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ZAIRE

**On the State of Agricultural Research
in Zaire with Recommendations for Its
Reorganization within an Education
and Extension Framework**

**Final Report of the Agricultural Research
Management Planner - INERA Support Project
USAID 660-0064. Draft submitted Sept. 1981**

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FOREWORD

Between July 1980 and June 1981, the author evaluated agricultural research in Zaire by visiting experimental and research stations, research centers, and other relevant agricultural organizations. This report contains some of the findings and the comments leading to certain proposals thought to improve Zaire's agricultural research effort. Part I points out the overall agricultural research situation of Zaire with particular insight into the National Agricultural Institute. Part II is particular to Yangambi, has details on the site, and proposes an international research center for education and extension.

At this time, it is with gratefulness that I acknowledge the help and support of the AID/Kinshasa personnel with whom I was in contact, mainly Ron Mininger and his logistics group, all those in Yangambi and Kisangani, INERA, and others. In particular, I thank Paulette, my wife, to have made this possible; Citoyen Nzundu, who accompanied me through many of my peregrinations; Dick Peters, for his encouragement and recognition of the importance of this assignment; and Nora Oliver, for the typing, and whose patience and quality as a person I admire.

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PART I. AGRICULTURAL RESEARCH IN ZAIRE

A. Introduction

Much of what will be discussed in these pages had been observed and recognized by the PP team who prepared this project. The following text is merely an updated version of what had been found and presented from findings obtained through independently rediscovered facts.

With independence, Zaire inherited vast and well-equipped structures to carry out scientific research. They belonged to IRSAC, INEAC, Louvanium University and others. INERA took over the imposing network of research stations that belonged to INEAC. The IRSAC installation became those of IRS and retained a scientific outlook and purpose. The university system has undergone a number of reorganizations and agricultural research is practically absent. Today INERA is left with 20 research stations some of which have important installations but in various degrees of deterioration. A number are found in remote areas of vast country which covers an area equal to one third of the continental U.S.A. Subsidized at a rate that does not even cover salaries, it has to obtain the difference through sale of products it is ill-equipped to produce. Furthermore, it has to do this within an economy which is overloaded with problems. It is under such difficulties that INERA is still trying to display an image of the past

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INEAC. Other research activities are found directly under the DOA (PNM, PNE, PRONAM), at the Regional Nuclear Energy Center of Kinshasa (CREN-K), and at IFA, an autonomous faculty of agriculture under the Rectorate. IFA has the largest agricultural research potential (14 PhDs or equivalent), yet, is the least of those institutions involved in agricultural research. The framework within which agricultural research in Zaire is taking place is laden with transport and communications problems and is not organized nor coordinated. Within such a framework, foreign aid to agriculture in Zaire requires a concerted action, one that will go beyond the normal five-year programming of national and international administrations. This scenario will have to include research, education, and extension in a structure this country can afford.

B. Zaire

The framework of agricultural research in Zaire was discussed in a paper presented with the MASI Third Quarterly Report of 1980 of the USAID/Kinshasa INERA Support Project, 660-0064. The role of coordinating scientific research was given to the National Research Institute (IRS) when it was founded in 1975. IRS has experienced and still is experiencing the same financial and personnel problems as the rest of the nation. In 1981, IRS produced the first annual report and its findings are published in a journal entitled "Revue Trimestrielle". Four issues appeared in 1978, a special issue in 1979, and none in 1980. Two activities that could be linked with food research

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are: (a) an attempt to introduce new fish species in lakes Kivu and Tanganyika, (b) new food products development particularly from fauna and wild fruit. IRS has not, to this date, been able to play a major role in the coordination of all scientific research. This situation is blamed on the lack of a clearly defined structure and little scientific authority and scope.

It appears, then, that agricultural research has no coordinated framework. Outside of INERA and the DOA agricultural research is carried out at IFA, the Agricultural Faculty Institute and the Nuclear Energy Center (CREN-K). The former, with the largest and most qualified human resource in this sub-sector, is chronically plagued by lack of budget and teaching overloads. The latter, although better endowed, has a radio-agronomy department that has yet to show tangible results. It has a number of qualified scientists concerned mainly with radiating biological material to be sent out and tested in the field. So far, no apparent and practical results are available.

Any further evidence of agricultural research at other Departments or public organizations has not been found. There is reason to believe one endeavor can be identified within the private sector. The Binga station, in the western Equateur Region, is owned jointly by "Les Plantations Lever du Zaïre" (PLZ) and the Société de Culture du Zaïre (SCZ). With a primary objective to improve the oil palm and secondary coffee

and cocoa, this station could take national responsibility for R & D in these crops. With a large proportion of state owned shares, such a mandate may be easily assumed if properly supported and funded (compensation in the form of tax exemptions, etc.).

Within the DOA and INERA, there are four internationally supported programs "the national corn (PNM), cassava (PRONAM), legume and fertilizer programs (PNE). An extension facet is incorporated into the PRONAM, the legume project, and the PNE.

Finally, the Research Institute for Agronomy and Animal Sciences (IRAZ) is still not off the ground. Perceived as an agricultural research coordinating body for the Great Lake community (Zaire, Rwanda, Burundi), IRAZ will find it difficult, for the time being, to get involved in research.

C. The National Institute for Agricultural Study and Research
INERA

1. Terms of Reference

The terms of reference leading to this part of the paper were to:

- a. Study the role of INERA in agricultural research;
- b. Analyze INERA's current research activities, including types of research, staff, budgets, etc.
- c. Analyze INERA research project formulation and research methodologies;

- d. Study Rockefeller's report, the final disposition of Yangambi's facilities, and location of new INERA headquarters;
- e. Analyze the location and adequacy of the facilities;
- f. Analyze the staffing, including current capabilities and future requirements;
- g. Analyze budgetary resources and future needs.

2. Methodology

The approach to this assignment was not based on any recognized fact-finding method nor on any scientific methodology. Insight into INERA's complex situation was obtained by:

- a. Individual and collective interviews and discussions;
- b. Personal observations;
- c. Collection and study of available documents.

The present paper is based on observations and facts obtained from stations found in the following regions - Bas-Zaire, Bandundu, Kasai Oriental, Shaba, Kivu, and the Yangambi complex.

3. Assessment

a. Role of INERA

Agricultural research in Zaire is not organized nor coordinated in any way or form. INERA is regarded as the only agricultural research institution. This image

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is greatly enhanced by such outside funded research programs as the PNM and the PRONAM.

b. INERA's current research

Cotton, and to some extent rice research are probably the only programs that have some form of structure within INERA. Prior to 1975, a new cotton variety named Zaire, has been developed under a Belgian supported program, and the GPS corn varieties among which GPS, is still in use.

Variety trials are carried out with rice, soya, peanuts, and developed prior to independence, some other legumes. Genetic material in rice, the oil palm, coffee and cocoa species are maintained with relative success. With the implementation of the PAM, INERA considers it is contributing to Research and Development by producing basic seed stocks of the best local corn, rice and cassava varieties. INERA, through its production branch, maintains a variety introduction program of food crops in a manner barely producing results at a number of its stations. The cause is not so much because of the quality of the work done but the complete absence of any follow-up. No further selection or evaluation of promising material takes place and there is little or no multiplication of material found superior. Yet, seeds

of improved varieties are badly needed by the farming population.

INERA has only three professionals with higher degrees, the President Delegate General, a.i., who has an M.Sc. (1978) in soil fertility, the Director of the Yangambi Research Center and the Scientific Director, a.i., who have a Doctor of Science (1979) and Ph.D. (1980) respectively. Other professionals with higher degrees are found in the PRONAM and the PNM and more will be trained by such programs, including seven professionals in the INERA Support Project. Outside of these projects there are very few professionals at the agrologist (ingenieur-agronome) level who are actively engaged in some kind of R & D (less than 15 out of a total of 36). When they are, they lack the necessary scientific and material support.

The 1979 financial statement (the 1980 was not available at the time of writing) showed a total outlay of funds in the amount of 5,917,316 zaires of which 79% went to salaries. The subsidy of 4,101,066 zaires, received from the GOZ did not cover all salarial expenses. The salarial proportion was much greater than the above for many of the stations. It ranged from 67.0% to 94.7%. Since 1975 INERA has not received any investment budget and in conjunction with an inadequate Operation & Maintenance budget, the INERA stations are left with

building and equipment in a state of disrepair. It is believed that previous years had similar budgetary deficiencies.

c. Research formulation

The notion of research project formulation and research methodologies is practically non-existent. Each January, INERA headquarters produce a program formulation for the oncoming year. It is a compilation of a large number of research projects most of which have little chance to be carried out in the oncoming year, if ever.

Project formulation and research methodology appear only in skeleton form. Towards the end of the year, a research report is produced. It contains the description of what can be considered routine station activities (chemical, pathological and similar analyses), an extensive meteorological report, and research results. Long term program formulation based on national and regional agricultural priorities with clearly defined goals and objectives are not available.

An analysis entitled "Actualizing the Contant Report Submitted to the Rockefeller Foundation" was annexed with the third MASI Quarterly Report of 1980 of the INERA Support Project, 660-0064.

d. Facilities

1. The Bas-Zaire Sector

A "sector" in INERA terms is an area of the country covered by a main station and a number of secondary stations. The Bas-Zaire Sector comprises the main station of M'Vuazi, the three secondary stations of Gimbi, Kondo and Luki in the Mayombe (Bas-Zaire), and the station at Kiyaka near Kikwit in the Bandundu. Except for the PRONAM at M'Vuazi, R & D is practically nil in that Sector. All three stations in the Mayombe reflect their past attractiveness, but are now in an advanced state of deterioration. Furthermore, because of the absence of any kind of communications, and the distance that separates them from M'Vuazi, they feel completely isolated and unsupported. Kiyaka, which is even more isolated, had been built anew just prior to independence. It is very attractively situated on top of a plateau, but because of its location and therefore its inaccessibility, it plays a very minor role in the network. (Also see comments by Masimango, 1981, and H. Gasser, 1981, footnotes 1 & 2)

1/ Masimango Mukamosi. 1981. Rapport de mission effectuée dans le station de Kiyaka et de Kipopo. (du 10 mars au 6 avril 1981).

2/ H. Gasser. 1980. A First Look at Some of INERA's Research Stations. Third MASI Quarterly Report, INERA Support Project, 660-0064. 4 pp.

2. The Southeast Sector

This sector covers both Kasai regions and the Shaba. The main station is at Gandajika and its secondary stations are Kipopo, South of Lubumbashi, Kaniama in the center of Shaba and Mukumari in the North of Eastern Kasai. Gandajika plays host to both PNM and PRONAM research workers. This makes it one of the most active research units of the network. In addition, three young professionals carry out a cotton program in the fields of plant breeding, agronomy and plant protection. Regretfully, this is not as impressive as it sounds because of lack of material support. Scientific support is given by the actual chief of headquarters' scientific division, himself a student of the former Belgian head of the program. Like the other stations visited, Gandajika has obsolete facilities. Many buildings, especially the main building, are old and need extensive repairs. The location is attractive as it is situated in a traditional agricultural region. The secondary station of Kaniama is strictly an experimental site for the PNM. Except for a field of tobacco, there are no other activities. Facilities are therefore adequate yet in the usual state of deterioration. Kipopo, which lies 15 km South of Lubumbashi is a secondary station engaged in fishculture and forestry. It

has approximately 5 ha of artificial ponds and a 15 ha natural pond. Income from these is limited which can only be explained by lack of interest or support. Buildings and grounds, and other facilities are adequate. They suffer the same shortcomings as elsewhere. There is no R & D activity, which may qualify as such. Belgian technical assistance has been available there for a number of years, but apparently not used. The secondary station of Mukumari has not been visited; it seems to encounter personnel problems like so many other stations in remote areas.^{3/}

3. The Kivu Sector

Mulungu is the main station of this Sector, the others being Kibangula in the Maniema and N'Dihira in North Kivu. Mulungu plays host to the MASI/INERA project which has already greatly enhanced its image, if only through the presence of the expatriate technicians and the nomination of counterpart professionals.

Previous to that and still to some extent at present, Mulungu was in the same predicament as any other

^{3/} Masimango, M., Matuila, M. et Ngwawale, K. 1981. Rapport de mission effectuée dans la station de Mukumari (du 27 avril au 16 mai 1981).

INERA station, as facilities had also deteriorated. It lies in one of the most attractive areas of the country. Neither Kibangula nor N'Dihira have been visited. The importance of these two stations may be appreciated by the size of their 1979 budgets which together amounted to 45,663 zaires of which 95.2% was consumed by salaries.

4. Yangambi

The Yangambi Research Center, as it is called for nostalgic reasons more than anything else, has been described at length by FAO, and Dr. Contant in his Rockefeller report. However, since 1975, conditions have considerably worsened. Salaries absorbed 92.6% of total expenses in 1979. This leaves very little to maintain the extensive installation of the Center. Furthermore, its budget represents one quarter of the total INERA budget. More than any station, it suffers from the chronic lack of funds which translates the station into a near state of paralysis, considering the extent of needs and potential. Since November 1979, there has been no electricity and is therefore the most inefficient research station of the network.

e. Staffing

Current capabilities have been dealt with under (b). All the professional research staff is at the agrologist

level, therefore, if recently graduated unsuited to do research in an autonomous manner. Scientific support at the highest level is of the greatest importance, and yet, it is practically unavailable. At present, INERA's Scientific Branch is headed, ad interim, by a young Doctor of Science who could have benefited from a period of at least four to five years of doing actual research prior to taking up such heavy responsibilities. The same comments may be made for the director of the Yangambi Research Center whose energies are spent on other matters than research. This branch has, in addition, two agrologists who have had some informal research training but could have greatly benefited from formal training (M. Sc., PhD). They too, could be more efficient in the field, doing research under an experienced research scientist. Headquarters has three other Branches: Production (and Services), Administration, and Finance. It is an over-staffed administration with approximately 200 people, not counting those responsible for the maintenance of the buildings and grounds. A large number of clerical staff is also found in each station.

The present head of INERA is a President Delegate General. In 1980, the position of Chairman of the Board and that of Delegate General of INERA was fused.

It is presently held by a young professional who had little previous experience in agricultural research management.

Outside of the supported programs such as the PNM, the PRONAM and the Mulungu station through the MASI/INERA Project, current staffing in trained scientists is totally inadequate, considering that there is an excessively large number of administrative staff and field workers. Current research capabilities are very low for reasons already outlined. Furthermore, documentation through the network is extremely deficient and all libraries are poorly supplied. INERA has not bought any scientific journals since 1975 because of lack of foreign exchange. With such a state of affairs in an area of utmost importance, the low research capabilities of INERA are further explained. Future requirements will be dealt with under item D.

f. INERA's budgetary allocations

An in-depth analysis of the budgetary resources and the future needs is not required. The fact that the Yangambi complex and the Kinshasa office alone absorbed 45.2% of the 1979 budget is sufficient to show the precarious situation of the remaining INERA stations. Of the remaining budget, 21.2% was available to the stations (excluding Yangambi) for Operation and Maintenance.

This amounted to 687,404 zaires. Of this, 437,347 zaires were used by only four stations, leaving 253,057 zaires for the remaining 15 stations among which was Mulungu, a major station.

D. Recommendations to Reorganize Agricultural Research Within An Education and Extension Framework

1. Issues

- Considering that only half of INERA's stations and a fragment of this nation's large agricultural regions have been visited, it might appear presumptuous to make recommendations. Yet, lack of funds, deterioration of facilities and equipment are obvious and unquestionable facts.
- It is assumed that this situation is widespread, particularly so for INERA.
- IRS is responsible for the coordination of scientific research in Zaire. After five years of existence, it has not even made a start to carry out this responsibility.
- IFA has the largest potential in human resources for agricultural research. INERA with its 20 stations, meager financial resources and support, and proportionately small qualified staff is not in a position to be the leading research institution.

- A chronic lack of funds from the local government affects even donor supported projects.
- At this stage, only food crops shall be considered.

2. Restructuring of Agricultural Research

Restructuring of agricultural research in Zaire cannot be limited to that of INERA. On the contrary, it should consider relegating INERA's responsibility to that of maintaining those stations and installations not needed at the present, nor in the immediate future. With this in mind, a restructuring of agricultural research in Zaire will be formulated in three scenarios.

Scenario 1. It is held in many circles that INERA is indissoluble; it is a heritage left for Zaire to preserve. Maintaining the integrality of INERA entails the refurbishing of six major and 14 secondary stations. Such an action will enable this institution to make a major thrust in research and development as well as reorganize their crop production capabilities. In order to take full advantage of its refurbished stations, the institute will have to depend heavily on foreign expertise and financing. In 1959, INEAC had 250 professional agriculturists using a budget of 141,725,000 Congolese francs. (1FC - 1FB). Here we have the extent of the requirement should this option prevail.

Table 1 lists five major stations and 14 secondary stations excluding Yangambi. Each of the major stations has elaborate

TABLE 1: A Model for the Future Use of the INERA and Other Stations

<u>Research Stations</u>	<u>Regions</u>	<u>Program</u>	<u>Remarks</u>
1. Mulungu	Kivu	PNL-Legume (Pulse) research	A high altitude high rainfall food crop center.
2. Bambesa	H. Z.	PNR-Rice and Cotton research	One of two possible stations to host the national rice research and support station for cotton, legumes, etc.
3. Gandajika	K. P.	PNC-Cotton, corn, cassava research	This station should have leading role in legume research. It is also a major support station for corn and cassava.
4. M'Vuazi	B. Z.	PRONAM-Cassava research	This station is the main cassava research center for Zaire. It can also be a support station for legumes, etc.
5. Bongabo	Equateur	PNR-Rice, corn, cassava	The other of the two possible stations to host the national rice program. Could pursue production for self support.
6. Kisanga	Shaba	PNM-Corn research	Although taken over by the Presidency, it is still the headquarters of the corn program.
7. Yangambi	H. Z.	Animal research station for IFA	The animal farm may be managed by IFA and set up as the University research farm. The disposition of the rest is complex.
8. Boketa	Equateur	None	One family to preserve the property.

<u>Research Stations</u>	<u>Regions</u>	<u>Program</u>	<u>Remarks</u>
9. Nioka	H. Z.	Minor, self-supporting animal farm	The size of the staff proportional to production.
10. Mout-Hawa	H. Z.	None	One family to preserve the property
11. N'Dihira	Kivu	Wheat	Second to MIDEMA for wheat research work.
12. Kibangula	Kivu	None	One family to preserve property.
13. Mukumari	K. O.	None	One family to preserve property.
14. Kipopo	Shaba	Presidential pond	Self-supporting to maintain the Presidential pond.
15. Kiyaka	Bandundu	Sub-station for PRONAM	PRONAM staff and one family to preserve property.
16. Kondo	B. Z.	None	One family to preserve property.
17. Gimbi	B. Z.	Sub-station for PRONAM	PRONAM staff and self-supporting animal production farm.
18. Luki	B. Z.	Forestry	Transfer to Department of Environment.
19. Kaniama	Sh.	Sub-station for PNM	Transfer to PNM as support station.
20. N'Gazi	H. Z.	None	One family to preserve property.

installations that need to be refurbished with research. In 1969, the operating budget amounted to 643,962 zaires, and in 1979, to 6,917,316 zaires or 98,917,618 Belgian francs. Even with only 20 out of the 37 stations in operation in 1959, their degradation has been continuous. It is suggested that the cost of rehabilitation could amount to 50 million dollars. In 1976, Dr. Contant estimated the Yangambi portion alone at 15 million dollars. A training program would be required whereby the scientific and technical staff would reach 200. Of these, 100 ought to be trained at the M.Sc. level and at least 25, at the PhD level, for a total outlay of close to 9 million dollars.

The execution of this scenario requires not only the participation of the entire donor community (\$59 million in non-recurrent, \$6 million and 30 million zaires in recurrent costs) but also a commitment by the GOZ greater than the present DOA budget and facilities in line with modern needs of a scientific activity. In particular a modern documentation and communication system is needed with reliable transport to and from major commercial centers.

Scenario 2. The basis of this scenario is the strengthening of commodity research, using only a few of the actual INERA stations. In 1976, Dr. Contant doubted "whether Yangambi can do much for the rehabilitation and development of Zairian agriculture". Dr. Djembi^{4/} wrote that same year "INERA has

4/ Dr. Djembi Mwembu. Report on Food Legumes and Soybean Production in Zaire. pp. 137 and 148.

received a great deal of financial aid in the past, but has still never been able to get off the ground". They suggested at that time that INERA should be reduced to a size this country can afford.

In the present scenario, INERA is asked to release (mettre à la disposition..) five major stations and three substations to five commodity programs with a vocation of applied research and outreach activities. Proposals for Yangambi will be described in a paper entitled "A Research Education and Extension Center in the High Rainfall Tropical Forest of Yangambi"

The program will be coordinated through a main office that has a minimum of administrative duties but responsibilities in research and extension affairs. Each program will manage its own budget through a committee made up by the Director, an expatriate chief advisor and the administrative officer. The main office will serve as link between the DOA, the programs and the donor community. It will find itself directly under the Secretary of State for Agriculture until a final structure for agricultural research is defined.

INERA with its heavy burden, i.e. more than 4000 employees to pay and the maintenance of INEAC's heritage will have to be redefined in terms of the national priorities. In this scenario, it is asked to release the major stations to the commodity programs, including human, physical and

budgetary resources. For 1982 this would amount to 16.5 million Zaires (See Annex "A Budget for a National Research Project").

Considering a long-haul approach to strengthening applied agricultural research and extension, an overall funding in nonrecurrent and recurrent expenditures of \$4 million per year and the equivalent counterpart funds will have to be considered.

According to Table 1 the stations involved in this scenario are the following:

- a. Mulungu in South Kivu represents the high altitude high rainfall zone. At present it is developing into a legume research station that was to be of a national scope. This should be reconsidered in view of the fact that such an ecological zone has also a vocation in animal production and vegetable crops. It is situated in an area that has been traditionally pastoral in nature, but due to population increase, it has had to restrict its number of large animals and use its limited land resources for food crops. The tea, coffee, quinquina, pyrethrum and forest at Mulungu will have to be disposed of in an appropriate manner giving due consideration for their future value as sources of germplasm.

- b. Bambesa is said to be an ecological region similar to that of Ibadan, the site of IITA, and as such ought to be strengthened in the food crops. Under INEAC it was a leading station in cotton research. It is one of the most recently built (late 1950's) yet it is presently relegated to a secondary role. Rice research in this country is still in an embryonic stage and would find a suitable site at this station. Cotton research may be a secondary activity for Bambesa, yet funded privately. The remainder of its production facilities will be farmed out since it is in an area moderately successful in plantation cropping.
- c. Gandajika lies in a relatively densely populated area and in a climatic zone endowed with soils suited to corn, legumes (pulses), cassava, and cotton cropping. Cotton research was one of the major activities pursued by this station. Since its facilities (except for the experimental ginning mill) are in dire need of rehabilitation, it will be more appropriate to equip the station towards a grain legume program for which its site is well suited. Cotton will be maintained as an outreach activity of Bambesa. Thus Gandajika will take the lead in the pulse crops, a normal combination with corn and cassava. This station is also endowed with large tracts of range

lands which may be leased, farmed out, or handed over to private management.

d. M'Vuazi has been discussed at length with DOA on many occasions. Its vocation as the leading cassava research station is well established. It will also serve as an outreach station for other programs, including the animal farm, if appropriate. Management of this station by the PRONAM would be in its best interest and would allow this program an autonomy of action it badly needs in order to develop properly. Assurances given with respect to the disposition of the property and facilities not needed by the PRONAM can be readily built in a transfer proposition.

e. Bongobo, known as the most financially productive, has a vocation as a major outreach station for the programs that need autonomous management schemes. It will be self-supporting considering that at present it has the largest income of all INERA stations. It is critical that it remains public property and eventually it should develop into a leading research station for the Equateur Region.

It is quite obvious that the basic principle of this scenario is an autonomy of the programs from any unwieldy and heavy bureaucratic structure. Any structural organization will evolve in time and when the need for it materializes.

The fate of the 14 secondary stations will be tied to that of INERA. Some like Kaniama, Kiyaka and Gimbi are already outreach stations. Kaniama in particular may be released entirely to the PNM whose corn research has a need for this site and is the only activity at present. MIDEWA has pursued an active wheat variety testing program at N'Dihira in North Kivu under the technical guidance of CIMMYT. This small outlying station should be released at once for this vocation. Other secondary stations may be made self-supporting units with a minimum of state subsidy and a maximum of personal incentives for production. They would have quasi-autonomy with minimum control under an umbrella organization that will guarantee their survival.

Scenario 3 is but a variant of Scenario 2. It is assumed that INERA is in a position to put its house in order and streamline it to suit the commodity programs as described above. The implications are a complete revision of the Ordinance Law of January 1978 which will allow each program the autonomy it needs. It is essential that each program can alone spend a budget allocated at the beginning of the year and pursue its activities without being paralyzed by a central administration with which communications are extremely difficult. A new INERA structure will have to take off its payroll nearly 3,500 employees in order to concentrate its funds on applied agricultural research.



Scenario 2 is the favored approach to restructuring agricultural research in Zaire. It is not institution-building but concentrates on an intensive training program. When this is achieved it will have a research core on which the country will be able to build its future development in agricultural R & D. The outside-funded technical assistance will be an integral part for at least 10 years. At such a time an institution assuring continuity can be developed from the individual programs.

It is a fact that INERA has been trying for the last ten years to concentrate its effort in research. It has not succeeded and is not likely to succeed because of its structure and restricted budgets. The Board of Directors has the power to act on any matters pertinent to the mandates of the Institute with the only constraint that its decisions be approved or authorized. To date the Board's actions have been very timid, to say the least, when major changes were required. The mandate of the Institute is to promote the scientific development of agriculture in Zaire through study missions, training programs, research and experimentation. The Board of Directors, also called the Scientific Board, so far has not succeeded in promoting research but rather production. Scenario 2 promotes the restructuring of applied agricultural research outside of the INERA constraints.

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3. The Education and Extension Framework

The separation of education from the mission-oriented departments is the rule in most political systems. Certain exceptions occur at the higher education level in particular with regards to agriculture (France, U.S.A.) In Zaire, the only faculty of Agriculture has been placed at Yangambi with the objective of encouraging INERA to participate more fully in the training process of its future employees. After ten years, success is far from being assured.

A framework within which applied agricultural research will have the greatest impact includes education and extension. It implies major changes in the public sector which take time to bring about. It is therefore proposed that an intermediate formula towards that goal is to make Yangambi the model for the framework. IFA has all the potential in human resources to carry out education, research, and extension. Yangambi has all the potential in physical installations (houses, buildings, lands) to support such an endeavor. The "Collectivité de Turumbu" is a natural laboratory to develop the extension model eventually to be applied to all of Zaire.

In order to attract outside technical assistance, the GOZ has to guarantee a certain minimum amount of freedom of action to this ensemble. A preferred approach is to

grant the Yangambi territory to an autonomous body endowed with a minimum budget (that of INERA and of IFA). This body will develop a strategy for action enabling it to attract outside technical assistance. More information is found on Yangambi in Part II of this paper entitled "A Research Center for Agricultural Education and Extension in the Humid Tropical Forest of Yangambi."

Thus, it is proposed on the one hand that applied agricultural research will undergo a restructuring phase with the implementation of the commodity-oriented programs, and on the other hand a model for integrated research, education, and extension in Zaire will be developed at Yangambi. The symbiosis expected between these two activities will be the framework within which a national system will be able to evolve.

E. Conclusions

This paper is the result of one's observations of the agricultural research framework of Zaire, a close look at INERA and an insight into the agricultural education system. It proposes restructuring applied agricultural research in the simplest possible way, i.e., five semi-autonomous programs under DOA. With regard to INERA it draws the same conclusion as many previous observers. INERA is not carrying out its mandate and in its present form is unwieldy and difficult to manage.

The PP assumed that the assessment of INERA would lead to a redefinition of its role and an optimization of its research resources. This paper, while recognizing similar findings to those of the PP team, concludes to the total exclusion of INERA from any reorganization of agricultural research in Zaire. Unlike the PP team, the paper points to a limited use of the Yangambi site, from which INERA will be absent. This is presented in the following pages.

PART II. A RESEARCH CENTER FOR AGRICULTURAL EDUCATION AND EXTENSION IN THE HUMID TROPICAL FOREST OF YANGAMBI

A. Introduction

In Zairian agricultural circles Yangambi is known for its National Institute for the Study and Research of Agriculture (INERA). The presence of the Faculty of Agriculture Institute (IFA) and the UNESCO program "Man and His Biosphere" (MAB) is not general knowledge. At the international level, Yangambi is remembered as the site of one of the largest tropical research centers of times past.

Within the last ten years or more Yangambi was the object of a number of activities that should have led to the relaunching of its Research Center, of IFA, or both.^{1/}

Once again it is thought that Yangambi should be given a new start, but on a scale this nation can afford.

B. The Site

Until 1970 INEAC and the missions were the sole occupant of a territory that covered 230 sq. km. Today it hosts INERA's headquarters, its Research Center, the Faculty of Agriculture, the Department of Environment with its Ecological Reserve (MAB), the Administration of the Sub-Region of the Tshopo plus the

^{1/} a) Trip report by the late Director General of INERA, Ndongo-Monumwo;
b) FAO report on the "Reléace du Centre de Recherche de Yangambi";
c) Reorientation and restructuring of INERA 1976;
d) The Contant report, for the Rockefeller Foundation.

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Turumbu collectivity. At some 20 km to the west was an agricultural production center known as CAPSA, but abandoned to a large extent. Four kilometers farther is the Yaekama fishculture farm, now part of the Yangambi Research Center.

1. The Faculty of Agriculture Institute

In 1978 the Faculty of Agriculture was transferred from Kinshasa to the Isalowe Plateau of Yangambi which was then part of INERA. It provides agricultural courses leading to the degree of Ingénieur-Agronome, the equivalent of an honors degree in the agricultural sciences. This Institute is described by the Director General of IFA.^{2/}

2. INERA Headquarters

The INERA Headquarters occupy most of the houses and facilities found on the Yangambi Plateau, including the main building which used to house the famous Central Library of INEAC. This area is known as the Administrative Center. In addition, Headquarters also has control over the storeroom (a very large construction), the garage, and the port facilities, all found at the "Beach" directly on the Zaire River.

3. The Yangambi Research Center

The Yangambi Research Center is the largest, both in area and infrastructure, of the agricultural research centers of Zaire. Alone it covers an area of 250 sq. km.

^{2/} IFA-81. Institut Facultaire Agronomique - Yangambi: Spécial-Rentrée Académique 1980-1981. 20 pp.

The administrative center, certain laboratories and research offices, climatology and the hospital are located at the KM5. Other laboratories and research facilities are at the KM17 and on the Isalowe Plateau.

What remains of the animal research center, i.e., the poultry, swine and other buildings, is in various stages of deterioration. It is situated midway between the HQ and the KM5. Pastures cover 100 hectares of improved land and need serious attention in order to bring them back into production.

Plantations of oil palm, coffee, cocoa and rubber trees cover an area of 2,500 ha. This is an indication of the importance this Center once had. Climatology is responsible for compiling observations made at the national level. The Soil Laboratory on the Isalowe Plateau harbors the Cartography and Classification Office. A separate building houses the National Herbarium of Zaire. Finally, the Center also owns oil, rubber, coffee and cocoa plants, wood and metal workshops, a saw mill and an agricultural equipment shop all found at or near the "Beach" area of Yangambi.

a. The N'Gazi Station

This is a secondary station located 25 km to the north of Yangambi and is primarily a rubber production unit with its own plant. All the plantings have been made prior to 1960 and originate from the Yangambi Center's research program.

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b. Yaekama

This fishculture farm is only partially in operation with less than a half dozen ponds in use. It has laboratories, offices, and a number of houses for the cadres. The workers have a compound of their own, separate from the houses and the administration buildings.

4. The Ecological Reserve

Since 1978, the majority of the Yangambi concession, i.e., 2,300 sq. km, has been transferred to the Department of Environment as a contribution to the UNESCO program "Man and his Biosphere". The reserve comprises two houses of the Yangambi Plateau and a laboratory on the Isalowe Plateau.

5. The Turumbu Cooperative

Inoperative, this cooperative still owns a number of buildings that are not in use and are deteriorating rapidly.

6. The Permanent Agricultural Center of the Agriculture Service (CAPSA)

This agricultural production center is found on the Lilanda Plateau some 20 km west of Yangambi. It covers an area of 350 ha, 160 ha of which were suitable for cultivation by heavy machinery. At present it is not in use and the small cassava starch production plant is inoperative. It might be renovated at a minimal cost.

The agriculture division of the Sub-Reigon is attempting to make some use of the buildings. The man in charge and some helpers live in mud huts on the site.

C. Some Practical Considerations

It is shown in the preceding chapter that Yangambi hosts a number of activities (agricultural education, some research, public administration, small farming and industrial crop production). From a perspective of relaunching these activities, what should be considered?

Dr. Cotant in 1976 estimated the cost of refurbishing the Research Center at 15 million dollars. It is questionable whether the entire Center should be refurbished, particularly because of the lack of trained personnel. In 1976 the Center had 20 university graduates; 14 of whom were "Ingénieur-agronomes" and six of other disciplines. In January 1981 there were only 12 university graduates left (recruitment of young graduates was underway). Between them they average 6 years of experience with INERA and they are chronically underemployed. Among them we have the Director of the Center who has little time for research, three giving general services (climatology, soils laboratory) and eight engaged in some experimental work. With little scientific support and insignificant budgets these people maintain some research activity through their own ingenuity and goodwill.

The Yaekama fishculture is under the supervision of an agronome at the A₃ level (3 years of technical high school). The activities are not reported in the 1978 and 1979 annual reports. The fish are fed with manioc leaves and other plant material. They are of a rather small size.

The MAB group is mainly concerned with surveillance of the reserve by patrolling on foot and canoe. With an annual budget of 1,600 Z and the participation of IFA and INERA it has started a small research program.

The Turumbu cooperative originates from the colonial times. The coop was given a new start between 1971 and 1972 as part of an effort to refurbish the Yangambi Center. This was not sustained and in 1980 the FAO was once more considering additional assistance.

As stated previously, the Lilanda CAPSA has shown very little activity, although it has a potential for seed production and rational exploitation of the 160 ha of improved land.

D. IFA at the Center of a Project for the Humid Tropical Forest of Yangambi

With 15 well qualified professors (Ph.D.'s or D.Sc.) the Faculty of Agriculture can play a major role within a research center integrated with agricultural education and extension. Dr. P. P. Antoine's text loc. cit. elaborates on this potential.

Concentrating on Yangambi as a whole and retaining that potential in human resources found at IFA, one can conceptualize a center where research, education and extension are integrated. The four themes proposed by Dr. Antoine will find sufficient space and facilities within the actual site. Thus soil potential and conservation studies may be carried out at Yangambi or even in its surroundings. The Center has also sufficient land for soil fertility studies and these may even be extended to the Lilanda Plateau.

The largest of the themes is the improvement of the food crops. It has been shown previously that the animal center has 100 ha of improved land. It is readily conceivable that some 20-30 ha of this land may be used for experimentation purposes, particularly in agronomy (variety trials, plant breeding, crop protection, multiple cropping, etc.). The facilities of the KM17 will also have to be considered. Although they are situated at some distance and over a difficult road, they have the appropriate equipment for rice research. At the applied level, away from the traditional farming, the corridor approach to crop production is also available. Finally, the Lilanda Plateau is the ideal site for seed multiplication.

Animal science is the third theme. The Animal Center is an appropriate site for small animal and poultry work. There are houses, office space and other buildings that are readily refurbished.

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The fourth and final theme, microeconomics and extension, will be developing the extension model that will eventually apply to the entire nation. This it can do through the local farmers, particularly those of the Turumbu collectivity.

Among other existing facilities in Yangambi there are a number of them that may be useful to the Center. The actual administration building of INERA Headquarters may be refurbished as the main national agricultural library. With the departure of the INERA Headquarters, the houses of the Yangambi Plateau will be useful to the Center.

Among the facilities found at the Beach, the Center will certainly need the storage room building, the garage, and the workshops. The generator house will have to be refurbished and reequipped to be the sole source of electricity. A future agricultural engineering department will be able to make good use of the now practically abandoned facilities on the Lusambila hill.

Finally, the Yaekama fishculture facilities will be of good use to a future biology department at IFA.

Thus, IFA, with a permanent status, will find itself at the heart of a project that should lead to an agricultural center for the humid tropics. Endowed with facilities presently controlled by INERA, it will need a long-term assurance of financial and technical help. This it will obtain from a

multi-donor community should the GOZ consider the creation of an international center and endow it as proposed in the budget of Annex 1.

E. The Disposition of Yangambi not part of the Center

Other than the facilities that will endow the Center, there remain in Yangambi large areas and structures to be disposed of. The activities of the actual Yangambi Research Center being what they are, one wonders whether it is worth maintaining any. The Elaeis program has large areas in oil palm and interesting genetic material. In parallel, however, the Binga station of the "Plantations Lever du Zaïre" (PLZ) and of the "Société des Cultures du Zaïre" (SCZ) is maintaining a similar program. These private concerns with an important government ownership (40 and 50 per cent respectively) are now seriously committed to plant breeding and other research in Elaeis.

Since the Binga station is already distributing improved seedlings it could be distributing on a national level and summer the leadership for that crop. The Yangambi genetic stock and some of the facilities could form the Binga sub-station. Binga is also interested in coffee and cocoa and can care for whatever material of interest is still in Yangambi.

The rubber plantation of Yangambi and N'Gazi need to be evaluated. Specialists should be sent in who will determine whether

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there is material of interest deemed worth retaining. In any case, there are in Yangambi sufficient cropping surfaces that the participation of the local population is warranted. This may be done in the form of a direct handout of farm land or leasing to a cooperative-type production unit.

It remains to be determined what the fate of the hospital, the Medical Center and the Social Center will be. The incorporation of the various "cités" into a town of Yangambi should be considered. As part of the Yanonge Zone it will come under the Department of Territories and obtain city status. In such a case, the hospital and medical center will also become the responsibility of the State. The Social Center with its Guest House, swimming pool and theatre should be an attraction for the private sector. With the coming of a new road, electricity and running water for Yangambi and the proximity of the Tropical Agriculture Center, these recreational facilities may even develop into a tourist attraction. With such a prospect, Yangambi will have a new start.

This paper does not claim to have covered the subject in all its aspects. The purpose was to show Yangambi as this author has seen it, to propose one alternative, among others, through a project which Zaire can afford.

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ANNEX

A BUDGET FOR AGRICULTURAL RESEARCH IN ZAIRE

ANNEX

A Budget for Agricultural Research in Zaire

For the fiscal year 1982, INERA-project expenditures are on the order of 60 million zaires (Prévision budgétaires 1982, Budget Ordinaire, INERA). This budget will provide salaries, social benefits of all kinds, operation and maintenance costs, and capital outlays to refurbish 20 stations and keep over 4,000 regular employees on the payroll.

It is submitted that this country needs no more than 7 stations to produce the new technology required in support of an agriculture based on the staple food crops. Enclosed are the project 1982 expenditures for these stations and those of the remaining 13 stations that will be in a state of latency until they are needed again as research stations.^{1/} The budget proposed here amounts to 16.5 million zaires in contrast to that proposed by INERA. The work force will be reduced to 591 regular employees and 206 person-years in the form of casual labor. In support of the alternative budget proposed, the GOZ will have to obtain outside support. It is maintained that this will be considered favourably in view of the fact that a rational approach to agricultural research is being proposed.

^{1/} It is estimated by INERA that the station of Bongabo will produce a revenue of more than 1.0 million zaires per year. Bongabo will therefore not need any support from the State except to man its meteorology station. Any of the other stations that will show similar potential should also develop that capacity.

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TABLE 1: Summary Table of the Projected 1932 Expenditures of Agricultural Research in Zaire

<u>Program</u>	<u>Salaries and Benefits</u>	<u>Operation Costs</u>	<u>Sub-total</u>	<u>Capital Costs</u>	<u>TOTAL</u>
Headquarters	718	1,077	1,795	598	2,393
Bambesa (substation)	158	236	394	131	525
Gandajika (PNL)	625	937	1,562	521	2,083
Lumbumbashi (PNM)	922	1,384	2,306	769	3,075
Kaniama (PNM)	188	279	465	154	169
Mulungu	373	559	932	311	1,243
M'Vuazi (PRONAM)	1,088	1,632	2,720	907	3,627
Yangambi (PNR)	624	936	1,560	520	2,080
<u>14 Stations in a state of latency</u>	<u>685</u>	<u>171</u>	<u>856</u>	<u>-</u>	<u>856</u>
<u>TOTAL</u>	<u>5,379</u>	<u>7,211</u>	<u>12,590</u>	<u>3,911</u>	<u>16,501</u>

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TABLE 2: Headquarters1982 Budget1. Salaries and Benefits

a. Salaries

Positions	Units	Salaries	
		Monthly	Annually
General Coordinator	1	6,000	72,000
Scientific Director	1	3,400	40,800
Director of Administration	1	2,900	34,800
Asst. Director of Administration	1	2,000	24,000
Personnel Officer	1	1,800	21,600
Procurement Officer	1	1,800	21,600
Public Relations Officer	1	1,800	21,600
Internal Auditors	2	1,400	33,600
Scientific Support Officer	8	1,000	96,000
Accountant	2	1,000	24,000
Clerk	2	600	14,000
Typists and Stenographers	8	600	57,600
Drivers	5	450	27,000
Crew	8	200	19,200
TOTAL	42		507,800

b. Pensions, fees and bonuses

Pension fund (4.5%)	22,851
INPP Fee (1 %)	5,078
Family Allowances (282.2 x 42)	11,852
Office Bonuses	88,800
Certificate Bonuses (207 x 19 x 12)	47,196
Cashier's Bonus	360
SUB-TOTAL	176,137
Miscellaneous (5%)	34,197
TOTAL	718,134
2. <u>Operating Costs</u>	1,077,201
Total "Budget Ordinaire" (BO)	1,795,334
3. <u>Capital Costs</u> (B1)	598,445
TOTAL BUDGET (BO / B1) 1982	2,393,780

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TABLE 2a: Office Bonuses

Grade	Units	Bonuses	
		Monthly	Annually
General Coordinator			
Scientific Director	1	900	10,800
Director of Administration	1	700	8,400
Asst. Director of Administration	1	500	6,000
Personnel Officer	1	400	4,800
Procurement Officer	1	400	4,800
Public Relations Officer	1	400	4,800
Internal Auditor	2	350	8,400
Scientific Support Officer	8	350	33,600
Accountant	2	300	7,200
TOTAL	19		88,800

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TABLE 3: Bambesa Sub-station1982 Budget1. Salaries and Benefits

a. Salaries

Positions	Units	Salaries	
		Monthly	Annually
Chief of Station	1	1,000	12,000
Technician	1	600	7,200
Meteorologist	2	600	14,400
Accountant	1	600	7,200
Cashier	1	550	6,600
Clerk-Typist	2	600	14,400
Farm Workers	5	200	12,000
Casual Labor	10	150	18,000
Drivers	3	450	16,200
Mechanics	1	500	6,000
Woodworker	1	450	5,400
Mason	1	450	5,400
Plumber	1	450	5,400
Electrician	1	450	5,400
TOTAL	31		135,600

b. Pension, fees and bonuses

Pension fund (4.5%)	6,102
INPP Fee (1%)	1,356
Family Allowances (282.2 x 31)	8,748
Office bonuses (300 x 12)	3,600
Certificate bonuses (150 x 12)	1,800
Cashier's bonus (30 x 12)	<u>360</u>

SUB-TOTAL 21,966

TOTAL 157,566

2. Operating Costs 236,349

Total "Budget Ordinaire" (BO) 393,915

3. Capital Costs (B1) 131,305TOTAL (BO + B1) 1982 525,220

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TABLE 4: National Legume Program, Gandajika

1982 Budget

1. Salaries and Benefits

a. Salaries

Positions	Units	Salaries	
		Monthly	Annually
Program Director	1	2,900	34,800
Senior Research Scientist	0	3,400	0
Asst. Director Administration	1	2,200	26,400
Junior Research Scientist	4	2,000	96,000
Asst. Research Officer	4	1,200	57,600
Station Manager	1	1,000	12,000
Senior Technician	3	850	30,600
Technicians	7	600	50,400
Asst. Accountant	1	550	6,600
Asst. Personnel Officer	1	550	6,600
Clerk	2	450	10,800
Typists	2	450	10,800
Farm workers	15	200	36,000
Casual labor	15	150	27,000
Drivers	5	450	27,000
Mechanics	2	500	12,000
Woodworker	1	450	5,400
Mason	1	450	5,400
Electrician	1	450	5,400
TOTAL	68		466,200

b. Pensions, fees and bonuses

Pension fund (4.5%)	20,979
INPP Fee (1%)	4,662
Family Allowance (282.2 x 68)	19,189
Office bonuses	78,600
Certificate bonuses (207 x 14 x 12)	34,776
Cashier's bonus (30 x 12)	360

SUB-TOTAL 158,566

TOTAL 624,766

2. Operating Costs

937,149

Total "Budget Ordinaire" (BO) 1,561,915

3. Capital Costs (B1)

520,638

TOTAL (BO + B1)

2,082,553

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TABLE 4a: Office Bonuses for PNL

Positions	Units	Bonuses	
		Monthly	Annually
Program Director	1	900	10,800
Senior Research Scientist	0	900	0
Asst. Director Administration	1	700	8,400
Junior Research Scientist	4	700	33,600
Asst. Research Officer	4	350	16,800
Station Manager	1	300	3,600
Senior Technicians	3	150	5,400
TOTAL	14		78,600

TABLE 5: National Corn Program, Lubumbashi

1982 Budget

1. Salaries and Benefits

a. Salaries

Position	Units	Salaries	
		Monthly	Annually
Program Director	1	2,900	34,800
Senior Research Officer	2	2,400	57,600
Asst. Director of Administration	1	2,200	26,400
Junior Research Officer	4	2,000	96,000
Asst. Research Officer	11	1,200	158,400
Technicians	7	600	50,400
Crop Technicians	20	450	108,000
Accountant	1	550	6,600
Asst. Personnel Officer	1	550	6,600
Clerks	2	450	10,800
Typists	2	450	10,800
Farm Workers	15	200	36,000
Casual labor	15	150	27,000
Drivers	5	450	27,000
Mechanics	2	500	12,000
Plumber	1	450	5,400
Woodworker	1	450	5,400
Electrician	1	450	5,400
TOTAL	93		690,000

b. Pensions, fees and bonuses

Pension fund (4.5%)	31,050
INPP Fee (1%)	6,900
Family Allowance (282.2 x 93)	26,245
Office bonuses	120,600
Certificate Bonuses (207 x 19 x 12)	47,196
Cashier's Bonus (30 x 12)	360

SUB-TOTAL 232,351

TOTAL 922,351

2. Operating Costs 1,383,526

Total "Budget Ordinaire" (BO) 2,305,877

3. Capital Costs (B1) 768,626

TOTAL (BO + B1) 1982 3,074,503

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TABLE 5a: Office Bonuses for PNM

Positions	Units	Salaries	
		Monthly	Annually
Program Director	1	900	10,800
Senior Research Scientist	2	900	21,600
Junior Research Scientist	4	700	33,600
Senior Technician	11	350	46,200
Asst. Director of Administration	1	700	8,400
TOTAL	19		120,600

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TABLE 6: PNM Kaniama Sub-station

1982 Budget

1. Salaries and Benefits

a. Salaries

Position	Units	Salaries	
		Monthly	Annually
Chief of Station	1	1,000	12,000
Technician	1	600	7,200
Meteorologists	2	600	14,400
Accountant	1	600	7,200
Cashier	1	550	6,600
Clerk-Typists	2	600	14,400
Farm Workers	15	200	36,000
Casual Workers	10	150	18,000
Drivers	3	450	16,200
Mechanics	1	500	6,000
Woodworker	1	450	5,400
Plumber	1	450	5,400
Electrician	1	450	5,400
Mason	1	450	5,400
TOTAL	41		159,000

b. Pensions, fees and bonuses

Pension fund (4.5%)	7,182
INPP Fee (1%)	1,596
Family Allowance (282.2 x 41)	11,570
Office Bonuses (300 x 12)	3,600
Certificate Bonuses (150 x 12)	1,800
Cashier's bonus (30 x 12)	360
SUB-TOTAL	26,108

TOTAL 185,708

2. Operating Costs 278,562

Total "Budget Ordinaire" (BO) 464,270

3. Capital Costs (B1) 154,757

TOTAL BUDGET (BO + B1) 1982 619,027

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TABLE 7: High Altitude Experimental Station1982 Budget1. Salaries and Benefits

a. Salaries

Position	Units	Salaries	
		Monthly	Annually
Junior Research Scientist	1	2,000	24,000
Asst. Research Officer	3	1,200	43,200
Station Manager	1	1,000	1,200
Technician	8	600	57,600
Accountant	1	600	7,200
Cashier	1	500	6,000
Asst. Personnel Officer	1	550	6,600
Clerks	2	450	10,800
Typists	2	450	10,800
Farm Workers	15	200	3,600
Casual labor	15	150	27,000
Drivers	5	450	27,000
Mechanics	2	500	12,000
Woodworker	1	450	5,400
Mason	1	450	5,400
Plumber	1	450	5,400
Electrician	1	450	5,400
TOTAL	61		301,800

b. Pensions, fees and bonuses

Pension fund (4.5%)	13,581
INPP Fee (1%)	3,018
Family Allowances (282.2 x 61)	17,214
Office Bonuses	24,600
Certificate Bonuses (207 x 5 x 12)	12,420
Cashier's Bonus (30 x 12)	360
SUB-TOTAL	71,193

TOTAL 372,993

2. Operating Costs 559,480

Total "Budget Ordinaire" (BO) 932,480

3. Capital Costs (B1) 310,827

TOTAL (BO + B1) 1982 1,243,309

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TABLE 7a: Office Bonuses

Position	Units	Bonuses	
		Monthly	Annually
Junior Research Officer	1	700	8,400
Asst. Research Officer	3	350	12,600
Station Manager	1	300	3,600
TOTAL	5		24,600

TABLE 8: National Cassava Program, M'Vuazi Station

1982 Budget

1. Salaries and Benefits

a. Salaries

Positions	Units	Salaries	
		Monthly	Annually
Program Director	1	2,900	34,800
Senior Research Scientist	2	2,400	57,600
Asst. Director of Administration	1	2,200	26,400
Junior Research Scientist	10	2,000	240,000
Asst. Research Officer	3	1,200	43,200
Technicians	7	600	50,400
Crop Technicians	15	450	81,000
Accountant	1	550	6,600
Asst. Personnel Officer	1	550	6,600
Clerks	4	450	20,600
Typists	4	450	20,600
Farm Workers	30	200	72,000
Casual labor	30	150	54,000
Drivers	8	450	43,200
Mechanics	4	500	24,000
Masons	2	450	10,800
Plumber	2	450	10,800
Woodworkers	2	450	10,800
Electricians	2	450	10,800
TOTAL	129		826,200

b. Pensions, fees and bonuses

Pension Fund (4.5%)	37,173
INPP Fee (1%)	8,262
Family Allowances (282.2 x 123)	36,404
Office bonuses	137,400
Certificate bonuses	42,228
Cashier's bonus (30 x 12)	360
SUB-TOTAL	261,833

TOTAL 1,088,033

2. Operating Costs 1,632,049

Total "Budget Ordinaire" (BO) 2,720,082

3. Capital Costs (B1) 906,644

TOTAL BUDGET (BO + B1) 1982 3,626,776

TABLE 8a: Office Bonus

Positions	Units	Bonus	
		Monthly	Annually
Program Director	1	900	10,800
Senior Research Scientist	2	900	21,600
Asst. Director of Administration	1	700	8,400
Junior Research Scientist	10	700	84,000
Asst. Research Officer	3	350	12,600
TOTAL	17		137,400

TABLE 9: National Rice Program, Yangambi Station

1982 Budget

1. Salaries and Benefits

a. Salaries

Positions	Units	Salaries	
		Monthly	Annually
Program Director	1	2,900	34,800
Senior Research Scientist	0	2,400	0
Asst. Director of Administration	1	2,200	26,400
Junior Research Scientist	4	2,000	96,000
Asst. Research Officer	4	1,200	57,600
Station Manager	1	1,000	12,000
Senior Technicians	3	850	30,600
Technicians	7	600	50,400
Accountant	1	550	6,600
Asst. Personnel Officer	1	550	6,600
Clerks	2	450	10,800
Typists	2	450	10,800
Farm Workers	15	200	36,000
Casual labor	15	150	27,000
Drivers	5	450	27,000
Mechanics	2	500	12,000
Woodworkers	1	450	5,400
Mason	1	450	5,400
Plumber	1	450	5,400
Electrician	1	450	5,400
TOTAL	68		466,200

b. Pensions, fees and bonuses

Pension Fund (4.5%)	20,979
INPP Fee (1%)	4,656
Family Allowances (282.2 x 68)	19,189
Office Bonuses	78,600
Certificate Bonuses (207 x 14 x 12)	34,776
Cashier's Bonus (30 x 12)	360

SUB-TOTAL 158,566

TOTAL 624,133

2. Operating Costs 936,199

Total "Budget Ordinaire" (BO) 1,560,332

3. Capital Costs (B1) 520,111

TOTAL (BO + B1) 1982 2,080,443

TABLE 9a: Office Bonuses

Positions	Units	Salaries	
		Monthly	Annually
Program Director	1	900	10,800
Senior Research Scientist	0	900	0
Asst. Director of Administration	1	700	8,400
Junior Research Scientist	4	700	33,600
Asst. Research Officer	4	350	16,800
Farm Manager	1	300	3,600
Senior Technicians	3	150	5,400
TOTAL	14		78,600

1.78

TABLE 10: Other Stations not in Use

1. Salaries and Benefits

a. Salaries

Position	Units	Salaries	
		Monthly	Annually
Meteorologist, Officer in charge	1	700	8,400
Meteorologist	1	600	7,200
Headman	1	500	6,000
Farm Workers	3	200	7,200
Casual labor	7	150	12,600
TOTAL	13		41,400

b. Pensions, fees and bonuses

Pension fund (4.5%)	1,863
INPP Fee (1%)	414
Family Allowances (282.2 x 13)	3,669
Office Bonuses (100 x 12)	1,200
Cashier's Bonus (300 x 12)	<u>360</u>
SUB-TOTAL	7,506

TOTAL 48,906

2. Operating Costs 12,226

Total "Budget Ordinaire" (BO) 61,132

For 14 stations

Salaries and Benefits 48,906 x 14 = 684,684

Operating Costs 12,226 x 14 = 171,164

TOTAL 855,884