilonga ARI.

The TanGov contribution (refer to Section IV, Item B.3.a of the FY 78 and 79 Project Agreements) stated that they would "provide the local currency costs of capital and recurrent cost

connected with maintaining and adequately operating the research facilities at Ilonga, other research stations and sub-stations, and village trials as outlined in annual work plans of the project." The PP Amendment I indicated that the TanGov LOP contributions (refer to Section II.B. "Detailed Description," Item No. 9; "Inputs and Phasing" page 15; and Table 2, page 16) to the project would total \$2,864,000 (T.Shs. 23,485,000); however, the ProAgs for FY 78 and 79 did not indicate any amount or the source of funding for the development of facilities at Ilonga.

The general agreement between the U.S. Government and TanGov for the sale of agriculture commodities and the use of PL 480 Title I local currency specified it to be used for economic development and support of USAID/T funded projects. Moreover, it was planned by USAID but never negotiated with the TanGov that the capital development costs for the project would be met from PL 480 Title I sales. When the Title I agreement was being drawn up it was proposed that T.Shs. 5.6 million (\$680,000) in 1977 and T.Shs. 4.8 million (\$582,000) would be used to complete the development of land and the construction of buildings. This, however was never put into a formal agreement between USAID and the Ministry of Finance.

The project did not receive funds for development during 1977/78 because the Ministry of Agriculture was not included in budget allocations to receive Title I local currency. The TanGov allocated T.Shs. 2 million for the 78/79 fiscal year but the project received only T.Shs. 1.2 million from the budget. For the 79/80 fiscal year the budget only allocated T.Shs. 1.8 million to the project. The local currency is being used for the purchase of concrete fence posts, concrete pipe for the irrigation system, land leveling, and other local development costs. Thus, the development of land and construction of research facilities which was to be financed from PL 480 Title I proceeds, never materialized.

4. Facilities Required

As indicated above, the real need exists for land development and construction of facilities if Ilonga ARI is to become a viable institution.

plan

The total/for facilities required for the 160 hectare research site (refer to the attached report on the Development of the Ilonga ARI, dated December 10, 1979) is in three phases. Activities in these three phases will be funded under this amendment and the proposed Farming Systems Research project as follows:

Phase One

- a. Development of 50 hectares of land including 25 hectares for furrow irrigation (Amendment II)
- b. Architectural and engineering design plans for the construction of research building (Amendment II)
- c. Drilling of two deep wells (TanGov)
- d. Purchase of development equipment and farm machinery (Amendment II)

Phase Two

- a. Development of an additional 50 hectares of land including 25 hectares for furrow irrigation (Amendment II)
- b. Construction of 20 buildings including the electrical, water, and sewage systems (Farming Systems Research project)
- c. Drilling of two additional deep wells (Amendment II)
- d. Purchase of remaining farm machinery (Amendment II)

Phase Three

- a. Construction of the remaining buildings and 5 silos (Farming Systems Research)
- b. Road surfacing (Farming Systems Research)
- c. Development of the remaining 40 hectares of land (Amendment II)

5. Need to Extend IITA Contract

The current contract with the International Institute of Tropical Agriculture (IITA) which provides technical assistance, long and short-term training, and the purchase of specialized equipment for the project expires September 30, 1980. In phasing out of the technical assistance component and the development of the new Farming Systems Research project, the Ministry of Agriculture and the Mission recognized the need for continuity between the two projects. Continuity can be assured if the following activities are continued for one more year: planting of new varieties; village

trials; collection of research data on 1979/80 village trials; the development of research data accumulated over the past five years; and farm budget surveys. If these activities are successfully completed by September 1981 the start up of the new project will be greatly facilitated. It is anticipated that the new project will be authorized in the third quarter of FY 1981.

Based on present funding levels the contract will be amended to utilize \$488,000 of the unearmarked FY 79 funds to increase IITA's level of effort by 48 person-months (see Table II for detailed summary of technical assistance), 3 person-months of short-term consultants, participant training, specialized commodity procurement and other costs (refer to Schedule E for detailed budget costs).

Upon approval of this PP Amendment the Mission will request IITA to provide an agricultural engineer for 15 person-months to continue developing the land during this interim period and the contract will be amended accordingly.

TABLE II

Staffing Patterns for Agriculture Research Project
Using FY 79 Funds

<u>Position</u>	<u>Time Frame</u>	<u>No. of Person-Months</u>
Maize Breeder	Oct. 1 - March 31, 1981	6
Legume Breeder	Oct. 1 - March 31, 1981	6
Sorghum Breeder	Oct. 1 - March 31, 1981	6
Legume Agronomist	Oct. 1 - Sept. 30, 1981	12
Agric. Economist	Oct. 1 - Sept. 30, 1981	12
Project Coordinator	Oct. 1 - March 31, 1981	6
Total Person-Months		<u>48</u>

C. Proposed Solution/Restructure of AID Inputs

In this proposed PP Amendment II the Mission is requesting the remaining FY 81 and FY 82 allotments (refer to Schedule F). The funds will be reprogrammed to obligate \$1,300,000 in FY 80 and \$1,345,000 in FY 81. This will finance critical activities at Ilonga ARI which AID is committed to complete. These activities are village trials, demonstrations, and farm budget surveys for an additional year so that data is collected and analyzed to finalize and publish recommendations for use by the extension service; the continuation of land development and the 15 months of services of an agricultural engineer so that this activity can be completed by September 1981. This will include the development of research

plots, irrigation facilities, and the drilling of two deep wells for domestic and irrigation purposes; and the initiation of designs and plans for the research facilities so that construction can begin when and if the new Farming Systems Research project is approved and authorized, or when other funds become available to complete construction at Ilonga ARI.

III. Project Amendment Analysis

A. Technical Analysis

The rationale of the MinAg in selecting Ilonga ARI as the National Center for Food Crops Research in Tanzania was based primarily on the availability of facilities and climatic conditions. The land site chosen consists of 160 hectares of prime soils suitable to conduct research on a variety of crops. The rainfall provides enough moisture during the major growing season to provide a reasonably good crop. There is sufficient underground water to support the irrigation of 50 hectares.

The MinAg felt and USAID agreed that there would be advantages in concentrating basic and applied research on one site rather than scattered around the country. This would allow development of more complete facilities for major food crops rather than have separate facilities for different crops. Adaptive research will be done in various agro ecological zones throughout Tanzania under the Farming Systems project.

The development of the Ilonga ARI will have two major components -- the development of 140 hectares of land to conduct year around research and development of 20 hectares for the construction of research facilities. Under the current project as amended, a major portion of financial and technical assistance will be utilized for land development.

The land development plan which was prepared by CIMMYT provides a field layout which cannot be finalized until an agricultural engineer spends considerable time in interpreting survey data and calculating erosion and soil movement. Considerable work is required to develop the 140 hectares for research. The existing contour banks will have to be removed through proper grading and adequate drainage. Storm drains need to be constructed to control water movement and water logging. The land development technology to be used at Ilonga ARI is similar to what CIMMYT and IITA have been recommending to countries involved in developing a national food crops research program. The equipment (some has been ordered and received) for the development of land is critical in movement of top soil, constructing drains and laying furrow irrigation system. The latter will require the drilling of two deep wells to supply required water. In addition, farm machinery is required for planting and harvesting of crops on well laid out research plots. The type of farm machinery is also critical to the development of the Ilonga ARI. The machinery was recommended by CIMMYT and IITA team because of its quality and suitability for conditions at Ilonga, maintenance capability and availability of spare parts.

The Farming Systems Research project will provide for the construction of buildings, roads and drains, and the installation of the electrical, water and sewage systems. Under the proposed amendment a local firm will be hired to develop the architectural and engineering designs for the construction. The A&E plans will cover the remaining 20 hectares of land, specifically set aside for the buildings. The 20 hectares are located on the highest point of the research site. The A&E plans will require 6 months to develop because of the need to determine structure of soil, load bearing capacity, topographic surveys, rainfall patterns, etc. In addition, the plans will determine the type of buildings and their locations, water and sewage systems, walk and roadways, and cost of construction. The cost of the designs will be approximately 10 percent of the total construction cost.

B. Initial Environmental Explanation

The IEE contained in the PP Amendment I is still valid. The project will develop a furrow irrigation system instead of a sprinkler irrigation system. The project staff and consultants feel the water from the furrow gravity flow system is much more manageable and will cause less erosion problems than under the sprinkler irrigation system.

IV. Administrative Arrangements and Implementation Plan.

A. Administrative Arrangements

1. General: The project is being implemented through a contract with the International Institute of Tropical Agriculture (IITA). The contractor provides both long- and short-term technical assistance except what may be provided under AID centrally funded programs (i.e. CRSP/Title XII). The contractor is also responsible for long and short-term participant training and the purchase of specialized research commodities. The project is managed by the Chief Research Officer of the Research Division of the Ministry of Agriculture. Project agreements are signed by the Ministry of Finance and all PIO's are signed by the Principal Secretary of the Ministry of Agriculture. No changes in the above general arrangements are anticipated for the remainder of the project, except that IITA's contract will be extended until September 30, 1981.

2. Ministry of Agriculture: Day to day operations of the project are under the control of the Chief Research Officer. Research guidance on various commodities is provided by the National Research Coordinating Committee which includes representatives from research, crop production, and extension. Supervision of the contract and local field staff is the responsibility of the Project Coordinator in consultation/coordination with the Chief Research Officer.

The agriculture research program in Tanzania is the responsibility of the Ministry of Agriculture. Thus the AID funded research project is integrated and coordinated within the overall agriculture research program. Annual work plans are developed by the various commodity coordinating committees (i.e. maize, legumes, sorghums, etc.) for discussion with, and approval by, the National Research Coordinating Committee. The contract staff usually serve as the National Coordinators. The Project Coordinator handles most of the administrative demands of the project.

Project inputs are developed by the project staff and IITA/CIMYT farm management personnel in consultation with the Chief Research Officer. All commodities are cleared by the Ministry of Agriculture but do depend, to some extent, on the General Services Offices of AID for processing. The Ministry of Agriculture depends a great deal on contract technicians for planning and decision making. However, the project expects the cadre of technicians being trained under the project to take over major decision-making within 3 to 4 years.

3. Contractor: With the extension of the IITA contract, technical assistance will be provided for seven technicians from October 1, 1980 to March 30, 1981 and three technicians from April 1, 1981 through September 30, 1981. Seven of the contract technicians

are on board. The agriculture engineer will serve as a short-term consultant to the project during May and June to continue the development of land at the Ilonga ARI. From July 1, 1980 through September 30, 1981, the engineer will be on a long-term contract. She/He will be responsible for land grading and management, laying of irrigation pipe, construction of reservoir, fencing of building and reservoir sites, machinery repair and maintenance, construction of storm drains, other construction activities, inventory, and record keeping of all AID funded commodities. The engineer also will prepare quarterly progress reports on the land development activities and will advise and train the Tanzania counterparts.

4. AID: An AID project officer is assigned to the project and will serve as USAID's primary contact between the project coordinator and the Chief Research Officer. The Project Officer will be responsible for developing all PIO's in a timely manner, monitoring on-going activities, and assisting in the evaluation of the activities re impact on beneficiaries. The Project Officer will also be responsible for identifying issues/problems that are affecting the implementation of the project and discuss the same with the Ministry of Agriculture, Project, and AID staff.

B. Implementation Plan.

The implementation plan for the development of the Ilonga ARI, and the transition of the current project (refer to Section II, A Background for historical events) is as follows:

<u>DATE</u>	<u>ACTION</u>	<u>RESPONSIBLE ORGANIZATION</u>
4/80	Amended PIO/T 621-0107-3-90004 and developed waiver to increase IITA's level of effort and ceiling amount by \$488,000 to fund contract to 9/30/81	USAID/MinAg
4/80	Amended PIO/C 621-0107-0-80194 to finance additional cost of workshop tools.	USAID
5/80	Agricultural Engineer arrived on TDY to continue/and development at Ilonga ARI.	IITA/MinAg
6/80	Urgently require approval of proprietary procurement waiver submitted to AID/W in 2/80	AID/W
6/80	Contract negotiated with IITA	REDSO/EA
6/80	Reservoir lining received	MinAg
6/80	Submit PP Revision No. II to AID/W	USAID

<u>DATE</u>	<u>ACTION</u>	<u>RESPONSIBLE ORGANIZATION</u>
6/80	3 Long-Term participants return	AID/MinAg
6/80	1 of 3 houses constructed at Ilonga completed	Contractor
7/80	PIO/C for development machinery and farm equipment	AID/MinAg
7/80	Approval of PP Revision No. II	AID/W
7/80	Obligate FY 80 Funds, ProAg signed	AID/TanGov
7/80	PIO/T to amend contract to increase level of effort and increase ceiling level for Ag Engineer	AID/MinAg
7/80	Farming Systems Design Team arrives, Evaluation of current project	Contractor
8/80	NCATSU Farm Management Survey Team arrives	USAID/MinAg
8/80	Expression of interests to A&E Firms	Min. of Works
8/80	8 Long-term participants leave for U.S.	Contractor/MinAg
8/80	Development Equipment arrives	MinAg/USAID
8/80	1 Long-term participant returns	MinAg
9/80	2 Long-term technicians depart (Project Coordinator and maize Agronomist)	USAID/MinAg
9/80	Development Equipment arrives	Contractor/MinAg
9/80	Farming Systems Research PP Design Team Departs	AID/MinAg
9/80	3 Long-term participants return	Contractor/MinAg
9/80	NCATSU Farm Management Surveys completed	USAID/MinAg

<u>DATE</u>	<u>ACTION</u>	<u>RESPONSIBLE ORGANIZATION</u>
10/80	-New Project Coordinator arrives	Contractor
	-2 remaining houses at Ilonga completed	Contractor/MinAg
	-A&E Firm contracted	AID/Min of Works
11/80	REDSO/EA certification of houses received	USAID/REDSO
11/80	Reimburse MinAg for Construction of 3 houses	USAID
11/80	Farming Systems Research PP submitted to AID/W	USAID/MinAg
11/80	PIO/C for Machinery & Equipment	USAID
12/80	FY 81 Funds obligated. ProAg signed.	USAID/TanGov
1/81	Farming Systems Research PP approved by AID/W	AID/W
1/81	Machinery & Equipment ordered 7/80 arrives	MinAg
1/81	PIO/C for equipment & machinery	USAID/MinAg
1/81	A&E Design Plans completed	A&E Firm
2/81	A&E Plans sent to Nairobi 611(e) approved and forwarded to AID/W	USAID
2/81	Machinery & equipment arrive ordered 7/80	MinAg
2/81	Drilling of 2 deep wells completed	MinAg
3/81	- 4 Long-term technicians depart (Project Coordinator and maize, legume, & sorghum breeders.)	Contractor/MinAg
	- PIO/C for farm machinery & general equipment	
4/81	Farming Systems Research Project started	USAID/MinAg Contractor

<u>DATE</u>	<u>ACTION</u>	<u>RESPONSIBLE ORGANIZATION</u>
5/81	1 Long-term participant returns	MinAg
6/81	Machinery & equipment ordered 1/81 arrives	MinAg/USAID
	Irrigation Facilities completed (Phase I 25 hectares)	IITA
6/81	2 Long-term participants return	MinAg
8/81	Land Development Component completed	IITA
8/81	3 Long-term participants return	MinAg
9/81	3 Long-term technicians depart (Agronomist, Agric Economist & Agric Engineer).	USAID
9/81	Farm machinery & general equipment ordered 3/81 arrives.	MinAg

V. Conditions, Covenants and Negotiation Status

A. Negotiation Status

During the 1979/80 planting season, USAID learned that the Chama Cha Mapinduzi (CCM) Training Institute in Ilonga is occupying approximately 50 hectares of prime land designated for the Ilonga ARI. The land is being used as a temporary holding grounds in the form of a cattle shed and corral for a small number of cattle. In addition, the CCM Training Institute uses a portion of the land for crop production purposes. When the TanGov apportioned the Ilonga site to the MinAg in 1977 for the development of the Ilonga ARI, all government institutes were informed of the apportionment. However, the development activities that were to take place (i.e., land development and construction of facilities) didn't materialize because of the lack of funds. Thus the CCM Training Institute continued to occupy the land. The problem was compounded when the project staff started preparing the land for research purposes. The CCM denied the staff the use of the land and prepared it for their own use.

The problem was discussed with the Director, CCM Training Institute and the Director of Research. Subsequently, the problem was brought to the attention of the Minister of Agriculture. The USAID Director received a letter dated March 24, 1980, from the Minister assuring AID that MinAg would resolve the problem and that the area under dispute will be made available to the Ilonga ARI. Positive steps have been made regarding the resolution of the issue, but USAID has not received any written confirmation that the MinAg has obtained a clear land use rights of the 50 hectares.

B. Conditions Precedent

The following condition precedent to disbursement of funds authorized by the project amendment is recommended.

"The Government of Tanzania will provide assurances to AID in form and substance satisfactory to the Director, USAID/T that all land designated for Ilonga ARI is and will remain available for project activities prior to obligation of funds for development."

C. Covenants

The following covenant is proposed for inclusion in project agreement:

"The Government of Tanzania covenants to provide local currency for recurrent and development costs of an amount not less than 5 million Tanzanian Shillings in each of the two years remaining under the project."

D. Other Project Agreement Articles

The Project Agreement will be amended to include the following:

1. All farm and development equipment purchased by the project for the development of the Ilonga ARI will remain on the research site for exclusive use by the Ilonga staff during its useful life.

2. All project vehicles and household appliances purchased under the project will be standardized and used by the technicians assigned to the current project and to the Farming Systems Research Project.

3. One vehicle purchased under the project will be assigned to USAID/T GSO motor pool for use in monitoring the project.
built

4. All houses / by the current project will be used by the technicians assigned to the project and to the Farming Systems Research project.

VI. Attachments

Schedule A
Schedule B
Schedule C
Schedule D
Schedule E
Schedule F
Schedule G

Appendix A - Standardization Plan for Equipment and Machinery
for Ilonga ARI

"Report on the Development of the Ilonga Research Station,

Letters from Minister of Agriculture

SCHEDULE A

AGRICULTURAL RESEARCH PROJECT (621-0107)

Estimated Funds Available as of 4/30/80

(\$000)

BUDGET LINE ITEM	LOP Authorization	Project Agreement Commitment	Earmarked Under PIOs	Uncarmarked	Proposed Usage 1/	Deobligations	Funds Available
TOTALS	\$8,496	\$5,851	\$5,223	\$628	619	9	9
<u>Technical Assistance \$3,412</u>							
01 Technical Assistance		2,757	2,756	1	1	0	0
04 Contract Equipment and Supplies		633	633	0	0	0	0
<u>Participant Training 1,790</u>							
02 Contract Training		866	866	0	0	0	0
03 Direct Training		180	158	22	20	2	2
<u>Commodities 661</u>							
05 Project Support Commodities		331	273	58	54	4	4
05 Equipment for Ilonga		667	297	379	395	0	0
<u>Other Costs 877</u>							
06 Local Procurement and Services		87	83	4	44	0	0
07 Local Construction		207	102	105	105	0	0
08 Evaluation							
Contract Overhead	902	55	55	0	0	0	0
Contingency*	288	68	0	68	--	3	3
Inflation*	566	--	--	--	--	--	--

*Spread over other Line items
1/ During FY 80

SCHEDULE B

FARMING SYSTEMS RESEARCH

PID (621-0156)		
Planned Inputs	<u>1/</u>	<u>\$000's</u>
Technical Assistance - 95 Person Years		\$9,500
Short-term Consultants - 60 Person Months		400
Commodities -- Machinery, Equipment, Vehicles		4,000
Construction -- 2 Substations and 15 Houses		4,000
Training:		
In-country	\$ 500	
Overseas	2,000	
Third Country	700	3,200
Other -- Evaluation and Contingency		1,400
Inflation		2,500
TOTAL		<u>\$25,000</u>

1/ Costs reflect the inclusion of Agriculture Extension to link
MINAG Extension Service to farmers.

SCHEDULE C

SUMMARY OF
FUNDING CATEGORIES AS AUTHORIZED BY AID/W
(\$000)

<u>Item</u>	<u>Original PP Funding</u>	<u>PP Revision I Funding</u>	<u>Proposed Revision II Funding</u>
Technical Assistance	\$ 2,075	\$ 3,412	\$ 3,560
Training	352	1,790	1,046
Commodities	172	661	2,273
Other Cost	100	1,779	1,014
Contingency		288	363
Inflation		566	240
	<u>\$2,699</u>	<u>\$8,496</u>	<u>\$ 8,496</u>

SCHEDULE D

AGRICULTURE RESEARCH PROJECT (621-0107)

GOVERNMENT OF TANZANIA CONTRIBUTION TO THE ILONGA ARI (in thousands)

BUDGET LINE ITEM	FY 74-76	FY 77	FY 78	FY 79	FY 80	FY 81 ^{1/}	FY 82 ^{2/}	TOTAL
Recurrent Costs								
Facilities (Land & Equip)	\$ 450.0	\$ 150.0	\$ 150.0	\$ 150.0	\$ 150.0	\$ 150.0	\$ 150.0	1,350.0
Budget Support	270.0	90.0	120.0	120.0	100.0	130.0	120.0	980.0
Participant Cost	55.0	49.0	67.0	67.0	67.0	69.0	69.0	443.0
Staff Salaries	60.0	40.0	60.0	75.0	90.0	100.0	100.0	525.0
Trust Account	21.0	13.0	15.0	18.0	18.0	17.0	26.0	128.0
Sub Total	856.0	342.0	412.0	430.0	425.0	466.0	495.0	\$3,426.0
Development Costs: ^{2/}								
Materials and Supplies	-	60.0	-	120.0	180.0	162.0	98.0	620.0
Casual Labor	-	7.0	-	15.0	18.0	25.0	30.0	95.0
Vehicle Operations	-	5.0	-	10.0	15.0	30.0	35.0	95.0
Machinery Maintenance	-	-	-	5.0	7.0	15.0	20.0	47.0
Sub Total	0	72.0	0	150.0	220.0	232.0	183.0	\$857.0
TOTALS	856.0	414.0	412.0	580.0	645.0	698.0	678.0	\$4,283.0

^{1/} Estimated

^{2/} Includes funding for off-station village trials, etc.

SCHEDULE E

AGRICULTURE RESEARCH PROJECT (621-0107)

IITA CONTRACT PROPOSED FUNDING LEVELS (\$000's)

	To September 30, 1981		Proposed Level With FY 80 Funds	Total Level of Funding
	Present Level	New Level With FY 79 Funds		
1. <u>Technical Assistance</u>				
Salaries	340	450 ^{1/}	96 ^{3/}	546
Benefits and Allowances	310	394	10	404
International Travel	80	68	--	68
Consultants	80	97 ^{2/}	--	97
Sub-Contracts (CIMMYT & ICRISAT)	500	630 ^{1/}	--	630
Overhead (11.6%)	<u>360</u>	<u>406</u>	<u>10</u>	<u>416</u>
Sub-Totals	1,670	2,045	116	2,161
2. <u>Commodities</u>				
Farms and Laboratory Equipment	100	170		170
I.I.E. Purchasing Fees	<u>12</u>	<u>19</u>		<u>19</u>
Sub-Totals	112	189		189
3. <u>Training</u>	<u>1,000</u>	<u>970</u>		<u>970</u>
Sub-Totals	1,000	970		970
4. <u>Other Costs</u>				
Local Travel	110	136	4	140
Local Costs	<u>118</u>	<u>158</u>		<u>158</u>
Sub-Totals	228	294	4	298
TOTAL	<u>3,010</u>	<u>3,498</u>	<u>120</u>	<u>3,618</u>

^{1/} 48 person months

^{2/} 3 person months

^{3/} 15 person months

SCHEDULE F

AGRICULTURE RESEARCH PROJECT (621-0107)

REVISION NO. I PLANNED INPUTS

<u>Budget Line Item</u>	<u>FY 81</u>	<u>FY 82</u>	<u>Total</u>
Technical Assistance *	\$466	\$299	\$745
Direct Training	276	277	553
Offshore Procurement	65	65	130
Local Procurement	132	126	258
Contract Overhead	188	147	335
Inflation	123	107	230
Prior Years' Allotment Shortage **	394		394
	<u>\$1,644</u>	<u>\$1,001</u>	<u>\$2,645</u>

* Includes contract training and the contract equipment and supplies categories of Schedule A.

** Represents differences between amounts authorized by the PP and amounts actually allotted for FY 77 through FY 80.

SCHEDULE G

AGRICULTURE RESEARCH PROJECT (621-0107)

PROPOSED BUDGET FOR FY 80 AND FY 81

(\$000's)

<u>Budget Line Item</u>	<u>FY 80</u>	<u>FY 81</u>	<u>Total</u>
a) Technical Assistance	\$120	0	\$120
-(Agriculture Engineer 15 person months)			
Farm Management Studies (2 months)	50		50
b) Offshore Procurement	475	800	1,275
-(See Appendix A Equipment List)			
c) Local Procurement and Services			
- Development Costs		300	300
- A & E Design Plans	300		300
- Drilling of 2 wells	65		65
- Inflation (12%)	140	100	240
- Contingency (15)	150	145	295
TOTAL	<u>\$1,300</u>	<u>\$1,345</u>	<u>\$2,645</u>

APPENDIX A

STANDARDIZATION PLAN OF MACHINERY AND EQUIPMENT REQUIRED FOR

ILONGA ARI

A. STATION MACHINERY

<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>SOURCE</u>
1. 60 Hp. Tractors	4	MF
2. 40 Hp. Tractors	2	MF
3. Fertilizer Distributor	2	Barber
4. Fertilizer Broadcaster	2	New Idea
5. Reversible Disc Plows	4	John Deere
6. Chisel Plows	2	John Deere
7. Drawn Field Cultivator	1	John Deere
8. 3 Bodied Ridger	4	John Deere
9. Bed Former	2	Marvin
10. Flailchoppers	2	SunMaster
11. Rotary Slashers	4	John Deere
12. 3 pt Hitch Disc Harrow	2	John Deere
13. Trail Disc Harrow	1	John Deere
14. Spike Tooth Harrow	1	John Deere
15. 4 Row Planter	2	John Deere
16. No till maize planter	1	John Deere
17. Cone Planters (Mounted	2	John Deere
18. 3 pt. Mounted Boom Sprayers	4	John Deere
19. Knapsack Sprayers	20	MCMaster-Carr
20. 2 Row Maize Harvester	1	AVCO
21. Double Shank Subsoiler	2	John Deere

<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>SOURCE</u>
22. Inter Row Cultivators	2	Lillieston
23. 2 Row Cultivator	2	John Deere
24. 4 Wheel Irrigation Pipe Trailer	4	John Deere
25. 4 Wheel Trailer	2	John Deere
26. Plot Thrasher	2	Allen
27. Seed Cleaner Grader	1	Burrown
28. Trail Bikes	4	Honda

B. DEVELOPMENT EQUIPMENT

1. 2 Wheel Tipping Trailer	2	John Deere
2. 40 feet Land Planer	1	John Deere
3. Back fill blades	2	MF
4. 100 Hp. Tractors	2	MF
5. Trail Bike	1	Honda
6. Scraper	1	John Deere
7. Truck Wrecker 3 T	1	Exprop
8. Tractor Full Track D7E	1	Exprop
9. Scraper PTO (7 cu. yards	1	Exprop

C. IRRIGATION EQUIPMENT

<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>UNIT</u>	<u>SOURCE</u>
1. 8" Waterman Alfalfa Valves Type 2	48	28	Open
2. Lengths of 9 mts 6" Aluminium gated pipe with gates every 75 cm.	66	182	
3. Lengths of 9 mts 6" Blind Aluminium gated pipe	12	138	
4. 6" Rubber seals for Aluminium pipe	48		
5. 8" Water Hydrants with outlet for 6" gated pipe	6	100	
6. 6" U Clips	12		
7. 6" End Plugs	6		
8. 6" T's	2		
9. 6" Elbows	4		
10. 2 x 15" Main Line Gate Valve with gibault connection	2		
11. 4 x 9" Main Line Gate Valve with gibault connection	4		
12. Irrigation Pumps (500 GPM)	4		

D. GENERAL EQUIPMENT

1. 125 KVA Generator	1		Exprop
2. Seed Dryer	5		Campbell
3. Lawn Mowers	4		Any
4. Block Making Machine	2		Exprop

E. WORKSHOP TOOL AND EQUIPMENT

<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>SOURCE</u>
1. Gasoline		Open
. Timing Light	1	
. Vaccum Tester	1	
. Compressor Tester	1	
2. Diesel		
. Injection Tester	1	
. Sleeve Puller	1	
. Hydraulic Press Tester	1	
. RPM Counter	1	
3. Acetylene Set and Goggles	1	
4. Electric Grinding Wheel	1	
5. Hydrolic Engine Hoist	1	
6. Air Painting Outfit	1	
7. Air Compressor 2000 PSI	1	
8. Battery Charger	1	
9. Floor Jacks	2	
10. Workbenches	4	
11. Hydrolic Press (10 Ton)	1	
12. Lathe. (Wood)	1	
13. Drill Press ($\frac{1}{2}$ " Drill)	2	
14. Circular Bench Saw	1	
15. Radical Saw 10"	1	
16. Wood Planer	1	

<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>SOURCE</u>
17. Power Washer	1	
18. Piston Groove Cutter and Cleaners	1	
19. Ring Compressor, Range 3' x 7"	1	
20. Ridge Reamer	1	
21. Replacement Carbide Cutter for Piston Groove Cutter	2	
22. Piston Ring Spreader	1	
23. Heavy Duty Tire Fit, 12 pc.	2	
24. Outside Calipers	1	
25. Inside Calipers	1	
26. Brake Adjustment Tool	1	
27. Straight Cut Snips, 12" Long	1	
28. Duckbill Snips, 12" Long	1	
29. Thin-Nose Snips	1	
30. Heavy Duty Single Speed 1/2" drill 220/50	1	
31. Super Duty Single Speed 3/8" drill 220/50	1	
32. Flexible Steel Measuring Tape 25' x 3/4	2	
33. Electric Cord, 300 feet, 220V 12 gauge, 3 wire ST, 25 Amps	2	

<u>DESCRIPTION</u>	<u>QUANTITY</u>
34. Arc Welding Set, AC upto 250 Amp. 240/50 input	1
35. Mobile DC Welder 300 Amp	1
36. Electrical Welding Set AC	1
37. Gas Welding Set	1
38. Bucket Type Grease Gun	2
39. Pump Type Grease Gun	6
40. Puncture Repair Kit	2
41. Tire Guage Wet/Dry	3
42. Engineers Vices	2
43. Carpenter's Vices	2
44. Pipe Vice	1
45. Carpenter's Tools (Complete Set)	2
46. Mason's Tools (Complete Set)	2
47. Disc Grinder	1
48. Assorted Files Sets	1
49. Bearing Extractors (Set)	1
50. Bottle Jacks	4
51. Heavy Duty Pallet Truck	1
52. Pop Rivit Gun with Rivits	1
53. Tool Box with Tools	2
54. Adjustable Wrench Set (18 pc)	1

<u>DESCRIPTION</u>	<u>QUANTITY</u>
55. Wood Drill Bits (Sets)	2
56. Pipe Wrenches (6 pc Set)	1
57. Micrometer	1
58. Fire Extinguisher	40
59. Assortment of Chains	
60. Wire Rope	1
61. Assortment Nuts, Bolts, Nails	
62. Pully Extractors (set)	1
63. Drill Bits (set)	1
64. Hacksaws/Blades (set)	2
65. Screwdriver Set (30 pcs)	2
66. Punch Line-Up Set, 5 pc	1
67. Cold Chisel, 4 pc set	1
68. Extractor, Set	1
69. Tap and Die Set with Round Adjustable Dies, 66 pcs Cuts National Course and National Fine Thread	1
70. Tube Bending, 6 pc. Set	1
71. Flaring Tool Set, 9 pc	1
72. Ball-Pine Hammer 16 oz	2
73. Hammer with Curved Claw	2
74. Heavy Duty Hammer 3/6 Head	2
75. Sledges 10/6 Head	2
76. Headblow Hammer	2
77. "C" Clamp Valve Spring lifter	1

<u>DESCRIPTION</u>	<u>QUANTITY</u>
78. Battery Tester (Hygrometer)	2
79. Volt-ohm Meter with temperature ranges	1
80. Diode Tester	2

F. COST SUMMARY

APPROXIMATE \$ AMOUNT

Station Machinery	290,000
Development Equipment	175,000
Irrigation Equipment	110,000
General Equipment	90,000
Workshop Tools and Equipment	120,000
Spare Parts	195,000
Transportation	590,000
	<u>590,000</u>
	\$1, 570,000

APPENDIX X

INITIAL ENVIRONMENTAL

EXAMINATION

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Project Location: Tanzania

Project Title: Ag Research

Funding: \$8,496,000

Life of Project: FY 71-82

IEE Prepared by: Stafford Baker, REDSO/WA

Date: June 28, 1977

Environmental Action Recommended: Negative Determination

Concurrence: Vernon C. Johnson
USAID. Director.

Date:

Assistant Administrator's Decision: Approved:

..... Disapproved:

..... Goler Butcher
AA/AFR

Date:

Clearance: AFR/DR/DSP:DDibble
GG/AFR:EDragon



INITIAL ENVIRONMENTAL EXAMINATION TANZANIA AG RESEARCH

I. Description of the Project

The project provides research staff and essential commodities to assist Tanzania to establish sound research capability in staple food crops (maize, food legumes and sorghum/milletts). A research coordinator, plant breeders and agronomists, participant training and related equipment are provided to the main research station at Ilonga. Project activities include basic trials for selection of improved genetic stock, fertilizer response, pest resistance and control.

The Ilonga research station covers approximately 2000 acres in Kilosa District of Morogoro Region. The station is 12 km. from the nearest major village, Kilosa. Research trials are also conducted at thirty sub-stations selected to represent the different climates, soil characteristics and elevations of farm lands throughout Tanzania. The acreage is negligible relative to the area of Tanzania.

II. Discussion of Impacts

A. Land Use

Assistance is provided to the existing research station at Ilonga. No expansion of the facilities is required. No change in land use will result from the project. The five houses to be constructed will be located in a presently defined residential area in which there are definite rules regarding the disposal of sewage and waste.

B. Water Quality

Sprinkler irrigation at Ilonga is used on approximately 30 acres and is carefully controlled to make research results meaningful. Surface irrigation will be used in the future after land has been properly leveled and prepared.

Research activities emphasize genetic resistance to pests and disease. The use of chemicals is minimal. Insecticides, fungicides and herbicides are applied by backpack sprayers to maximize effectiveness and minimize possible runoff into water sources.

Research is also conducted to determine optimal amounts of fertilizer to be used in the different climates and soil types zones of Tanzania. Results to date have usually led to a

reduction in the amounts currently recommended. Research on nitrogen fixing varieties, crop rotation and inter-cropping is intended to further reduce fertilizer requirements.

C. Atmospheric

The use of chemicals is minimal, carefully controlled by backpack sprayer application and limited to areas of the research station. While not used in this project the Government of Tanzania is currently conducting tests to find safe substitutes for DDT. The project has no significant impact on the atmosphere. By 1978 the GOT should have formulated its policy regarding the use of DDT. At that time the Agriculture Research project will adopt an appropriate policy (see - attached letter).

D. Natural resources

Thirty acres at Llonga are under sprinkler irrigation drawn from the river bounding the station. The amount used is small and does not divert water from other users.

E. Cultural

The project environment is an existing research station. No altering of physical symbols or dilution of cultural tradition is involved.

F. Socioeconomic

Extension of research results into the socioeconomic system in Tanzania is not a part of this project, however extension of research results may have impact over the long run. (See "H" below for discussion.)

G. Health

There are no health impacts

H. General

As a generator of useable information on new varieties, the project has the potential to make larger program impacts on human welfare and natural resources. General it is expected that the project will have a positive effect. Breeding better crop varieties will increase production while for the lower rainfall

areas the varieties and agronomic practices developed should reduce crop losses and help conserve the natural resources.

Use of higher yielding varieties will increase the incomes of small farmers. New crop rotation and inter-cropping techniques may require more work of the farmer. New varieties may lead to new land put under cultivation.

Specific problems could occur as better sorghum/millet varieties, and agronomic practices, are developed which permit people to successfully farm in the drier areas. Drought beyond the ability of the varieties and the practices would lead to a rapid and complete destruction of ground cover leading to a greater erosion risk when the rains return. Nevertheless, it should be pointed out that there is a growing utilization of these areas due to population pressures. This utilization will continue with or without the research and traditional agricultural practices might be even more detrimental. Also, the use of new areas does imply a reduction in the pressure on other areas enabling positive conservation benefits.

It should be pointed out also that it is not certain that new areas would be cultivated as a result of project information and varieties developed. Most of the areas where the results would be employed are already under cultivation. Therefore, production expansion from existing acreages would be the only certain result. If the better varieties and better agronomic practices are utilized, soil erosion may decline and soil fertility might actually be raised as crop rotation and fertilizer applications are practiced instead of the traditional "extractive" farming methods. Fertilizer run off is not judged to be a problem since recommended levels are likely to be low.

It should be noted that as farmers are concentrated in villages, it becomes important to develop more intensive agriculture based on higher yielding varieties and better agronomic practices. It will not be possible to practice the old "slash and burn system" which calls for new land every few years. In the absence of improved varieties and better agronomic practices production on these continuously cropped lands can be expected to decline rapidly with effects on both the environment and farmers.

All varieties and techniques that are recommended by the research station are tested for a minimum of three growing seasons to insure that they are suitable to conditions in Tanzania. IITA is aware of the need for environmental considerations and therefore varieties under development include disease resistant nitrogen fixation, etc., so that a minimal application of insecticides, pesticides and fertilizers will be required. IITA is conducting its own research in Ibadan to determine the bio-degradable time factor. Given the trend to reduce fertilizer and pesticide requirements, adaption of research results will have a net positive impact on the environment.

Finally, extension of research results into the socioeconomic system and physical environment is not a major component of this project, however one technician, an Information/Training Specialist has been added for a two year period. This technician will be responsible for any field testing, demonstration and extension activities and, liaison with other development project activities. While the GOT will ultimately determine how these research results will be used and disseminated, AID should have significant impact on these decisions. Other development activities in Tanzania, include For example, the grant activity in Agricultural Manpower training is training both rural extension workers at the certificate and diploma level and others are being trained in the U.S. at the BS, M.S. and Ph.D levels. Training covers a broad range of technical areas including those fields related to food crop production. The efforts of this project are also closely tied to the AID financed Seed Multiplication project. AID is sponsoring development of four foundation seed multiplication farms. The research results produced through the Agriculture Research project are being further tested and utilized at the four farm sites. The seed project also has a large training component part of which focuses on use of chemicals. USAID and the GOT, as demonstrated in the attached letters from Mr. Duffield to Jack Cornelius and Mashelle to USAID Director, are mutually concerned regarding proper use of chemicals, i.e. insecticides, pesticides, and fertilizers. For example, the Ministry of Agriculture is currently testing several substitutes for DDT.

Therefore while this research project is not likely to have significant effects on the socioeconomic and physical environment. In the short-run, AID is attempting through this and its other projects to favorably affect the long-term consequences on the environment.

III. Recommendation for Environmental Action

Given that the project meets the requirements of a controlled research program in confined areas the project will not have a significant impact on the environment. For research purposes, potential environmentally hazardous applications of irrigation, fertilizer and pesticides are carefully monitored and measured. Research results reduce the need for these applications by farmers. The project has a minimal but net positive impact on the environment and a negative determination is recommended.