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 PD-AAB-908-B1

AGENCY FOR INTERNATIONAL DEVELOPMENT  
**PROJECT PAPER FACESHEET**

TRANSACTION CODE  
 A ADD  
 C CHANGE  
 D DELETE

2. DOCUMENT CODE 3

3. COUNTRY ENTITY  
 Republic of Zaire

4. DOCUMENT REVISION NUMBER -

5. PROJECT NUMBER (7 digits) [ 660-0064 ]

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 [ ] INERA Support

8. ESTIMATED FY OF PROJECT COMPLETION  
 FY [ 8 ] [ 2 ]

9. ESTIMATED DATE OF OBLIGATION  
 A. INITIAL FY [ 7 ] [ 7 ] B. QUARTER [ 4 ]  
 C. FINAL FY [ 8 ] [ 1 ] (Enter 1, 2, 3, or 4)

10. ESTIMATED COSTS (\$000 OR EQUIVALENT \$) - 0.87 Zaires

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						
(GRANT)	( -400- )	( -0- )	( 400 )	( 3,350 )	( -0- )	( 3,350 )
(LOAN)	( -0- )	( -0- )	( -0- )	( -0- )	( -0- )	( -0- )
OTHER U.S. 1.	---	---	---	---	---	---
OTHER U.S. 2.	---	---	---	---	---	---
HOST COUNTRY	-0-	142	142	-0-	2,809	2,809
OTHER DONOR(S)	---	---	---	---	---	---
TOTALS	400	142	542	3,350	2,809	6,159

11. PROPOSED BUDGET APPROPRIATED FUNDS (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY 77		H. 2ND FY 78		K. 3RD FY 79	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) SA	113	080	n.s.	400	-0-	879	-0-	867	-0-
(2)									
(3)									
(4)									
TOTALS									

A. APPROPRIATION	N. 4TH FY 80		O. 5TH FY 81		LIFE OF PROJECT		12. IN-DEPTH EVALUATION SCHEDULE
	Q. GRANT	P. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN	
(1) SA	730	-0-	494	-0-	3,350	-0-	MM YY 07/79
(2)							
(3)							
(4)							
TOTALS							

13. DATA CHANGE INDICATOR: WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PID FACESHEET.

2 1 NO  
2 YES

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE *Fermino J. Spencer*

TITLE **Fermino Spencer  
 Director, USAID/Zaire**

DATE SIGNED 06/05/77

15. DATE DOCUMENT RECEIVED IN AID/W. OR FOR AID/W. DOCUMENTS, DATE OF DISTRIBUTION



INERA SUPPORT PROPOSAL

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PROJECT COMMITTEE

Mr. William Roach, PSC Design Officer  
 Mr. Leroy Rasmussen, PSC F&A Officer  
 Mr. David Fredericks, USAID/Zaire Program Officer  
 Mr. Robert Shoemaker, USAID/Zaire Design Officer

## I. Project Summary and Recommendations

### A. Recommendations:

1. Grantee: Department of Agriculture, General Direction
2. Implementing Agency: National Institute for Agricultural Research (INERA)
3. Coordinating Agency: Institute for Scientific Research (IRS)
4. Financing:

AID Grant	\$3,350,000
GOZ Funding	<u>2,809,000</u>
TOTAL	\$6,159,000

### B. Description of the Project

Agriculture in Zaire has been given "the priority of priorities" by President Mobutu in an effort to achieve national self sufficiency in food production. This project will contribute to the above goal of food production self sufficiency by assisting in the development of the capability of INERA to:

1. create "production packages" for food legumes through applied, adaptive, and participatory research;
2. provide soils services to producers of food and other crops with regard to the characteristics, distribution, and production potential of specific soils; and
3. concentrate, coordinate, and optimize its scarce resources in the priority areas of agricultural research.

In order to develop these capabilities, a blend of technical assistance, on-the-job training, and formal graduate level academic training will be provided in the specific areas of food legumes and soils research. Approximately 27-28 person years of foreign technical assistance will be provided, including agricultural technicians and a rural sociologist, and coupled with eleven participant trainees completing

degrees at the graduate level in food legumes and soils research. Training is also proposed on-the-job for the rural sociologist and agricultural economist stationed at Mulungu and at the lower research skill levels, including para-professional soil surveyors, lab technicians and field crop technicians.

The soils lab at the INERA station in Mulungu will be remodeled and enlarged; equipment and operating supplies and materials will be made available in order to establish the main operating base for the project.

Also during the first two years of the project, technical assistance will be provided to:

1. assess the agricultural research subsector in general and INERA in particular;
2. develop recommendations derived from the assessments and a short term and long term implementation strategy; and
3. assist in implementing recommendations.

Approximately four to five person years of technical assistance will be provided including two years of an agricultural research management planner and two years of a business management consultant. The rural sociologist adviser assigned to Mulungu will assist the management planner on an as needed basis. The Bureau of Studies in the DOA will supply an agricultural economist to the project. The principal counterparts of these technical advisers will be the General Director and Scientific Director of INERA. The work in this area will also be closely coordinated with the DOA and the IRS. On-the-job training will be used in the planning and management areas as INERA top management will not be able to be away from their work for an extended period of time.

The end of project status should show INERA with:

1. a small, trained field research team dealing with the production of food legumes;
2. a responsive, trained soils services team; and
3. an optimal mix of resources (management planning, human and physical resources) devoted to relevant research, within budgetary restraints, concentrated in the priority areas of research, and coordinated with the other institutions in the agricultural research subsector.

C. Summary Findings

The Project Committee has reviewed the technical, social, economic and financial aspects of the project and recommends that this INERA Support Project be approved and that a grant in the amount of \$3,350,000 be authorized to the Government of Zaire.

The INERA Support Project is ready for implementation and has been for some time. The initial INERA assistance request from the Director General of Agriculture was made in June 1975. Modifications to the initial request leading to the Project described herein have been negotiated with the GOZ and differences have been resolved\* No new legislation is required for project implementation.

The project meets all applicable statutory criteria as shown in the checklist in Annex A. The Mission Director's 611(e) certification is presented in Annex B.

\* This has resulted in a more detailed letter of request from the Director General of Agriculture, dated April 4, 1977. (See Annex D.)

## D. Issues

### 1. INERA Capability to Implement the Project:

INERA management and administrative capabilities are limited. To overcome these weaknesses, technical assistance to INERA in the form of a business management consultant is planned beginning in the first year of the project. During this time, the technical advisor will perform an in-depth institutional analysis of INERA and develop recommendations to improve management capabilities. He will also be available to assist in any potential problem areas which may impinge on the performance of the soils services and legumes research components. Further, a full-time project manager will be assigned by INERA to facilitate paperwork and implementation of the project.

### 2. Research/Extension Relationships:

The linkage between research and extension is weak and ineffectual, partly due to a lack of relevant research to extend to farmers and partly due to policing of quotas function carried out by the DOA extension agents. Due to this vacuum, food crop production projects, private sector interests, and PVO's have moved into a research/extension or solely extension role. The project is designed to address these weak linkages through a participatory food legumes research methodology designed to wed the roles of research and extension. Relevant research results will be made possible through the farming systems data collection effort and simulation of these farming systems on the Mulungu research station. Extension workers will be trained to carry the results of the adaptive research to the farmer.

### 3. Initiation of Project before Assessment Completed:

The initial request from the GOZ for assistance in the area of food legumes and soils research was received by the Mission in June 1975. Since that time, two teams have been sent to Zaire to write the PRP and PP, respectively. Both teams recommended that a program of soils and legumes research be implemented ASAP. The Mission is in full agreement with this recommendation and, for the reasons presented in this PP, believes that these programs can stand on their own.

At the same time the Mission feels strongly that there is need to assess the agriculture research subsector in general and INERA in particular, in order to assist the GOZ/DOA in reaching a decision as to the strategy, objectives, direction, and approach of agricultural research.

The Mission is well aware of the possibility that the assessment may recommend modifications in the INERA program which will have direct implications regarding the potential success of the soils and legumes research effort being funded under this project.

Thus, within six months of the completion of the assessment (to be completed during the first project year), a major review of the project will be undertaken by AID and the GOZ to determine the implications of the study's recommendations on the design of this project. The GOZ/DOA and USAID will collaboratively revise the design to address any serious problem areas which have been identified and which directly impact on the activities financed under this project. This revised design will be approved by the Assistant Administrator for Africa (AA/AFR).

## II. Project Background and Detailed Description

### A. Project Background

#### 1. General

Zaire is the third largest country in Africa, covering an approximate 2.3 million square kilometers, or an area roughly equal to the United States east of the Mississippi. Most of the country is located south of the equator reaching from 5 degrees North to 13 degrees South latitude. Diverse climate, topography and soils allow a wide range of crops including coffee and tea at higher elevations and palm oil and rubber at the lower altitudes.

The country is endowed with extensive natural resources including timber reserves and important deposits of copper, zinc, lead, cobalt, cadmium and manganese. Commercially exploitable quantities of diamonds, gold, tin and tungsten ores are also found.

The present population of Zaire is estimated at 22 million persons. Population growth rates are increasing at an accelerated pace from a 2.0% per annum increase in the years 1950-1955 to an approximate 2.9% at present. Population density is not high; in 1970 there were only 8.4 persons/sq. km. However, when considering only productive land, only 0.6 acres are available per person. The urban/rural population ratio now stands at approximately 30/70, indicating a fairly low urbanization; however, the urban areas are expanding much more rapidly than the rural areas. Estimated urbanized population is projected at 36% of total population in 1980.

Per capita GDP was estimated at \$140 in 1974 by the World Bank. Sector composition of GDP is shown in the following table together with average growth rates for 1968-1973.

<u>SECTOR</u>	<u>% of GDP</u>	<u>AVERAGE GROWTH RATE</u>
Agriculture	17	2.5
Mining	13	7.5
Manufacturing	11	11.0
Energy	1	7.4
Construction	5	12.8
Transportation	8	4.5
Government	14	12.4
Other Services	<u>32</u>	<u>8.8</u>
	100	7.0

Economic conditions have deteriorated in Zaire due principally to substantial drop in worldwide copper prices coupled with increases in import prices and quantities for such basics as food grains and oil. Debt rescheduling was carried out by the international lenders in 1976. Inflation was fueled by deficit financing in the past and is still considered a major problem.

Coffee has become a major foreign exchange earner for Zaire; annual production is now estimated to be 100,000 tons with a world market value of \$600 million.

Zaire has suffered from long periods of turmoil and war since its independence in 1960. Recent incursions in Southern Shaba again threaten Zaire's political and economic security. Production of copper, which accounts for 60% of Zaire's foreign exchange earnings, takes place in the Southern Shaba copper belt.

## 2. Agriculture Sector

Agriculture provides a livelihood for approximately 75% of the people in Zaire, with most of these living at a subsistence level. In 1973, the total value of agricultural production was estimated to comprise 17% of GDP and around 14% of total exports.

During the years of turmoil following 1960, agricultural production declined rapidly. This was especially true of plantation crops -- rubber, palm oil and coffee -- that had largely been under expatriate management. Total agricultural production, including food crops, did not reach pre-independence levels until the late 1960's. Per capita food production has since decreased forcing large imports of maize, rice, meat, and other food products.

The agricultural economy of Zaire can be divided into two broad headings: traditional and commercial.

The traditional agricultural sector is based on staple food crops including maize, manioc, rice, plantain, and ground nuts. Over three million families, included in the traditional category, account for approximately 50% of agricultural production contained in GDP.

The commercial agricultural subsector is historically characterized by large farms and ranches employing advanced technological and management techniques with the principal crops including oil palm products, rubber, sugar, and livestock. This subsector has become undercapitalized due to the 1973 programs of nationalization and subsequent measures which

have generated a climate of risk and uncertainty for agri-business investment in Zaire. Steps to restore such enterprises to original owners are being taken in 1977 but much uncertainty remains. The commercial sector accounted for about 8% of GDP in 1974.

Agricultural exports amounted to 12% of total exports in 1974, down sharply from 30% of total exports during the last year of pre-independence, while imported food products have increased and account for 20% of locally financed imports, adversely affecting the balance of payments.

Nutritional levels have also suffered from less reliance on domestic food production.

Malnutrition is generally considered to be the principal or associative cause of approximately 60% of Zaire's high morbidity and mortality. It is estimated that average daily per capita calorie intake is 85 percent of the minimum required level as recommended by WHO for this area. The situation is worse so far as protein is concerned as average daily capita intake of protein is only approximately 50% of the recommended minimum. This represents a total "protein gap" for the population of Zaire of more than 200,000 metric tons of protein per year. If present trends are not reversed, this will reach 380,000 metric tons by 1980.

The World Bank in its 1972 Agriculture Sector Survey points out three types of protein deficiency. These include temporary, urban, and chronic deficiencies.

A temporary deficiency is created mainly by an interruption of food crop production due either to security problems in the area or bad weather. Urban deficiencies occur primarily to a lack of purchasing power. Chronic deficiencies are tied to production potentials of the land and unbalanced dietary habits.

Three chronic deficiency areas are identified in Zaire: southern Bandundu Province; southern Kasai Occidentale Province; and central Kivu Province. INERA research on soybeans is being carried out at the Mulungu station in Kivu Province and the Gandajika station in Kasai Occidentale with rotations of corn. Acceptability of soybeans in the local diet in certain areas of both these provinces has been achieved through local missionary groups by milling the beans into a flour and then mixing it with regular flour.

The Government of Zaire has established agriculture as "the priorities of priorities" and has set as a goal nutritional self sufficiency in food production. In the past (1968-1975), the agriculture budget fluctuated between 1-2% of total current expenditure, while in 1976 the agriculture budget accounted for 2.4% of total current expenditures, reflecting the higher priority given agriculture.

In order to achieve the stated agricultural goal of the GOZ, the DAP identifies certain fundamental barriers or constraints which must be overcome. These are listed below:

- inadequacy of the transport system;
- shortage of skilled manpower to fill professional posts in government agriculture agencies;
- unfavorable pricing and marketing policies;
- gross inadequacy of scientific research and development;
- weak, ineffective extension system;
- low level of education and poor health and nutrition of farmers; and
- certain sociological conditions resulting from tribal customs and the land tenure system.

This project deals with the inadequacy of scientific research and the shortage of skilled manpower.

### 3. Agricultural Research

No institution in Zaire was more seriously affected by independence and turmoil of the 1960's than the agricultural research sector.

a. Early Development: Agricultural research in the region dates back to 1910. While INEAC developed and serviced the industrial crops, palm oil, rubber, coffee, cocoa, and cotton, the Institute included a division of food crops with equal rank and concern. The division worked on the genetic adaptation, improvement and protection of traditional food crops, as well as exotic species and on methods of cultivation. Research was conducted with sweet potatoes, soybeans, sugar-cane, peanuts, rice, manioc, field beans, cowpeas and maize.

The INEAC soils laboratory ran up to 15,000 analyses a year in support of the experiment stations and the major farming areas

In 1953, the Belgian Commission for Technical Cooperation in Africa south of the Sahara established the Inter-African Pedologic Service at Yangambi. Over the next ten years it made soil and vegetation surveys of all except the center of the country.

b. INERA: At the height of its operations INEAC employed over 500 Belgian scientists 400 at Yangambi main station and the rest spread among six regional substations. By the late 1950s the INEAC research complex had reached a level of development and scientific output that was first among tropical agricultural research institutions and compared favorably with the better agricultural research establishments in the world. The library at Yangambi contained 49,000 volumes and those at the regional stations were adequate for day-to-day technical references.

There were a series of interruptions in INEAC's activities during the internal conflicts of the 1960s, and in 1969, INEAC withdrew all its Belgian personnel, but left all properties, facilities, furnishings and documents in place.

INEAC employed 4,000 Zairois as laboratory technicians, field technicians and laborers. They remained in place, and the GOZ assumed their payroll. There were seven Zairois engineer-agronomists in the system.

In 1970, the GOZ established L'Institute National pour L'Etude et la Recherche Agronomiques (INERA) in the office of the President of the Republic. The seven Zairois scientists, who were able to keep one station, Gandajika, operating all through the political turbulence of the 1960s, were given the job of taking charge of the INEAC assets and developing a program.

In 1973, INERA submitted a proposal for reorganization to the President and that document serves as the policy paper. The paper is derived from the premise that the dominant form of agriculture in Zaire would be the family-tended farm unit consisting of both cash and subsistence crops.

The paper defines research levels by a combination of complexity and scale as follows:

Level A, major restructuring of genetic makeup of plants and animals and of cultural systems -- international centers.

Level B, adaptation of Level A outputs to regional requirements -- INERA stations.

Level C, adaptation to farm requirements and introduction to adoption -- pilot farming centers.

The paper also proposed guidelines for cooperating with the National University of Zaire (UNAZA).

In 1975, INERA was placed in the office of the Director General of Agriculture. The Director General, who was formerly Director of INERA, indicated that he concurred with the reorganization proposed, stating specifically that he wished to see more direct support of the production projects than had been the case in the past.

INERA presently carries out agricultural research on cotton, palm oil, cocoa, rice, manioc, legumes and livestock. The legume project is headquartered at the Mulungu research station with satellite support at the station in Gandajika. Limited and very basic soils analyses are carried out in Yangambi on an infrequent basis.

INERA operates a network of seven principal and 16 secondary stations located throughout the country, employing some 4,400 persons, with a general labor force accounting for the bulk of personnel. The professional staff consists of 48 members in supervisory roles and with degrees in Engineering Agronomy or its equivalent. An additional 28 employees have degrees from agricultural technical schools. Expatriates on the staff are virtually nil with the exception of the IITA team working with the INERA team at M'Vuazi on manioc research and Belgian technical assistance at the Nioka station working on livestock research.

The Yangambi complex before independence was managed and operated by a large staff of Belgians. Today the same facilities are managed by only a handful of Zairois: 14 engineer agronomists; 6 senior staff with equivalent degrees in administration; and 11 agricultural technicians graduated from the secondary agricultural technical schools. The current budget for Yangambi of approximately \$1.1 million is, in real terms, only 3% of pre-independence annual budgets.

Serious problems are evident in the research directions and operations of INERA.

✓ - Research directions are determined based on what INERA has done in the prior year going further back to what INEAC had done.

✓ - Location of research stations has been determined by availability of physical facilities left over from INEAC days.

✓ - Yangambi research center <sup>absorbs</sup> ~~chews-up~~ 1/3 of INERA budget, while INERA administration recognizes the station as the least productive in its network.

✓ - With INERA budget devoted almost exclusively to salaries and Yangambi maintenance and operations, little in the way of funds is available for the necessary supplies and equipment to conduct research.

✓ - The INERA staff is young and inexperienced and spread much too thinly over the research network and activities.

✓ - Research project formulation and evaluation are virtually non-existent.

✓ - Administrative control is highly centralized.

c. Higher Education and Research: Integration of agricultural research and higher education at Yangambi has been the subject of further study in 1976-77, sponsored by the Rockefeller Foundation at the request of President Mobutu. Yangambi is the headquarters and the largest research station of the INERA network. The Faculty of Agricultural Sciences of UNAZA is also located at Yangambi.

The Rockefeller study points out that the physical resources of Yangambi, left over from its day as the largest research station in the tropics, are considerable; on the order of \$15 million. The physical resources of the INERA facilities are underutilized while those of the Faculty are not sufficient for the academic and student population, indicating that a joint use of the Yangambi facilities is needed. The study then called for the creation of a University Center of Agronomic Sciences to include all of the assets under INERA and UNAZA control at Yangambi. The University Center would become the highest institution for agricultural education in the country and would also serve as a national institution for fundamental agricultural research and as a support for the more applied INERA research activities.

Estimated capital costs of this proposal were projected at Z 8.6 million in addition to an annual operating and maintenance budget of Z 550,000.

The Yangambi part of the study is now in the process of being implemented. Progress on the Yangambi proposal has been made, as follows:

- an autonomous Faculty of Agronomic Sciences has been established at Yangambi;

- provision has been made for Z 600,000 in the 1977 budget to support the Faculty;

- additional request for Z 400,000 is now in the Bureau of the Presidency; and

- Director General of the Faculty has been selected and ready to take charge once the above request for Z 400,000 is approved.

If the proposal is carried out, the impact on INERA will be felt in several ways:

- INERA will be free from the substantial burden of the underutilized Yangambi facilities (Rockefeller study stated "INERA itself is of the opinion that Yangambi is the least productive of all its present 17 stations. Yet it absorbs one third of the total annual INERA budget");

- INERA headquarters will be moved to another location;

- New INERA soils lab, or upgrading of existing lab will be required; and

- The new center will backstop and support INERA applied research at its various stations.

In addition to the Yangambi proposal which would have a significant short term impact on INERA, the study also makes other recommendations which will have long term implications for INERA.

According to the study the whole higher agricultural education system in Zaire would be modified in order to improve the coordination, use of faculty and facilities and curriculum.

- First cycle post secondary agricultural education (three years) would be made available only at the two ISEA's (Superior Institute for Agronomic Studies) now operating and a proposed additional school in 1981.

- The ISEA programs should be limited to no more than two basic options: agronomy; and forestry. As faculty becomes stronger orientations within the program would include field crop; plantation crop, and animal production; adapted technology, extension methodology and others to improve communication skills.

- A new second cycle curriculum would be developed around broad job categories including leadership in rural extension, agricultural education, management and research and related sciences. Over-specialization would be avoided. Increasing emphasis would be given to socio-economic disciplines.

- The Yangambi University Center would be the only school for second cycle agricultural education (additional three years) and recycling of Engineer Agronomists.

The ISEA's would be moved from control of the General Council of Higher Technical Institutes and the University Center from the control of the Kisangani campus. Coordination of the ISEA's would be achieved through a council consisting of the head of the University Center and directors of the ISEA's.

At the national level higher agricultural education policy and control would be achieved through a Commission for Agricultural Education composed of the following:

- State Commissioner for Agriculture, Chairman
- Counsellor for Education, Office of the President
- Counsellor for Agriculture, Office of the President
- Director-General, Department of National Education
- Director-General, Department of Agriculture
- Rector, National University of Zaire
- Delege General, INERA
- President, Association Nationale des Entreprises du Zaire
- Director-General, University Centre of Yangambi

Broad responsibilities would include study of trained agricultural human resource needs; supervision of the council linking the University Center and the ISEA's; issuance of policy guidelines for research at the University Center; stimulation of local and regional level agricultural extension and rural development in higher agricultural education; study and recommendations of budget proposals of all higher agricultural education institutions and coordination of external assistance from donor agencies.

The curriculum improvements proposed by the study will have long term implications on INERA, especially on its research clientele, directions and methodologies. Proposed curricula at both the ISEA's and University Center will give increasing emphasis to rural extension leadership and methodologies, rural development, adapted technologies and socio-economic disciplines all relying on greater interaction and participation of farmers and technicians and requiring more detailed knowledge of not only technical constraints faced by the farmer, but also the farmers' socio-economic environment and cultural patterns.

d. Coordination in the Subsector: Further attempts at improving coordination of research in Zaire have been made, principally with the establishment of the Institute of Scientific Research in 1975. The Institute is situated organizationally in the Bureau of the Presidency and is responsible for the coordination of all scientific research in Zaire, including agricultural research.

Its relationship to INERA is described briefly below. INERA is an autonomous agency of the GOZ with responsibility for its own budget. INERA, however, is responsible to the DOA for overall direction and programming of resources. Organizationally, a committee, with the Director General of IRS as one of its members, is interfaced between the Delegate General of INERA and the DOA. This committee is comprised of the following members:

President:	Minister of Agriculture
Vice President:	Delegate General of INERA
Members:	Director General of Agriculture
	- Director of one of the Agriculture Offices
	- Dean of Faculty of UNAZA Agriculture Sciences
	- an of Faculty of UNAZA Veterinary Sciences
	- Director General of IRS

This committee meets once a year to review the past year of INERA operations and to approve INERA program for the coming year.

The role of IRS and its relationship with agricultural research carried out by the national production office such as PNM and CIMMYT maize research and ONAFITEX and cotton research are unclear at this time. INERA's relationship at present with PNM, ONAFITEX and other research being carried out is on an informal exchange of information basis only and in many instances relationships are strained.

The IRS, on paper, is an improvement over previous attempts to coordinate the subsector through ONRD. However, it is a fledgling institution, only in its second year of operations, and its standing within the research sector is still an unknown quantity.

e. National Academy of Science (NAS)/Institute of Scientific Research Workshop on Agricultural Research and Integrated Rural Development: The NAS/IRS workshop was held in November, 1976, and dealt specifically with the topics of agricultural research and integrated rural development. Zairois participants represented IRS, INERA, UNAZA, Public Health, Department of Agriculture, and the ERTS program. Subsequent to the workshop NAS prepared a draft paper. Comments below are taken from this paper.

The topical areas of the workshop were divided into three categories:

- social science applications with respect to rural development models and agricultural research in Zaire and other tropical countries;
- rural oriented science policy, research structure, management, organization and education; and
- discrete problem areas.

Several topics were of particular interest to AID and its commitment to integrated rural development as a means to reach its constituency, "the poor majority". These subjects included the following:

- creation of rural sector data bank;
- strengthening social sciences input in solution of rural sector problems;
- agricultural extension oriented toward integrated rural development;
- study of rural development models in Zaire;
- study of agriculture research and education in other tropical countries;
- policy making for science and technology oriented to rural sector needs; and
- research structure, management and organization.

Although all of the above have some relevancy to the INERA support project, two subjects are of direct prime importance: research policy making and management. The NAS paper succinctly addresses the problems in these two areas.

Policy Making: "Committed to integrated rural development as the highest priority, Zaire must weigh the implications of this policy with respect to the present use and further development of its scientific and technological resources. Scarce means both human and material must be carefully husbanded and applied to tasks that have reasonable prospect of fulfilling urgent needs. With a clearer view of rural sector problems a strict ordering of priorities should lead to more effective allocation and use of Zaire's S&T manpower and other resources, more disciplined planning for the future, and a better coordination of initiatives by various parts of the Zairian government."

Research Management: "An inheritance from the colonial era, Zaire's research infrastructure -- very long on physical assets and extremely short on qualified researchers and administrators -- poses very serious management problems. A beginning toward their solution requires a hard and objective examination of ends and means, an adaptation of the research system (structure, operation, management) to the severe realities facing the country, and a training program particularly to initiate agricultural research personnel in the basics of research management."

Two of the other workshop topics emanate from the policy making for science and technology theme. Taking integrated rural development as the highest priority, social science inputs become crucial in the determination of strategies and tactics aimed at the rural sector. At the operational level technical inputs carried by trained agricultural extension have to be adapted to the social, economic, and cultural conditions existing in the rural sector.

f. Research and Extension: The official government network of agricultural extension has been ineffectual. Past efforts have achieved minimal results due to a variety of reasons: a lack of training, supervision and logistic support, and performance of policing functions. Observations made by the North Shaba PP team support this general consensus.

- farmers and merchants view extension work as a policing function of the forced cultivation of cotton and collection of license fees.

- farmers contend that the agents knew little or nothing about farming and local conditions. (More than one half of extension

agents in North Shaba project area have never received technical agricultural training.)

Dr. Djembi in his report on soybean production indicates that the extension agent policing function is carried out in Kivu Province also, but instead of cotton each farmer is required to cultivate 10 ares of soybeans. No technical advice is given to the farmer in carrying out this mandate.

To fill the extension vacuum several extension sub-systems have been developed. These include extension programs within separate government offices such as the PNM program, ONAFITEX and cotton; Action Kusaidia (AKU); various PVO's including the Catholic and Protestant missionary groups and private sector groups such as the tobacco company and coffee farms.

The Department of Agriculture is aware of the problems in its official extension network and has recently taken two steps to deal with these problems. The DOA has agreed to use as an experimental model, the research extension sub-system proposed in the North Shaba project. Further the GOZ has requested AID financial assistance from counterpart funds to strengthen the PVO's doing extension work.

#### 4. AID Involvement

a. In-Country: AID is actively involved in the agriculture sector in Zaire. Individual projects are discussed below.

Soybean Flour Mill: INEAC began experiments with soybeans at Yangambi in the 1940s. In the early 1950s research was carried on at 5 substations including Gandajika. L'Ecole Technique Secondaire Superieure d'Agriculture (ETSA) Tshibashi, evidently got seed for the Gandajika station, promoted production and introduced whole soy flour. In 1966, the school produced 950 kg of whole soy flour. In 1970, there were 35MT produced and in 1971, about 100 MT produced. In 1971, a USAID project agreement provided a counterpart loan of Z 25,000 as part of the cost of soy flour mill.\* A small counterpart grant financed the production of a motion picture to promote the demand for soybeans in the local diet. A seed distribution and buying system for the product was set up. The program is still functioning and the mill is still operating, although the group cannot get enough soybeans to supply the local demand.

\* Thus, in 1975 ETSA purchased 193.8 MT of soya and produced 123.8 MT of soy flour and 16.2 MT of feed. Their capacity is 300 MT of soybeans per year. The average yield in the area of soybeans is 600-700 kg/ha (650kg/ha = 6.75 bushels/acre).

Manioc Research Project: While manioc is practically void of the essential amino acids, it is extremely important to Zairois as an energy crop because it will yield on land too deficient in phosphorus to produce grain. Zairian manioc was hard-hit by bacterial wilt around 1970. The GOZ solicited AID assistance, and a contract was arranged with IITA to work with INERA using PL 480 counterpart funds. This project has already identified a relatively high yielding variety of manioc totally resistant to bacterial wilt, and it is now multiplying the stock as well as continuing selections for increased yields.

Maize Research Project: In response to a request for assistance in maize production in 1972, the Mission arranged a contract with CIMMYT to develop and demonstrate a maize production package. They have developed their first prototype package consisting of a new variety and tentative fertilizer recommendations.

Maize Production Project: Project purpose is to increase the income of small rural farmers in the North Shaba region, primarily by increased maize production and marketing. Project inputs include an AID project manager, 60-man-months of contract services, training (both in-country and in U.S.), and commodities -- including training equipment, agricultural supplies, and construction equipment, plus other costs for seminars, publications, and project-related support. This project is in the first stages of implementation.

Grain Marketing Project: Project purpose is to develop a public and private maize marketing infrastructure capable of assuring a fair market price for farmers, and adequate supplies at reasonable prices for maize consumers by providing short term advisory services, a long term grain marketing expert and training. The interim report preparatory to a project paper has just been completed.

Agriculture Economics Development Project: The purpose of the project is to increase the capability of the GOZ's Department of Agriculture to develop and implement public sector action strategies in agriculture by improving the DOA organization through provision of long term academic training. This project is also in the early stages of implementation.

Fertilizer Requirements and Potentials Survey: In 1975, the Mission (TVA PASA) surveyed the fertilizer requirements for Zaire to produce its minimum food requirements, and concluded that by 1980 the country will need 82,000 MT.

Fortunately for the long term, the survey revealed ample supplies of phosphate (12.5 to 25 million MT of P<sub>2</sub>O<sub>5</sub> equivalent) awaiting development in Bas-Zaire coastal plain. The survey estimated that the maximum projected nitrogen requirement for food and fiber production in 1985 could be produced by using 80 megawatts, or only 5 percent of the combined capacity of the INGA I and INGA II hydroelectric projects. To support even a minimum investment in the industry, domestic consumption would have to be greatly increased.

Agriculture Sector Study: This proposed project will assist agricultural decision-makers in the GOZ to develop a workable strategy for the development of the agriculture sector.

The INERA project proposed herein will directly impact on the manioc and maize research programs in addition to the maize production project (North Shaba). INERA soils services and analyses capabilities will be used to provide technical information to the research and food production projects. Additionally, INERA soils services and determination of responses to fertilizer will be needed to optimize agricultural inputs thus leading to greater domestic consumption of fertilizers, a necessary condition, according to the TVA, to support minimum investment in fertilizer production.

The timing of the proposed agricultural research subsector and INERA assessments will overlap with the agriculture sector study proposed for funding by the Mission.

b. AID Experience Elsewhere: While no two AID projects contain totally identical components, our experience in this area is quite general. The following cases are illustrative:

N.C. State World-Wide Soil Fertility Project and USAID/Bolivia Wheat and Seed Project: In 1965, AID and the Government of Bolivia initiated a project to increase wheat production and seed production (including wheat and soybeans). The project was implemented through a contract with Utah State University with the assistance of the Peace Corps. U.S. U. advised research workers on their experimental work, both at the experiment station and on private farms, and advised extension workers who carried out the promotion work, which included buying, processing, storing and distributing seed. Peace Corps volunteers worked with the extension agents.

AID had a world-wide contract with North Carolina State University to determine fertilizer response for the major crops and major agricultural soils of the tropics. In this case N.C. State initiated fertilizer trials parallel to those of the U.S. U. wheat

project. Thus, N.C. State determined optimum fertilizer combinations which were compatible with the cultural method devised by U.S. U. The N.C. State project assisted the Bolivian Ministry of Agriculture in tooling up a soils laboratory at Santa Cruz, which AID had built in an earlier project, and the laboratory did the chemical analysis of the N.C. State samples. The tooling amounted to: (1) adding chemical reagents; (2) adding a few minor pieces of equipment; (3) giving refresher training for laboratory technicians; and (4) a visit to the laboratory by the N.C. State soil scientist about once a month.

Cambodia Soils Laboratory: AID assisted the Cambodian Ministry of Agriculture with the equipping of four soils laboratories between 1957 and 1962. An AID soils adviser trained the staff and remained until the U.S. evacuation in December 1963. Subsequently, all the equipment was set up in one, rather large, quite complete laboratory, and up to 1973, it effectively serviced the Mekong Delta Commission in its development planning work.

Bangladesh Agriculture Research Project: The purpose of this project, proposed in 1975, is the establishment of a Bangladesh agricultural research system for non-rice food crops and cropping systems. While the primary thrust of the project is aimed at establishing an institution capable of carrying out research on food crops other than rice, the project also addresses coordination and efficient functioning of the entire agriculture research subsector in Bangladesh.

## 5. Other Donors

Although INERA has provided by large-scale inputs of both bi-lateral and multi-lateral aid in the past, outside assistance at present is limited to a small Belgian staff at the Nioka livestock station in the northeast, and a team from IITA conducting food crop research at the M'Vuazi station in the Bas Zaire halfway between Kinshasa and Matadi (near M'Banza-Ngungu).

As recently as five years ago, the Belgian Technical Assistance Program benefitted a dozen stations, while the FED supplied one technician and scientific materials, and the FAO assisted with technicians and material assistance at the old INEAC Headquarters at Yangambi. These programs were phased out as "completed"; however, little tangible evidence remains of their existence.

One reason for this may have been linked to the timing and direction of the assistance. It is to be remembered that, at the time of Independence, and for several years thereafter, technically trained Zairois officials, capable of managing and/or operating field research stations, could be counted on the fingers of one hand. At the same time, INERA continued, following Independence, to direct its research primarily in the area of cash (export) crops. With the decline of the plantation system, the demand for research in this area also declined as did the support for INERA. With growing food deficits, the GOZ is aware of the need to change the direction of INERA's research toward food crops. Five-year, or even ten-year, projects initiated at that time could hardly have been expected to yield lasting results especially in the area of food crop production; for it is only within the past five to seven years that sufficient numbers of academically trained personnel have become available to give INERA the semblance of a competent staff.

Due to this lack of managerial staff and counterpart personnel, as well as the narrow focus of INERA's research, other agricultural research programs have been initiated by donors, and by the GOZ, outside of the INERA institution. An example is the Chinese Agricultural Mission charged with adaptive

research in the field of paddy rice production. The Chinese operate without attachment to any Zairois government institution. The CIMMYT corn project, dubbed the PNM (National Maiz Production) has been attached to the National Cereals Office at the urging of the project director. The reasons for this were that it seemed expedient at the time to move away from INERA in order to attain a degree of self-sufficiency and autonomy that the expatriate project director deemed necessary to manage the program.

This trend, towards the establishment of research programs outside of the INERA framework, is now under study and at the most recent meeting of the Executive Council of INERA, held in Kinshasa in early April, 1977, the agenda contains a proposal to regroup all such activities within INERA. The final resolution of this proposal is not available at the time this project is submitted, however, private discussions with members of the Executive Council found no dissent from the principal of institutionalized research in one department. It is anticipated therefore that both the Maiz program and the rice program will ultimately be placed under INERA control.

Discussions with other donors reveals strong support for more participatory approach for carrying out applied agricultural research with small farmers. Considerable interest on the part of Belgians especially regarding the result of assessment. It is appearing likely that funds will be made available for an expanded area specifically INERA applied research program aimed at increasing production of food crops by small farmers.

## 6. AID Strategy

a. Background: The project background has attempted to define the present general economic and agricultural pictures in Zaire and the particular situation in the agricultural research and related subsectors. This background is summarized below:

- General economic and political situations have deteriorated and prospects appear bleak over the short run.

- Per capita food production has decreased over the years forcing large imports of food products. Malnutrition, including protein deficiency is prevalent and acute in many areas of the country. Self-sufficiency in food production has become a national goal and agriculture given the "priorities of priorities" by the President.

- INERA, as the national agricultural research agency, is not fulfilling its role due to research directions being determined by what was done in the past, poor research management and planning, the Yangambi burden and a young and inexperienced staff. Agricultural research has consequently started to proliferate among several agencies.

- Higher agricultural education is the subject of a reorganization proposal with short and long term implications for INERA, including lifting of the Yangambi burden and relocation of its headquarters in the short run, and over the longer term, curriculum improvements emphasizing rural development extension methodologies and socio-economic disciplines requiring greater interaction with agricultural producers.

- The role granted IRS, the new Zairian super agency for the coordination of research, is quite broad, but from an operating viewpoint the Institute is still feeling its way along and its standing vis-a-vis agricultural research institutions has not yet been determined. There is also lack of coordination among the various agricultural research entities.

- The NAS/IRS workshop on agricultural research and integrated rural development held in late 1976 concentrated on needs to make agricultural research more relevant to the rural sector and pointed to necessity for proper research policy making and management, social science inputs and agricultural extension oriented toward integrated rural development.

- The linkage between research and extension is weak. The DOA extension network is ineffectual, primarily serving a policing function, as a result DOA extension has been preempted by separate government agencies, private sector firms and PVO's. The DOA has indicated its willingness to try an experimental

approach to extension for the AID financed North Shaba project and has also requested assistance for the use of PVO's as outreach mechanisms.

- The proposed project will directly benefit other ongoing AID/GOZ projects including the IITA/INERA manioc and PNM/CIMMYT maize research programs and the North Shaba maize production project.

Another factor which should be considered within the Zairian agricultural research scene is a review of past research efforts in other parts of Africa. In Uma Lele's study of rural development programs in Africa, two principal failures in the development of suitable technologies are mentioned, as follows:

- "...in practice most programs reviewed seem rather poorly equipped to develop an understanding of the interactions in the existing farming systems and the changes that are generated in the overall system by introduction of one or more innovations."

- "Far too often there is either not a profitable technological package that takes account of specific local constraints faced in applying research results to farming systems; or there is not effective training of extension agents, making much of the extension effort ineffective. Often the extension service also fails to appreciate its role in identifying the farm level constraints which can be removed through research. There is, therefore, little emphasis on an adaptive approach to research so as to make the necessary improvements in the package with which the extension service is equipped. Apart from helping to create technological packages, local research stations need to facilitate a two-way flow between research and extension."

b. Strategy: The INERA Support Project has three different components: food legumes (soy bean emphasis) research, soils services and assessments of the agricultural research subsector and INERA. The PRP team in November, 1975, and the technical design team, one year later, reviewed the DOA request for assistance and recommended that a program for development of food legume research emphasizing soybeans and soils services be instituted

at the INERA research stations at Mulungu and Gandajika. The soils services component is needed to assist on-going food crop production programs including those of the National Maize Program and National Manioc Program and should also be on line to complement research and production activities under the North Shaba Project.

The food legumes research component has been given a high priority with special emphasis on soybeans as a means to help alleviate protein deficiencies in the country.

Gandajika has since been excluded in the final project design as a project site for several reasons relating to technical matters, social and physical infrastructure deficiencies and timeliness of the impact of food legumes research on production. The final design includes two other features.

The first concerns the development of a more responsive or participatory research approach in an attempt to deal with the historically weak linkage between research and extension in Zaire and more traditional research approaches in other parts of Africa. The food legumes research component will be used as the vehicle for the development of this participatory research model, aimed at the traditional agriculture sector small farmer.

The research team will include not only technical advisors but also a rural sociologist and agricultural economist. Before any technical research begins, a data collection effort, consisting of interviews with small farmers in the area, will be undertaken to define overall farming systems and technical practices carried out by the farmer and the physical environment, socio-economic conditions and cultural milieu in which the farmer operates. This information will be the beginning of dialogue between the farmer and researcher. The research team will use the data collected to simulate the farming systems on the research station. A package or packages will be developed within the context of the simulated systems in order to have relevance to the area farmers and will be extended on a pilot basis by a small group of project trained extension agents.

The second additional feature of the final design includes an assessment of the agricultural research subsector and INERA. The purposes of the assessments will be to develop: (1) priorities in agricultural research; (2) preferred method(s) to coordinate agricultural research; (3) preferred approach(es) to linkages among agricultural education, both national and international levels of research and extension; (4) preferred research methodologies, such as the pilot participatory research model for food legumes and the experimental approach in the North Shaba Project; (5) definition of research clientele; and (6) improved management, planning, and operating policies and procedures at the INERA level.

The assessment should be finished by the end of the first year complete with recommendations and a short term and long term implementation strategy. Implementation of short term recommendations will be carried out during the second year of the project with the assistance of technical advisers assigned to the assessment team. The short term recommendations will include those steps which can be put into practice within the framework of present budgetary, physical and human resource constraints. Long term recommendations will involve, without doubt, additional budgetary support and external funding sources to meet new physical facility, and operating and human resources requirements. The availability of external funds would depend on the outcome of an extensive evaluation at the end of the second year to measure the GOZ and INERA performance in carrying out short term recommendations and levels of proposed financial support for the long term institutional and subsector reorganization.

## Part II.

### B. Description of the Project

#### 1. Summary Description

a. The Request: In June 1975, the Government of Zaire requested USAID assistance in advancing its research work in agriculture, particularly in food crop production with supportive soil and climatological studies. In subsequent deliberations, USAID agreed to study the situation and to consider a cooperative project to enhance the capability of INERA to conduct research on:

- food legume production;
- soil fertility support; and
- soil classification and fertility correlation.

The food legume crops to be studied may include soybeans, ground nuts, field beans and cowpeas. These crops fit well into the established cropping pattern as well as into national nutritional requirements. They, along with a soils service program, particularly complement maize production and marketing projects being planned or already under way. The food legume research component will be used as a model of a participatory research methodology targeted at the small farmer, the main food crop producers.

In addition to the three specific research activities mentioned, it was decided upon further analyses, that a thorough assessment of the whole Zairian agricultural research subsector in general and INERA in particular should be undertaken. The purposes of this assessment would be to provide the GOZ with:

- priorities in agricultural research;
- preferred method(s) to coordinate agricultural research;
- preferred approach(es) to linkages among agricultural education, research and extension;
- preferred research methodologies; and
- in-depth institutional analyses of INERA with appropriate recommendations and short term and along term implementation strategies.

b. Sector Goal

1) The overall sector goal is to increase the level, availability, and the nutritional quality of food production for the low income majority in Zaire.

2) Measure of Goal Achievement: Part of the potential increase of food production would be achieved by the annual increase in availability of food legumes. The legume increase would be drawn from systematic observation of the spread of the improved varieties and cultural practices introduced. At present, legumes are subsistence crops but eventually the direct beneficiaries of the project should produce surpluses for the market. The needs of the target group for this project would have since been met in-so-much as subsistence needs would have been satisfied first.

Potential increases in other food production crops, due to the soils services component of the project would have also been expected, although the measurement of goal achievement would be more subjective and indirect. Factors such as the number of users, purpose of use, types of crops and amount of acreage helped by the soils services would be used on the assumption that usage of the services yields more effective agricultural practices.

Implementation of assessment recommendations will be the measure of goal achievement for the third component of the project.

3) Means of Verification: A current mission project provides a USDA team to assist the GOZDA in setting up a food demand and supply data system. Beyond this in the near future, the (North Shaba Project) and successors to that project should provide for the measurement of their respective commodity outputs.

INERA will maintain detailed records of the number of users, purposes of use, types of crops, and amount of acreage using the soils services facilities.

Assessment recommendations dealing with coordination of agricultural research; linkages among agricultural education, research and extension; participatory research approaches; and INERA will be used as benchmarks.

4) **Assumptions:** The Government of Zaire will maintain prices for commodities such as maize and legumes at a level that is sufficiently attractive to farmers to provide incentives to take the risks in adopting modern practices and in purchasing inputs necessary to obtain reasonable yields. This assumption is currently a reality with a recent decision by the GOZ to increase the official minimum farm price on virtually all food crops. For example, the price of maize at the farm was raised by 200 percent over a 12-month period.

The traditional agricultural sector is composed of about 3 million holdings occupied by 70 to 75 percent of the total population. Obviously more resources than have been committed by USAID and other donors so far are required to achieve the sector goal. The present proposed project should be followed by production and extension activities related to food legume crops.

#### c. Project Purpose

1) **Statement of purpose:** The project will assist with the development of the institutional capability of INERA to:

- create "production packages" for food legumes through applied and adaptive research, using participatory research approach;

- provide soil fertility investigations, consulting and recommendation services to those interested in advancing food crops production, and while developing this capability, to deliver those services to the on-going food production projects. This implies early-on cooperation and participation of the soils services of this project in the on-going food production projects;

- provide reliable estimates of the production potentials and limitations of soils in support of regional development programs; and

- devote its resources in an optimal manner within budgetary restraints, to research priorities.

2) **End of Project Status:** By the end of the fourth project year, INERA should have a small, well trained, multi-disciplinary field research team using a participatory research methodology and dealing with the production of food legumes, fully supported with minimally essential equipment in place, and should be:

- conducting reliable adaptive research which will lead to the identification and distribution of efficient, disease resistant seed varieties of food legumes;

- developing and adapting cultural practices suitable to traditional farmers and compatible with the ecological balance and socio-economic conditions;

- assisting with first round on-farm demonstrations of the production packages developed through research;

INERA should have functioning, viable soil fertility services to support the planned advancement of the production of its major food crops. By the end of the project, INERA should be systematically:

- making soil analyses and supervising soil fertility response trials as part of the field research addressing the major food crops;

- providing planned consulting services to the regional Agricultural Commission Services on soil fertility and soil management for crop production;

- providing assistance to the field teams in adapting and testing symbiotic nitrogen-fixing inoculants;

- providing assistance to food crop projects in the design and evaluation of their adaptive trials, including soil and fertilizer evaluation; and

- developing soil and crop management systems which maximize the use of organic and indigenous mineral materials and, to the extent possible, maintaining soil fertility.

INERA should have a cadre of small, multi-disciplinary agricultural resource planning teams capable of:

- evaluating production potentials and limitations of given soil groupings within context of socio-economic conditions;

- elaborating the potential payoffs from alternative regions and sites that might be proposed for intensive rural development;

Such a team would include soil scientists, agronomists, agricultural economists, and possibly rural sociologists.

INERA should have its role within the agricultural research subsector clearly defined and coordinated with other research institutions and, within its budgetary restraints, should be optimizing its research resources through proper management planning involving judicious location of facilities, use of staff and formulation and evaluation of research projects.

Subsector and institutional redirection and reorganization will be based on the assessment. Recommendations from the assessment will evolve short and long run strategies. The short run strategy will include those reorganization steps which can be implemented within present budgetary, physical and human resource constraints. Short run recommendations should be carried out by the end of the second project year. The long run strategy will involve, in all probability, additional budgetary support and outside funding to cover new physical facility and operating requirements and human resource needs through recruitment, training and technical assistance.

The availability of additional outside funding would be predicated on the outcome of an extensive evaluation of the GOZ and INERA performance in implementing the short run recommendations and commitments of appropriate levels of budgetary support for the long run institutional reorganization.

3) Means of Verification: External evaluation (PAR).

4) Assumptions: The achievements of these purposes depend on:

- early placement of qualified contract technicians into the program in Zaire;

- availability of qualified participants for graduate training -- the first group at the end of the 1st project year, and another group each year thereafter, with the last group returning one year after the end of the project; and

- active institutional cooperation between on-going or potential production projects, INERA, IRS, the Agricultural Extension Service and local outreach organizations.

- strong commitment from the GOZ, THE DOA, and INERA to develop an agricultural research network responsive to its goals of food self sufficiency.

d. Outputs

1) Trained Manpower:

- three soil scientist plus two agronomists with M.S. degrees by the end of the project;

- six additional persons --land classification (4), plant pathology (1), entymology (1) -- with M.S. degrees by the end of the project;

- eight para-professional soil surveyors by the end of the fourth year of the project;

- rural sociologist and agricultural economist trained on-the-job;

- three laboratory technicians by the second year of the project;

- two field crops technicians by the third year of the project;

- General Director and Scientific Director trained on-the-job; and

- extension agents trained in data collection and technical aspects of food legumes "production package".

2) Soil Fertility Service:

- Operating laboratory at Mulungu by the end of the second project year:

- 4,000 soil samples a year by the end of the third project year; and

- 8,000 soil samples a year by the end of the fourth project year.

- Consulting services to production projects:

- Mulungu station by third year;
- most food and agricultural production projects, in the four southeastern regions by fourth project year; and
- field tested recommendations beginning in the third year of project.

3) Soil Classification Service:

- map each experimental site on which soil test correlation data are to be obtained;
- correlation of these soil maps with the USDA Soil Taxonomic system by third project year;
- mapping of project areas beginning in the third project year;
- guidance in the selection of soil areas for intensive agricultural development beginning in the third project year; and
- evaluation of alternate use of project area by fourth project year.

4) Food Legume Package and Participatory Research Model:

- development of information base of socio-economic and cultural factors affecting local farmers in the project area;
- training of extension agents in data collection techniques and promotion of use of food legume production package;
- simulation of farming systems at the research stations;
- testing of named varieties and experimental lines in all years;
- establishment of seed increase planting beginning in the third year;
- establishment of farm demonstrations in the fourth year; and

- "Farmer Days" held in the second year and thereafter.

5) Agricultural Research Subsector Assessment:

- Assessment and in depth institutional analyses of INERA completed by end of first year together with recommendations and a short and long term implementation strategy; and

- Implementation of short term assessment and INERA analysis recommendations, within budgetary restraints, completed by end of the second year.

6) Assumptions:

- technical experts are available and can be recruited on schedule;

- equipment and supplies can arrive at project areas on schedule;

- adequate local currency support; and

- INERA can allocate personnel capable of conducting research both before and after in-service and graduate training.

- GOZ, DOA, and INERA are committed to reorganization and redirection of agricultural research. INERA has stated that its research policies should be reoriented toward food crop production with a research clientele of farmers in the traditional sector.

e. Inputs: AID and GOZ inputs to the project are shown in the following table.

<u>INPUT</u>	<u>QUANTITY</u>	<u>\$000's</u>
<b>AID:</b>		
Technical Assistance	24 person years long term; 3 1/3 person years short term.	2,240
Training	24 participants preselected and receiving OJT with 11 finally selected for graduate work; 17 persons at OJT level.	322
Equipment	Soils lab and legume research equipment and supplies; vehicles	430
Contingency		37
Inflation		<u>321</u>
Sub-Total		3,350
<b>GOZ:</b>		
Technical Assistance Support	Housing, travel, support, etc., for long term technical assistance	380
Training-Support	Travel, support	66
Salaries	24 participants, 17 OJT trainees, 11 direct support personnel	636
Other	Soils lab remodeling and expansion. House renovations, fuel and lubes, office supplies	186
Contingency		31
Inflation		<u>1,510</u>
Sub-Total		2,809
<b>TOTAL</b>		<u><u>6,159</u></u>

See Table III, page 67, for estimated inputs by project components.

## 2. Detailed Description

a. Initial Research Station Site: Previous discussions among personnel of the GOZ and USAID considered several locations for possible assistance with food legumes and soil services. These locations included Yangambi (equatorial forest region), Mulungu (eastern highlands), Gandajika (southern savannahs), and M'Vuazi (Bas-Zaire). The team visited these four areas and discussed the possibility of work with legumes, especially soybeans, and soil services with key people in each of the areas.

Yangambi and M'Vuazi were immediately excluded: Yangambi because of the proposed move of INERA upon establishment of the new University Center and on technical grounds due to the narrow soils spectrum; M'Vuazi was excluded because of the IITA/INERA team concentrating its efforts on manioc. Mulungu was chosen over Gandajika for a host of reasons including technical, social and physical infrastructure and timeliness of the impact of food legumes research on production.

Protein deficiencies, especially of children and mothers, and hunger are severe, in both the Mulungu and Gandajika areas. Population pressure on the land, intensity of land use, and the importance of legume food crops are greatest in the Mulungu area. Some soybeans are already being grown, processed and used in this area. The Mulungu area is ripe for further development of legume food crops, especially soybeans. The PRP team also noted that the Kivu area is an optimal region for training field soil scientists and further that the soils spectrum is broad and diversified.

The need for more legumes in the cropping system is probably greater in the Gandajika area than in the Mulungu area. The long run potential for soybeans also appears to be greater in Gandajika than in Mulungu because of lower elevations. However, the expansion of food legumes, such as soybeans, may be slower in the Gandajika area than near Mulungu as both producers and consumers in the former area have less experience with these crops.

In terms of physical facilities, communications and transportation availability, the station at Mulungu has clear advantages over the one at Gandajika.

- The Mulungu station presently has a soils lab, although not in use. Costs to rehabilitate and remodel to double the space of the present 100 M<sup>2</sup> lab are estimated at \$50,000. Gandajika has no soils lab and would require an investment of over \$200,000.

- Housing is better for foreign advisors in Mulungu than in Gandajika.

- Mulungu is 25 kilometers from Bukavu, over an asphalt paved road and only 5 kilometers from the airport, capable of handling Boeing 737's. Gandajika is isolated, about 100 kilometers from Mbuji-Mayi, the capital city of Kasai-Orientale Region with the road connecting the two sites being passable, but only with 4-wheel drive vehicles.

- Electrical service is available on a 24 hour basis at Mulungu while electricity is available only two hours per day, four days a week in Gandajika.

- Bukavu is the capital city of the Kivu region. It is a modern city with many conveniences; shopping facilities, hotels, churches, schools, hospital and medical facilities. Living conditions in Gandajika are poor; shopping facilities are limited; closest doctor is 30 kilometers away; etc.

The Mulungu station is located in the DOA's Kivu Region, South Kivu subregion and the Walungu Zone. The total population in the region is 3.5 million persons; the South Kivu subregion has a population of 1.2 million persons. The population in the Walungu zone is approximately 230,000 people. The size of the Walungu zone is about 1,800 km<sup>2</sup>.

Walungu zone major agricultural production activities, estimated by DOA zone personnel for the year 1974, show the following:

<u>CROP</u>	<u>HECTARES CULTIVATED</u>	<u>TONS OF PRODUCTION</u>
Maize	6209	4346
Manioc	5122	48659
Sweet Potatoes	4250	21250
Haricot	6209	4346

A small amount of soybeans were also cultivated amounting to 38 tons in the Walungu Zone in 1974. The total number of planters in the area was estimated at 51,000, although no figures were available to translate the number of planters into farm families or units.

The project can be divided into three discrete components: legumes research ; soils research and services; and agricultural research subsector and INERA institutional assessment. Each of these components is described in greater detail.

b. Legumes Research: The purpose of the legumes research component is to assist INERA in its capability to develop "production packages" for food legumes and to develop a working participatory research model targeted at small farmers in the vicinity of the Mulungu station. This capability will be advanced through a data collection effort at the small farmer level, variety testing, cultural experiments and extension training carried out by a team of INERA researchers led by a research agronomist and rural sociologist on long term contracts, an agricultural economist supplied by the Bureau of Plan in the DOA, with assistance on a short term basis from consultants in specialized technical research fields.

In addition to carrying out this adaptive research in-country, the technical advisers will conduct training on the job and assist in developing criteria for selection of participants for long term training.

Agricultural equipment and supply needs will also be provided for this component as shown in Annex F.

#### 1) Data Collection:

- First year of project. Before any adaptive research begins, a program will be developed to collect information from project area farmers regarding overall farming systems and covering, among others, the following characteristics:

- physical: basic soil type, topography, farm size, degree of isolation;

- economic: inputs, yields, income, markets;

- technical: crops, cultural practices, tools; and

- socio-cultural: land tenure, division of labor, size of family.

This information will be used to reproduce farming systems on the research station appropriate to the area and to test appropriateness of various technologies, including those indigenous to the area, within these systems.

- Other project years. Data collection will continue over the project life.

The research team at Mulungu will initially establish contact with the North Shaba data collection team which is proposed to start up some six months before the Mulungu team is formed. Collaboration between the two teams will be maintained as the data collection effort is a learning process. First contacts in the Mulungu area would involve the Secondary Institute for Social Sciences in Bukavu which offers training for rural development agents with a model farm near the Mulungu station; the Catholic Diocese in Bukavu, presently operating a small agricultural development program; the IRSAC team in the area which has been collecting demographic, nutritional, and other data; and the Regional DOA extension agency. These institutions are all potential sources of personnel for the data collection, and, at a later date, extension teams to be formed.

## 2) Variety testing

Establish contact with PNM/CIMMYT research team to determine work being carried out by the PNM/CIMMYT team and to develop a system for collaboration of research results over the project life.

- First year of project: Plant variety trials of soybeans and other locally important food legumes. Seed and planting instructions can be obtained from Intsoy, IITA, and other international agricultural research organizations, and locally important varieties from farmers and seed centers in the area.

Screen experimental lines where there is not enough seed available for field sized plots. Requests will be made to Intsoy, IITA, and other agencies for small quantities of breeding lines from plant breeders throughout the tropics. Duplicate, meter-length rows will be planted.

- Second year of project: Continue variety testing as in the first year. Add to the variety trials promising lines from the preliminary trials of the first year.

- Third year of project: Continue variety testing as in the first year.

Establish seed increase plantings of 1, 2, or 3 varieties that were high yielding and exhibited satisfactory agronomic characteristics. Seed multiplication activities for mass distribution of selected seed will not be a part of this project.

Establish at least twelve (12) farm demonstrations. The seed increase fields indicated above can serve as demonstrations.

Conduct "farmer days" where both the variety plots on the experiment station and the farm demonstrations are shown to farmers and other interested persons. Agricultural extension workers from PVO's and the DOA in the vicinity should be asked to participate actively in presenting the plots to the public.

- Fourth year of project: Continue variety testing as in previous years.

Continue modest seed increase plantings of several varieties. Begin larger scale seed increases of varieties that were increased in the third year and appear to be exceptionally high yielding and have satisfactory agronomic characteristics.

Continue farm demonstrations.

Conduct farmer days and invite active participation of local extension staff.

### 3) Cultural experiments

- First year of project: Conduct an experiment with all combinations of: 3 varieties, 3 row spacings, and 4 levels of fertilization. There should be at least 3 replications.

Compare at least 3 commercial sources of Rhizobium cultures in field trials. If available, add several experimental lines from microbiologists throughout the world. Intsoy and IITA undoubtedly will cooperate in obtaining these cultures. In all trials an uninoculated check should be included to determine if effective strains are normally present in the soil, and, if they are present, how efficient they are in relation to the commercial strains.

Study the effect of various indigenous and transported cultural practices, such as timing of planting, planting techniques, weeding, crop rotation, fallow periods and timing of harvesting on the productivity of soybeans and other food legumes.

- 2nd, 3rd, and 4th years of project: The experiments and data collection in the first year should acquaint the research team with farming systems and food legumes and soybeans in southern Kivu. After completing the proposed experiments on simulated farming systems the team will be in a good position to identify the major problems and to design subsequent work to increase the production of soybeans and other food legumes in the vicinity of Mulungu.

4) Extension activities based on results of variety and cultural trials: This should begin in the third year of the contract. As packages of practices based on the results of the variety trials and cultural experiments on the simulated farm systems are developed, they will be presented to groups of trainees who, in turn, will transmit them to farmers within the project area.

5) Coordination with research and INERA assessment team: Part of the outputs expected from the assessments made by the research and INERA assessment team (component three of the project) will include preferred research methodologies, linkages between research and extension and better management and planning tools. To the extent that these recommendations are relevant to the food legumes research program, they should be integrated into the program.

6) Training:

- Technical Research: Two counterparts will be appointed at Mulungu to assist in the technical legume variety and cultural trials. They will work in close contact with the American crops technician at the location and perform all the operations in the crop experiments. At the end of the first year, qualified counterparts will be selected for graduate training at American universities. Two new counterparts will be selected at the beginning of the second year to replace those who go for graduate training or are released from the project and likewise for the third year. Normally, the graduate training program will stop at the Master of Science degree. However, if a student establishes an excellent record, he may be given an opportunity to become a candidate for the Ph.D. degree.

Arrangements will be made for participant trainees to return to Zaire to complete their research work and related theses on subjects which will have practical uses for the country.

Careful preselection of Zairois counterparts assigned to the legumes research program will be necessary as it will be from this group that participants for long term training will be finally selected. Counterparts will be selected on the basis of several criteria, including their undergraduate academic record; prior job performance for preselection and actual job performance during the one year on-the-job training in the legumes research program; professional interests; and aptitude in learning the English language.

Formal post graduate training will be provided for four Zairois in the fields of research agronomy, plant pathology and entomology. On-the-job training will be made available for two field crop technicians and the sociologist and agricultural economist assigned to the station.

Data Collection and Extension: Probable sources of persons to be trained in data collection techniques in the first year and technical information on "production packages" during the third and fourth years will be the ISES, missionary groups, and DOA extension workers in the Walungu Zone.

ISES, the Secondary Institute for Social Studies is located in Bukavu with a model farm near the Mulungu station. Part of its curricula is devoted to the development of rural development agents. Missionary groups, including the Catholic Diocese and Norwegian Baptists also are involved in small agricultural development programs with out-reach mechanisms in the area. One program developed by the Catholic Diocese on a farm near Mulungu has a farmer training program for older adolescents. The Walungu DOA Zone has 11 extension agents which are a potential source for training, also.

Data Collection: Data collection techniques will be taught by the Mulungu research team to a group of approximately 10 people, designed to reach possibly some 2,000 farms for the purpose of obtaining information from a representative number of area farmers regarding technical practices and socio-economic and cultural patterns involved in total farming systems and later extensions follow up.

Extension: The objective of the training courses for extension workers will be to give them factual information based on experimental findings that they can extend to farmers.

The training will be divided among classroom, laboratory, and field with heavy emphasis on simple, practical concepts. Classroom instruction will consist of discussions of the "package of practices" and the experimental results on which they are based. Field activities will consist of actually going through the steps in the package of practices for two or three crops.

Soils Services: The purpose is to increase the capacity of INERA to provide to producers of food crops and associated crops detailed information concerning: (a) the characteristics, distribution, production potentials and management needs of specific soils; and (b) the response of various crops to fertilizer recommendations for various crop and soil conditions, taking into account the expected returns in relation to costs.

To develop this capability long term technical assistance in the areas of soils science, land classification and lab technical services will be provided in addition to short term consultants in special fields. Two types of training, at the formal postgraduate level and on-the-job, will be provided. Equipment and supply needs for the lab and survey teams will also be provided. (See Annex F ).

### c. Soils Services

1) Soils Lab: The Soils Scientist and his counterpart and the soils laboratory technician and his counterpart will organize the first soil testing laboratory in the Chemistry and Pedology Laboratory building at the Mulungu station early in the first contract year. During the first year, they will also start the soil test correlation experiments with food legumes and maize. This work will be coordinated with the PNM/CIMMYT research team. When the soil test correlations are sufficiently established for major nutrients on food legumes and maize - probably during the third year - training will be made available to personnel from project clientele such as National Maize Program, National Manioc Program, ONAFITEX, private sector groups, and integrated rural development projects (North Shaba). Training will cover the collection of soil samples, interpreting soil tests results, and making specific recommendations to farmers concerning fertilizer application and other soil and crop management practices. These recommendations will integrate information from the soil testing, soil survey, and food legume projects, as well as from other sources.

After soil test correlations are established for food legumes and maize, this work will be extended to other crops such as coffee, tea, manioc, palm oil, and crops in mixed farming systems. Also, if micronutrient deficiencies appear, work will be done with soil analyses, plant analyses or pot tests to identify the deficiencies and develop procedures to correct them.

2) Soil Classification and Interpretation: This will involve field and laboratory work to determine the characteristics and distribution of different kinds of soil and how they should be used and managed. Special emphasis will be given to (a) identify the soils on research plots in order to assist in transferring information to soil areas to which it is adapted, (b) delineating the best soil areas and making recommendations to increase crop production, and (c) selecting soil areas suitable for cultivation to relieve pressure on the land where population density is high. Soil maps made prior to 1960 will be reinterpreted in terms of the USDA Soil Taxonomy, and soil management

groupings will be made to assist in applying adapted practices to the land. The pedology laboratories at the Mulungu Station will be reactivated to analyze samples necessary to support the soil survey field work, related to this project.

The initial staff will comprise the Land Classifier and his counterpart, a soil survey field party leader and two field party members, laboratory technician, cartographer, and clerk/typist. After the first field party is trained, they will be available to map soils in other areas under the supervision of the Land Classifier and his counterpart. At the beginning of the third contract year, a second field party will be trained and then will be transferred to an area where soil survey information is needed to guide increased agricultural production and development.

The information from soil surveys and soil testing will be integrated into comprehensive management recommendations for various crops and soils.

### 3) Training:

- Integrated short course in soils: During the first six months of the contract, the Soils Scientist, the Land Classification Adviser, and Lab Technician should organize a 3-month intensive course in soil classification, soil testing and interpretation. This course would be given for INERA staff members who are provided as counterparts in pedology and soil fertility, soil survey party leaders, and soil survey party members. Ten to twelve INERA Engineer Agronomists who are interested in soils should take this course, from which 6 would be selected for work at the higher technical areas of the soil testing and soil survey projects. The course would include lectures, laboratory work and field work. Topics such as the following would be included:

- Principles of soil classification;
- Relationships among soil classification systems used by Belgians, USA Soil Taxonomy, and FAO;
- Soil survey mapping;
- Interpretations for soil management;
- Principles of soil fertility -- major nutrients, non-mobile; mobile micronutrients; and

- Soil testing techniques
  - Extractants
  - Soil test correlations for various crops
  - Interpreting soil tests and making treatment recommendations.

This course would assist in selecting interested and capable INERA staff members to work on the soil projects and also provide an excellent opportunity for the contract soil advisers and senior soil staff members in UNAZA and INERA to work together intimately and become familiar with the soil projects. The course would be conducted at Yangambi if suitable laboratories and equipment are available; otherwise it would be given at Mulungu.

- Technical Training: The Soil Scientist and Lab Technician will have Zairian counterparts appointed to work with them in all details of the soil testing program. This will involve both laboratory and field work. The Land Classifier will also have counterparts appointed to work with him in all phases of the soil survey program. After one year of on-the-job training, qualified counterparts will be selected for graduate training at American universities, and new counterparts will be appointed to work with the Land Classification and Soil Science Advisers. Preselection of counterparts is critical as it will be from this group that participants for long term training will be finally selected. Criteria for selection are listed under the legumes research component (Section III A, 2&6). As with the case of participant trainees under the legumes research component, soils trainees will also return to Zaire to do research work and related theses on subject matter which will have practical uses for the country.

The Land Classifier will also train Zairois soil survey field party leaders in-country and the Lab Technician adviser will provide on-the-job training for lab technicians.

Formal post graduate level training will be provided for seven Zairois in the fields of soil sciences and land classification. Additionally, on-the-job training will be used to develop eight paraprofessional soil surveyors and three lab technicians.

d. Agricultural Research Subsector and INERA Institutional Assessments: Simultaneously with the soils services and legumes research components of the project, a separate activity will be undertaken dealing with the organization management, and coordination in the agricultural research subsector and INERA.

The purpose of this component will be twofold:

- First, to develop an overall coordinated framework of agricultural research in Zaire with the role of each participating institution clearly spelled out and with the linkages among education, research (at national and international levels), and extension (production) elucidated; and

- Second, to assist INERA in the development of its capability, as the prime national agricultural research institution, to optimize its research inputs, including budgetary, physical and human resources, in priority areas through proper management planning and administration.

To achieve these purposes an assessment of the agricultural research subsector and INERA will be carried out during the first year of the program. These assessments will be immediately followed up with a series of recommendations and a short term and long term strategy to implement the recommendations. Advisers will assist in the implementation of the short term recommendations during the second year of the project.

Technical assistance in the form of an agricultural research management planner, with assistance on an as needed basis from the rural sociologist technical adviser and DOA Bureau of Plan Agriculturist Economist stationed at Mulungu, and together with a business management consultant will be made available during the first two years of the project. Counterparts to the technical advisers will be the General Director and Scientific Director of INERA. Training will be provided on-the-job as the work of the two key counterpart positions cannot be interrupted for long periods of time.

1) Agricultural research management planning: The technical adviser for agricultural research management planning will have in a scope of work the following responsibilities:

- Agricultural research subsector assessment:

- identification of problems in agricultural subsectors, to determine research priorities;

- inventory and analysis of agricultural research in Zaire including types of research, institutions, staff, budget, etc.;

- analysis of agricultural research clientele;

- analysis of coordination within the subsector including roles of the DOA and IRS;

- analysis of linkages between national research and international research institutions including roles of the DOA and IRS; and

- analysis of linkages among education, research and extension including roles of the UNAZA and DOA.

- INERA Assessment:

- study of role of INERA in agricultural research;

- analysis of INERA's current research activities including types of research, staff, budgets, etc.;

- analysis of INERA research project formulation and evaluation methodologies;

- study of Rockefeller report, final disposition of Yangambi facilities, and location of new INERA headquarters;

- analysis of location and adequacy of facilities;

- analysis of staffing including current capabilities and future requirements; and

- analysis of budgetary resources and future needs.

2) Business Management: The business management consultant will have a focus much more micro than that of the agricultural research planner. The scope of work will relate only to INERA and will include an administrative assessment of the organization, recommendations and implementation strategies, assistance in implementation and on-the-job training. Additionally, he will be able to assist in the solution of administrative and operational problems which may affect performance of soils services and legume research components.

Particular areas needed to be studied include, among others, development of a research project accounting and reporting system; a tightly centralized organization and the need to develop a more decentralized administrative approach; hiring practices, pay scales and personnel procedures; and purchasing policies and procedures.

3) Recommendations and Implementation: Recommendations and implementation strategies, based on the above assessments, will be developed by the technical adviser with considerable input from his INERA counterparts and contacts developed in the DOA, UNAZA, and IRS.

The recommendations should address, among others:

- priorities in agricultural research;
- preferred method(s) to coordinate agricultural research;
- preferred approach(es) to linkages among agricultural education, research (both national and international) and extension;
- preferred research methodologies;
- definition of research clientele; and
- improved management, planning, and operating policies and procedures at the INERA level.

The short run strategy will include those reorganization steps which can be implemented within present budgetary, physical and human resource constraints. Short run recommendations should be carried out by the end of the second project year. The long run strategy will involve, in all probability, additional budgetary support and outside funding to cover new physical facility and operating requirements and human resource needs through recruitment, training, and technical assistance.

The availability of additional outside funding would be predicated on the outcome of an extensive evaluation of the GOZ and INERA performance in implementing the short run recommendations and commitments of appropriate levels of budgetary support for the long run institutional reorganization.

The technical assistance team will assist in implementation of the short run recommendations and the extensive evaluation to be carried out at the end of the second year.

4) On-the-job training: During the two years in-country the technical assistance team will also be providing on-the-job training to their INERA counterparts in the general areas of research management and planning with particular emphasis on effective research project formulation and evaluation. It will also assist INERA in the development of the participatory research effort to be carried out in the legumes research component of this project.

e. Table of Technical Assistance Inputs: Total technical assistance provisions for the project are shown in the table below:

	<u>PERSON MONTHS OF TECHNICAL ASSISTANCE</u>					<u>TOTAL</u>
	<u>FISCAL YEAR</u>					
	<u>78</u>	<u>79</u>	<u>80</u>	<u>81</u>	<u>82</u>	
<u>Long Term</u>						
Soils Scientist	4	12	12	12	8	48
Land Classifier	4	12	12	12	8	48
Lab Technician	4	12	12	12	8	48
Research Agron.	4	12	12	12	8	48
Rural Sociol	4	12	12	12	8	48
Agricultural Res.	4	12	8			24
Mgt. Planner						
Business Mgt.	4	12	8			24
Consultant						
Sub-Total	<u>28</u>	<u>84</u>	<u>76</u>	<u>60</u>	<u>40</u>	<u>288 = 24 yrs.</u>
<u>Short Term</u>						
Pedology		2	1			3
Plant Pathology		2	1	3		6
Plant Physiology and Weeds		1	2	2	1	6
Soil Fertility			2	1		3
Entomology			2	1		3
Crops Extension				3		3
Soil Microbiology			1	2		3
Food Technology	2	1				3
Farm Management					3	3
Soils Extension					3	3
Contract Super- vision		1	1	1	1	4
Sub-Total	<u>2</u>	<u>7</u>	<u>10</u>	<u>13</u>	<u>8</u>	<u>40 = 3+ yrs.</u>
<b>TOTAL</b>	<u><u>30</u></u>	<u><u>91</u></u>	<u><u>86</u></u>	<u><u>73</u></u>	<u><u>48</u></u>	<u><u>328 = 27+ yrs.</u></u>

f. Table of Participant Trainees: Total participant trainee provisions for the project are shown in the table below:

PERSON MONTHS OF PARTICIPANT TRAINEES

<u>FIELD OF STUDY</u>	<u>FISCAL YEAR</u>					<u>TOTAL</u>
	<u>79</u>	<u>80</u>	<u>81</u>	<u>82</u>	<u>83</u>	
Soils Sciences	6	27	30	9		72
Land Classification	6	27	33	21	9	96
Research Agronomist	3	15	21	9		48
Plant Pathology		3	12	9		24
Entymology			3	12	9	24
TOTAL	<u>15</u>	<u>72</u>	<u>99</u>	<u>60</u>	<u>18</u>	<u>264</u> =22 yrs.

g. Participant Training Selection Committee: Proper selection of participants for training is of critical importance to the overall success of the program. Accordingly, a selection committee will be formed during the first year of the project to determine criteria and to select those participants who will be trained at the postgraduate level. The committee should consist of the Delegate General of INERA, Deans of relevant UNAZA departments, USAID project manager and contractor head of party.

### Part III. Project Analyses

#### A. Technical Analysis and Environmental Assessment

##### 1. Physical Characteristics of Mulungu Station

The Mulungu station contains approximately 1,000 ha. Altitudes range from 1,650 to 2,200 meters; soybeans are now being grown at altitudes of 1,700 meters or slightly higher. The average annual temperature is 16 degrees centigrade and average annual precipitation is 1,730 mm. with four dry months. The natural vegetation is primarily mixed secondary forest with some grasses such as Hyparrhenia and Loudetia species. Most of the land is now cultivated except on the steepest slopes. The soils on the Mulungu Station developed from basalt and associated basic eruptive rocks (Percot and Leonard, 1960). The soils were examined at two locations. On the plots of the Intsoy soybean experiment the soil has a very dark brown (Munsell 7.5YR 2/2) friable silty clay loam A horizon, approximately 25 cm. thick and a reddish brown to dark reddish brown (5YR 4/4-3/3) clay sub-soil. There are a few rocks on the surface and basaltic rock often occurs at depths of 60 to 120 cm. The soil reaction is approximately ph 5.0. These soils are permeable and well drained. The soils which were examined near the headquarters of the isolated Nyamunyunye tract do not have basaltic rock within a depth of 120 cm. but in other characteristics they are similar to the soils observed on the Intsoy soybean plots.

##### 2. Legume Research Cultural Trials

Soybeans and other food legumes are not only important as a source of protein in the human diet but they are also beneficial to the non-leguminous food crops grown in association with them and following them. Through a symbiotic relationship between legumes and various Rhizobium sp. nitrogen is fixed in nodules on legume roots. As a result, nitrogen fertilizer is not required by legumes and subsequent crops benefit from the nitrogen added to the soil when the legume biomass is incorporated into the soil. Therefore, it is important to study the beneficial effects of legumes on non-legumes grown in the crop sequence.

The optimum arrangements for growing soybeans alone should also be determined. Seedbed preparation, inoculation procedures and strains, population density and distribution, fertilizer requirements, control of weeds and harvesting procedures should be studied in controlled experiments.

### 3. Soil Testing and Management

A sound soil testing program involves three steps. The first step is to select or adapt analytical methods to measure the level of nutrients in soils which are available to plants. The second step is to correlate the laboratory analyses with crop response to applied nutrients for major crops and soils. This involves the establishment of field plots for each crop concerned, laboratory measurements to determine the level of plant nutrients in the soil, application of several rates of the nutrients to be studied, measurement of crop yields on the various plots, and correlation of crop yields with the measured nutrient level(s) in the soil and the nutrients added in fertilizer(s). The results from these correlations provide response curves or response surfaces for the soil, crop, and environmental conditions studies. Limitations in personnel and budget for experimental work often restrict the correlation data to less than the full range of field conditions. Interpretation - the third step in the soil testing program - is the modifying process to (a) broaden the correlation over a wider range of field conditions; (b) determine cost-benefit ratios for fertilizers and expected increases in crop yields; and (c) make recommendations in the light of soil, crop, and socio-economic factors. The first and third steps outlined above will be done by the Soil Scientist and his counterparts. They will also conduct many of the soil test correlation field experiments included in step two. In addition, arrangements will be made with PNM, Yangambi, IITA at M'Vuazi, and others as available to conduct cooperative soil test correlation experiments with selected crops. In developing soil test correlations, first emphasis will be given to food legumes and maize.

### 4. Expansion of Soybean Production to Other Adapted Areas

The expansion of soybeans to locations other than Mulungu will depend on testing the "package of practices" within simulated farming systems and in farm trials throughout the potential production area. The trials will be in cooperation with extension agencies and interested farmers. They will serve as farm demonstrations. Seed of superior varieties will also be provided for expansion to other areas. Therefore, seed increases will be an important part of the expansion program. Field days where farm demonstrations and seed multiplication fields are featured will play an important role in the expansion of soybeans into new areas.

### 5. Linkages to PNM, North Shaba Rural Development Project and Food Production:

a. Soil Services: The soil testing laboratory will serve all parts of Zaire. In fact, samples from all of Zaire will be desirable

for establishing soil test correlations throughout the country. The correlations can be made with any crop so the soil testing laboratory can serve all crops. However, when large numbers of samples begin to come to the laboratory, the number of soil testing laboratories should be increased to more than one. Soil survey results and interpretations will first be provided to extension workers and farmers near Mulungu and gradually be expanded to other areas.

The soils services component will have a "project clientele" orientation. These "projects" will include the National Maize Program, National Manioc Program, ONAFITEX, Tabazaire (tobacco company), coffee production firms, and integrated rural development projects such as the North Shaba Rural Development Project. These "projects" rely on small holders for their product. They each maintain extension and field testing operations which will use the soils services.

Arrangements will be made with PNM to conduct cooperative field experiments to determine soil test correlations for maize and food legumes. After soil test correlations have been established for food legumes and maize, soil testing service can be made available to participants in the North Shaba Rural Development Project. PNM/CIMMYT has indicated that they would need an approximate 1,000 soils sample analyses per annum.

b. Food Legumes Research: Soybean variety trials, including varieties from INTSOY and IITA, are being grown by PNM at Lubumbashi. In mixed cropping experiments at both Lubumbashi and Gandajika soybeans are being compared to other legumes in terms of their beneficial effects on maize. Cooperation between INERA and PNM in planning experiments and probing the results of trials will enhance the value of the data. A pattern of cooperation between INERA and PNM will be established that can be followed elsewhere. Coordination through the Office of the Director General of the DOA will be arranged.

The INERA legumes research component will coordinate its data collection and participatory research efforts with those to be carried out in the North Shaba Project. This will be especially the case in identifying information to be gathered and techniques to be used in collection of data. The proposed timing of the North Shaba project start up, approximately six months ahead of the INERA project start up, will facilitate the learning process for the legumes research component.

Assessment of and recommendations for coordination within the agricultural research subsector and linkages of research to extension and production are principal parts of the scope of work of the agricultural research management planning team proposed for the first two years of the program.

#### 6. Sources of Qualified Personnel for Training

a. Postgraduate Training: Eleven participants will be selected to receive long term postgraduate training. A review of authentically qualified INERA personnel plus projected UNAZA graduates from 1977-1979, indicates that there is an adequate source of personnel.

The professional staff at INERA presently includes 48 members at the Engineer Agronomist (A<sub>0</sub>) level or its equivalent in other fields. Of these 48 members, six have degrees in administration thus leaving a group of 42 from which the first participant trainees will be selected. Participant trainees in subsequent years will, no doubt, be selected from those remaining in the group of 42 plus new Engineer Agronomists graduated from UNAZA in the years 1977-1980. Projected UNAZA graduates at the A<sub>0</sub> level are 91 in 1977, 100 in 1978, and 85 in 1979.

b. On-the-job Training: Thirty counterparts will receive extensive on-the-job training to upgrade para-professional skills. A review of INERA qualified personnel plus projected graduates from the two agricultural technical schools indicates that there is an adequate source of personnel.

The staff of INERA includes 28 employees at the Agricultural Technician (A<sub>1</sub>) level. The first counterparts to be selected for the on-the-job training will be chosen from this group of 28. Subsequent selections will in all probability be selected from those remaining in the group of 28 plus new technicians graduated from the Agriculture Technical Schools in the years 1977-1979. Projected A<sub>1</sub> graduates are 67 in 1977, 140 in 1978, and 115 in 1979.

c. Data Collection and Extension: Potential sources for data collection and extension personnel include the ISES in Bukavu and its training program for rural development agents, the missionary groups including the Catholic Diocese now already involved in small scale agricultural development and training and the small corps of regional DOA extension workers in the Walungu Zone. If one assumes a target group of some 2,000 farmers to be reached by the pilot participatory research effort in the food legumes component, then approximately ten agents would be needed.

## 7. Equipment Requirements

Detailed equipment and supply lists for the soils laboratory and survey component, legumes research component and research assessment component are included in Annex F.

Equipment and supply requirements were developed through an on site inventory of equipment and supplies on hand and matched against project needs. The relative isolation of the facilities at Mulungu and Yangambi was also considered as one factor in the development of requirements. Types of equipment and supplies to be purchased include the following:

- agricultural equipment;
- vehicles;
- maintenance and repair equipment;
- seed and fertilizer;
- office equipment;
- soils lab equipment and supplies;
- soils survey equipment;
- legume lab and field equipment; and
- household furniture.

It is assumed that one contractor or institution will be awarded the contract for technical assistance. Based on this assumption, it is proposed that the contractor would carry out procurement of the above equipment allowing in the contract an amount of 5% for administrative costs associated with procurement.

## 8. Maintenance and Repair Capability:

The maintenance and repair capability appears to be fair. Good working space is available at a central garage location. Much of the area is open on one side but there are closed shops for tool and equipment storage and for lathe work, welding, etc. They have ample grease pit areas for vehicle service.

Equipment includes: fair assortment of wrenches and other mechanics hand tools; a large new metal turning lathe; a drill press; grinder; air compressor; battery charger; steam cleaner; oxyacetylene cables and electrode holder; and a forge with anvil and swage block. There is a woodshop mostly for making furniture for the station. It has a circular saw and a thickness planer as well as appropriate hand tools.

There are two skilled mechanics who received their training at a technical school in Bukavu. It was originally set up by a mission and is still run by the Brothers although it has been taken over by the government. Several assistants work with the trained mechanics.

The workshop personnel are adequate to provide support to the proposed project but additional equipment will be needed. (See Annex F for list.)

#### 9. Environmental Assessment

Short term effects on the environment will be minimal, but positive. No new construction of physical facilities is planned; only renovation and remodeling of existing facilities are to be carried out enhancing the use of these facilities. The Mulungu station covers an area of approximately 1,000 hectares with a good part of the land being hilly. Presently, erosion is a very serious problem at the station. The Director of the Mulungu station suggested to the PRP team that assistance in soil conservation, specifically the control of erosion, was needed. Improved practices, such as contour farming, intercropping and crop rotation, banding areas with permanent vegetation strips, will be developed by the research team to control erosion.

The longer term impact on the environment brought about by the legumes research and soils services components will be positive. Soils surveys and land classification will lead to more effective uses of land. The soils services team will be able to carry out preinvestment studies of land use potentials of given areas for agricultural development. Soils analyses will determine optimum fertilizer application rates thus conserving natural resources. Applied research will lead to an increase in the use of organic nutrients. Although the new technologies usually require the use of chemical pesticides, their use will be limited through the development of higher insect and disease resistant varieties. Overall impact on the environment will be positive.

## B. Institutional and Financial Analyses

### 1. IRS

The Institute of Scientific Research was created by Law No. 75-029, in late 1975 under the supervision of the Bureau of the President. The directive issued to the IRS is to carry out, promote and coordinate scientific, technical and industrial research in Zaire. This broad role includes:

- participation in the National Plan through development of research programs;
- study of research programs proposed in the National budget;
- rationalization of scientific equipment usage;
- control of research program activities of research institutions;
- proposal of means to ensure usage of research results;
- maintenance of inventory of research activities in the country; and
- assurance that research results concur with country development plans.

The Institute is headed by Director General named by the President. An IRS committee is responsible to the Director General of IRS and recommends courses of action within its broad powers of promoting and coordinating scientific research. The Committee's composition:

- |                       |  |
|-----------------------|--|
| - President:          | Director of the Bureau of the President  |
| - 1st Vice President: | Director General of IRS  |
| - 2nd Vice President: | UNAZA Rector   |
| - Members:            | Vice-Rectors of the three University campuses  |
|                       | People in charge of the Special Commissions whose number, nature and composition are determined by the internal regulation of the institute. |

IRS is a new institution; only in operation a year and one half. Its role is broad, covering not only agricultural research, but all types of research carried out in the country. Because of its newness, its ability to coordinate and work effectively with research institutions is still unknown. The IRS staff is small and of very unequal capability. The major activity to date has been a start in the cataloguing of research being done in Zaire. This work has not been completed.

Technical assistance in agricultural research management planning will be provided to assess the coordinating function of the IRS with respect to institutions in the Zairian agricultural research subsector and the linkages between these national institutions and the international research organizations. The assessment should lead to specific recommendations regarding the role of IRS in agricultural research.

## 2. INERA

a. Historical: INERA was established in 1970 as the successor agency to INEAC. Its responsibilities under the 1970 law include the promotion and development of agricultural research in Zaire. The institution is an autonomous entity with its own budget; however, it operates under the authority of the DOA.

A steering committee is placed between the DOA and INERA and determines broad policies and directions regarding INERA's program. The committee is composed of the following members:

President:	State Commissioner of Agriculture
Vice President:	Delegate General of INERA
Members:	Director General of IRS
	- Representative of Director General of Agriculture Offices
	- Director of the Department of Agriculture
	- Dean of the Faculty of Veterinary Medicine
	- Dean of the Faculty of Agricultural Sciences

The committee generally meets once a year to review INERA's past year programs and results and determine directions for the current year program.

The Delegate General is charged with the implementation of the INERA program and counts on sub-directors in the areas of research, technical services, and administration. Organizationally, INERA is divided into geographical sectors with a main research station supported by sub-stations in each area of the country. The INERA Delegate General and main administration are headquartered in Yangambi. There are six geographical sectors with a total of 23 research facilities.

The geographical sector and principal research station for each area are shown below:

<u>GEOGRAPHICAL SECTOR</u>	<u>PRINCIPAL STATION</u>
Yangambi	Yangambi
Bas-Zaire	M'Vuazi
l'Equator	Bongabo
Su-Est	Gandajika
Kivu	Mulungu
Nord-Est	Nioka

Research projects are being carried out on cotton, palm oil, cacao, manioc, legumes and livestock. In addition there are commercial operations relating to production and sales of crops.

INERA employs approximately 4,400 employees most of which are laborers. At the technical level there are 42 researchers with Engineer Agronomist degrees and 28 assistants with Agricultural Technician degrees. At the higher management level six employees have the equivalent of bachelor degrees in administration. There are approximately 600 employees at middle and lower level supervisory positions. Staff cut-backs of 20%, principally in the unskilled labor force, were carried out in May, 1976, due to reduction in INERA budget from Z 3.6 million to Z 2.2 million, following GOZ economy moves. The only expatriates on the staff include IITA on manioc research at M'Vuazi and Belgian technical assistance team on livestock at Nioka.

Approximately 86% of INERA revenues is set aside for salaries with 14% devoted to Yangambi maintenance and research projects. Funds available to the research stations are tightly controlled by the Delegate General. Although each research station has an annual budget, funds are strictly allocated on a monthly basis. Accounting is by research station with no accounting nor reporting on a project basis.

Discussions with several sources, including the Delegate General of INERA, indicate serious problems in the capability of INERA to carry out its research role.

- Research directions are determined based on what INERA has done in the prior year going further back to what INEAC had done.

- Location of research stations has been determined by availability of physical facilities left over from INEAC days.

- Yangambi research center chews up 1/3 of INERA budget, while INERA administration recognizes the station as the least productive in its network.

- With INERA budget devoted almost exclusively to salaries and Yangambi maintenance and operations, little in the way of funds is available for the necessary supplies and equipment to conduct research.

- The INERA staff is young and inexperienced and spread much too thinly over the research network and activities.

- Research project formulation and evaluation are virtually non-existent.

- Administrative control is highly centralized.

INERA, operating as the national agricultural research agency in Zaire, is a given and one must work within these limits. The staff is young and inexperienced, but at the same time eager and malleable and not necessarily steeped in traditional research approaches. The burden of Yangambi on the resources of INERA should shortly be lifted with the creation of the University Center proposed by the Rockefeller study. Proper training in technical research areas coupled with technical assistance leading to meaningful reforms in the research, management and budgetary policies of the institution can have a handsome payoff.

Technical assistance is proposed in two areas. An agricultural research management planning team will assess both the whole agricultural research subsector and INERA to determine the role of INERA within the subsector, its research programs, and, at the institutional level itself, to develop an overall scheme for research methodologies, location of facilities, use and type of staff, and budgetary requirements.

Further technical assistance will be provided to develop the internal management capability of INERA by concentrating on "nuts and bolts" of operation and administration, i.e., organization and types of support services needed, personnel practices, accounting and reporting systems, delegation of authority and decentralized operations, etc.

Implementation of recommendations derived from the assessments of the agricultural research subsectors and INERA should set the role for INERA and its research directions, clientele and methodologies. A rationalization of the sites of INERA research stations and composition of research teams should be developed from the assessments and carried out. Budgeting techniques allowing for the proper blend of salaries, operating supplies and equipment and some flexibility in decentralized use of these funds for the efficient functioning of the research teams should be in place. Accounting and reporting systems designed to feed into the research project formulation and evaluation efforts should also be in place.

The management technical adviser will be on board during the first two years of the project coinciding with the start up of the soils services and legumes research components and will be able to assist in working out operational and logistics problems which may arise.

b. Project Costs: Summary financial tables for the project and the supporting narrative are presented at the end of this section.

The total cost of the project over its four year life is estimated at \$6.159 million. Foreign exchange costs, to be completely grant funded by AID, are projected at \$3.350 million, or 54% of the total. Local currency costs of \$2.809 million, or 46% of the total, are to be financed by the GOZ through a combination of support from INERA's annual budget and local currency counterpart resources from the PL 480 Title I Sales and Commodity Import Programs.

AID's contribution to the project includes \$2.240 million for 24 person years of long term technical assistance and a little more than 3 years of short term consultants; \$0.322 million for 11 person years of participant training at the masters degree level in U.S. universities; \$0.430 million in equipment costs primarily to support the soils services and legume research components of the project; a contingency allowance of \$31,000 to meet unexpected needs; and \$0.321 million to allow for inflation estimated at 6% annually.

The GOZ's contribution to the project includes \$0.636 million to cover salaries of participants, counterparts, technicians trained within the country and secretarial and administrative personnel directly assigned to the project; \$0.380 million for local currency support costs associated with long term technical advisers; \$0.186 million in other costs set aside for rehabilitation of six houses for long term consultants, remodeling and expansion of soils lab at Mulungu, fuel and lubricant costs used in operation of vehicles and equipment, miscellaneous office supplies; \$66,000 to cover participant training costs; a contingency fund of \$31,000; and \$1.510 million to allow for inflation at an estimated 40% annually.

The project is divided into three discrete cost components: soils services, legumes research and agricultural research assessment.

- The soils service component uninflated total cost is estimated at \$2.259 million. AID contribution is \$1.528 million and GOZ funding at \$0.731 million.

- The legumes research component uninflated total cost is estimated at \$1.437 million. AID contribution is \$1.027 million and GOZ financing at \$0.410 million.

- The agricultural research assessment component is costed on an uninflated basis at \$0.632 million with AID funding \$0.474 million and the GOZ picking up the remainder of \$0.158 million.

The GOZ's contribution to the project is spread fairly evenly over the four year project period and at its highest uninflated annual amount represents 9.7% of the 1976 INERA budget of \$3.510 million. This relationship is shown in the following table.

<u>FISCAL YEAR</u>	<u>(\$000's) Amount</u>	<u>% of 1976 INERA Budget</u>
78	142	4.0
79	335	9.5
80	321	9.1
81	310	8.8
82	191	5.4

Sources of GOZ's funding will include regular budgetary support and counterpart generations from PL 480 Title I sales and Commodity Import Program.

c. Recurring Costs: Annual recurring costs after the completion of the four year project are estimated at \$238,800 on an uninflated basis and consist of salaries of \$192,000 and operating supplies of \$46,000. Operating supplies include fertilizers, seeds, fuel and lubricant costs, supplies, spare parts and expendable property replacements for lab and field equipment together with miscellaneous office supplies and technical literature.

These annual recurring costs of \$238,000 represent 9.3% of the 1976 INERA budget of \$2.570 million. Gross income of \$930,000 from Yangambi commercial operations has been excluded from total 1976 INERA revenues because of the probable transfer of INERA facilities at Yangambi to the new University Center proposed by the Rockefeller Report.

The percentage of annual recurring costs to the 1976 INERA budget appears to be within the financial capacity of the GOZ and INERA given no future drastic setbacks in the economy. Further assurances of fund availability to cover recurring costs will, in all probability be developed from the planning and management assessments of INERA and the probable assimilation of Yangambi research facilities by the Faculty of Agronomic Sciences leading to efficient operations and optimization of its resources.

**TABLE I**  
**SUMMARY COST ESTIMATE AND FINANCIAL PLAN**  
**\$000's**

		<u>OZ LC</u>		<u>TOTAL</u>		<u>TOTAL</u>
				<u>FX</u>	<u>LC</u>	
Technical Assistance		380		\$2,240	\$ 380	\$2,620
Training	322	66		322	66	388
Salaries		636*			636*	636*
Equipment	421			421		421
Other	16	186		16	186	202
Inflation	321	1,510		321	1,510	1,831
Contingency	<u>30</u>	<u>31</u>		<u>30</u>	<u>31</u>	<u>61</u>
<b>TOTAL</b>	<b><u>\$3,350</u></b>	<b><u>\$2,809</u></b>		<b><u>\$3,350</u></b>	<b><u>\$2,809</u></b>	<b><u>\$6,159</u></b>

\* Salary costs are from INERA's annual budget. The balance of \$2,173 LC will be derived from counterpart funds.

TABLE II  
COSTING OF PROJECT INPUTS/OUTPUTS

\$000's

	<u>Soils Services</u>	<u>Legumes Research</u>	<u>Research Assessment</u>	<u>Total</u>
<b>AID:</b>				
Technical Assistance	\$1,070	\$ 762	\$ 408	\$2,240
Training	206	116		322
Equipment	223	139	59	421
Other (Radio)	12	4		16
Inflation (Unallocated)				321
Contingency	<u>17</u>	<u>8</u>	<u>5</u>	<u>30</u>
Sub-Total	\$1,528	\$1,029	\$ 472	\$3,350
<b>GOZ:</b>				
Technical Assistance Support	\$ 186	\$ 117	\$ 77	\$ 380
Training - Support	42	24		66
Salaries	374	215	47	636*
Other	109	46	31	186
Inflation (Unallocated)				1,510
Contingency	<u>20</u>	<u>8</u>	<u>3</u>	<u>31</u>
Sub-Total	\$ 731	\$ 410	\$ 158	\$2,809
<b>TOTAL</b>	<u>\$2,259</u>	<u>\$1,439</u>	<u>\$ 630</u>	<u>\$6,159</u>

\* Salaries are from INERA's annual budget. The balance of \$2,173 LC will be derived from counterpart funds.

**TABLE III**  
**YEARLY COST ESTIMATE AND FINANCIAL PLAN**  
**\$000's**

	<b>FISCAL YEAR</b>														
	78			79			80			81			82		
	AID	GOZ	T	AID	GOZ	T	AID	GOZ	T	AID	GOZ	T	AID	GOZ	T
<b>Soils Service:</b>															
Technical Assistance	93	15	108	267	47	314	268	46	314	268	47	315	174	31	205
Training				45	9	54	66	14	80	33	7	40	62	12	74
Salaries		14	14		65	65		103	103		123	123		69	69
Equipment	146		146	12		12	45		45	20		20			
Other	12	43	55	35	46	46		7	7		9	9		4	4
Contingency	5	5	10	5	5	10	5	5	10	5	5	10			
<b>Legumes Research:</b>															
Technical Assistance	41	6	47	147	25	172	190	29	219	235	34	269	149	23	172
Training				12	2	14	22	5	27	43	9	52	39	8	47
Salaries*		12	12		42	42		57	57		65	65		39	39
Equipment	82		82	26		26	23		23	8		8			
Other	4	10	14	14	14	14		8	8		9	9		5	5
Contingency	1	2	3	3	2	5	2	2	4	2	2	4			
<b>Research Assessment:</b>															
Technical Assistance	69	12	81	204	38	242	135	27	162						
Training															
Salaries		8	8		24	24		15	15						
Equipment	49		49	10		10									
Other		13	13		15	15		3	3						
Contingency	1	2	3	4	1	5									
<b>Sub-total</b>	<b>500</b>	<b>142</b>	<b>642</b>	<b>735</b>	<b>335</b>	<b>1070</b>	<b>756</b>	<b>321</b>	<b>1077</b>	<b>614</b>	<b>310</b>	<b>924</b>	<b>424</b>	<b>191</b>	<b>615</b>
<b>Inflation: FX 6% pa LC 40% pa</b>				44	130	174	91	300	391	116	540	656	70	540	610
<b>TAL</b>	<b>500</b>	<b>142</b>	<b>642</b>	<b>779</b>	<b>465</b>	<b>1244</b>	<b>847</b>	<b>621</b>	<b>1468</b>	<b>730</b>	<b>850</b>	<b>1580</b>	<b>494</b>	<b>731</b>	<b>1225</b>

\* Salary costs will be derived from INERA's annual budget. The balance of GOZ contribution will be from counterpart funds.

## C. Social Analysis

### 1. Agriculture: Traditional and Commercial

The agricultural economy of Zaire can be divided into two broad categories: traditional and commercial.

Research in this project is directed towards traditional farming which centers around food crops and small livestock and provides the livelihood for 75% of the population. Production is primarily for subsistence. A wide variety of farming techniques are employed with respect to crop mixes, cultivation methods, types of tools, land clearing, and lengths of fallow periods. This variety is brought about by such factors as climate, ecology, knowledge, availability of capital and agricultural inputs, marketing capability, and attitudes of groups of people and of individuals.

Despite the wide variety in the traditional agricultural sector, certain major characteristics are common in most instances. The first common characteristic is the meager use of capital and purchased inputs with the converse being labor as the major production factor. The second deals with the division of labor between men and women, while the third centers on land ownership and use systems.

The farm family's own labor is the main production input, with little specialization between families in the villages. Lack of more sophisticated inputs is principally due to the weak research, extension, and delivery systems in the country as well as the lack of credit. The division of labor between men and women is distinct. The major responsibilities of the men are hunting, forest and land clearing, and hut building, while the women assume most responsibility for sowing, cultivation, weeding, and harvesting.

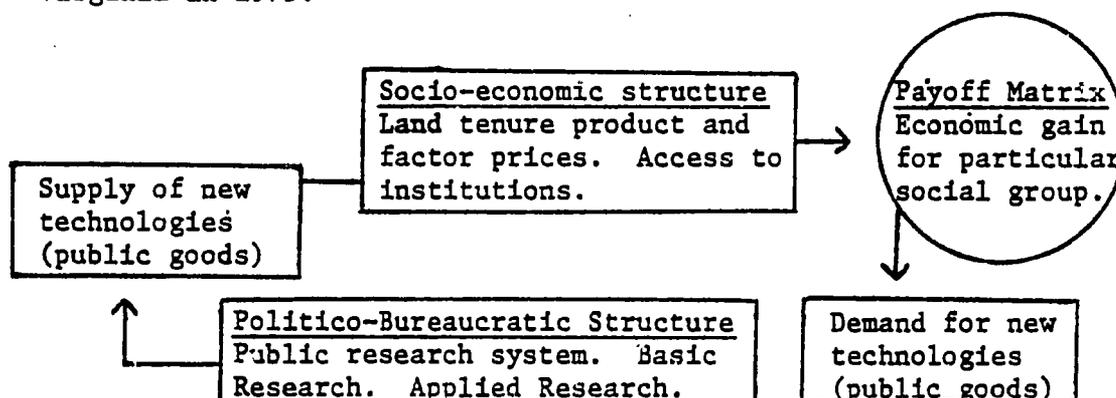
The principal form of land tenure is that of clan property. The land belongs to the community with no individual ownership. Crops grown on the land are individual property. The size of plot cultivated by a farmer in a given year ranges from 0.6 hectare in the forest areas to 1 to 2 hectares in the savannah.

Variations exist within this general framework, and cropping systems show great diversification. In the North Shaba Maize Production Project Paper, 11 different cropping systems were identified, thus showing the need for data collection efforts in the beginning to develop a responsive research process.

Commercial farming historically has centered around major export crops and sugar and livestock for domestic consumption. Generally commercial farming is done on large plantations involving heavy capital usage and advanced agricultural and management practices. The commercial farming sector is important to the country as a source of employment and foreign exchange.

2. Research Systems and Constituency Groups: From a technical standpoint, research is neutral. However, various groups because of their socio-economic standing or political stature are more readily able to capitalize on new technologies developed through research. Further, these groups also have a great deal of influence in determining the types of research to be undertaken.

These facts are clearly spelled out in the following model, presented by Alain de Janory at the Conference on Resource Allocation in National and International Agricultural Research at Airlie House, Virginia in 1975.



"The key to the model is the pay-off matrix in the upper right hand corner. This consists of particular interest groups in society -- commercial farmers, landed elites, subsistence farmers, consumers -- who derive income gains or losses from alternative public goods such as research. The supply and demand for research is centered in the pay-off matrix and is conditioned by the socio-economic structure on the one hand and the political-administrative structure on the other. Each social group pressures the political-administrative structure for research goods to be (or not be) generated depending on the particular pay-off that it expects.

".... research is filtered through the socio-economic structure and produces specific pay-offs for different social groups. In agricultural research, the pay-offs are determined by: (1) the physical characteristics of the innovation in terms of its ability to raise yield or reduce cost; (2) the extent of the diffusion of the innovation which is conditioned by its suitability to local ecologies and social and institutional arrangements such as land tenure, access to credit, etc.; and (3) prices which determine its relative profitability. These pay-offs induce further demands for new research."

One of the principal tasks to be carried out in the proposed assessment of the agricultural research subsector will be to determine research priorities and to identify a research constituency group or groups. With the GOZ emphasis on food production, small traditional farmers would appear to be a prime grouping.

Also in the determination of research priorities and the role of INERA, specific attention will be given to the type and composition of research teams needed to address socio-economic and political-administrative realities as perceived by the small, traditional farmer in Zaire. The linkages between research and extension will also be studied to determine more effective ways to develop research that can be used by the small farmer. This will have to involve the researcher, extension agent and farmer in a continuous flow of information both ways.

### 3. Cultural Acceptability of Legumes and Soybeans:

a. Initial research area: Initially legume research, to be carried out under this project, will be centered at the INERA research station at Mulungu in the Walungu Zone of Kivu Province. Disaggregated information at the provincial level\* is available regarding demographic characteristics of food legumes and soybean production and consumption.

- Population, land pressure and malnutrition: The two mountainous sub-regions of Kivu (North Kivu and South Kivu) exhibit serious problems of overpopulation, land pressures, and malnutrition. The sub-region of South Kivu, where the problem is particularly acute, includes the zone of Kale, Walungu, Kabari. The same problems also exist

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\* Sources include Duncan report on legumes research prepared in November 1975, as part of the PRP, "Report of Dr. Djembi (Belgian trained researcher) on Soybean Production in Zaire", prepared in 1976; and DOA regional agricultural statistics for 1974.

in North Kivu, but to a lesser degree. North Kivu includes the zones of Beni, Lubero, Goma, Rutshuru and Masis.

A local missionary at Bukavu who has carried out social studies indicated that in the area of Ikoma on the Kabar-Walungu road, the population increase is 35/1000/year. The area of arable land was about 0.21 ha/inhabitant in 1948; 0.17 in 1969; and 0.16 in 1970. At present child mortality is reducing the population growth. It is estimated that in this type of soil 0.60 ha. is the minimum requirement for mere subsistence. Figures of 214 and 320 inhabitants per arable km<sup>2</sup> have been reported.

At the IRSAC station, close to Mulungu (Institute de Recherches Scientifiques in Afrique Centrale) a medical team has published statistics on occurrence of Marastic Kwashiorkor in the Kivu area.

Malnutrition is increasing at an alarming rate; it affects mostly children between 6 months and 1 year of age. The 1974 CEMUBAC report mentions infant mortality figures of 230 per thousand. Statistics show that the situation is getting worse every day, and is more dramatic in rural areas than in the cities.

It is not restricted to proteins. Fats are also becoming extremely expensive and road deterioration hinders imports from Kisangani. One liter of palmoil is sold for 1 Zaire at present, which is prohibitive for most people, even if it were available in rural areas.

- Soybean Cultivation and Consumption: The government through the regional DOA and local missionaries is encouraging the growth of soybeans in the area. A small CAPSA center, part of the regional DOA located at Kavumu, S. Kivu, carries out seed multiplication of soybeans and other crops.

Missionaries in the area have been active in the introduction of soybeans in crop rotations and the mixture of whole soybean flour in the diet. A toasting plant and a mill driven by local hydro-electric energy supply is running at the mission, but the supply of soybeans is too small to meet the demand. The same group of missionaries is presently trying to repeat the experiment in the northern part of Kivu.

Small farmers in the Walungu area concentrate on four principal crops: haricot, manioc, sweet potatoes, and maize. A small amount of soya beans is grown. In 1974, approximately 38 tons were produced. At the provincial level production of food legumes covers, in addition to haricot, large quantities of peas and peanuts. 750 tons of soybeans were produced in the province in 1973.

Soybean cultivation is practiced according to traditional techniques without inoculation or chemical fertilizer. After clearing the field, it is cultivated manually with a hoe. Seeds are planted haphazardly, one or two grains per hill. Yields are accordingly low.

In Kivu soybeans are no longer prepared in the same manner as other beans. People use it in the form of flour which is prepared in a mixture with other flours. The flour is added often to other foods, such as coffee and tea; like powdered milk. As indicated above, demand for processed soybean flour is greater than supply.

b. Other areas: Similar efforts to promote consumption of soybeans have been tested and found to be practical in another chronic protein deficiency area: Kasai Occidentale Province. Soya has been introduced into the local diet by again processing a flour from the bean and mixing it with maize flour and manioc to produce a highly similar version of bidia, the basic food of Kasai. The cultivation of soybean has not presented any special problems. It brings a higher price than groundnuts thus providing a financial incentive.

Further, the beany flavor in soybeans can be avoided through a process developed by the University of Illinois, Food Technology Department. Inexpensive means of producing bland (enzyme-inactive) soybeans by cooking before the undesirable flavor develops are now available. The basic "boiled beans" can be eaten alone or in preparations that are common in the human diet in a particular region.

It has taken much effort to develop these inroads but a beginning has been made. A food technologist, early on in the project, will be made available on a short term basis to review work done to date and work with the research team to determine ways to spread the effects of the pilot projects.

#### 4. The Role of Women

At present no women are employed at INERA in the higher level technical areas of agricultural research, principally due to the lack of opportunity for women in higher education in Zaire. In 1963 there

was only one woman attending the University. Progress, although slow, has been made. In 1973, there were 159 women enrolled at the National University representing 4% of the total student population.

Of much greater importance, however, to the achievement of the sector goal and spread effects, is the role of women in food production, selection, and preparation. In traditional small farm subsistence agriculture, women contribute approximately 60% of the total farm labor with emphasis on planting, cultivation, and harvesting. Cultural practices to be developed in the INERA project must take into account the farming activities contributed by women and the impact of change in cultural practices on the women's role and farm production. Further, the women have main responsibilities for the types of foods selected, prepared and included in the local diet, thus impacting quite strongly on nutritional levels, especially the most vulnerable targets of malnutrition, of children.

Because of the "women behind" philosophy predominate in much of the culture, technology transfers may have to be carried out on a woman to woman basis, indicating that a possible need for women extension agents may arise. These factors will be considered by the rural sociologist presently assigned to the Mulungu station.

## D. Economic Analysis

### 1. Returns on Agricultural Research

Returns on agricultural research appear to be high. This is documented by several studies made, as summarized in the following table.

SUMMARY OF DIRECT COST-BENEFIT-TYPE STUDIES OF  
AGRICULTURAL RESEARCH PRODUCTIVITY <sup>1/</sup>

<u>Study</u>	<u>Country</u>	<u>Commodity</u>	<u>Time Period</u>	<u>Annual Internal Rate of Return %</u>
Griliches (1958)	U.S.A.	hybrid corn	1940-1955	35-40
Griliches (1958)	U.S.A.	hybrid sorghum	1940-1957	(20)
Peterson (1966)	U.S.A.	poultry	1915-1960	21-25
Ardito-Barletta (1970)	Mexico	wheat	1943-1963	90
Ardito-Barletta (1970)	Mexico	maize	1943-1963	35
Evenson (1969)	S. Africa	sugarcane	1945-1962	40
Ayer (1970)	Brazil	cotton	1924-1967	77+
Hertford, Ardila, Roches and Trujillo (1975)	Colombia	rice	1957-1972	60-82
	Colombia	soybeans	1960-1971	79-96
	Colombia	wheat	1953-1973	11-12
	Colombia	cotton	1953-1972	none
Peterson and Fitzharris (1975)	U.S.A.	aggregate	1937-1942	50
			1947-1952	51
			1957-1962	49
			1967-1972	34

<sup>1/</sup> Source: Seminar Report, "Resource Allocation and Productivity in National and International Agricultural Research", The Agricultural Development Council, Inc.

As can be seen by the preceding table, returns in most cases are indeed very high when compared to more conventional development projects. However, these studies and results have been challenged on several grounds:

- charging only direct costs of research against gross benefits and ignoring implementation costs; thus inflating rate of return;

- estimating of gross benefits is highly subjective, thus distorting rate of return; and

- failing to account for surplus benefits of research outside the country or area, thus conservatively stating benefits.

It is argued that correcting the first deficiency, i.e., charging not only direct research costs, but also implementation costs would bring returns back within ranges of 15%-20%, or more in line with the more conventional development projects. However, these same critics of the methodologies used to determine agriculture research return rates have concluded that investment in agriculture research is necessary because it has been an important factor leading to increases in agricultural productivity.

The conclusion that agricultural research returns are in line with more conventional development projects appears to be the case in the AID financed North Shaba Maize Production Project which purpose is the identification of "a rural development process for improving small farmer production and incomes for replication in other parts of Zaire." Using a very conservative approach, the economic analysis shows an estimated internal rate of return of 18%. Project costs include all development investment costs and research directly associated with the project in addition to recurrent costs of DOA extension agents and ONACER/PNM personnel and operational costs connected with the project. Costs also include on-going investments in fertilizer. Life of project is conservatively stated at ten years and no allowance has been made for the spillover of technological improvements to other regions of the country. The 18% internal rate of return would seem to be a very conservative calculation.

The North Shaba Project Papers states that over the long run the INERA support project will play a major role in the research program. Specific needs to be supplied by INERA include soils surveys and studies to determine changes in the physical properties of soils over time such as "the impact of fallowing on soil organic matter and nitrogen contents."

Taking the North Shaba economic analysis one step further, and assuming for the moment that the benefits from the INERA soils services facility to be developed under this proposed project have already been included in the North Shaba array of benefits, but that the costs associated with soils testing for North Shaba have not been included, a new rate of return calculation can be made. Using these two assumptions lowers the rate of return to 15+%. (See Annex G for calculation.) The returns are still above minimum AID target rates.

Another way to examine the issue of economic returns to research is to determine the capital recovery factor of the investment in research over a certain period of years at the opportunity cost of capital and comparing this with the increase in efficiency in agricultural production (for example, optimum fertilizer utilization and subsequent cost saving due to soils services and nitrogen fixation traits of food legumes) needed to offset the new costs.

Calculations based on the proposed INERA project yield the following results. (See Annex G for calculation.) Fertilizer needs for eight major crops in 1980 are estimated at approximately 83,000 metric tons at a cost of \$350/ton<sup>1/</sup> for a total fertilizer cost of \$29.0 million. For analysis purposes it is assumed that average annual costs of fertilizer needs over the next ten years are \$29.0 million. By further assuming a ten year project life and a 15% opportunity cost of capital, the INERA support research investment plus recurring costs are \$5.150 million in 1980 and the capital recovery factor (annual amount needed to amortize a loan over ten years at 15%) is \$1.021 million. Net annual savings in fertilizer costs would then have to equal \$1.021 million, or 3.6% of annual fertilizer costs, which is a reasonable expectation.

## 2. Scarcity of Research Resources and Indigenous Capability:

Another factor to consider is that research resources are scarce in Zaire, both in terms of dollars allocated and trained human resources. The INERA budget for 1976 amounted to approximately \$2.6 million. INERA staff consists of 48 professionals with the degree of Engineer-Agronomist of which 42 are engaged in some form of agriculture research. Fully 86% of INERA budget covers salaries with only 14%

<sup>1/</sup> Source: "Supplying Fertilizers for Zaire's Agricultural Development", Tennessee Valley Authority, 1975.

available for research and commercial exploitation operating supplies, materials, and other costs. As agricultural research is potentially quite productive, the opportunity costs of bad decisions are high. It is for this reason that an assessment of the agriculture research subsector in general and INERA in particular is proposed for this project.

Furthermore, studies by R. Evenson show that countries without the technical capacity to perform significant agricultural research also lack the capability to benefit from the research of others.

#### Part IV.

##### A. Implementation Plan

1. Recipient: There are three agencies of the Government of Zaire involved in this project:

- a. Department of Agriculture, General Direction and Office of Commissioner;
- b. National Institute for Agricultural Research (INERA); and
- c. Institute for Scientific Research (IRS).

These agencies of the GOZ are established and operating offices. Responsibility for coordinating the activities of a, and b with c rests with the Department of Plan and the Presidency.

This coordination will be necessary in analyzing the subsector of agricultural research, and will only be necessary for project execution purposes during the first two years of the project. IRS has a broad coordinating function over all research in Zaire, while responsibility for carrying out activities devolves upon INERA and other agencies. The Department of Agriculture will be the GOZ executing agency. Program documents will be negotiated, reviewed, and signed by the Director-General and/or the Commissioner of State for the DOA. Within the DOA, the principal administrative unit will be the National Institute for Agricultural Research, through the office of its Delegate General. The Chief of the INERA Research Station at Mulungu will be operational manager of GOZ inputs to the project for the soils services and food legumes research components while the Delegate General of INERA at Yangambi will coordinate overall program and be charged with responsibility for the research assessment component.

The proposals and undertakings described in this project paper have been reviewed with the Department of Agriculture, INERA, IRS, and the Department of Plan, who are in agreement with the findings.

2. USAID: The USAID Food and Agriculture Officer or his delegate, is the Project Manager. He will assist the Director of USAID in program or policy discussions and negotiations concerning the project.

The USAID Controller will administer a Counterpart Trust Fund allocated by the Departments of Agriculture, Plan and Finance to the USAID for local support costs of the U.S. technicians working in the project.

3. GOZ Budget for Project Operations: A special account will be established at a local bank, as depository for Counterpart Funds and Regular Budget funds for the execution of this project. Disbursements from this fund will be authorized by the joint signature of the USAID Project Manager and the Director General of the DOA, or their representatives, as designated in writing.

4. Contracting Procedures: A single contract will be entered into with an institution or consulting firm, in all probability a U.S. University, to carry out the project. Normal AID procurement procedures will be followed in selecting the contractor. Part of the overall responsibilities of the contractor, particularly if it is a U.S. University, will include procurement of U.S. \$ cost commodities and administration of the participant trainees under the project. The contract will be administered by the USAID, as the Department of Agriculture has limited experience in administering such contracts for foreign technical assistance. Exception is taken to the host-country contracting principle.

5. The Implementation Plan is contained in the Project Performance Tracking Analysis, Annex H.

#### B. Evaluation Plan

During the project, there will be two separate and distinct foci of evaluation. One will be evaluation of the technical assistance and training in the agricultural research activities in legumes and soils carried out at the Mulungu INERA Station. The other evaluation focus will be of the process of analyzing the entire subsector of agricultural research. Annual evaluations will be complete by July 31, 1979 through 1982. The purpose of these annual evaluations will be to reexamine project strategy and to assess actual performance against planned performance as presented in the logical framework. Based on this reexamination, the evaluation team will identify corrective action. These corrective actions will be integrated into the project's annual work plans, which are prepared by the contract team and its Zairian counterparts.

The evaluation completed by July 31, 1979, will be especially important as the research assessment team will have completed its assessments of the agricultural research subsector and INERA complete with recommendations and a short run and long run implementation strategy. The evaluation in the following year to be completed by June 30, 1980, will be of even greater importance as it will be a measure of the GOZ commitment to rationalize research resources and perform relevant research in accordance with its needs. The evaluation will specifically focus on the GOZ's track record in implementing recommendations called for in the short run strategy. The second and following year evaluations will also consider the soils services and food legumes research components and

results to date of the participatory research model to be developed for the food legumes.

The evaluation team will consist of two GOZ representatives, the USAID project manager, the contractor Chief of Party, and the USAID evaluation officer. They will present their findings in draft to the USAID Mission Director and the Director General of the Department of Agriculture

## LIST OF ANNEXES

<u>Annex</u>	<u>Description</u>
A	Statutory Checklist
B	Mission Director's 611(e) Certification
C	PRP Guidance Cable
D	GOZ Request for Assistance
E	Logical Framework
F	Financial Tables and Equipment Lists
G	Economic Analysis Tables
H	PPT Network, Implementation Plan and AID Accrued Expenditures
I	Draft Project Agreement
J	Project Financial Implemen- tation Plan (PFIP)

STANDARD ITEM CHECKLIST

Listed below are statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by exclusion (as where certain uses of funds are permitted, but other uses not).

These items are arranged under the general headings of: (a) procurement, (b) construction, and (c) other restrictions.

(a) PROCUREMENT:

1. FAA Sec. 602: Are there arrangements to permit U.S. small business to participate equitably in the furnishing of goods and services financed? Yes.
2. FAA Sec. 604(a): Will all commodity procurement financed be from the U.S. except as otherwise determined by the President or under delegation from him? Yes.
3. FAA Sec. 604(d): If the cooperating country discriminates against U.S. marine insurance companies, will agreement require that marine insurance be placed in the U.S. on commodities financed? The agreement will contain appropriate provision.
4. FAA Sec. 604(d): If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? N.A.
5. FAA Sec. 600(a): Will U.S. Government excess personal property be utilized whenever practicable in lieu of the procurement of new items? Yes.
6. MMA Sec. 901(b): (a) Compliance will require that at least 50 percent of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately-owned U.S. flag commercial vessels to the extent that such vessels are available at fair and reasonable rates. The agreement will contain appropriate provision.
7. FAA Sec. 621: If technical assistance is financed, will such assistance be furnished to the fullest extent practicable as goods and professional and other services from private enterprise on a contract basis? If the facilities of other Federal agencies will be utilized, are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs? Yes.

(b) CONSTRUCTION:

1. FAA Sec. 601(d): If a capital (e.g., construction) project, are engineering and professional services of U.S. firms and their affiliates to be used to the maximum extent consistent with the national interest? N.A.
2. FAA Sec. 611(c): If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable? N.A.
3. FAA Sec. 620(k): If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed \$100 million? N.A.

(c) OTHER RESTRICTIONS:

1. FAA Sec. 201(d): If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter? N.A.
2. FAA Sec. 301(d): If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights? There is no such fund in this project.
3. FAA Sec. 620(h): Do arrangements preclude promoting or assisting the foreign aid projects or activities of Communist-Bloc countries, contrary to the best interests of the U.S.? Yes.
4. FAA Sec. 636(1): Is financing not permitted to be used, without waiver, for purchase, long-term lease, or exchange of motor vehicle manufactured outside the U.S. or guaranty of such transaction? Yes.
5. Will arrangements preclude use of financing:
  - a. FAA Sec. 114: to pay for performance of abortions or to motivate or coerce persons to practice abortions? Yes.
  - b. FAA Sec. 620(g): to compensate owners for expropriated nationalized property? Yes.
  - c. FAA Sec. 660: to finance police training or other law enforcement assistance, except for narcotics programs? Yes.
  - d. FAA Sec. 662: for CIA activities? Yes.

CHECKLIST (cont'd)

C.L. 3

- e. App. Sec. 107: to pay pensions, etc., for military personnel? Yes.
- f. App. Sec. 107: to pay U.N. assessments? Yes.
- g. App. Sec. 110: to carry out provisions of FAA Secs. 209(d) and 251(h)? (Transfer to multilateral organization for lending?) Yes.
- h. App. Sec. 501: to be used for publicity or propaganda purposes within U.S. not authorized by Congress? Yes.
- i. App. Sec. 504: to furnish petroleum fuels produced in the continental U.S. to Southeast Asia for use by non-U.S. nationals? N.A.

C.C.L. 1.

COUNTRY CHECKLIST

Listed below are, first, statutory criteria applicable to FAA funds, and then criteria applicable to individual Development Assistance and Security Supporting Assis

A. GENERAL CRITERIA FOR COUNTRY:

1. FAA Sec. 116: If assistance is to a government, has it engaged in consistent pattern of gross violations of internationally recognized human rights? If so, can it be demonstrated that such assistance will directly benefit the needy?  
No. The project aims at helping the needy by strengthening the major institutional structure dealing with that sector of the economy (agriculture) where one finds the majority of the needy. Through the GOZ's strong emphasis on agriculture, this increased capability of the GOZ to carry out its policy decisions should benefit small farmers.
2. FAA Sec. 481: Has it been determined that the government of the recipient country has failed to take adequate steps to prevent narcotics, drugs, and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. Government personnel or their dependents, or from entering the U.S. unlawfully?  
No.
3. FAA Sec. 620(a): Does recipient country furnish assistance to Cuba or fail to take appropriate steps to prevent ships or aircraft under its flag from carrying cargoes to or from Cuba?  
The Secretary of State has determined in accordance with Sec. 664 of the FAA, that waiver of the provisions of Sec. 620(a)(3) of the Act is in the national interest & therefore waived the provisions of that section. (See F.R. Doc. 75-24126 of Sept. 10, 1975.)

CHECKLIST (cont'd)

C.C.L. 2.

4. FAA Sec. 620(b): If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement? Yes.
5. FAA Sec. 620(c): If assistance is to a government, is the government liable as debtor or unconditional guarantor of any debt to a U.S. citizen for goods or services furnished or ordered where: (a) such citizen has exhausted available legal remedies and (b) debt is not denied or contested by such government? We are not aware of any such case.
6. FAA Sec. 620(e)(1): If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities. In 1974, Zaire nationalized US oil firms and in Sept. 1975, Zaire initiated moves to nationalize the pharmaceutical industry. However, as of Sept. 1976, Zaire has reversed its position and offered these same firms the opportunity to regain their lost businesses with 100% interest reduced to 60% share after about 5 years. This is a positive private step to attract back foreign private investors and will support domestic investment.
7. FAA Sec. 620(f): Is recipient country a Communist country? No.
8. FAA Sec. 620(1): Is recipient country in any way involved in: (a) subversion of, or military aggression against, the United States or any country receiving U.S. assistance, or (b) the planning of such subversion or aggression? No.

9. FAA Sec. 620(j): Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction, by mob action, of U.S. property? No.
10. FAA Sec. 620(l): If the country has failed to institute the investment guaranty program for the specific risks of expropriation, has the AID Administrator within the past year considered denying assistance to such government for this reason? Zaire has an Investment Guaranty with the U.S.
11. FAA Sec. 620(o), Fishermen's Protective Act, Sec. 5: If country has seized, or imposed any penalty or sanction against any U.S. fishing activities in international waters: Not applicable.
- a. Has any deduction required by Fishermen's Protective Act been made?
- b. Has complete denial of assistance been considered by AID Administrator?
12. FAA Sec. 620(q): Is the government of the recipient country in default on interest or principal of any AID loan to the country? Zaire has been in default for more than 6 months on several loans made under the FAA. The period of default on a few of these loans extends back to more than 9 months. On 5/24/76, the Administrator determined, in accordance with Section 620 (q) of the FAA and delegation of authority issued thereunder, that it is in the national interest of the U.S. to provide assistance to Zaire notwithstanding Zaire's failure to pay principal and interest on AID loans for a period of more than 6 months.
13. FAA Sec. 620(s): What percentage of country budget is for military expenditures? How much of foreign exchange resources is spent on military equipment? How much spent for the purchase of sophisticated weapons systems? (Consideration of these points is to be coordinated with the Bureau for Program and Policy Coordination, Reg'l Coordinators & Military Assistance Staff (PPC/RC). Based on Zaire's recurring budget figures, Zaire's 1976 military expenditure is expected to be about the same as 1975 which is significantly less than that of 1974. In FY76 Zaire concluded a \$19 million Foreign Military Sales Agreement with the U.S. No sophisticated weapons systems were purchased in 1975.

CHECKLIST (cont'd)

C.C.L. 4.

14. FAA Sec. 620(t): Has the country severed diplomatic relations with the U.S.? If so, have they resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?
- No.
15. FAA Sec. 620(u): What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget?
- Zaire's short-term arrearage is approximately \$60,000. It does not pose a problem with regard to provisions of Article 19 of the UN Charter.
16. FAA Sec. 666: Does the country object, on basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. there to carry out economic development program under the FAA?
- No.
17. FAA Sec. 901: Has the country denied its citizens the right or opportunity to emigrate.
- We are not aware of any case.

FUNDING CRITERIA FOR COUNTRY:

Development Assistance Country Criteria

FAA Sec. 102(c), (d): Have criteria been established, and taken into account, to assess commitment and progress of country in effectively involving the poor in development, on such indexes as: (a) small farm labor intensive agriculture, (b) reduced infant mortality, (c) population growth, (d) equality of income distribution, and (e) unemployment.

Yes.

FAA Sec. 201(b)(5), (7) & (8); Sec. 208; 211(a)(4), (7): Describe extent to which country is:

- a. Making appropriate effort to increase food production and improve means for food storage and distribution.
- b. Creating a favorable climate for foreign & domestic private enterprise and investment.

Considering the fact that the GOZ has made agriculture the priority of priorities, important steps have been made to increase food production along with raising the price received by farmers for most foods. Efforts have been made by the GOZ to improve the transportation system by making greater investments in this area while

CHECKLIST (cont'd)

- at the same time programs are presently being developed to improve marketing. See FAA 620(e) (1) above.
- c. Increasing the public's role in the development process.
- The GOZ is attempting to increase participation at the local level through the development of cooperative groups ("Brigades Agricoles") which would collaborate with local leaders in establishing production objectives and programs for meeting those objectives. Further, by increasing producers' prices, the GOZ has demonstrated a commitment to increasing rural participation in the development process. In this context, the GOZ/DOA was fully supportive of the heavy emphasis on local level participation in decision making contained in this project.
- d. (i) Allocating available budgetary resources to development.
- More than 74% of the GOZ's capital investment budget is allocated to social and economic development. 7% of the budget goes to health and education, 7% to agriculture, 20% to mining, 15% to transportation and communications, 10% to commerce and industry, and 31% to other projects under the Office of the Presidency covering all sectors.
- (ii) Diverting such resources for unnecessary military expenditures.
- (See FAA Sec. 620(s) above.)
- e. Since Independence, the GOZ has aggressively encouraged the growth of a Zairian participation in the private industrial and commercial sectors. Recent decisions regarding pricing and marketing of agriculture commodities are designed to provide incentive for participation of small subsistence farmers in the modern sector through appeals to entrepreneurial propensities.

CHECKLIST (cont'd)

- f. Otherwise responding to the vital economic, political and social concerns of its people, and demonstrating a clear determination to take effective self-help measures.
- The GOZ has become increasingly aware of the need for self-help measures to achieve greater economic independence, particularly in the agriculture sector. It is taking steps to increase agricultural production in both the long and the short run, including transportation improvement, marketing improvements, price incentives, etc.
3. FAA Secs. 201(b), 211(a): Is the country among the 20 countries in which development assistance loans may be made in this fiscal year, or among the 40 in which development assistance grants (other than for self-help projects) may be made?
- Yes.
4. FAA Sec. 115: Will country be furnished, in same fiscal year, either security supporting assistance, or Middle East peace funds? If so, is assistance for population programs, humanitarian aid through international organizations, or regional programs?
- No.

Listed below are, first, statutory criteria applicable generally to projects with FAI funds, and then project criteria applicable to individual fund sources: Development Assistance (with a sub-category for criteria applicable only to loans); and Security Supporting Assistance funds.

CRMC REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? IDENTIFY.  
HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

A. GENERAL CRITERIA FOR PROJECT.

1. App. Sec. 113. Describe how the Committees on Appropriations of the Senate and House have been or will be notified concerning the project. A Congressional Notification will be sent.
2. FAI Sec. 611(a)(1). Prior to obligation in excess of \$100,000, will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance? Yes.
3. FAI Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance? Yes.
4. FAI Sec. 611(b); App. Sec. 101. If for water or water-related land resource construction, is there a benefit-cost computation made, insofar as practicable, in accordance with the procedures set forth in the Memorandum of the President dated May 15, 1962? N.A.
5. FAI Sec. 611(d). If loan is for capital assistance, (e.g., construction) project, and all U.S. assistance for it will exceed \$1 million, has Mission Director certified the country's capability effectively to maintain and utilize the project? Yes.

6. FAA Secs. 209, 619. Is project susceptible of execution as part of regional or multilateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. If assistance is for newly independent country, is it furnished through multilateral organizations or plans to the maximum extent appropriate.
7. FAA Sec. 601(a). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperative, credit unions and savings and loans association; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.
8. FAA Sec. 601(b). Information and conclusion on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).
9. FAA Sec. 612(b); Sec. 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services.
- FAA Sec. 612(d). Does the U.S. own excess foreign currency and if so what arrangements have been made for its release?
- FAA Sec. 640C. Will grant be made to loan recipient to pay all or any portion of such differential as may exist between U.S. and foreign exchange rates?

FUNDING CRITERIA FOR PROJECT

(a) Development Assistance Project Criteria

1. FAA Sec. 102(c); Sec. 111. Extent to which activity will effectively involve the poor in development, by extending access to economy at local level, increasing labor intensive production, spreading investment out from cities to small towns and rural areas; extent to which it will help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life. This project will provide legume production packages and recommend optimal land resource use strategies for food production. The primary client group for these research results is the rural subsistence farmer in Zaire. Farmers will benefit by having improved production packages defined, which are feasible in their milieu of labor-intensive agriculture.
  
2. FAA Secs. 103, 103A, 104, 105, 106, 107. Is assistance being made available:
  - a. for agriculture, rural development or nutrition; if so, extent to which activity is specifically designed to increase productivity and income of rural poor; if for agricultural research, is full account taken of needs of small farmers; Research activities in this project are designed to take full account of small farmers' needs.
  
  - b. for population planning or health; if so, extent to which activity extends low cost, integrated delivery systems to provide health and family planning services, especially to rural areas and poor; N.A
  
  - c. for education, public administration, or human resources development; if so, extent to which activity strengthens non-formal education, makes formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in development; N.A
  
  - d. for technical assistance, energy, research, reconstruction, and selected development problems, if so, extent activity is: Yes
  
- (1) technical cooperation and development, especially with U.S. private and voluntary, or regional and international development organizations; N

- (2) to help alleviate energy problem; No
- (3) research into, and evaluation of, economic development processes and techniques;
- (4) reconstruction after natural or man-made disaster; No
- (5) for special development problem, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance; No
- (6) for programs of urban development, especially small labor-intensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development. No

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by grants for coordinated private effort to develop and disseminate intermediate technologies appropriate for developing countries. No

201 Sec. 110(a); Sec. 203(e). Is the recipient country willing to contribute funds to the project, and in what manner has or will it provide assurances that it will provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)?

Yes. The project agreements will require a GOZ contribution for an excess of 25% of the cost of the project.

201 Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing? N.A.

201 Sec. 207; Sec. 113. Extent to which assistance reflects appropriate emphasis on: (a) encouraging development of democratic, economic, political, and social institutions; (b) self-help in meeting the country's food needs; (c) improving availability of trained manpower in the country; (d) programs designed to meet the country's health needs; (e) other important areas of economic, political, and social development, including industry; free labor unions, cooperatives, and Voluntary Agencies; transportation and communication; planning and public administration; urban development, and modernization of existing laws; or (f) integrating work into the recipient country's national economy.

- a) The project encourages development of economic and social institutions.
- b) It will increase domestic food production.
- c) It will provide about 20 trained specialists to Zaire, in fields underrepresented presently.
- d) N.A.
- e) N.A.
- f) Project outputs designed to aid Zaire's farmers; over 60% of farm activity carried out by women.

• FAA Sec. 201(a). Extent to which the assistance will contribute to objective of assuring maximum participation in the task of economic development on the part of the people of the country, through the encouragement of democratic, private and local governmental institutions.

N.A.

FAA Sec. 201(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civic education and training in skills required for effective participation in governmental and political processes essential to self-government.

The project responds to the GOZ's desire to use the country's research and training facilities, such as INERA and UNAZA.

FAA Sec. 201(b)(1); Sec. 211(a)(1). In what ways does the activity give reasonable promise of contributing to the development: of economic resources, or to the increase of productive capacities; or of educational or other institutions directed toward social progress?

See Part II of PP.

FAA Sec. 201(b)(2); Sec. 201(a); Sec. 211(a)(3). Information and conclusion on an activity's economic and technical soundness.

See Part III of PP.

FAA Sec. 201(b)(4); Sec. 211(a)(2). Information and conclusion on activity's relationship to and consistency with, other development activities, and its contribution to realizable

The project is consistent with DAP objectives within the agricultural sector.

11. FAA Sec. 201 (b)(9); Sec. 211(a)(8). Information and conclusion of whether the activity will contribute to the achievement of self-sustaining growth. Yes
12. FAA Sec. 201(b)(6); Sec. 211(a)(5), (6). Information and conclusion on possible effects of the assistance on U.S. economy, with special reference to areas of substantial labor surplus, and extent to which U.S. commodities and assistance are furnished in a manner consistent with improving or safeguarding the U.S. balance of payments position. The project will have no discernable impact on the U.S. economy.
13. FAA Sec. 653(b). Is assistance within country or international organization allocation for fiscal year reported to Congress (or not more than \$1 million over that figure plus 10%)? Yes

Certification Pursuant to  
Section 611(e) of the  
Foreign Assistance Act  
As Amended

I, Fermino J. Spencer, the Principal Officer of the Agency for International Development in Zaire, do herewith certify that, in my judgment, Zaire has both the financial capability and human resources to maintain and utilize effectively goods and services procured under the assistance project entitled INERA Support.

This judgment is based upon the record of implementation of AID-financed projects in Zaire and the results of the consultations undertaken during intensive review of this new project.

---

Fermino J. Spencer  
Director, USAID/Zaire

Date:



REPUBLIQUE DU ZAIRE



F R A

Annex D

Kinshasa, le 04 AVR. 1977

B. P. N° Tel. N°

(1) N° 50/ 001008 /DA/77

DEPARTEMENT DE L'AGRICULTURE  
MINISTRE DE  
DIRECTION GENERALE.  
Cabinet du Ministre

APR 04 1977

V/Ré. :

N/Ré. :

Objet :

Aspects :

USAID/ZAIRE

ACTION	INFO
DIR	
PR	✓
CO	✓
CP	
PEA	✓
CAAO	

Monsieur Fermino SPENCER  
Directeur USAID  
B.P. 8.599

KINSHASA.

Monsieur le Directeur,

Comme vous le savez certainement, le Zaïre ~~est~~ actuellement face à de sérieux problèmes de production de denrées alimentaires, surtout de production du maïs et de légumes, et des besoins alimentaires connexes.

Le Conseil Exécutif accorde une attention accrue à ces deux domaines, et désirerait que l'assistance de l'USAID y soit associée. Des besoins prioritaires additionnels ont été identifiés dans la recherche agricole afin de financer les programmes de production de denrées alimentaires en cours et de parer aux déficiences alimentaires. L'assistance de l'USAID est requise aussi afin de faire face à ces besoins prioritaires. Ces besoins comprennent le développement d'un service pédologique au Zaïre, et une assistance supplémentaire pour le travail de recherche en légumineuses actuellement entrepris par l'INERA.

Un service de pédologie est nécessaire pour:

- 1) faire l'analyse des sols, surveiller les essais de fertilité des sols et développer des systèmes d'administration des récoltes et des sols pour les programmes essentiels de production de denrées alimentaires; et

- 2) évaluer le potentiel de production des diverses régions, sites et groupe des sols.

La recherche sur les légumineuses est nécessaire pour :

- 1) assister l'INERA dans son travail d'adaptation et d'application à la station de recherche de Mulungu et Gandajika comprenant le développement des procédures de production pour les légumes.

Une assistance supplémentaire est requise pour réaliser une évaluation et élaborer des recommandations pratiques pour le sous-secteur de recherches agricoles et pour l'INERA, menant à :

- 1) une structure générale de recherches coordonnées dans les domaines prioritaires ;
- 2) le rôle et les domaines de recherches prioritaires de l'INERA clairement définies;
- 3) l'utilisation des ressources de recherches de l'INERA portée au maximum au moyen d'une location efficace des installations, une répartition des membres du personnel, une formulation et une évaluation des projets de recherches.

L'assistance proposée dans cette demande comprend :

l'assistance technique, la formation des participants au niveau universitaire et post-universitaire, la formation sur le tas; les équipements de recherches sur les légumineuses et de laboratoires de pédologie, et les fournitures. Le montant total de l'assistance s'élève à 2,540 million pendant les quatre années de durée du projet.

Le Conseil Exécutif fournira, à partir de son budget et des fonds de contrepartie, une aide pour les conseillers techniques, les stagiaires participants, les salaires des homologues, des stagiaires et l'aide financière directe pour le personnel comprenant les secrétaires, les chauffeurs et autre assistance administrative, ainsi que les frais en monnaie locale relatifs à l'expansion du laboratoire de pédologie de Mulungu, la rénovation des maisons d'habitation pour les conseillers, l'essence et les fournitures de bureau. La contribution du Conseil Exécutif est estimée être équivalente à \$ 1,140 million pendant les quatre années du projet.

Veuillez agréer, Monsieur le Directeur, l'assurance de ma considération distinguée.



LE DIRECTEUR GENERAL

MUKENDI MBUYI TSHINGOMA.

**PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK**

Annex E

Life of Project:  
From FY 1978 to FY 1982  
Total U. S. Funding \$1,350,000  
Date Prepared: March, 1977

Project Title & Number: INERA Support

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTION:
<p>Program or Sector Goal: The broader objective to which this project contributes:</p> <p>1. Increase the level, availability, and the nutritional quality of food production for the low income majority in Zaire.</p>	<p>Measures of Goal Achievement:</p> <p>1. Annual increase in availability of food legumes, first in the participatory research model areas and after in other areas of the country.</p> <p>2. "Project clientele" using soils services.</p> <p>3. Acceptance and adoption, within budgetary, physical, and human resources constraints, of assessment recommendations.</p>	<p>1. GOZ Department of Agriculture statistics and analysis as assisted by USAID/PASA team.</p> <p>2. INERA Soils Service user statistics</p> <p>3. Project evaluation.</p>	<p>Assumptions for achieving goal targets:</p> <p>1. GOZ will maintain prices for agricultural commodities at a level that will encourage farmers to adopt modern practices and purchase required inputs.</p> <p>2. This project will be accompanied by production and extension activities related to food crops.</p> <p>3. GOZ will continue to place a high priority on rationalizing agriculture education and research</p>
<p>Project Purpose: To assist with the development of the institutional capability of INERA to: (a) develop test production packages for food legumes, using a participatory research model; (b) provide soils analysis and classification information to those interested in advancing agricultural production; (c) provide potentials and limitations of soils in Zaire; and (d) allocate its resources in an optimal manner</p>	<p>Conditions that will indicate purpose has been achieved: End of project status.</p> <p>1. By project year 4, INERA will have a small trained field research team dealing with legume production, conducting adaptive research, in a participatory manner.</p> <p>2. INERA will also then have functioning soil fertility services to support the planned advancement of its food crops.</p> <p>3. INERA role in ag. research sub-sector clearly defined.</p>	<p>External Evaluation (PAR)</p> <p>1. Quality evaluation of legume production packages and research model.</p> <p>2. Quality evaluation of acceptability of developed cultural practices.</p> <p>3. Quality and Quantity evaluation of on-farm demonstrations of production packages.</p> <p>4. No. of soils analyses and field response trials.</p> <p>5. Evaluation of scientific expertise and out-reach capability to serve clients.</p>	<p>Assumptions for achieving purpose:</p> <p>1. Qualified U.S. technicians can be placed in the project early.</p> <p>2. Qualified Zairian participants can be identified, and trained as scheduled.</p> <p>3. Effective collaboration between INERA and its clients.</p>
<p>Outputs: 1. U.S. trained Ag. Scientist (soils, agronomy).</p> <p>2. Para-professional soils surveyors, lab technicians, field crops technicians trained by U.S. advisers.</p> <p>3. Operating soils lab at Mulungu.</p> <p>4. Consulting services re soils available to clients by 3rd year.</p> <p>5. Operating soils classification service</p> <p>6. Food legume packages developed</p> <p>7. Agriculture research sub-sector assessment completed.</p>	<p>Magnitude of Outputs:</p> <p>1. Eleven, M.S. level.</p> <p>2. Thirty, OJT</p> <p>3. 4,000 soils samples analyzed per year, beginning 3rd year.</p> <p>4. Servicing all major food production projects in the 4 southeastern regions of Zaire by the end of the 4th year.</p> <p>5. Mapping of experimental sites, project areas, etc.</p> <p>6. M.A.</p>		<p>Assumptions for achieving outputs:</p> <p>1. Equipment and supplies arrive as scheduled.</p> <p>2. Adequate local currency support.</p> <p>3. INERA can allocate personnel capable of conducting research.</p>
<p>Inputs: U.S. Contribution</p> <p>27+ Person years technical assistance</p> <ul style="list-style-type: none"> <li>- 12 person years in soils services long-term.</li> <li>- 7 to 8 person years in legumes research long-term.</li> <li>- 4 to 5 person years in research and general manage, long-term</li> <li>- 3 1/3 person years short-term consultants</li> </ul> <p>* See continuation sheet.</p>	<p>Implementation Target (Type and Quantity)</p>		<p>Assumptions for providing inputs:</p> <p>1. French speaking U.S. professionals will be available.</p> <p>2. Zairian participants will be available.</p> <p>3. Adequate GOZ budget and sources of counterpart funding.</p> <p>4. PP approval.</p>

PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK  
CONTINUATION

NARRATIVE SUMMARY

Inputs (continued): U.S. Contribution

- Soils Laboratory and Survey Equipment, Supplies
- Legumes Research Equipment, Supplies
- Vehicles for Soils Services, legume research and research assessment teams.

GOZ Contribution:

- Salaries for counterparts and participants
- Remodeling of facilities
- Secretaries, drivers and expeditor
- Support financing for advisers and participants
- Fuel, lube, and miscellaneous supplies

## FINANCIAL TABLES AND EQUIPMENT LISTS

INERA SUPPORT PROJECT  
INPUTS  
U.S. \$ COSTS

Technical Assistance Costs

Technical assistance costs are estimated on the basis of person years/months of technical assistance, long and short term. Costs include the following:

	<u>Long Term</u> <u>\$/Person Year</u>	<u>Short Term</u> <u>\$/Person Month</u>
Salary	\$30,000	\$ 2,500
Per Diem		1,800
Differential	6,000	
Overhead (120% of Salary)	36,000	3,000
Education, Int. Travel, To & From Post, R&R, Home Leave, etc.	8,000	700
	-----	-----
TOTAL/PERSON YEAR/MONTH	\$80,000	\$ 8,000
PERSON YEARS/MONTHS	----- 24	----- 40
TOTAL COST	<u>\$1,920,000</u>	<u>\$320,000</u>

Participant Training Costs

Participant training costs are based on a per month cost in the U.S. of \$950, plus a set aside of 20% of total participant program cost of \$50,000 for a University Contractor to handle the administration, counseling, etc., of participants, and an additional fund of \$22,000 for English language training. ( $\$950 \times 24 \text{ mo} \times 11 \text{ participants} + \$50,000 + \$22,000 = \$322,800$ )

Commodity Costs

Commodity costs are based on individual estimates on an item by item basis. The following pages of this annex show the breakdown. Equipment requirements are summarized as follows.

	FISCAL YEAR				TOTAL
	78	79	80	81	
Agricultural Equipment	\$ 30,000	\$20,800	\$ 1,000	\$ 1,200	\$ 53,000
Transportation Equipment	59,100	10,000	37,000		106,100
Maintenance and Repair Equip.	9,200		600		9,800
Seed & Fertilizer	2,000	3,000	5,000	5,000	15,000
Office Equipment	9,900				9,900
Pedology Lab Equipment	24,000	16,000	5,500	5,500	51,000
Soil Survey Equipment	26,000	24,000	14,000	14,000	78,000
Legume Lab and Field Equipment	4,000	2,000	1,000	1,000	8,000
Household Furniture	70,000				70,000
Sub-Total	\$234,200	\$75,800	\$64,100	\$26,700	\$400,800
5% *	<u>12,100</u>	<u>3,900</u>	<u>3,200</u>	<u>1,300</u>	<u>20,500</u>
TOTAL	<u>\$246,300</u>	<u>\$79,700</u>	<u>\$67,300</u>	<u>\$28,000</u>	<u>\$421,300</u>

\* It is assumed that a sole contractor or institution in the United States will be awarded the contract for technical assistance; therefore, it is proposed that the University carry out the purchase of equipment, allowing a 5% surcharge for administration.

1. Agricultural Equipment and Spare Parts

ITEM	FISCAL YEAR				TOTAL
	78	79	80	81	
2 - John Deere Model 2040 Tractors	\$ 14,000	\$ 14,100			\$ 28,100
2 - John Deere 3-botton disk plows, mtd.	1,900	2,000			3,900
2 - John Deere one-way disk harrows, mtd.	2,200	2,300			4,500
2 - John Deere mtd. 4-section spike-tooth harrows	700	800			1,500
2 - Swanson experimental seeders	600	600			1,200
2 - Test plot threshers	3,700				3,700
2 - Gandy fertilizer applicators	1,300				1,300
4 - BNB knapsack sprayers	700				700
2 - Engine driven port. air comp. for field work	1,200				1,200
8 - wheel hoes with attachments	600				600
Spare parts for trac.	2,000	500	\$ 500	\$ 600	3,600
Spare parts for mach.	<u>1,100</u>	<u>500</u>	<u>500</u>	<u>600</u>	<u>2,700</u>
TOTALS	<u>\$ 30,000</u>	<u>\$ 20,800</u>	<u>\$ 1,000</u>	<u>\$ 1,200</u>	<u>\$ 53,000</u>

2. Transportation Equipment and Spare Parts

<u>ITEM</u>	<u>FISCAL YEAR</u>			<u>TOTAL</u>
	<u>78</u>	<u>79</u>	<u>80</u>	
8 - Chevrolet Blazers, 4-WD	\$ 50,000	\$ 10,000	\$ 20,000	\$ 80,000
1 - 1/4 ton 2-wheel trailer	1,100			1,100
1 - Chevrolet 9-pass Suburban 2-WD			9,000	9,000
Spare parts for vehicles	8,000		8,000	16,000
<b>TOTALS</b>	<u>\$ 59,100</u>	<u>\$ 10,000</u>	<u>\$ 37,000</u>	<u>\$106,100</u>

3. Maintenance and Repair Facilities

<u>ITEM</u>	<u>FISCAL YEAR</u>			<u>TOTAL</u>
	<u>78</u>	<u>79</u>	<u>80</u>	
200 amp. DC welder, 16 hp engine driven, with 5 KVA auxillary 115/230 v., 50 Hz. AC power	\$ 3,600			\$ 3,600
Drills, drill stands, and acc.	600			600
Bench grinders	700			700
Vises	600			600
Special vehicle & tractor serv. equip.	900			900
Wrenches & general hand tools	2,000			2,000
Mobile tool cabinets and tote boxes	200			200

3. Maintenance and Repair Facilities (continued)

<u>ITEM</u>	FISCAL YEAR				<u>TOTAL</u>
	78	79	80	81	
Supplies, as weld. \$ electrodes, bolts, stock metal, etc.	600		600		\$ 1,200
<b>TOTALS</b>	<u>\$ 9,200</u>		<u>\$ 600</u>		<u>\$ 9,800</u>

4. Seed and Fertilizer

<u>ITEM</u>	FISCAL YEAR				<u>TOTAL</u>
	78	79	80	81	
Seed & Fertilizer	\$ 2,000	\$ 3,000	\$ 5,000	\$ 5,000	\$ 15,000

5. Office Equipment

<u>ITEM</u>	FISCAL YEAR				<u>TOTAL</u>
	78	79	80	81	
6 Desks	\$ 1,200				\$ 1,200
3 Secretary Desks	500				500
6 Desk Chairs	600				600
6 Occas. Chairs	300				300
3 Typewriters	1,300				1,300
3 Typewriter tables	100				100
3 Typist Chairs	200				200
9 4-dr. filing cabinets	1,200				1,200
6 Bookcases	900				900
3 Metal Cabinets	<u>300</u>				<u>300</u>
Sub-Total	\$ 6,600				\$ 6,600
Contingency	<u>3,300</u>				<u>3,300</u>
<b>TOTAL</b>	<u>\$ 9,900</u>				<u>\$ 9,900</u>

<u>ITEM</u>	<u>FISCAL YEAR</u>				<u>TOTAL</u>
	<u>78</u>	<u>79</u>	<u>80</u>	<u>81</u>	
Laboratory equipment for the following analyses:					
Particle-size analysis					
Moisture content at 1/3 and 15 atmospheric tension					
Bulk density					
Free carbonates					
Organic carbon and nitrogen					
Cation exchange capacity					
Exchangeable cations - Ca, Mg, K, and Na					
Exchangeable Al					
pH					
Conductivity					
Fe 2 <sup>0</sup> 3					
Total K					
Others as needed					
Sub-Total for Lab Equipment	\$ 9,600	\$13,000	\$ 3,000	\$ 3,000	\$28,600
General Laboratory Apparatus such as:					
laboratory carts, aliquot dispensers, bottle rack washer, beakers, bottles, brushes, burets, clamps, cork, borer, graduated cylinders, filter paper, flasks, filter paper, funnels, glass tubing, glass rod, label tape, mortar and pestle, pupets, rubber stoppers, tubing, spatulas, thermometers, breakers, etc.					
Sub-Total for General Lab Apparatus	4,000	1,000	1,000	1,000	7,000
Chemicals and reagents	1,000	1,000	1,000	1,000	4,000
Plus 30% Transportation	7,400				7,400
Scientific Journals and Books	2,000	1,000	500	500	4,000
<b>TOTAL</b>	<u>\$24,000</u>	<u>\$16,000</u>	<u>\$ 5,500</u>	<u>\$ 5,500</u>	<u>\$51,000</u>

7. Soil Survey Equipment

ITEM	FISCAL YEAR				TOTAL
	78	79	80	81	
Cartographic Equipment					
Portable stereoscope	\$ 7,000				
Aerial photographs and base maps	6,000				
Drafting equipment and supplies	8,000				
Total cartographic equipment					\$21,000
Field equipment such as Munsell color books, Abney levels, soil angers and probes, hand stereoscopes, map boards, field pH kits, soil sample bags, measuring tapes, spades, shovels, picks, axes, cutlasses, etc., camping equipment	5,000	\$ 5,000			10,000
New Equipment		11,000	\$ 6,000	\$ 6,000	23,000
Supplies and Replacement Equipment		8,000	8,000	8,000	24,000
TOTAL	<u>\$26,000</u>	<u>\$24,000</u>	<u>\$14,000</u>	<u>\$14,000</u>	<u>\$78,000</u>

8. Legume Lab and Field Equipment

To include, but not limited to germinators, scales, moisture testers, sacks, pollinating equipment	\$ 4,000	\$ 2,000	1,000	\$ 1,000	\$ 8,000
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9. Household Furniture

7 sets for advisers at \$10,000	\$70,000				\$70,000
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SUGGESTED LIST OF SPARE PARTS TO BE PURCHASED FOR VEHICLES

Two types of vehicles are proposed for the project. They are Chevrolet Blazers, 4-wheel drive; and Chevrolet Suburban 9 passenger carryalls, 2-wheel drive. It is proposed to replace these vehicles at about midpoint in the 4-year time span, as necessary. The following items should be ordered with the original purchase of vehicles:

- Tires - 6 each for each size required, per vehicle
- Batteries - 6 Delco permanently sealed
- Oil Filters - 30
- Spark Plugs - 96 of each type required
- 2 Complete replacement electronic ignition systems
- 2 Sets Chrysler electronic ignition test equipment with manuals translated into French
- Radiator hoses - 6 upper, 6 lower for each type vehicle
- Fan belts - 6 of each type required
- Air cleaner elements - 40 of each type required
- Fuel filters - 30 of each type required
- Shock absorbers - 10 each front, heavy duty; 10 each rear, heavy duty
- Springs - one set complete for each type vehicle - left and right front, left and right rear
- Water pumps - 2 each type required
- Fuel pumps - 2 of each type required
- Front wheel bearings - complete set, left and right, inner and outer with races for each type vehicle.
- Brake shoes - 4 sets of each type vehicle, left and right front, left and right rear.
- Carburetors - 2 rebuilt for each type vehicle
- Alternators - 4 rebuilt for each type vehicle

**Suggested List of Spare Parts to be Purchased  
For Vehicles (continued)**

- Sealed beam headlights - 10 for each type vehicle
- Bulbs for tail light, marker and turn signal - 10 of each type required
- Valve cover and head gaskets - 2 each for each type vehicle
- Fuses - six of each type required
- Wheel cylinders - 2 each left and right front, left and right rear, for each type vehicle
- Universal joints - 4 each for front and rear of driveshaft, for each type vehicle
- Seals - 4 rear end seals, each type vehicle
  - 4 each left and right rear axle for each type vehicle
  - 4 each for front of transfer case, for each type vehicle
  - 4 each front end seals for 4 WHD vehicles
  - 4 each front axle seals for 4 WHD vehicles
- Exhaust system - 4 each exhaust pipe for each type vehicle
  - 4 each tail pipes for each type vehicle
  - 4 each mufflers for each type vehicle
- Bumpers - 1 front and 1 rear for each type vehicle
- Windshield - 1 for each type vehicle
- Tubes - 24 each as appropriate to the tires
- Radiator - 1 for each type vehicle
- Spare wheels - 5 for each type vehicle
- Transmission - 1 for each type vehicle
- Differential - 1 rear complete for each type vehicle
  - 1 front complete for each type 4 WHD vehicles

INERA SUPPORT PROJECT  
INPUTS  
LOCAL CURRENCY COSTS

Technical Assistance - Support Costs

Technical assistance support costs were estimated on the basis of a person year/month of long term and short term technical assistance. Costs include the following:

	<u>LONG TERM</u> <u>\$/PERSON YEAR</u>	<u>PERSON</u> <u>YEARS</u>	<u>TOTAL</u>
INERA value of housing and utilities	\$ 7,600		
Cost of living allowance	2,600		
Consultation trips to Kinshasa	3,600		
In country travel and miscellaneous *	1,200		
TOTAL	\$15,000	24	\$360,000

\* Allowance of \$500/month for miscellaneous expenses and in country travel made for short term consultants equaling \$20,000.

Participant Training - Support Costs

Participant training support costs represent invitational travel to States plus miscellaneous expenses estimated at a total of \$3,000 per participant training year. Cost per year:

<u>ITEM</u>	<u>FISCAL YEAR</u>				<u>TOTAL</u>
	<u>79</u>	<u>80</u>	<u>81</u>	<u>82</u>	
# of Participants in School	5	9	6	2	22
Participant Year Cost	\$ 3,000	\$ 3,000	\$3,000	\$3,000	\$ 3,000
TOTAL	<u>\$15,000</u>	<u>\$27,000</u>	<u>\$18,000</u>	<u>\$6,000</u>	<u>\$66,000</u>

Salaries

Salaries are estimated from salary scales supplied by INERA but exclude in kind benefits such as housing, utilities, transportation, etc. Salaries were applied only against INERA personnel being trained formally or informally, under the program, and agricultural economist, rural sociologist, and drivers, clerk-typist and expeditors directly chargeable to the project.

Salaries per year:

<u>DESCRIPTION</u>	<u>PERSON YEARS</u>					<u>TOTAL</u>
	<u>78</u>	<u>79</u>	<u>80</u>	<u>81</u>	<u>82</u>	
Directors (counterpart to research assessment)	1	2	1			4
Participants (including those not selected for academy training)	4	12	20	24	12	72
Ag. Economist and Sociologist	1.5	3	3	3	1.5	12
Expeditor	0.5	1	1	1	0.5	4
Technicians (Soil, Lab, Field Crop)	2	7	10	12	6	37
Clerk Typists	1.5		2	2	1	10.5
Drivers	<u>2</u>	<u>6</u>	<u>3</u>	<u>3</u>	<u>1.5</u>	<u>15.5</u>
Total Person Yrs.	12.5	35	40	45	22.5	155
TOTAL SALARY	<u>\$49,000</u>	<u>\$131,000</u>	<u>\$172,000</u>	<u>\$188,000</u>	<u>\$96,000</u>	<u>\$636,000</u>

Other - Support Costs

Other costs include reconditioning of eight houses for technical advisers at \$7,500/house or \$60,000; \$50,000 to remodel and expand soils lab at Mulungu, petroleum fuel and lubricants and miscellaneous office supplies.

Cost per year:

<u>DESCRIPTION</u>	<u>FISCAL YEAR</u>					<u>TOTAL</u>
	<u>78</u>	<u>79</u>	<u>80</u>	<u>81</u>	<u>82</u>	
Recondition Houses	\$ 60,000					\$ 60,000
Mulungu Soils Lab	50,000					50,000
Petroleum and Lubricants	6,400	\$13,500	\$13,400	\$13,700	\$7,400	54,400
Miscellaneous, Ext. Training, Office Supplies	8,000	5,000	4,000	4,000		21,000
<b>TOTAL</b>	<u>\$124,400</u>	<u>\$18,500</u>	<u>\$17,400</u>	<u>\$17,700</u>	<u>\$7,400</u>	<u>\$185,400</u>

INERA SUPPORT PROPOSAL  
RATE OF RETURN  
CALCULATION  
\$000's

<u>Year</u>	<u>No. Shaba 1/ Net Benefits</u>	<u>INERA Soils 2/ Services Costs</u>	<u>No. Shaba New Net Benefits</u>	<u>15% Disc. Factor</u>	<u>P.V. of New Net Benefits</u>
1	(6,154)	----	(6,154)	.870	(5,354)
2	(1,930)	(330)	(2,260)	.756	(1,708)
3	(1,412)	(501)	(1,913)	.658	(1,259)
4	( 116)	(559)	( 675)	.572	( 386)
5	2,044	(517)	1,527	.497	759
6	3,801	(352)	3,449	.432	1,490
7	4,792	(154)	4,638	.376	1,744
8	5,652	(154)	5,498	.327	1,798
9	5,973	(154)	5,819	.284	1,653
10	6,298	(154)	6,144	.247	<u>1,518</u>
					<u>255</u>

1/ From No. Shaba PP, pg. 242

2/ From financial analysis section; no additional costs for INERA Soils Service in first year of No. Shaba Project due to different start up dates.

INERA SUPPORT PROPOSAL  
ECONOMIC ANALYSIS  
\$000's

	YEAR													
	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Research Inv.	642	1072	1077	924	615									
Recurring Costs							238	238	238	238	238	238	238	238
\$ Fertilizer Needs							28,800	←-----→						28,800
Value of Res. Inv. Yr. 3				4428										
Value of Recur. Costs Yr. 3				703										
<b>TOTAL</b>				5131										
Capital Recovery Factor (CRF) 10 Yrs. 15%							1021	←-----→						1021
CRF as % of \$ Fertilizer Needs							3.6%	←-----→						3.6%

COUNTRY	PROJECT NO.	PROJECT TITLE	DATE	<input checked="" type="checkbox"/> ORIGINAL <input type="checkbox"/> REVISION # _____	APPROVED
ZAIRE	660-064	INERA Support	4/7/77		

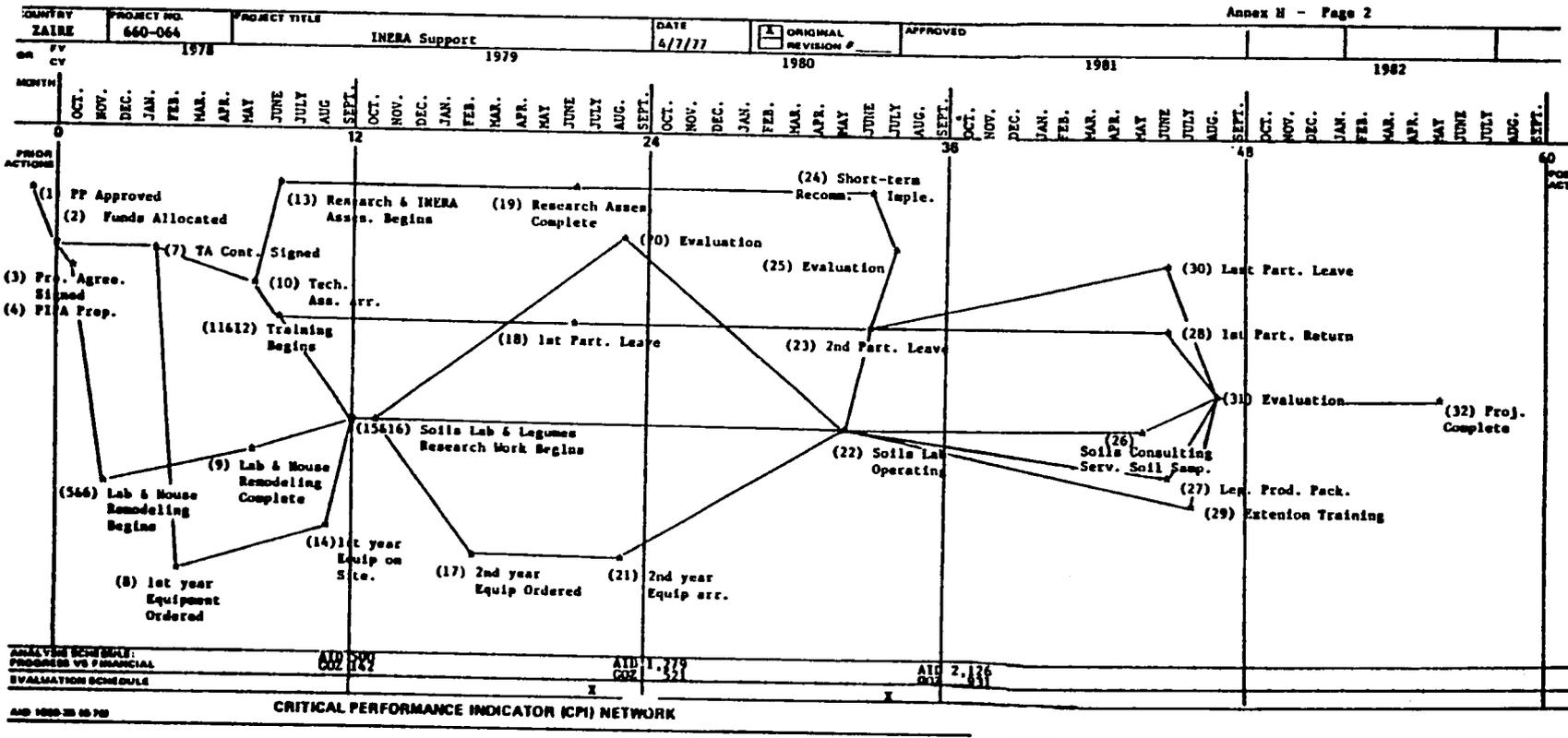
## PROJECT PURPOSE (FROM PRP FACESHEET)

To assist with the development of the institutional capability of INERA to: (a) develop test production packages for food legumes, using a participatory research model; (b) provide soils analysis and classification information to those interested in advancing agricultural production; (c) provide potentials and limitations of soils in Zaire; and (d) allocate its resources in an optimal manner.

<u>CPI DESCRIPTION</u>	<u>DATE</u>
(1) PP Approved	6/30/77
(2) Mission Receives Allotment	10/01/77
(3) Project Agreement Signed	10/15/77
(4) PIPA Prepared - Contractors' Services	10/15/77
(5) Remodeling of Mulungu Lab Started	11/30/77
(6) Renovation of Houses Started	11/30/77
(7) Technical Assistance Contracts Signed	1/31/78
(8) First Year Equipment Ordered	2/28/78
(9) Lab and House Remodeling Completed	5/31/78
(10) Technical Assistance Team Arrives	5/31/78
(11) Soils Training Short Course Begins	6/30/78
(12) Data Collection Training Begins	6/30/78
(13) Research and INERA Assessments Begin	6/30/78
(14) First Year Equipment All On Site	8/31/78
(15) Soils Lab Work Begins	9/30/78
(16) Legumes Variety Testing and Cultural Experiments Begin	10/31/78
(17) Order Second Year Equipment	2/28/79
(18) First Participants Leave	6/30/79
(19) Completion of Research and INERA Assessments	6/30/79
(20) Evaluation	7/31/79
(21) Arrival Second Year Equipment	8/31/79
(22) Soils Lab Operating	5/31/80
(23) Second Participants Leave	6/30/80
(24) Implementation of Short-Term Recommendations Complete	6/30/80
(25) Evaluation	7/31/80

CPI DESCRIPTION

<u>CPI DESCRIPTION</u>	<u>DATE</u>
(26) Soils Consulting Services and Classification Work Begin, Soils Lab 4000 Samples a Year	5/31/81
(27) Legume Production Package Developed	6/30/81
(28) First Participants Return	6/30/81
(29) Extension Training Begins	7/31/81
(30) Last Participants Leave	6/30/81
(31) Evaluation	8/31/81
(32) Project Complete	5/31/82



P.P. Annex I  
AID Project Number 660-0064

PROJECT GRANT AGREEMENT  
between  
THE REPUBLIC OF ZAIRE  
and the  
UNITED STATES OF AMERICA  
for  
ASSISTANCE TO THE INERA

DATED: \_\_\_\_\_

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AID Project Number 660-0064

Project Grant Agreement

Dated. , 1977

Between The Republic of Zaire (Grantee)

and

The United States of America, acting through

The Agency for International Development (AID)

Article 1: The Agreement

The purpose of this agreement is to set out the understandings of the parties named above ("Parties") with respect to the undertakings by the Grantee of the Project described below, and with respect to the financing of the Project by the Parties.

Article 2: The Project

Section 2.1. Definition of the Project: The project, which is further described in Annex 1, consists of assistance to the INERA (National Institute for Agricultural Research) to develop a capability in the following areas:

1. development of 'production packages' for food legumes through applied and adaptive research undertakings;
2. establishment of a soils analysis laboratory and a land classification unit to provide soils analysis and land classification services to producers of food and other crops in Zaire;

3. assistance to the Directorate of INERA in the area of management and research planning; and
4. development of methodology for reaching the small Zairian farmers by using the legume research results as a model.

Annex 1, attached, amplifies the above description of the project.

Within the limits of the above definition of the Project, elements of the amplified description stated in Annex 1. may be changed by written agreement of the authorized representatives of the Parties named in Section 8.2, without formal amendment of this Agreement.

Section 2.2. Incremental Nature of Project:

- (a) AID's contribution to the Project will be provided in increments, the initial one being made available in accordance with Section 3.1 of this Agreement. Subsequent increments will be subject to the availability of funds to AID for this purpose, and to the mutual agreement of the Parties, at the time of a subsequent increment, to proceed.
- (b) Within the overall Project Assistance Completion Date (PACD) stated in this agreement, AID, based upon consultation with the Grantee, may specify in Project Implementation Letters appropriate time periods for the utilization of funds granted by AID under an individual increment of assistance.

Article 3: Financing

Section 3.1. The Grant: To assist the Grantee to meet the costs of carrying out the Project, AID pursuant to the Foreign Assistance Act of 1961, as amended, agrees to grant the Grantee under the terms of this Agreement not to exceed five hundred thousand United States ("U.S.") Dollars (\$500,000).

The Grant may be used only to finance foreign exchange costs, as defined in Section 6.1. of goods and services required for the Project.

Section 3.2. Grantee Resources for the Project:

- (a) The Grantee agrees to provide or cause to be provided for the Project all funds, in addition to the Grant, and all other resources required to carry out the Project effectively and in a timely manner.
- (b) The resources provided by the Grantee for the Project will be not less than the equivalent of U.S. \$2,809,000, including costs borne on an in-kind basis.

Section 3.3. Project Assistance Completion Date:

- (a) The "Project Assistance Completion Date", which is October 1, 1983, or such other date as the Parties may agree to in writing, is the date by which the Parties estimate that all services financed under the Grant will have been performed and all goods financed under the Grant will have been furnished for the Project as contemplated in this Agreement.

- (b) Except as AID may otherwise agree in writing, AID will not issue or approve documentation which would authorize disbursement of the Grant for Services performed subsequent to the PACD or for goods furnished for the Project as contemplated in this Agreement, subsequent to the PACD.
- (c) Requests for disbursement accompanied by necessary supporting documentation prescribed in Project Implementation Letters are to be received by AID or any bank described in Section 7.1 no later than nine (9) months following the PACD, or such other period as AID agrees to in writing. After such period, AID, giving notice in writing to the Grantee, may at any time or times reduce the amount of the Grant by all or any part thereof for which requests for disbursement, accompanied by necessary supporting documentation prescribed in Project Implementation Letters, were not received before the expiration of said period.

#### Article 4: Conditions Precedent to Disbursement

Section 4.1. First Disbursement: Prior to the first disbursement under the Grant, or to the issuance by AID of documentation pursuant to which disbursement will be made, the Grantee will, except as the Parties may otherwise agree in writing, furnish to AID in form and substance satisfactory to AID:

- ) documentary evidence of the establishment of a Project bank account in Kinshasa and a sub-account in Bukavu,

which will serve as a depository for the local currency of the budget; and

- (b) documentary evidence of the deposit in said bank account of the local currency equivalent of \$142,000 to cover the cost of the first years operations.

Section 4.2. Additional Disbursements: Prior to any L/C disbursements under the Project or to the issuance by the Grantee of any documentation pursuant to which disbursement will be made, the Grantee will, except as the Parties may otherwise agree in writing, furnish to AID in form and substance satisfactory to AID:

- (a) A statement of the name(s) of the person(s) holding or acting in the office of the Grantee specified in Section 8.3, together with specimen signatures for each person specified in such statement, including a one paragraph description of the procedures to be established for effecting withdrawals from the local currency accounts.

Section 4.3. Notification: When AID has determined that the conditions precedent specified in Section 4.1. and 4.2. have been met, it will promptly notify the Grantee.

Section 4.4. Terminal Dates for Conditions Precedent:

- (a) If all of the conditions specified in Section 4.1. have not been met within ninety (90) days from the date of this Agreement, or such later date as AID may agree to in writing, AID, at its option, may terminate this

- (b) If all of the conditions specified in Section 4.2. have not been met within 180 days from the date of this Agreement, or such later date as AID may agree to in writing, AID, at its option, may cancel the then undisbursed balance of the Grant.

Article 5: Special Covenants

Section 5.1. Project Evaluation: The Parties agree to establish an evaluation program as part of the Project. Except as the Parties otherwise agree in writing, the following format will be used as the basis for evaluation.

Evaluation Plan: During the project, there will be two separate and distinct foci of evaluation. One will be evaluation of the technical assistance and training in the agricultural research activities in legumes and soils carried out at the Mulungu INERA Station. The other evaluation focus will be of the process of analyzing the entire subsector of agricultural research. Annual evaluations will be complete by July 31, 1979 through 1982. The purpose of these annual evaluations will be to reexamine project strategy and to assess performance against planned performance as presented in the logical framework. Based on this reexamination, the evaluation team will identify corrective action. These corrective actions will be integrated into the project's annual work plans, which are prepared by the contract

team and its Zairian counterparts.

The evaluation completed by July 31, 1979, will be especially important as the research assessment team will have completed its assessments of the agricultural research subsector and INERA complete with recommendations and a short run and long run implementation strategy. The evaluation in the following year to be completed by June 30, 1980, will be of even greater importance as it will be a measure of the GOZ commitment to rationalize research resources and perform relevant research in accordance with its needs. The evaluation will specifically focus on the GOZ's track record in implementing recommendations called for in the short run strategy. The second and following year evaluations will also consider the soils services and food legumes research components and results to date of the participatory research model to be developed for the food legumes.

The evaluation team will consist of two GOZ representatives, the USAID project manager, the contractor Chief of Party, and the USAID evaluation officer. They will present their findings in draft to the USAID Mission Director and the Director General of the Department of Agriculture.

Article 6: Procurement Source

Section 6.1. Foreign Exchange Costs: Disbursements pursuant to Section 7.1 will be used exclusively to finance the costs of goods and services required for the Project having their source and origin in the United States (Code 000 of the AID Geographic Code Book as in effect at the time orders are placed or contracts entered into for such goods or services) ("Foreign Exchange Costs"), except as AID may otherwise agree in writing, and except as provided in the Project Grant Standard Provisions Annex, Section C.1(b) with respect to marine insurance.

Section 6.2. Local Currency Costs: Disbursements pursuant to Section 7.2 will be used exclusively to finance the costs of goods and services required for the Project having their source and, except as AID may otherwise agree in writing, their origin in Zaire ("Local Currency Costs"). To the extent provided for under this Agreement, "Local Currency Costs" may also include the provision of local currency resources required for the Project.

Article 7: Disbursement

Section 7.1. Disbursement for Foreign Exchange Costs:

- (a) After satisfaction of conditions precedent, the Grantee may obtain disbursements of funds under the Grant for the Foreign Exchange Costs of goods or services required for the Project in accordance with the terms of this Agreement by such of the following methods as may be mutually agreed upon:

- (1) by submitting to AID, with necessary supporting documentation as prescribed in Project Implementation Letters, (A) requests for reimbursement for such goods or services, or, (B) requests for AID to procure commodities or services in Grantee's behalf for the Project; or
  - (2) by requesting AID to issue Letters of Commitment for specified amounts (A) to one or more U.S. banks, satisfactory to AID, committing AID to reimburse such bank or banks for payments made by them to contractors or suppliers, under Letters of Credit or otherwise, for such goods or services, or (B) directly to one or more contractors or suppliers, committing AID to pay such contractors or suppliers for such goods or services.
- (b) Banking charges incurred by Grantee in connection with Letters of Commitment and Letters of Credit will be financed under the Grant unless Grantee instructs AID to the contrary. Such other charges as the Parties may agree to may also be financed under the Grant.

Section 7.2. Other Forms of Disbursement: Disbursements of the Grant may also be made through such other means as the Parties may agree to in writing.

Section 7.3. Rate of Exchange: Except as may be more specifically provided under Section 7.2, if funds provided under the Grant are

introduced into Zaire by AID or any public or private agency for purposes of carrying out obligations of AID hereunder, the Grantee will make such arrangements as may be necessary so that such funds may be converted into currency of Zaire at the highest rate of exchange which, at the time the conversion is made, is not unlawful in Zaire.

Article 8: Miscellaneous

Section 8.1. Communications: Any notice, request, document, or other communication submitted by either Party to the other under this Agreement will be in writing or by telegram or cable, and will be deemed duly given or sent when delivered to such party at the following addresses

All such communications will be in English, unless the Parties otherwise agree in writing. Other addresses may be substituted for the above upon the giving of notice.

Section 8.2. Representatives: For all purposes relevant to this Agreement, the Grantee will be represented by the individual holding or acting in the office of Director-General, Department of Agriculture and AID will be represented by the individual holding or acting in the Office of Director, USAID, each of whom, by written notice, may designate additional representatives for all purposes other than exercising the

power under Section 2.1. to revise elements of the amplified description in Annex 1. The names of the representatives of the Grantee, with specimen signatures, will be provided to AID, which may accept as duly authorized any instrument signed by such representatives in implementation of this Agreement, until receipt or written notice of revocation of their authority.

Section 8.3. Standard Provisions Annex: A "Project Grant Standard Provisions Annex" (Annex 2) is attached to and forms part of this Agreement.

Section 8.4. Language of Agreement: This Agreement is prepared in both English and French. In the event of ambiguity or conflict between the two versions, the English language version will control.

IN WITNESS WHEREOF, the Grantee and the United States of America, each acting through its duly authorized representative, have caused this Agreement to be signed in their names and delivered as of the day and year first above written.

The Republic of Zaire

By: \_\_\_\_\_

Title: \_\_\_\_\_

United States of America

By: \_\_\_\_\_

Title: \_\_\_\_\_

AID Project Number 660-0064

PROJECT AGREEMENT ANNEX

AMPLIFIED DESCRIPTION OF THE PROJECT

A. Parties Responsible for Project Administration and Implementation

This project is jointly administered by the General Direction of the Department of Agriculture of the Republic of Zaire and the Zaire Mission of the Agency for International Development of the United States of America.

The implementing agency for the General Direction of the Department of Agriculture is the National Institute for Agricultural Research (INERA).

The implementing agency for the Zaire Mission of the USAID will be a U. S. firm or institution or international research institution which will be selected by USAID with consultations from the Director General of the Department of Agriculture.

Activities carried out in this project will be coordinated with the Institute for Scientific Research by the General Direction of the Department of Agriculture.

B. Project Summary

The attainment of self-sufficiency in food production is Zaire's highest development priority. This project contributes to the self-sufficiency in the food production goal by assisting in the development of the capability of INERA to:

1. create "production packages" for food legumes through applied, adaptive, and participatory research;
2. provide soils services to producers of food and other crops with regard to the characteristics, distribution, and production potential of specific soils; and
3. concentrate, coordinate, and optimize its scarce resources in the priority areas of agricultural research.

In order to develop these capabilities, a blend of technical assistance, on-the-job training, and formal graduate level academic training will be provided in the specific areas of food legumes and

soils research. Approximately 19-20 person years of foreign technical assistance will be provided, and approximately 11 participant trainees will complete degrees at the graduate level in food legumes and soils research. On-the-job training for the rural sociologist and agricultural economist stationed at Mulungu and at the lower research skill levels, including para-professional soil surveyors, laboratory technicians, and field crop technicians, will be carried out under the project.

The soils laboratory at the INERA Station at Mulungu will be remodeled and enlarged; equipment and operating supplies and materials will be made available in order to establish the main operating base for the project.

Also during the first two years of the project, technical assistance will be provided to:

1. assess the agricultural research subsector in general and INERA in particular;
2. develop recommendations derived from the assessments and a short-term and long-term implementation strategy; and
3. assist in implementing recommendations.

Approximately four to five person years of technical assistance will be provided including services of an agricultural research management planner and of a business management consultant. The rural sociologist adviser assigned to Mulungu will assist the management planner on an as-needed basis. The Bureau of Studies in the DOA will supply an agricultural economist to the project. The principal counterparts of these technical advisers will be the General Director and the Scientific Director of INERA. The work in this area will also be closely coordinated with the DOA and the IRS. On-the-job training will be used in the planning and management areas as INERA top management will not be able to be away from their work for an extended period of time.

The end of the project status should show INERA with:

1. a small, trained field research team dealing with the production of food legumes;
2. a responsive, trained soils services team; and
3. an optimal mix of resources (management planning, human and physical resources) devoted to relevant research, within budgetary restraints, concentrated in the priority areas of research, and coordinated with the other institutions in the agricultural research sub-sector.

C. Special Project Emphases

1. INERA will assign as soon as possible after this Grant Agreement is signed, a full-time project manager.
2. USAID will provide in the first years of the project a business management consultant who will perform an in-depth institutional analysis of INERA and develop recommendations to improve management capabilities.
3. One important design aspect of this project is to address the linkages between agricultural research and extension in Zaire through a food legumes research methodology. Research will be coordinated with farming systems data collection so that these farming systems may be simulated on the INERA research station at Mulungu, where extension workers will be trained to carry the results of the adaptive research to farmers.
4. USAID and the Department of Agriculture have agreed there is need to assess the agriculture research subsector in general and the INERA in particular, in order to assist the Department of Agriculture in reaching a decision as to the strategy, objectives, direction, and approach of agricultural research. Within 6 months of the completion of this assessment, a major review of this project will be undertaken by AID and the Department of Agriculture to determine the implications of the assessment on the design of this project. The DOA and the USAID will collaboratively revise this project, as necessary.

#### D. Project Description

This project will enhance the capability of INERA to conduct research on food legume production, soil fertility support, and soil classification and fertility correlation.

The food legume crops to be studied may include soybeans, ground nuts, field beans and cowpeas. These crops fit well into the established cropping pattern as well as into national nutritional requirements. They, along with a soils service program, particularly complement maize production and marketing projects being planned or already under way. The food legume research component will be used as a model of a participatory research methodology targeted at the small farmer, the main food crop producers.

In addition, an assessment of the Zairian agricultural research subsector and INERA will be carried out. This assessment will identify priorities in agricultural research; preferred methods to coordinate agricultural research; preferred approaches to linkages among agricultural education, research, and extension; and will provide in-depth institutional analyses of INERA with appropriate recommendations and short term and long term implementation strategies.

1. Sector Goal: The overall sector goal is to increase the level, availability, and the nutritional quality of food production for the low income majority in Zaire.

Measure of Goal Achievement: Part of the potential increase of food production would be achieved by the annual increase in availability of food legumes. The legume increase would be drawn from systematic observation of the spread of the improved varieties and cultural practices introduced. At present, legumes are subsistence crops but eventually the direct beneficiaries of the project should produce surpluses for the market. The needs of the target group for this project would have since been met in-so-much as subsistence needs would have been satisfied first.

Potential increases in other food production crops, due to the soils services component of the project would have also been expected, although the measurement of goal achievement would be more subjective and indirect. Factors such as the number of users, purpose of use, types of crops and amount of acreage <sup>helped by</sup> ~~availint~~ on the soils services would be used on the assumption that usage of the services yields more effective agricultural practices.

Implementation of assessment recommendations will be the measure of goal achievement for the third component of the project.

Means of Verification: A current GOZ/USAID project provides a USDA team to assist the GOZDA in setting up a food demand and supply data system. Beyond this in the near future, the (North Shaba Project) and other such projects should provide for the measurement of their respective commodity outputs.

INERA will maintain detailed records of the number of users, purposes of use, types of crops, and amount of acreage using the soils services facilities.

Assessment recommendations dealing with coordination of agricultural research; linkages among agricultural education, research and extension; participatory research approaches; and INERA will be used as benchmarks.

Assumptions: The Government of Zaire will maintain prices for commodities such as maize and legumes at a level that is sufficiently attractive to farmers to provide incentives to take the risks in adopting modern practices and in purchasing inputs necessary to obtain reasonable yields. This assumption is currently a reality with a recent decision by the GOZ to increase the official minimum farm price on virtually all food crops. For example, the price of maize at the farm was raised by 200 percent over a 12-month period.

The traditional agricultural sector is composed of about 3 million holdings occupied by 70 to 75 percent of the total population. Obviously more resources than have been committed by USAID and other donors so far are required to achieve the sector goal. The present proposed project should be followed by production and extension activities related to food legume crops.

2. Project Purpose:

Statement of Purpose: The project will assist with the development of the institutional capability of INERA to:

- create "production packages" for food legumes through applied and adaptive research, using participatory research approach;
- provide soil fertility investigations, consulting and recommendation services to those interested in advancing food crops production, and while developing this capability, to deliver those services to the on-going food production projects. This implies early on cooperation and participation of the soils services of this project in the on-going food production projects;
- provide reliable estimates of the production potentials and limitations of soils in support of regional development programs; and
- devote its resources in an optimal manner within budgetary restraints, to research priorities.

End of Project Status: By the end of the fourth project year, INERA should have a small, well trained, multi-disciplinary field research team using a participatory research methodology and dealing with the production of food legumes, fully supported with minimally essential equipment in place, and should be:

- conducting reliable adaptive research which will lead to the identification and distribution of efficient, disease resistant seed varieties of food legumes;

- developing and adapting cultural practices suitable to traditional farmers and compatible with the ecological balance and socio-economic conditions;

- assisting with first round on-farm demonstrations of the production packages developed through research;

INERA should have functioning, viable soil fertility services to support the planned advancement of the production of its major food crops. By the end of the project, INERA should be systematically:

- making soil analyses and supervising soil fertility response trials as part of the field research addressing the major food crops;

- providing planned consulting services to the regional Agricultural Commission Services on soil fertility and soil management for crop production;

- providing assistance to the field teams in adapting and testing symbiotic nitrogen-fixing inoculants;

- providing assistance to food crop projects in the design and evaluation of their adaptive trials, including soil and fertilizer evaluation; and

- developing soil and crop management systems which maximize the use of organic and indigenous mineral materials and, to the extent possible, maintaining soil fertility.

INERA should have a cadre of small, multi-disciplinary agricultural resource planning teams capable of:

- evaluating production potentials and limitations of given soil groupings within context of socio-economic conditions; and

- elaborating the potential payoffs from alternative regions and sites that might be proposed for intensive rural development.

INERA should have its role within the agricultural research subsector clearly defined and coordinated with other research institutions and, within its budgetary restraints, should be optimizing its research resources through proper management planning involving judicious location of facilities, use of staff and formulation and evaluation of research projects.

Subsector and institutional redirection and reorganization will be based on the assessment. The short run strategy will include those reorganization steps which can be implemented within present budgetary, physical and human resource constraints. Short run recommendations should be carried out by the end of the second project year. The long run strategy may involve additional budgetary support and outside funding to cover new physical facility and operating requirements and human resource needs through recruitment, training and technical assistance.

Means of Verification: External evaluation (PAR).

Assumptions: The achievements of these purposes depend on:

- early placement of qualified foreign technicians into the project in Zaire;
- availability of qualified Zairians for graduate training -- the first group at the end of the 1st project year, and another group each year thereafter, with the last group returning one year after the end of the project;
- active institutional cooperation between on-going or potential production projects, INERA, IRS, the Agricultural Extension Service and local outreach organizations; and
- strong commitment from the GOZ, the DOA, and INERA to develop an agricultural research network responsive to its goals of food self sufficiency.

### 3. Project Output Targets:

#### a) Trained Manpower:

- a maximum of three soil scientist plus two agronomists with M.S. degrees by the end of the project;

- a maximum of six additional persons -- land classification (4), plant pathology (1), entymology (1) -- with M.S. degrees by the end of the project;

- a maximum of eight para-professional soil surveyors by the end of the fourth year of the project;

- a rural sociologist and agricultural economist trained on-the-job;

- three laboratory technicians by the second year of the project;

- two field crops technicians by the third year of the project;

- General Director and Scientific Director trained on-the-job; and

- extension agents trained in data collection and technical aspects of food legumes "production package".

#### b) Soil Fertility Service:

- Operating laboratory at Mulungu by the end of the second project year:

- about 4,000 soil samples a year by the end of the third project year; and

- about 8,000 soil samples a year by the end of the fourth project year.

- Consulting services to production projects:

- Mulungu station by third year;

- most food and agricultural production projects, in the four southeastern regions by fourth project year; and

- field tested recommendations beginning in the third year of project.

## c) Soil Classification Service:

- map each experimental site on which soil test correlation data are to be obtained;
- correlation of <sup>these</sup> INEAC soil maps with the USDA Soil Taxonomic system by third project year;
- mapping of project areas beginning in the third project year;
- guidance in the selection of soil areas for intensive agricultural development beginning in the third project year; and
- evaluation of alternate use of project area by fourth project year.

## d) Food Legume Package and Participatory Research Model:

- development of information base of socio-economic and cultural factors affecting local farmers in the project area;
  - simulation of farming systems at the research stations;
  - testing of named varieties and experimental lines in all years;
  - establishment of seed increase planting beginning in the third year;
  - establishment of farm demonstrations in the fourth year;
- and
- "Farmer Days" held in the second year and thereafter.

## e) Agricultural Research Subsector Assessment:

- Assessment and in depth institutional analyses of INERA completed by end of first year together with recommendations and a short and long term implementation strategy; and
- Implementation of short term assessment and INERA analysis recommendations, within budgetary restraints, completed by end of the second year.

## f) Assumptions:

- technical experts are available and can be recruited on schedule;
- equipment and supplies can arrive at project areas on schedule;
- adequate local currency support; and
- INERA can allocate personnel capable of conducting research both before and after in-service and graduate training;
- GOZ, DOA, and INERA are committed to reorganization and redirection of agricultural research. INERA has stated that research policies should be reoriented toward food crop production with research clientele of farmers in the traditional sector.

4. Project Input Targets: AID and GOZ inputs to the project are shown in the following table:

<u>INPUT</u>	<u>\$000's</u>
AID:	
Technical Assistance	2,240
Training of Zairians in the U.S.	322
Equipment	430
Contingency	37
Inflation	<u>321</u>
Sub-Total	3,350
GOZ:	
Technical Assistance-Support	380
Training of Zairians in the U.S.	66
Salaries	636
Other	186
Contingency	31
Inflation	<u>371</u>
Sub-Total	1,670
<b>TOTAL</b>	<b><u>5,020</u></b>

5. Project Implementation Guidelines:

a) Legumes Research: During the first year of the project, and before any adaptive research begins, project personnel will collect information from project area farmers regarding overall farming systems, including but not limited to:

- basic soil type, topography, farm size, degree of isolation;

- inputs, yields, income markets;

- crop rotations, cultural practices, tools; and

- land tenure, division of labor, and size of family.

As data becomes available, it will be used to reproduce farming systems on the INERA research station appropriate to the area.

Formal cooperation links will be established between the INERA Mulungu station team, the North Shaba Rural Development Project data collection unit, and the Secondary Institute for Social Sciences in Bukavu, the Catholic Diocese in Bukavu, the IRSAC team in Bukavu, and the Regional DOA extension agency.

Variety Testing: The Mulungu INERA team will establish contact with PNM/CIMMYT researchers and exchange information.

In the first year of the project, Mulungu researchers will plant and analyze varietal trials of soybeans and other locally important food legumes. Seed and instructions will be obtained, as required from INTSOY, IITA, and farmers and seed centers in the area.

In the second year of the project, variety testing will continue, adding promising lines from the first year's trials.

In the third year, variety testing will continue. Seed multiplication of 1-3 high yielding varieties will be undertaken. Twelve on-farm demonstrations will be used for seed multiplication activities. "Farmer Days" will be conducted to show both Mulungu variety plots and on-farm demonstrations will be organized by Mulungu

In the fourth project year, variety testing, seed multiplication, on-farm demonstrations, and "Farmer Days" will continue.

b) Cultural Experiments: In the first project year, experiments will be conducted with all combinations of: 3 varieties, 3 row spacings, and 4 levels of fertilization. There should be at least 3 replications. Comparisons of at least 3 commercial sources of Rhizobium will be carried out. A study of the effect of various indigenous and transported cultural practices will be initiated.

During the 2nd, 3rd, and 4th years of the project, the INERA Mulungu team will utilize first year experiments and data collection, and will identify major problems and design subsequent work to increase the production of soybeans and other food legumes in the vicinity of Mulungu.

Extension activities based on results of variety and cultural trials should begin in the third year of the project.

To the extent that the findings of the INERA assessment team are relevant to the food legumes research program, they should be applied to that program.

INERA will appoint two professional Zairians to work with American scientists in the technical legume variety and cultural trials.

These Zairian professionals will be selected on the basis of their undergraduate academic record, prior job performance, and professional interests. English proficiency and actual job performance during on-the-job training in the legumes research program will be the essential criteria for selection of participants for U.S. training under the project.

Additional U.S. post-graduate training will be provided for 4 Zairians in the fields of research agronomy, plant pathology, and entomology. Selection criteria will be generally outlined above.

On-the-job and informal training will be carried out for two field crop technicians, one sociologist, one agricultural economist,

data collection specialists, and extension officers.

Both formal post-graduate level and on-the-job training will be carried out under the project in soils science, land classification, and lab technical services.

c) Soils Services: The U.S. soils scientist and the U.S. soils laboratory technician and their Zairian counterparts will organize the first soil testing laboratory at the Mulungu station in the first project year. They will start soil test correlation experiments with food legumes and maize. Beginning in the third project year, INERA/Mulungu will begin training programs for personnel from project clientele (such as PNM, ENManioc, UNAFITEX, private sector firms, and GOZ projects). As soil test correlations are established for food legumes and maize, this work may be extended to other crops.

Field work and laboratory work will be undertaken to determine characteristics of different kinds of soil and how they should be used and managed.

During the first 6 months of the U.S. contract for technical services, a 3 month intensive course in soil classification, soil testing, and interpretation will be given by the U.S. soils scientist, land classification advisor and lab technician, for at least 12 INERA Engineers of Agronomy who will serve as counterparts in pedology and soil fertility as soil survey party leaders, and soil survey party members. The course would be conducted at Yangambi if suitable laboratories and equipment are available; otherwise it would be given at Mulungu.

The U.S. soils scientist and lab technician will have Zairian counterparts for work in the soil testing program. The U.S. land classifier will have at least 12 Zairian counterparts working with him in the soil survey program. Selection of participants for U.S. training will be as in Section 5 b) above.

Zairian soil survey field party leaders, lab technicians, and para-professional soil surveyors will receive on-the-job training.

d) Agricultural Research Subsector and INERA

Institutional Assessments: These assessments will be carried out during the first project year. The assessments will result in a series of recommendations and short term and long term strategies for implementation of the recommendations.

U.S. technical assistance will consist of an agricultural research management planner and a business management consultant. They will cooperate with the Director General and Scientific Director of IENRA and the Mulungu station's rural sociologist and agricultural economist to carry out the assessments.

The assessment, recommendation and implementation activities will address priorities in agricultural research; preferred method(s) to coordinate agricultural research; preferred approaches to linkages among agricultural education, research, and extension; preferred research methodologies, definition of research clientele; and improved management, planning, and operating policies and procedures at the INERA level.

6. Financial Plan

The Financial Plan is subject to change by the representatives named in Section 8.2 of the Project Agreement, without formal amendment of the agreement. The Financial Plan represents the intention of the Project Agreement signatory parties, as outlined in the project design process.

SUMMARY COST ESTIMATE AND FINANCIAL PLAN

	\$000's		TOTAL		TOTAL
	AID FX	GOZ LC	FX	LC	
Technical Assistance	\$2,240	\$ 380	\$2,240	\$ 380	\$2,620
Training	322	66	322	66	388
Salaries		636		636	636
Equipment	421		421		421
Other	16	186	16	186	202
Inflation	321	1,510	321	1,510	1,831
Contingency	<u>30</u>	<u>31</u>	<u>30</u>	<u>31</u>	<u>61</u>
TOTAL	\$3,350	\$2,809	\$ 3,350	\$2,809	\$6,159

COSTING OF PROJECT INPUTS/OUTPUTS

Project Inputs	Project Outputs			Total
	Soils Services	Legumes Research	Research Assessment	
AID:				
Technical Assistance	\$1,070	\$ 762	\$ 408	\$2,240
Training	206	116		322
Equipment	223	139	59	421
Other (Radio)	12	4		16
Inflation (Unallocated)				321
Contingency	<u>17</u>	<u>8</u>	<u>5</u>	<u>30</u>
Sub-Total	\$1,528	\$1,029	\$ 472	\$3,350
GOZ:				
Technical Assistance Support	\$ 186	\$ 117	\$ 77	\$ 380
Training-Support	42	24		66
Salaries	374	215	47	636
Other	109	46	31	186
Inflation (Unallocated)				1,510
Contingency	<u>20</u>	<u>8</u>	<u>3</u>	<u>31</u>
Sub-Total	\$ 731	\$ 410	\$ 158	\$2,809
TOTAL	<u>\$2,259</u>	<u>\$1,439</u>	<u>\$ 630</u>	<u>\$6,159</u>

## YEARLY COST ESTIMATE AND FINANCIAL PLAN

\$000's

	78			79			FISCAL YEAR 80			81			82		
	AID	GOZ	T	AID	GOZ	T	AID	GOZ	T	AID	GOZ	T	AID	GOZ	T
<b>Soils Services:</b>															
Technical Assistance	93	15	108	267	47	314	268	46	314	268	47	315	174	31	205
Training				45	9	54	66	14	80	33	7	40	62	12	74
Salaries		14	14		65	65		103	103		123	123		69	69
Equipment	146		146	12		12	45		45	20		20			
Other	12	43	55		46	46		7	7		9	9		4	4
Contingency	5	5	10	5	5	10	5	5	10	5	5	10			
<b>Legumes Research:</b>															
Technical Assistance	41	6	47	147	25	172	190	29	219	235	34	269	149	23	172
Training				12	2	14	22	5	27	43	9	52	39	8	47
Salaries		12	12		42	42		57	57		65	65		39	39
Equipment	82		82	26		26	23		23	8		8			
Other	4	10	14		14	14		8	8		9	9		5	5
Contingency	1	2	3	3	2	5	2	2	4	2	2	4			
<b>Research Assessment:</b>															
Technical Assistance	69	12	81	204	38	242	135	27	162						
Training															
Salaries		8	8		24	24		15	15						
Equipment	49		49	10		10									
Other		13	13		15	15		3	3						
Contingency	1	2	3	4	1	5									
<b>Sub-total</b>	<b>500</b>	<b>142</b>	<b>642</b>	<b>735</b>	<b>335</b>	<b>1070</b>	<b>756</b>	<b>321</b>	<b>1077</b>	<b>614</b>	<b>310</b>	<b>924</b>	<b>424</b>	<b>191</b>	<b>615</b>
<b>Inflation: FX 6% pa LC 40% pa</b>				44	130	174	91	300	391	116	540	656	70	540	610
<b>TOTAL</b>	<b>500</b>	<b>142</b>	<b>642</b>	<b>779</b>	<b>465</b>	<b>1244</b>	<b>847</b>	<b>621</b>	<b>1468</b>	<b>730</b>	<b>850</b>	<b>1580</b>	<b>494</b>	<b>731</b>	<b>1225</b>

## Annex J

INERA SUPPORT PROPOSAL  
ACCRUED EXPENDITURES  
PFIP

	\$000's					<u>FY '79</u>	<u>FY '80</u>	<u>ALL OTHERS</u>
	<u>1Q</u>	<u>2Q</u>	<u>FY 1978</u>		<u>T</u>			
			<u>3Q</u>	<u>4Q</u>				
Soils Services			23	230	253	349	430	663
Food Legumes Research			13	115	128	199	266	561
Research & Institutional Assessment			15	104	119	231	151	
<b>TOTAL</b>			<b>51</b>	<b>449</b>	<b>500</b>	<b>779</b>	<b>847</b>	<b>1,224</b>