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### Country Projects

**As of 30 June 1977**

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**Total**

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**Of which**

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| Programme Reserve Projects | 70,000 |
ACCOMMODATION

LAGOS

Federal Government Guesthouse

Mr. and Mrs. McNamara
Mr. C. Koch-Weser
Mr. R. Chaufournier
Mr. W. Clark
Mr. P. Taylor-Lewis

KADUNA

State House

Mr. and Mrs. McNamara
Mr. C. Koch-Weser
Mr. R. Chaufournier
Mr. W. Clark
One other if required

Durbar Hotel

Mr. P. Reitter
Mr. P. Taylor-Lewis

IBADAN

Premier Lodge

Mr. and Mrs. McNamara
Mr. C. Koch-Weser
Mr. R. Chaufournier

Other Accommodation

Mr. W. Clark
Mr. P. Reitter
Mr. P. Taylor-Lewis
INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE (IITA)

1978 Program and Budget

Observations of the Secretariat

I. INTRODUCTION

History

1. IITA, established in 1969, has the major objective of seeking solutions to the problems involved in finding alternatives to traditional shifting cultivation systems in the humid tropics. It has, therefore, a strong effort in Farming Systems Research, with associated crop improvement programs.

2. Research activities currently comprise the Farming Systems Program, the Cereal Improvement Program, the Grain Legume Improvement Program, the Tuber and Root Improvement Program. These are complemented by a strong Research and Training Support Program which includes the direction of Special Projects, station management, library and documentation, statistical services, information services and a more recent addition, a Germ Plasm Collection Unit.

Mandate

3. The mandate of IITA has recently been amended by the Board of Trustees. It now more clearly defines the role of IITA with respect to farming systems research in the humid tropics and better delineates its global and African regional responsibilities in respect of crop improvement. Among "other crops which are, or may become, important in the farming systems," it now specifically names vegetable plantain. The mandate spells out responsibilities for collaborative work with IBPGR on the exploration, collection, conservation, documentation and utilization of genetic resources, and it provides for a wide range of cooperative activities at national and regional level including, as approved by the Board, "activities concerned with the application of the results of research to rural, agricultural and national development."

Program Changes

4. Both the Cereals Improvement Program and the Grain Legumes Improvement Program have been emphasizing breeding and selection for high yield, disease and insect resistance, and tolerance to adverse environmental stresses with wide adaptation under monocrop conditions. They now include improvement within mixed cropping systems, which is particularly relevant to the farming systems of Africa, in which intercropping of cereals and legumes is very common.

5. Whilst every attempt is being made to overcome disease and pest problems by selecting for resistance and reducing pesticide use to a minimum, some chemical control is still necessary. This is carefully integrated with the use of the selected resistant varieties.
High Rainfall Substation

6. At Ibadan, IITA is outside the true Guinean rain forest zone. It therefore felt the need to establish a substation at Onne, in Rivers State, E. Nigeria, which is in a high rainfall area (2,300 mm p.a.) with highly leached acid soils more typical of large areas of the humid tropics.

7. The development of the substation is proceeding satisfactorily, but its final scope will depend upon whether tree crops are to be included within the Farming Systems Program and may also be affected by the possibility of participating in agro-forestry research and research on small animals in cooperation with ILCA.

Basis for Commentary

8. This commentary has been prepared by the CGIAR Secretariat in cooperation with the TAC Secretariat. It is based on the 1978 Budget Proposal of IITA and its draft Supplement, which should be read in conjunction. Members of the TAC and CGIAR Secretariats attended the Annual In-House Review of Programs in February 1977.

II. PROGRAMS

Farming Systems

9. The Farming Systems Program is divided into four main subsections: Cropping Systems, which includes associated studies of the ecology and control of major pests and weeds; Soil and Environmental Management, including soil microbiology, chemistry, soil physics, water management, fertility, pedology and agroclimatology; Agricultural Engineering, including field implements and postharvest machinery; and finally, Agricultural Economics.

10. Highlights of the past years' work include achieving doubled yields of maize in the zero-tillage trials on the research farms without loss of soil fertility, and establishing parameters for land use classification for a large number of benchmark soils of the humid tropics. Economic studies have demonstrated the utility of mulch-tillage techniques developed at IITA and have provided useful data on the effects of rising population pressures on farming systems, including greater use of household refuse, animal manure and mulch in farming within family compounds and the increased importance of livestock and tree crops.

11. Future plans of the Farming Systems Program include the wider off-site testing of the successful zero- and minimum-tillage findings and of the potentially superior system of soil management utilizing minimal fertilizer applications to arrest available nutrient decline.
12. Preliminary cropping studies have led to the design of eight two-year sequences and rotations with potentially high efficiency. Inter-disciplinary studies will be intensified, on the basis of these eight sequences, to establish year-round production systems for small farmers.

13. The Institute is considering increasing its activities in Agricultural Engineering and, although agreeable to holding staffing levels at those of 1977, as suggested by TAC, is seeking improved facilities for the design and production of prototype innovative tools adapted to the needs of the small farmers of the African region. TAC's previous reservations about aspects of this program will be reassessed during the Quinquennial Review.

14. The complex and inter-disciplinary nature of the Farming Systems Program makes it the key program. The crop improvement programs draw from, and feed into, the systems program, and systems program scientists provide services to all other programs.

Cereals

15. The objective of the Cereals Improvement Program is to improve maize and rice in Africa. Both crops form a major responsibility of other IARCs and consequently IITA's work, of a regional nature, relies heavily on CIMMYT and IRRI. IITA has a formal agreement with the latter. It cooperates with WARDA in training programs in rice production and in testing genetic material. The new approach adopted in 1977 of directing research to problems of specific environments, rather than attempting to breed for wide adaptability, will be continued through 1978 and into the future.

16. Maize work will be directed at four specific environments—rain forest, savannah, the intermediate (transition) zone and medium elevations. Present program objectives continue to be to achieve resistance to stem borer, streak virus and various diseases, early maturity and high protein. Resistance to streak virus will be tested internationally. The use of hybrid maize to reduce variability in crop experiments and its potential in farmers' fields as compared to composites will be examined. Tolerance to the stem borer has been identified, utilizing a mass rearing and infestation methodology developed at IITA.

17. Ecosystem analysis was also incorporated into the rice program to identify the diverse soil and agroclimatic conditions under which rice is cultivated in tropical Africa, and to develop screening methods for segregating populations and cultivars with adaptations to specific environments. Some good lines for swamp conditions and irrigated conditions with high disease incidence have already been identified. Broad based resistance to blast disease especially is being sought.

18. Work on rice is carried out in cooperation with the Institut de Recherches Agronomiques Tropicales et des Cultures Vivrières (IRAT), IRRI and WARDA.
Grain Legumes

19. The Grain Legume Improvement Program is concerned with the improvement of cowpea, lima bean, soya bean, and with exploratory studies on miscellaneous potentially useful leguminous crops. Emphasis has been on cowpea and good progress has been made through breeding. Both initial and advanced yield trials have been conducted "off-campus" for the first time in three African countries and Puerto Rico. A new strategy aims to develop plant types with resistances and suitable photo-period response for different ecological zones and cropping systems. No major constraints appear to be impeding work in this program.

Tubers and Roots

20. The Tuber and Root Improvement Program continues to accord major attention to cassava and, in light of successes gained in 1976 with the introduction of improved lines in Nigeria, will put considerable effort into the rapid multiplication of five lines identified as high yielding and having good palatability, as well as resistance to cassava bacterial blight and mosaic diseases.

Research Support

21. Work will be started on virology, in the Research Support Unit but under the technical guidance of the Institute's pathologist. The initial core position, to be filled in the first instance by a visiting scientist, is in line with TAC's recommendations, although it is understood that IITA intends to expand this initiative to a project of regional dimensions (see "Issues").

22. TAC has under consideration a CGIAR initiative in vegetable research, entailing a proposal to establish several small vegetable units, including one to be located at IITA for which it would provide land and logistic support, but not management. Similarly, IITA may be called upon to assist in the selection of a location and provide logistic support for a small research subunit of ILCA. Both the above proposals, if they were to be adopted, could hold interest for the Farming Systems Research Unit of IITA.
III. BUDGET TRENDS

23. The evolution of IITA's budgets is summarized in Table I below:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior scientists and management)</td>
<td>53</td>
<td>57</td>
<td>45.0</td>
<td>58.3</td>
<td>63.5</td>
</tr>
<tr>
<td>Senior technical support)</td>
<td></td>
<td></td>
<td>19.3</td>
<td>23.5</td>
<td>28.5</td>
</tr>
<tr>
<td>Total Senior</td>
<td>53</td>
<td>57</td>
<td>64.3</td>
<td>81.8</td>
<td>92.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Core budget - operating</td>
<td>5,959</td>
<td>7,201</td>
<td>8,353</td>
<td>9,999</td>
<td>11,669/1</td>
</tr>
<tr>
<td>- capital</td>
<td>699</td>
<td>1,281</td>
<td>1,076</td>
<td>2,411</td>
<td>2,093/2</td>
</tr>
<tr>
<td>Total Core</td>
<td>6,658</td>
<td>8,482</td>
<td>9,429</td>
<td>12,410</td>
<td>13,762</td>
</tr>
<tr>
<td>Special Projects</td>
<td>553</td>
<td>1,332</td>
<td>1,631</td>
<td>2,512</td>
<td>4,719</td>
</tr>
<tr>
<td>Total</td>
<td>7,211</td>
<td>9,814</td>
<td>11,060</td>
<td>14,922</td>
<td>18,481</td>
</tr>
</tbody>
</table>

/1 Includes $90,000 in 1978 for the TAC Quinquennial Review, not shown in IITA's current budget paper.

/2 Capital budget being reviewed by IITA.

IITA has carried out a review of the growth of funding by program, which is summarized on pages 21-22 of the 1978 Program and Budget Paper. Allocations of funds among the various activities are summarized in Table II below.
Table II - Allocation Among Core Operating Activities (Current $'000)

<table>
<thead>
<tr>
<th></th>
<th>1974 actual $'000</th>
<th>1975 actual $'000</th>
<th>1976 actual $'000</th>
<th>1977 revised $'000</th>
<th>1978 budget $'000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farming systems</td>
<td>799</td>
<td>1,110</td>
<td>1,359</td>
<td>1,426</td>
<td>1,460</td>
</tr>
<tr>
<td>Cereals</td>
<td>281</td>
<td>501</td>
<td>710</td>
<td>783</td>
<td>777</td>
</tr>
<tr>
<td>Grain legumes</td>
<td>432</td>
<td>564</td>
<td>701</td>
<td>895</td>
<td>983</td>
</tr>
<tr>
<td>Tubers and roots</td>
<td>283</td>
<td>412</td>
<td>506</td>
<td>767</td>
<td>826</td>
</tr>
<tr>
<td>Subtotal</td>
<td>1,795</td>
<td>2,587</td>
<td>3,276</td>
<td>3,871</td>
<td>4,046</td>
</tr>
<tr>
<td>Research Support /1</td>
<td>2,052</td>
<td>2,535</td>
<td>2,713</td>
<td>3,158</td>
<td>4,035</td>
</tr>
<tr>
<td>Subtotal Research</td>
<td>3,847</td>
<td>5,122</td>
<td>5,989</td>
<td>7,029</td>
<td>8,081</td>
</tr>
<tr>
<td>Conferences &amp; Training</td>
<td>338</td>
<td>280</td>
<td>433</td>
<td>655</td>
<td>778</td>
</tr>
<tr>
<td>Library, Documentation &amp; Information</td>
<td>196</td>
<td>307</td>
<td>390</td>
<td>459</td>
<td>558</td>
</tr>
<tr>
<td>General Administration</td>
<td>835</td>
<td>896</td>
<td>1,088</td>
<td>1,233</td>
<td>1,481</td>
</tr>
<tr>
<td>General Operating</td>
<td>307</td>
<td>376</td>
<td>421</td>
<td>423</td>
<td>481</td>
</tr>
<tr>
<td>Contingency, other /2</td>
<td>436</td>
<td>220</td>
<td>32</td>
<td>*</td>
<td>200</td>
</tr>
<tr>
<td>TOTAL</td>
<td>5,959</td>
<td>7,201</td>
<td>8,353</td>
<td>9,999</td>
<td>11,669</td>
</tr>
</tbody>
</table>

/1 Includes full cost of Physical Plant Services.

/2 Includes $90,000 in 1978 for the TAC Quinquennial Review, not shown in current budget paper.

* Less than 0.5%.

It will be noted that there have been only minor changes in the proportion of total operating resources allocated to different activities. Farming systems, having got off to an early start, has somewhat reduced its share, though it remains much the biggest program. Tubers and roots has increased its share between 1974 and 1978, to be more or less on a par with cereals and grain legumes. Research, as defined in IITA's budget, has accounted for an increasing share of total resources, amounting to 70 percent in 1978. Research budgets have accordingly grown between 1974 and 1978 at an average
annual compound rate of just over 20 percent per annum, in current terms, while
the total operating budget has grown slightly slower, at about 18 percent per
annum. However, the "Research Support" category includes Physical Plant
Services, which, though obviously supporting the research effort, is normally
shown separately from research at other centers. Eliminating this item from
the "Research" budget category results in the following reductions in relative
resources allocated to research.

<table>
<thead>
<tr>
<th>Year</th>
<th>Actual</th>
<th>Actual</th>
<th>Actual</th>
<th>Revised</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td>65</td>
<td>71</td>
<td>71</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>1975</td>
<td>44</td>
<td>49</td>
<td>52</td>
<td>55</td>
<td>53</td>
</tr>
</tbody>
</table>

25. Trends in selected indicators at IITA are given in Table III.

Table III - Selected Indicators

<table>
<thead>
<tr>
<th>Year</th>
<th>Actual</th>
<th>Actual</th>
<th>Actual</th>
<th>Revised</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td>93</td>
<td>77</td>
<td>88</td>
<td>97</td>
<td>99</td>
</tr>
<tr>
<td>1975</td>
<td>112.4</td>
<td>126.3</td>
<td>130.5</td>
<td>122.3</td>
<td>126.8</td>
</tr>
<tr>
<td>1976</td>
<td>65</td>
<td>71</td>
<td>71</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>1977</td>
<td>122.3</td>
<td>126.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1978</td>
<td>52</td>
<td>51</td>
<td>68</td>
<td>65</td>
<td>68</td>
</tr>
<tr>
<td>1979</td>
<td>9.4</td>
<td>9.8</td>
<td>9.3</td>
<td>8.0</td>
<td>8.5</td>
</tr>
</tbody>
</table>

"Fill rate" - budget manyears as a percentage of authorized positions.
As from the 1978 Budget, IITA has divided professional staff into two
categories -- "Senior Staff", and "Senior Technical Support Staff".
The fill rates shown cover both categories.
1976 Budget

26. Program priorities as reflected in actual expenditures in 1976 broadly remained as originally envisaged in the approved budget. However, mandatory salary increases raised unit costs above the impact of overall inflation. In 1976 IITA therefore ended up spending on core operations 95 percent of the funds budgetted, but on real inputs (expressed in terms of professional staff manyears) only 84 percent of those that were planned. The shortfall in professional staff was most marked in the research programs, though research expenditures stayed close to the budget. The total core operating cost per professional staff manyear turned out at $130,000, as against $111,800 in the original budget.

1977 Budget

27. Revised estimates of operating expenditures are, as last year, close to the budget, and the total is identical. As in 1976, unit costs appear to be rising, from $116,300 per professional staff manyear in the approved budget, to $122,300 in the revised estimate. Again, the shortfall in manpower is most marked in the research programs. It is hoped that the forthcoming TAG review (schedule for October 1977) will clarify whether this is due to a reevaluation of program requirements, or to other factors.

Donors

28. IITA has been successful in attracting support for its core programs from an increasing number of major donors. Five of IITA's donors account for 75 percent of the total contributions for 1977, prior to allocation of unallocated contributions.

Capital

29. IITA has so far been the most expensive center in the CGIAR system to establish. Total capital costs in the period 1968 through 1980 are estimated at $38 million in 1977 dollars, applying worldwide deflators, or $27 million in current dollars. Total capital invested over the 13-year period to 1980 therefore amounts, in 1977 dollars, to $.4 million per core professional staff manyear, or $.7 million per senior research scientist manyear, at the 1978 staffing levels. This is among the highest of the established centers, but of course includes a heavy investment in staff housing, which other centers do not need to the same extent, due to a better local supply of rental housing. IITA's future capital program is at present under review, and a revised version will be presented to the Group in the latter half of 1977.
The 1978 Budget

30. IITA’s 1978 Budget is its first to be based on a new system of program and project review and identification of short- and long-term goals. As program leaders grow more accustomed to the system, they may find it increasingly helpful in orienting their future work.

Special Projects

31. IITA points out that several special projects are still under discussion, and the budgets for them are still tentative. Extra-core funded projects are now classified as one of three types—(a) outreach projects, (b) training and collaborative research, and (c) supplements to core activities. Total extra-core funding for 1978 is expected to amount to $5 million, allocated as follows:

Table IV - Extra-Core Funding, 1978

<table>
<thead>
<tr>
<th>No. of Donors</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Outreach projects</td>
<td>7</td>
</tr>
<tr>
<td>b) Training &amp; collaborative research</td>
<td>5</td>
</tr>
<tr>
<td>c) Supplements to core</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>16/1</td>
</tr>
</tbody>
</table>

Funds Requested from the Consultative Group

32. IITA’s total core expenditure for 1978 is estimated at $13.9 million, and the amount requested from the Consultative Group is $13.1 million, an increase of 18 percent in current dollars over the net request for 1977, computed as follows:

/1 Some donors are in more than one category.

Of the 16 donors to extra-core activities, 10 are also members of the Consultative Group, supporting IITA’s core programs.
In addition, IITA expects to undertake special projects totalling $4.7 million in 1978.

Projections Beyond 1978

33. IITA is conducting a review of capital requirements which may result in a request for substantial funds in 1978 and subsequent years, in addition to those shown in the current budget paper. Current projections for capital needs, including additional working capital, are $1.4 million, $0.4 million and $0.4 million in 1979, 1980 and 1981, respectively. Major items are additional housing in 1979 ($0.9 million) and equipment (averaging about $0.2 million a year).

34. Projections of operating expenditures indicate little or no changes in allocation of resources among programs, and virtually no real growth overall. A major item classified as Research Support, Physical Plant Services, is shown as constant from 1979 through 1981, but this will presumably change if IITA embarks on any major capital expansion.

35. IITA's projections of operating costs for 1979 are somewhat higher than the estimates for the same year made in previous budget proposals. Part of this increase is due to the virology unit. When allowance is made for this, IITA's forward projections of the total operating funds it expects to request from donors for 1979 have shown little change, amounting to an increase of less than 5 percent between the estimate made in 1975 and that made in 1977.

<table>
<thead>
<tr>
<th>1979 Core Operating Budget</th>
<th>1979 $'000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Budget</strong></td>
<td><strong>Adjusted for Virology Unit</strong></td>
</tr>
<tr>
<td>1978 budget paper</td>
<td>12,814</td>
</tr>
<tr>
<td>1977 budget paper</td>
<td>12,503</td>
</tr>
<tr>
<td>1976 budget paper</td>
<td>12,013</td>
</tr>
</tbody>
</table>
Management

36. IITA has created the new post of Planning and Budget officer, which was filled in 1976. As noted above, this has been accompanied by the introduction of a new system of programming and budgeting during 1976 and 1977. This may be expected to provide the basis for the systematic monitoring of ongoing programs, in addition to improving the accuracy of budgets. Towards the end of 1978, program leaders will be able to assess the degree of progress made towards the specific goals for the year. IITA points out that one objective of the system will be to develop a "full-cost" system of management accounting for the main research programs. Computerized files on administrative systems are to be developed during 1978. Other centers might wish to watch IITA's early experience with the system, with a view to adapting it for their own needs.

37. IITA notes another management change in 1978, in that administrative responsibility for all Special Projects is given to a single office, though core scientists remain responsible for program direction.

38. In order to provide additional flexibility in reallocating resources as needs arise, IITA has created a new budget category—"personnel pool"—shown for the first time in the 1978 budget paper. This reflects what has in fact been the practice since 1977, whereby some of the labor budget was detached from individual programs, and allocated when and where needed. IITA is very conscious of the need to improve the efficiency of labor, and this change is a step towards doing so.

IV. ISSUES AND COMMENTS

39. In preparation for the forthcoming TAC Quinquennial Review of IITA, a list of questions and issues has been drawn up for discussion with IITA and TAC. The program issues which follow were highlighted during the TAC discussion of the forthcoming review and will be closely examined by the Quinquennial Review Panel.

Amended Mandate of IITA

40. The amended mandate has clarified the role of the Farming Systems Program and added plantain to IITA's crops. The last paragraph of the mandate would permit IITA to indulge in almost any type of agricultural activity, including extension and production, a deliberate move to avoid restricting IITA to a too closely defined role. A considerable number and variety of special projects could be accommodated under such a provision, however, and the Review Panel could well examine the extent to which departure from a "research and its application" approach might be contemplated.

Breeding and Selection

41. There has been a basic change in the philosophy of approach to breeding and selection in the crop improvement programs. The new programs are aimed at breeding and selection for defined agro-ecological sites rather than
for wide adaptability. This was based on the need to identify varieties for both yield and environmental characteristics, in view of the location specificity of farming systems, especially those including upland rice. The TAC Review Panel will examine the implications closely.

**Agricultural Engineering**

42. The Agricultural Engineering Program and its plans for expansion will be reexamined in the light of an earlier recommendation of TAC not to expand the program further. The activities are in no way concerned with sophisticated equipment, being aimed at the development of tools which could be made by village blacksmiths.

**Virology**

43. TAC also advised against expansion of the virology work beyond IITA's own immediate program needs. The Board, however, now seeks to expand the program beyond the modest level endorsed by TAC, and eventually to establish a sizeable regional service. In view of the existence of a national competence in virology quite close at hand, the validity of this proposal will be examined by the Review Panel.

**ICIPE**

44. IITA shows collaborative entomology research with ICIPE as a "core supplementary" Special Project. The cost of this program is provisionally estimated by ICIPE at about $360,000 per year, but this figure does not appear in IITA's Special Project budget. IITA felt that the program was not well enough formulated for consideration by the Board for 1978. If extra-core funds can be found to initiate the program in 1977, or 1978, then the Board will consider the question of long-term funding in its review of the 1979 budget.

**Medical Facilities**

45. IITA is proposing a modest improvement ($30,000) to the medical clinic in 1978. Medical facilities available in Ibadan have proved inadequate, and IITA makes a strong case for improving its own medical capabilities. A consultant has been retained to study alternative means of improving facilities. It appears that IITA is already required to provide medical care for all the staff and their families, including daily-rated labor. The detailed description in the budget document states that one of the clinic's long-term objectives is to have "sufficient facilities in the Medical Unit to diagnose and treat our patients, without going through the trauma of sending patients to outside hospitals." Whilst adequate health care is obviously very important IITA will no doubt wish to continue to review all the alternatives before embarking on what could develop into a major undertaking.
Special Projects

46. IITA is proposing a major expansion of special projects in 1978. Tentative estimates of expenditure suggest an increase of nearly 90 percent, from $2.5 million in 1977 to $4.7 million in 1978. IITA's special projects would be equivalent in 1978 to 41 percent of its core operating budget, which is about double the percentage experienced in the past by IITA and other centers. $274,000 (excluding any amount for ICIPE) of the special project budget is designated as supplementary to core operations, and with one exception, funded by core donors. Even if all the proposed special projects do not materialize, the figures presented raise the question of whether IITA should not reexamine extra-core funded projects, in the light of the CGIAR Review Committee's recommendations that centers take care not to upset the balance of their programs through taking on too many extra-core projects. IITA's 1978 budget document gives an account of how each special project relates to IITA's core activities. However, the descriptions of special projects are as yet much less detailed than those of core programs—they do not, for example, identify any specific tasks for 1978. This tends to reinforce the view that IITA should reexamine its program of special projects during the course of the TAC Quinquennial Review.

Fill Rate and Unit Costs

47. IITA is budgetting for all posts (except one virologist) to be filled for all 12 months of 1978, resulting in a "fill rate" of nearly 100 percent. It is probable that this will not be achieved in practice, resulting in savings in personnel and related costs. For example, a reduction in fill rate from 100 percent to 95 percent would result in savings in personal services, supplies and expenses, and travel of some $400,000 in the 1978 budget.

Budget Classification

48. As noted in paragraph 24 above, IITA classifies its expenditure on Physical Plant Services as Research Support. In a sense, of course, every activity undertaken by a center can be regarded as supporting research. Nevertheless, maintenance and operation of buildings other than laboratories or farm buildings, vehicle pools, utilities, etc., are not functions that are usually regarded as direct research support. Including them gives quite a distorted view of the resources going to research as opposed to overheads and other activities. IITA is reexamining its budget categories, and may find it appropriate to identify those parts of the Physical Plant Services budget which constitute direct research support, as defined in paragraph 22 (b) of the Secretariat's budget guidelines dated February 25, 1976. IITA is in the process of redesigning its management accounting system, and it is therefore an appropriate time to make any such change.

Capital Plan

49. It is premature to comment in detail on IITA's capital plan, which is still being formulated. The Secretariat suggests that IITA take particular
care to provide a complete justification for any substantial new capital items, including a full evaluation of alternative solutions, and alternative phasing. The justification for each item should also be explicit in terms of its relevance to scientific programs. IITA will also wish to consider possible trade-offs between construction and equipment standards and maintenance costs.

TAC Review

50. A quinquennial review of IITA is scheduled by TAC for October 1977. No budgetary provision has yet been made to cover its cost, estimated by the TAC Secretariat at $90,000. IITA is revising its 1978 budget to make allowance for this.

Conclusion

51. Noting the comments made above, and bearing in mind that IITA will shortly be reviewed by TAC, the Secretariat recommends IITA's 1978 Program and Budget proposals for approval of CGIAR donors.
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VENZOleo, CARACAS

ROCKFOUND, NEWYORK

AGROSEARCH, EKONA

VARSITY, NAIROBI

AGRIC UNIVERSITY
WINNIPEG, CANADA

IRATROP, PARIS
IITA's Administration block

Yam growing from seed to tuber

Rice in the field

Preparing to irrigate soybean plot

Rice trainees host a field day

HERE AT IITA

INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE IBADAN, NIGERIA
Visitors Are Welcome

IITA is an autonomous, non-profit corporation under terms of Decree No. 32 issued on 24 July, 1967 by the Federal Republic of Nigeria. We are an international body with many scientists and some supporting staff from 22 nations. The 15-member Board of Trustees comprises internationally known leaders in education and agricultural research from 11 nations.

**IITA’S OBJECTIVE**

The broad objective of our programme is to increase the quantity and quality of basic tropical food crops. To do this, we:

1. Conduct extensive research on all phases of tropical food crop production including cereals, roots and tubers, grain legumes and tropical farming methods.

2. Distribute improved plant breeding materials to research centres and governments in the tropical zone for use in their crop improvement programmes.

3. Provide research and training opportunities for students, technicians and scientists who work in tropical agriculture.

4. Stimulate interchange of ideas and knowledge through our publications, workshops, conferences, seminars and symposia.

**HOW IS IT FINANCED?**

The Federal Republic of Nigeria provided 1,000 hectares of land for development of IITA, and the Ford Foundation supplied capital for buildings and site development. Support for our research and day-to-day operations are currently provided by the Ford and Rockefeller Foundations; the Canadian International Development Agency (CIDA), the Overseas Development Ministry of the United Kingdom, the United States Agency for International Development (USAID), the International Bank for Reconstruction and Development (the World Bank), the United Nations Environment Programme (UNEP) and the governments of Nigeria, West Germany, Belgium, the Netherlands and Iran.

**RESEARCH EXTENSION**

Although the IITA site near Ibadan has been the centre for initial research efforts, the Institute now works in cooperation with African countries in national food production programmes in Liberia, Sierra Leone, Zaire, Cameroon and Tanzania, as well as Nigeria.

International Institute of Tropical Agriculture
Oyo Road
P.M.B. 5320
Ibadan, Nigeria
Phone 23741

**CROPS ON WHICH IITA IS CONDUCTING RESEARCH**

*Grain Legumes:* Cowpea, lima bean, soybean, winged bean, velvet bean, African yam bean, jack bean, pigeon pea, etc.

*Cereals:* Rice and maize.

*Roots and tubers:* Cassava, yam and sweet potatoes. Also cocoyam.

Using simple hand-held implements

A technician in the laboratory

Intercropping maize with cowpea

Cassava harvest

Installing plant growth chambers
Cowpea-maize-melon intercropping

Technicians servicing IITA's generating plant

Scientists touring high-yielding cowpea plants

Maize developed at IITA
The International Institute of Tropical Agriculture (IITA) was established as an autonomous, non-profit corporation on 27 July 1967 by decree of the Federal Military Government of Nigeria and formally organized at the first meeting of its board of trustees in Ibadan during July 1968. The Federal Republic of Nigeria provided 1,000 hectares of land for the IITA site. The Ford Foundation provided capital for buildings and development. Support for research and day-to-day operations are currently provided by the Ford and Rockefeller Foundations, the Canadian International Development Agency (CIDA), the Overseas Development Ministry of the United Kingdom, the U.S. Agency for International Development (USAID), the International Development Bank for Reconstruction and Development (the World Bank), the United Nations Environmental Program (UNEP) and the governments of Nigeria, West Germany, Belgium, the Netherlands and Iran. The institute is governed by an international board of trustees.

Introduction

The need to increase the quantity and quality of food in the face of increasing populations and consequent increasing pressures on available land is imperative. But improving the agriculture of the humid tropics, and thereby improving living conditions for all, involves more than developing new crop varieties or finding ways to control various factors that limit production. An integrated well-balanced research effort that takes into account existing systems of production and the needs of the small farmers and society is required.

The International Institute of Tropical Agriculture has accepted the challenge of finding solutions to the problems associated with replacing shifting cultivation—the predominant system in most of the tropics—with more productive land-use systems.

To achieve that broad objective, IITA scientists:

- Conduct research on all phases of tropical food crop production, with specific emphasis on grain legumes (cowpea, lima beans, soybeans, pigeon peas and others), root and tuber crops (cassava, yam, sweet potatoes, cocoyam), and cereals of the humid tropics (maize and both non-irrigated and paddy rice).
- Develop with these new high-yielding crop varieties production systems to replace traditional shifting and natural-fallow cultivation and enable farmers of the humid tropics to maintain good yields of high-quality crops.
- Distribute improved plant materials and disseminate knowledge of improved farming practices suited to the small farmer of the humid tropics to other research centers and to national food production programs throughout the tropics.

- Offer research and production training opportunities for students, technicians and scientists from many countries who work or who will work in tropical agriculture.

- Stimulate interchange of ideas and knowledge through publications, workshops, seminars and symposia.

---

**Extension of Research Activities**

Extending research through national programs, institutions and agencies is basic to the international character of IITA. Although the IITA site near Ibadan has been the center for initial research efforts, research is now carried out both at the site and at other locations – mainly, but not exclusively, in Africa south of the Sahara.

The nature of these cooperative efforts includes scientist-to-scientist visits and cooperation, professional training and, at the request of national governments, the placement of IITA scientists in national programs. The emphasis is always on problem-solving studies. In some cases, IITA acts as the executive agent for nationally and internationally sponsored projects that fall within its scope and expertise. Such projects are designed to benefit both IITA and the host country. They provide feedback and generate new information to add to IITA’s research base and they assist host-country agencies in establishing and implementing food-production research and development programs. The projects are regarded as extensions of IITA’s core research programs, although they may have special funding arrangements.
Research Programs

IITA’s research effort is divided into four programs that are interdisciplinary and directly oriented toward specific goals.

Farming Systems Program

Helping the farmer change from the traditional system of shifting cultivation or natural fallows to continuous cultivation that makes the most efficient use of land, water and manpower resources is the objective of IITA’s integrated, multidisciplinary farming systems research.

Traditionally, tropical farmers have practiced a system of shifting cultivation. The forest is cut, crops grown for one to three years, depending on soil fertility, and the forest is allowed to regenerate (natural fallow), replenishing the soil before another cycle starts. As the population increases however, the farmer is forced to shorten the fallow period or eliminate it altogether.

When shifting cultivation is replaced by more intensive forms of land use problems arise. These include: depletion of soil fertility and organic matter, increased soil erosion, deterioration of physical properties of the soil, uncontrolled weed growth and increased pest and disease problems.

IITA’s farming systems research program involves studies of mixed cropping and relay cropping; soil management, including soil fertility improvement and erosion control; development of appropriate technology for mechanizing farm operations, and regional economic and environmental analyses to assure that new systems devised can be adapted to different local conditions.

Farming systems research also integrates the results from the commodity-oriented research programs and feeds back to these programs results that help determine priority problem areas.

Grain Legume Improvement Program

Grain legumes are important sources of low-cost protein for the people of the tropics and have the potential to become even more important as yields are raised. The primary goal of IITA’s grain legume improvement program is to develop food legumes that have built-in resistance to pests and diseases and can efficiently use soil nutrients and sunlight to assure consistently high yields. Legumes are also an important part of the farming systems program because bacteria on their roots fix nitrogen from the air and improve soil fertility.
The multidisciplinary grain legume research program includes work in plant improvement (plant breeding), plant protection, growth and management, microbiology and nutritional quality. IITA plant breeders carefully screen new varieties for yield potential; resistance to diseases, insects and viruses; photosynthetic efficiency; adaptability to management under both sole and mixed cropping, nutritional quality and consumer acceptance. New varieties that have been developed yield far more than the unimproved varieties commonly grown by farmers of the region. A continuing flow of elite germplasm together with packages of improvements are delivered to national agencies as uniform trials, collaborative agronomic or protection experiments and as material for testing for disease and insect resistance under different conditions. Collaboration in national research and development programs provides feedback that guides research direction.

Cereal Improvement Program

The main emphasis of the IITA cereal improvement program is on maize and rice. In much of its cereals work, IITA cooperates with the International Rice Research Institute (IRRI) in the Philippines and the Maize and Wheat Improvement Center (CIMMYT) in Mexico.

At IITA emphasis is given to regionally adopted research that includes all aspects of improved crop production. Maize workers, for example, breed and select maize varieties that are suited to conditions of the humid tropics, concentrating on such factors as disease and insect resistance, high protein content, short plant stature and problem-soil performance.

Similarly, rice workers are concerned with varieties adapted to the region. They concentrate on blast resistance, insect resistance, problem-soil tolerance and general performance for both lowland and dryland rice. Research on weed control and other agronomic factors, appropriate mechanization, soil problems and physiological adaptation is also conducted. Farm production studies in Sierra Leone, Nigeria and Tanzania provide useful feedback to guide research direction. In Nigeria IITA is also associated with production development of sorghum, millet and wheat through the National Accelerated Food Production Program (NAFPP).

Root and Tuber Improvement Program

Root and tuber crops – high in calories, but low in protein – are staples in the diets of many people in the humid tropics. Cassava, for example, is the major source of calories for an estimated 300 million people. Improving the quality and quantity of these crops will help to improve the diets of millions in the region.

IITA's root and tuber improvement program puts top priority on cassava, followed by yam, sweet potato and cocoyam. The primary objectives of the research program are to minimize factors that currently limit production, to develop plants adapted to advanced farming systems, and to improve processing and nutritional quality. Specific research goals are to improve varieties for maximum production per unit of area and time by developing widely adapted plant types that are resistant to major pests and diseases, that respond to better management, and that more efficiently assimilate carbohydrates.

Other goals are to breed genotypes better suited to simple mechanization, to improve nutritional value and keeping qualities, and to introduce more convenient propagation characteristics, particularly in yams and sweet potatoes.
Training Program

Training is an important part of IITA’s activities. Training participants work in close association with IITA scientists in all disciplines.

Two types of training are offered:

- **Research training** provides opportunities for research workers to sharpen skills and learn new research methods and for students registered for higher degrees to conduct their degree-related research at IITA.

- **Crop production technology and extension training** is designed to familiarize those responsible for training or supervising extension workers in national crop production programs with improved practices and methods of conducting accelerated crop production campaigns.

Training participants are normally nominated by agencies or university faculties. Participants are sponsored by the nominating body or by IITA through one of a limited number of scholarships available.

Post-Doctoral Program

Post-doctoral fellowships are offered to selected, qualified applicants who have newly acquired Ph.D.’s. Through this program the Institute helps to increase and strengthen the body of trained agricultural scientists available to work on problems of food crop production. Young scientists work with experienced research scientists on relevant problems of crop production in the humid tropics. Post doctoral fellows, in return, help the Institute achieve its research goals by designing and carrying out research studies on priority problems, thereby adding to the manpower resources of the permanent scientific staff. Post-doctoral fellows may later have the opportunity to join the staff of this or other agricultural research institutes and agencies.
IITA/IBPGR Genetic Resources Conservation Project

For many years plant scientists have been aware of the need to collect and conserve the genetic diversity of crop plants. It is an invaluable natural resource because it is the essential and irreplaceable raw material of present and future plant breeding. It is also a vulnerable resource, however, liable to be eroded or even lost as the pace of agricultural development quickens, especially in those areas where diverse and often 'primitive' cultivars abound in traditional agricultural systems. Although such systems remain for the time being undeveloped, they have great potential for future change accompanied by serious losses of genetic resources.

In cooperation with the International Board for Plant Genetic Resources (IBPGR) a project was established at IITA in 1975 to collect and conserve genetic resources of African food legumes and roots and tubers. Four project botanists, plus supporting staff, will explore Africa south of the Sahara for about six years. They will collect the genetic resources of food legumes and roots and tubers, especially from traditional farming systems, and study the collections intensively at IITA to conserve them effectively and to prepare documentation that is useful to plant scientists everywhere.

Though it is based in Ibadan, the success of the project will depend heavily on close cooperation with national ministries, research organizations and universities throughout Africa.

FAO/African Rural Storage Center:

The FAO/African Rural Storage Center has two objectives:

- Collection of information on farm storage losses, structures and methods in Africa south of the Sahara as a basis for formulating subsequent research and extension projects to improve rural storage.
- Evaluation of existing and improved methods of drying and storing maize in the humid tropics of Africa and stimulation of extension programs using structures and methods appropriate to the areas concerned.

Preliminary analysis indicates a striking similarity in traditional farm storage structures and methods adopted by farmers in different climatic zones. Little evidence is available of wide-scale adoption of novel and improved storage methods by small farmers.

Though active extension programs are encouraging innovations some change is noticeable, but in most cases the popularity of a particular technique declines rapidly when the extension effort is removed or diluted.

Large-scale storage and drying installations on farms are found mainly in East and Central Africa and only to a limited extent in West Africa. The evaluation of techniques associated with small-scale producers makes it clear that work in this area is urgently required and the Center has undertaken this as first priority.

COPR-Pesticide Residues Study:

Pesticides when used for crop protection may contaminate soil either during application or through incorporation of sprayed vegetation when crop debris is plowed in.

IITA has a fundamental interest in soil fertility. The Centre for Overseas Pest Research (COPR) is concerned with the appraisal and recommendation of pesticides for crop protection and to demonstrate that their recommendations are not harmful in the long term. This mutual interest led to the establishment of research to:

- Examine any changes in soil fertility due to pesticide contamination.
- Monitor the behavior, persistence, effects and distribution of a specific pesticide in a specific crop ecosystem.
- Identify the principal processes operative in nutrient cycling in a tropical soil and the response of the organisms involved to pesticides.
Library and Documentation Center:

The IITA Library and Documentation Center currently has more than 9,000 books, 14,000 volumes of periodicals, 2,500 pamphlets and reprints and several microfiche, microfilm and slide collections on agricultural subjects. The library has the largest collection of French language agricultural publications outside Francophone Africa. The entire collection is open to researchers and students in and outside IITA.

The International Grain Legume Information Centre has been established as part of the Library and Documentation Center with support from the International Development Research Center (IDRC) of Canada. The Center publishes the Tropical Grain Legume Bulletin to keep grain-legume workers throughout the world informed of developments in their field and to promote communication among them.

Statistical Services:

The biometrician provides consultative or full services in experimental design, data reduction, statistical inference and programming. The staff includes a scientific programmer, a computer operator and two keypunch operators. The hardware facilities include an IBM System/3, a Hewlett-Packard 9100B and several smaller desk calculators. The computer facility is maintained as an open shop. Approximately 75 percent of computer usage is scientific; the remainder, administrative.

Communications and Information:

The Communications and Information Office supports all IITA research and training efforts. Support provided includes editorial, photographic and printing services, design and production of visual-support materials and maintenance of an audio-visual equipment loan pool.

Communications and Information also carries out a public information program through information releases to national and international news media.

Analytical Services:

Chemical and physical analyses of soil, water and plant material samples are provided as a service to research scientists at IITA. The following types of assays are performed:

- mechanical analysis, mineral nutrient content of soils
- pH and nutrient content of runoff water
- protein and starch content of roots and tubers
- protein, lysine and starch content of cereals
- protein, sulfur and oil content of grain legumes

The availability of modern equipment and of staff trained in its use permits more than 30,000 assays to be made annually.

Research Station Management

A farm management team supports IITA research and training programs by providing assistance in laying out and preparing research plots and recruiting and training farm staff to carry out day-to-day field operations. The field services will be extended to the high rainfall substation currently being developed.
Staff and Campus

IITA's senior scientific staff has been recruited from among the most able scientists in the world. About 55 scientists from more than 20 nations comprise the senior scientific staff. Technicians, administrative, clerical and other support personnel are drawn largely from Nigeria and nearby West African countries.

IITA is located about 16 kilometers north of Ibadan, which with a population of more than one million is the largest indigenous city in Africa south of the Sahara. The vegetation around Ibadan is tropical rain forest, but much of the forest is cleared for farming. Annual rainfall is about 1200 mm, most of which falls between May and September. The average daily temperature fluctuates between 20°C and 35°C.

About 60 percent of the 1000-hectare site has been cleared and developed as research fields, including 80 hectares under irrigation. Construction of research laboratories, screen-houses, dormitories and administrative conference and support facilities was completed in 1974. A substation at Onne in the high-rainfall area of southern Nigeria is currently being developed.

Physical Plant Services

This unit provides a comprehensive range of support services. It comprises eight sections: Buildings and Grounds, Automotive, Electrical/Utilities, Fabrication/Development, Refrigeration/Airconditioning, Scientific/Electronics, Heavy Machinery/Farm Equipment and Construction/Site Engineering.

Each section is under a specialist service officer with his own supporting staff.

Most staff have been trained at IITA to meet the demands of maintaining a variety of equipment peculiar to a research establishment. First-class workshop facilities exist and are fully utilized, enabling the Institute to be self-reliant in almost all areas. The unit, in fact, provides all services to be found in a small town - water supply, sewage system, refuse collection, central airconditioning system, street lighting, recreational grounds and many more.
ITA is one of eight international centers established since 1960 that provide agricultural research, training and assistance to national crop production and development programs.

<table>
<thead>
<tr>
<th>Center</th>
<th>Location</th>
<th>Founded</th>
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<tbody>
<tr>
<td>International Rice Research Institute (IRRI)</td>
<td>Philippines</td>
<td>1960</td>
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<tr>
<td>International Maize and Wheat Improvement Center (CIMMYT)</td>
<td>Mexico</td>
<td>1966</td>
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<tr>
<td>International Institute of Tropical Agriculture (ITA)</td>
<td>Nigeria</td>
<td>1967</td>
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<tr>
<td>International Center of Tropical Agriculture (CIAT)</td>
<td>Colombia</td>
<td>1968</td>
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<tr>
<td>International Potato Center (CIP)</td>
<td>Peru</td>
<td>1972</td>
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<td>International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)</td>
<td>India</td>
<td>1972</td>
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<tr>
<td>International Laboratory for Research on Animal Diseases (ILRAD)</td>
<td>Kenya</td>
<td>1973</td>
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<tr>
<td>International Livestock Center for Africa (ILCA)</td>
<td>Ethiopia</td>
<td>1973</td>
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THE CHALLENGE OF THE TROPICS

INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE
Foreword

For the first time in history, a global agricultural research network has been created to help improve the quantity and quality of food production in developing countries, which, in turn, will improve the quality of life for present and future generations. The International Institute of Tropical Agriculture (IITA), with headquarters at Ibadan, Nigeria, is part of that network. Within it, the Institute has world-wide and continental responsibilities for improvement of certain food crops and a mandate to study and seek ways to improve traditional farming systems in the humid and subhumid tropics.

IITA, the first international agricultural research center established on the African continent, was founded by an official decree signed by the Federal Military Government of Nigeria on July 24, 1967. The research program started two years later.

This publication highlights the development of the Institute, outlines the constraints faced by farmers and scientists, reviews IITA's contributions to science and humanity during its first decade and presents a brief look at what might be accomplished in the near future under its research and training programs.

William K. Gamble
Director General

The Challenge of the Tropics

The tropics are the largest underdeveloped regions to which the world may look for increased food production. But they do not live up to a popular vision of a perpetual garden with abundant food crops ripening in the equatorial sunshine, freshened by abundant rains. Reality forms a grim contrast to this description. Food production is not keeping up with rapid gains in population. In fact, the largest share of the world's hungry people live in the tropics.

International Network

To help bring about a more equal balance in the food-population race, the Ford Foundation and the Rockefeller Foundation, in cooperation with the Government of Nigeria, launched the International Institute of Tropical Agriculture in Africa in 1967. It is one of nine major links in an international network of agricultural research and training centers. Each center is international (though situated in one country) and governed by its own international, non-political board of trustees. Senior staff members are recruited from among
the most able scientists in the world. Most of
the support staff comes from the host country.
The centers cooperate with each other and
complement, support and strengthen national
and regional programs.
This international network accounts for only
5 percent of the total research resources
devoted to improving agriculture in the
developing countries. But programs of
research and training carried out under its
auspices encompass crops and animals that
make up 75 percent of their food supply.
The first four international institutes,
including IITA, were supported in the
beginning by the two foundations. However,
when additional centers were planned, new
funding arrangements became necessary. In
1971, the Consultative Group on International
Agricultural Research was formed—a group of
donor countries, development banks, founda-
tions and agencies. Cosponsored by the
World Bank, Food and Agriculture
Organization of the United Nations and U.N.
Development Programme, the Consultative
Group arranges for the major financing of the
centers.

Nigeria's Substantial Support
The host country has never wavered in its
material and moral support of IITA. The official
decree establishing the Institute at Ibadan was
signed by the Nigerian Federal Military
Approximately 1,000 hectares, only a short
distance from the University of Ibadan, were
provided without cost to IITA. This interesting
section in the official decree set an unusual
rental fee: “Land so made available by the
Government shall be held upon such terms as
may be agreed and upon payment of, in each
case, one peppercorn as annual rental (if
demanded).” Although not demanded, the
Chairman of IITA’s Board of Trustees, as a
symbolic gesture, presented a suitably
mounted peppercorn to a representative of the
Federal Government at the dedication cere-
monies on April 20, 1970.
The Federal Government compensated the
villagers living in the area allotted to IITA for
their land, buildings and crops. The amount
paid so far has added up to more than
1,250,000 Naira. ($2,000,000) Most of the
villagers were resettled in a new village named
“Ibadan Parapo” adjacent to the Institute with

a primary school, water and other services
provided.
The Government of the former Western
State (now Ondo, Ogun and Oyo States)
completed a soil survey of the site at Ibadan
and appraised the value of crops for Federal
indemnity payments. In 1975, Rivers State
allocated an 80-hectare site for an IITA
substation in a high-rainfall, acid-soil area at
Onne near Port Harcourt. That same year,
Nigeria became the first host country to
participate in the funding of international
agricultural research centers. It subscribed
500,000 Naira ($800,000) on an annual basis.

IITA headquarters
with approximately
1,000 hectares for
experimental lands,
laboratories, offices
and housing.

New experimental substalion in a high-
rainfall, acid-soil area in southeastern
Nigeria.
Helping Unlock the Food Potentials of the Humid and Subhumid Tropics

Only infusions of new and strikingly better technologies that have to come from research can transform traditional agriculture to modern agriculture and unlock the food potentials of the humid and subhumid tropics.

Constraints to Overcome

Many constraints face scientists, extension workers and farmers. Among the most important:

- Very small farms. (Approximately 95 percent of the farmers till less than two hectares of land annually.)

- Millions of small farmers, especially in Africa, are locked into an outmoded system of shifting cultivation and related bush fallow systems. (They farm small pieces of land for a short period of time then let wild vegetation and nature restore at least part of the fertility.)

- Superficially fertile soils lose productivity and erode rather quickly under a hostile tropical environment.

- No place on earth has more plant diseases, insects and weeds which take such a heavy toll of crops.

- Insufficient improved plant materials that are resistant to diseases and insects and respond to better management.

- Farmers lack adequate credit facilities and have limited resources to purchase food production inputs which are often high priced and not easily available.

- Lack of trained manpower for agriculture. (Universities in the tropics of Africa are young and the number of trained people relatively low.)

- Peak demands for farm labor at certain times of the year, unsuitability of the humid tropics for draft animals and no inexpensive alternative power sources limit the area a small farmer can manage well.

- Insufficient food marketing and distribution facilities.

- The typical farmer is in no position to take much risk unless he believes the possibility of gain is great enough for him to take the chance. (But evidence shows that given the right opportunity he will respond in an amazing way.)
IITA’s Objectives

Finding remedies to these constraints is the driving force behind the Institute’s objectives:

- Increase yields and improve the quality of food crops in the humid and subhumid tropics through every available means, especially the development of high-yielding and insect- and disease-resistant plants.
- Distribute improved plant materials to national research centers where they can be of significant value to breeding or improvement programs.
- Develop soil and crop management practices and farming systems for millions of small farmers that will make possible a stable, permanent and productive agriculture in place of the centuries-old shifting cultivation and related bush fallow systems.
- Build up the capacity of developing countries through intensive training programs so they will be able to solve their food production problems with their own expertise.
- Publish and disseminate research findings to agricultural scientists all over the world, to policy makers and to extension workers in national programs and through them to farmers.
- Operate an information center and library with a collection of the world’s literature on tropical agriculture in both English and French for the use of scientists and scholars.
- Organize and conduct conferences, forums and seminars which review new research, consider current problems and discuss needs for the future.

Worldwide and Continental Responsibilities

Within the international network, each center is assigned major world responsibility for one or more crops. For IITA, those crops are:

- Cowpea (*Vigna unguiculata*)
- Yams (*Dioscorea spp.*)
- Sweet Potato (*Ipomoea batatas*)

IITA has regional or continental responsibilities within tropical and subtropical Africa for five crops:

- Cassava (*Manihot esculenta*)
  (In cooperation with International Center for Tropical Agriculture—CIAT)
- Maize (*Zea mays*)
  (In cooperation with International Maize and Wheat Center—CIMMYT)
- Rice (*Oryza sativa*)
  (In cooperation with International Rice Research Institute—IRRI)
- Pigeon Pea (*Cajanus cajan*)
  (In cooperation with International Crops Research Institute for the Semi-Arid Tropics—ICRISAT)
- Soybean (*Glycine max*)
  (In cooperation with International Soybean Program—INTSOY)

Among other crops being studied for their potential are:

- Lima Bean (*Phaseolus lunatus*)
- Winged Bean (*Psophocarpus tetragonolobus*) and other grain legumes
- Cocoyams (*Colocasia esculenta* and *Xanthosoma sagittifolium*)
- Plantain and other forms of *Musa*

The collection of germplasm in Africa for grain legumes, root and tuber crops and rice (*Oryza glaberrima*) is also an IITA responsibility.
Unique Features of the Institute

Although IITA is relatively young, it was the first *international* agricultural research center established on the continent of Africa—one of the world’s most impoverished areas in terms of human nutrition and a part of the world where little research attention has been paid to food crops in the past.

The Institute’s mandate to concentrate on research on food crops was something new because these crops had been neglected in most agricultural research programs in the humid and subhumid tropics of Africa. Up to the 1960’s, many countries skewed agricultural policy and research in favor of foreign exchange earning export crops (such as cocoa, palm oil and groundnuts) in the mistaken belief that food production would take care of itself.

Since its beginning, the Institute has experimented with ideas on how to resolve the problems of small farmers. Scientists find out what the problems are at the farm level, what farmers do and why and start from there with the research.

Three out of four of IITA’s principal programs are crop centered: Cereal Improvement, Grain Legume Improvement and Root and Tuber Improvement. The fourth and heart of the total effort is the Farming Systems Program—the first and largest of its kind established at any of the international centers. It is assigned slightly more than 40 percent of the total research staff.

Staff members in this program develop new methods and practices that will enable farmers in the humid and subhumid tropics to attain larger yields and help those who depend on shifting cultivation to move toward settled, continuous systems of land use. In other words, the end objective, to be achieved through national channels, is to increase agricultural production and income of vast numbers of small farmers who have not yet felt the impact of improved technology.

In all four programs, the Institute follows a multi-disciplinary team approach. For example, a crop improvement staff complement may consist of a plant breeder, plant pathologist, entomologist, plant physiologist, and agronomist. Through farm studies and other means, agricultural economists assess the productivity and the profitability of new varieties and farming methods under different local conditions. Also, new varieties are evaluated for food value and consumer acceptance.

IITA has formal cooperative contracts and agreements with several nations and scientific organizations. Such cooperative programs are designed to help strengthen national research capabilities, to present opportunities for testing crop lines under different ecological conditions and to provide a feedback on research problems. In addition to having staff members “on site” in some countries, scientists at the Ibadan headquarters are frequently involved in the cooperative programs. They visit the research sites, consult with cooperators and bring back field problems for study and laboratory analyses. In turn, cooperators participate in research reviews and attend seminars and other professional IITA activities.
Root and Tuber Improvement Program

Developing countries produce and consume most of the world's production of cassava and yams and 80 percent of the sweet potatoes. Africa produces more cassava and yams than any other area of the world, and more than 80 million people in the tropical zone of this huge continent depend almost entirely on these two crops as their basic staple foods.

But supplies are not adequate for several reasons, including low farm yields, huge crop losses caused by diseases and insects, historic reliance of plant breeders on selection from a small number of existing vegetatively propagated cultivars to improve yam varieties and high yam and sweet potato storage losses.

With these facts in mind, IITA scientists decided that the objectives of the Root and Tuber Improvement Program should be to seek plants that produce high and stable yields, that carry resistance to economically important diseases and insects, that are adapted to a wide range of environments and production methods, and that have better storability and improved quality in terms of consumer acceptance, nutritional value and processing characteristics.

Dramatic Results with Cassava

A starchy crop with an annual farm value of $2 billion in developing countries worldwide and a major source of calories for millions of people in the humid and subhumid tropics, cassava received little attention from scientists until recent years. As a food crop it is now grown on more land in Africa than in South America—continent of its origin.

Since the program started in 1971, IITA, in cooperation with CIAT in Cali, Colombia, has developed improved lines with disease and insect resistance and with high yields and good root characteristics. Now the Institute is moving them to farmers’ fields in Africa through national food production programs.

Throughout Africa cassava mosaic disease (CMD) and cassava bacterial blight (CBB) severely attack the crop and have caused yield losses as high as 80 percent on some farms. Fortunately, the resistance of IITA-developed clones to these two diseases has proven to be stable in several countries. Cassava materials from exotic sources have been successfully improved for resistance to both diseases and lodging, while maintaining other desirable traits.

Experimental trials indicate that cassava yields can be increased dramatically by selecting for high productivity and disease resistance and by adopting good agronomic practices. The average yield in Africa is 7.4 tons per hectare. Trials in many locations in Nigeria have shown yields ranging from 17.5 to 56.2 tons per hectare. At 19 different locations in Zaire, IITA cassava hybrids produced yields of 21 tons per hectare in 10 months, compared with 8 tons for local cassava.

The Institute has perfected techniques for propagating cassava from seed to speed up progress in breeding and facilitate the distribution of improved material with minimum risk of spreading disease. Approxi-
mately 100,000 cassava seedlings a year from 1,500 families are grown in the nursery. The seeds come from Africa, Asia and Latin America.

What about the future? Average tuberous root yield of cassava can be increased from the present 7.4 tons to 30 tons per hectare per year, and new varieties will have root characteristics suitable for mechanized harvesting. Cooking and eating quality of tuberous roots will be improved, as well as the quality of leaves in terms of high protein quality and quantity and low hydrogen cyanide (HCN). Cassava leaves are important in the diets of many Africans.

A source of resistance to and methods of controlling mealy bugs and green mites, which are causing serious damage in Africa, will be found, and resistance incorporated into susceptible varieties possessing other desirable agronomic traits.

New Techniques Accelerate Yam Research

Despite the importance of the white yam to feed millions of people, progress to improve its yield, quality and storability has been painfully slow in the past mainly because of continuous vegetative propagation and lack of hybridization. To improve this food product, plant breeders historically had to rely on field selection from a small number of existing varieties. Past attempts to propagate white yam from seed to produce plants with greater genetic diversity and to lower the cost of planting materials were largely unsuccessful and later abandoned because of the common belief that seeds were not viable.

But now IITA scientists have perfected techniques for germinating large numbers of white yam seed and for artificial hybridization. The broad genetic diversity in yam plants produced from seeds provides many combinations of characteristics not previously seen in vegetatively propagated cultivars. Moreover, the protein content of white yam grown from seed has reached as high as 10 percent (usually 4 to 6 percent from vegetatively propagated yam). Yam germplasm is now being collected, stored and exchanged with researchers around the world as seed rather than as bulky, easily perishable tubers. This overcomes the many problems of moving vegetative materials from one country to another.

A rapid method of mechanical inoculation to screen seedlings for resistance to yam virus has been developed, as well as techniques to root white yam vine cuttings that are being used to produce planting materials and multiply promising white yam lines free of tuber-borne diseases and nematodes.

What about the future? Scientists expect that through a tissue culture technique there will be rapid multiplication on a large scale of disease-free planting material of improved yam
Reducing storage losses adds to the available supply of yams—a staple food for millions of people in the tropics.

Doubling and Tripling Sweet Potato Yields

Spread of this crop throughout the tropics has been extensive, and it has the staggering potential of producing up to 43,000 K calories of energy per hectare per year. Its high vitamin A content is especially important in the humid and subhumid tropics where many children lack this essential nutrient.

Scientists now have sweet potato varieties that can yield 20 to 30 tons per hectare in four months without fertilizer, compared with average on-farm production of 8.9 tons per hectare. IITA-improved sweet potato lines are being evaluated continuously in performance trials in many African countries. Several varieties have been found to be resistant to the sweet potato virus and some less susceptible to the weevil.

In the near future, disease-free planting material of improved sweet potato varieties will be produced by tissue culture technique for distribution. Average field yields per hectare per year can be increased from 8.9 tons to 20 tons per hectare per year and perhaps up to 30 tons.

New sources of resistance to weevil will be found by introducing and evaluating extensive exotic materials from other areas, and plant breeders will select for better root characteristics, storability, and high protein content. Moreover, cooking and eating quality will be further improved.

Yields of sweet potatoes resistant to the sweet potato virus are far greater than a non-resistant variety (center).
Grain Legume Improvement Program

Malnutrition is widespread in the tropics of Africa where poor people may get less than half of the protein they need. Grain legumes—cowpeas, soybeans, lima beans, winged beans, and pigeon peas—are essential to provide the quality protein for normal growth and to maintain health in diets based primarily on root crops and cereals. Food legumes are especially important in the diets of pregnant and lactating mothers and children. They are used in various forms—as green tender leaves, unripe whole pods or green or dry peas or beans.

But here again production is not sufficient to meet the needs of expanding populations primarily because of marginal soils, poor management and severe losses caused by pests and diseases. For example, cowpea yields may be reduced 60 to 100 percent by cowpea yellow mosaic virus (CYMV). Leafhoppers, thrips and pod borers can cause similar losses.

To help solve these problems, the objectives of the Grain Legume Improvement Program are aimed at raising and stabilizing yields of legume species that occur as unimproved plants in the humid and subhumid tropics, extending the use of improved legumes in relay and mixed cropping as sources of nitrogen through biological fixation, and expanding the potential of legumes in tropical nutrition through development of better processing and utilization techniques.

Grain legume seeds from the Institute have been distributed for breeding programs in many parts of the world.
New Improved Cowpea Lines Increase Yields

Africa produces more cowpeas (also called blackeye peas) than any other continent in the world, and within the international agricultural research centers network, IITA has worldwide responsibility for research on this crop. It is a useful and abundant source of protein and can be an inexpensive way to provide essential nutrients to growing children.

Among the least studied crops in the past, cowpeas are well adapted to the dry savannas of Africa. Although not traditionally a crop of the humid tropics, progress has been made in selecting cultivars adapted to high-rainfall climates, mainly through breeding and incorporating genetic sources of resistance to diseases and insects.

New improved lines developed by IITA have been tested in many countries in Africa, Asia and Latin America. Five new strains of cowpeas—VITA-1 to VITA-5—are high in protein content, disease and insect resistant and high yielding. They have been distributed as breeding material to national programs in several countries for further testing or use as parental stocks. VITA-5, the most recently described cowpea line, is not only high-yielding but has the added advantage of producing creamy white seed preferred in much of Africa.

Many of the new lines have been selected for their high yield as a sole crop of cowpeas. Traditionally, most of the cowpeas in Africa are intercropped with maize or with sorghum and millet. For this reason, selection is being extended to include different plant types and particularly those suited for use as intercrops. Also, several thousand lines in the IITA World Cowpea Collection have been screened for protein content and quality.

Cooking a favorite food made from cowpeas. Consumer preferences—taste, texture and appearance of traditional dishes are not forgotten in the development of high-yielding varieties.

Other Legumes

Soybeans and lima beans are continually being screened for high yields and resistance to major disease and insect problems. Selected seeds go to several tropical countries for testing. Soybean work is in cooperation with INTOSAI. Research work on pigeon peas is being coordinated with ICRISAT in India. Both low and high plants and early-maturing types suited for planting in relay cropping systems have been developed at IITA and are now available. Superior lines of these three food legumes are continually being tested in multi-location trials and the best lines given to national programs.

The Future

By combining resistance of VITA-4 and VITA-5 to post-flowering insects with VITA-3's resistance to pre-flowering insects, cowpea breeders should have a new source of multiple resistance to insects and diseases, plus high-yield potential. Increased emphasis will be put on selection for insect resistance and additional basic studies initiated on mechanisms and inheritance of resistance to ensure that identified resistances are stable.

A more intensive investigation of cowpea selection techniques for intercropped conditions is underway, and a package of recommended management practices for grain legumes will be ready in the near future. In collaboration with the Farming Systems Program, more answers will be found concerning the effect of mixed cropping on disease development.

The soybean hybridization program is being expanded and attempts made to evaluate elite lines at other locations and distribute them to research organizations willing to test them for possible use in their national projects. Further investigations will be made to determine the potential for improving tropical diets by using green leaves and green pods of legumes.
Cereal Improvement Program

Extending the "green revolution" in rice and maize to Africa is a difficult assignment. The tropics of Africa are different in many ways from areas in other parts of the world where dramatic increases in yields have occurred. But progress is being made by IITA scientists with both rice and maize to find innovative and practical approaches for African conditions. The program is conducted in collaboration with IRRI in the Philippines, CIMMYT in Mexico and the West Africa Rice Development Association (WARDA) based in Monrovia, Liberia. Rice breeding materials come from the Philippines, Colombia, Brazil, Indonesia, Malaysia, Bangladesh, India, and Sri Lanka and maize breeding materials from Mexico, the United States, and other countries. Trials of both crops are in progress in many areas of Africa.

Problems and Objectives

Major problems include lack of improved varieties for African conditions, poor crop-management practices, diseases and insects (many specific to Africa) that severely damage both maize and rice crops, iron-toxic and other problem soils in many areas, environmental stresses that adversely affect plant growth and yield, large losses between harvest and consumption and low protein content and quality.

Related closely to those problems are the program's objectives:

- Help identify and solve problems in improvement of rice and maize production in Africa.
- Intensify multi-local cooperative screening of local and introduced germplasm for adaptation to different ecological areas and for resistance to diseases and insects.
- Develop lines resistant to nutritional imbalances associated with soil toxicities and develop improved practices for these soils.
- Improve adaptability and high dependence yields.
- Expand the maize breeding program by establishing elite populations with lines with better adaptation and high dependable yields, plus greater disease and insect resistance.
- Develop maize with better balanced and higher protein content and improved storage quality that will be acceptable to consumers in traditional African food preparations.
- Develop early maturing lines to fit into African cropping systems.
- Develop an analytical ecosystem approach to rice improvement to cover dryland, swamp, irrigated and hydro-morphic rice in the wet-forest, savanna and mid-altitude regions.

Performance of IITA-Bred Maize in Africa

In experimental plots, scientists have been able to maintain maize yields over several years of about 6 tons per hectare with IITA-improved lines and with suitable production inputs. Average yields on the small farms in Africa with mixed crops and minimum inputs are only 1 ton per hectare. However, performance of maize materials released through a national program in Nigeria shows that yields of 3 tons per hectare can be readily obtained by small farmers.

IITA-developed materials have been the top yielders in maize trials throughout West Africa, and they recently outyielded all others in trials conducted in five lowland locations in Tanzania.

The need for "fine tuning" of new varieties under local conditions is exemplified by the long list of major insect pests of maize in Africa, most of which differ from those found on other continents.
Adapting Rice Lines to African Conditions

IITA scientists have made more than 700 crosses to develop better rice for Africa. In collaboration with IRRI and with their cooperators, including WARDA, national ministries of agriculture and universities in 10 African nations, they have screened thousands of lines from many countries.

Germplasm is evaluated in relation to the different primary ecological zones in Africa: wet-forest, transition, savanna and mid-altitude. Each of these zones includes dryland, hydromorphic, swamp or irrigated rice ecosystems—each with its special problems. Progress is being made to improve rice varieties and technology for each. Usable, adapted varieties resistant to iron toxicity have already been identified.

Rice yields in experimental plots have been as high as 8.6 tons per hectare. (The average rice yield in Africa is approximately 1.7 tons per hectare.) Scientists are aiming at stable and permanent rice blast resistance, as well as resistance to other diseases which include new virus diseases recently discovered in Africa by IITA’s researchers. Insect pests of rice in Africa are nearly all unique to the continent, and resistant lines have been found to several of them. The resistance must now be incorporated into adapted varieties.

New promising methods have been developed for assessing genotypes across a wide range of stress conditions. Agronomic and engineering research is underway to adapt technology, as well as varieties, to African conditions.

Many trials show that there is considerable potential in Africa for using swamp areas and hydromorphic soils for rice production, even with low inputs. Vast areas of such land, currently underutilized, could be productively used.

In the years ahead, stable, high-yielding rice varieties resistant to African diseases and insects will be identified and developed for the specific ecologies of dryland, hydromorphic, swamp and irrigated areas in different climatic zones. A new program of breeding for permanent resistance to blast is being developed.

Research will be intensified to help solve physiological disorders in problem soils in each rice ecology, and packages of recommendations will be developed to assure consistent, reasonable yields with minimum costly inputs and labor requirements. Rice is expected to play an important role in the development of cropping systems in rotation with other crops.
Farming Systems Program

Development of practical substitutes for Africa’s traditional shifting cultivation and related bush fallow systems practiced by more than 60 million farmers is the “key log in the jam” holding back increased food production. Almost one-third of the world’s exploitable soil resources is farmed under these outmoded systems. Whatever improved farming systems may be finally chosen or developed by farmers, agriculture in the tropics can be considerably intensified.

Research to improve existing farming systems or design alternative ones involves a team approach with scientists from many disciplines working together. The program is aimed at serving, through national organizations, 95 percent of the farmers in Africa’s tropics. They are the small holders farming less than two hectares of land annually.

These farmers contend with serious constraints, including a shortened interval of bush fallow because of the pressure of rapidly increasing populations, poor inherent fertility of highly weathered soils, very low levels or lack of available nutrients because of leaching and soil erosion, overabundance of weeds, insects and other pests and diseases, lack of water control, farm labor bottlenecks, problems with draft animals in the humid tropics and no inexpensive alternative power sources, unfavorable prices for farm products, lack of production inputs and high prices and inadequate farm credit.

The principal objective of the Farming Systems Program is to improve traditional farming systems and enable the small farmers to make the transition from mainly subsistence, intermittent bush fallow systems to continuous, more productive systems with a minimum of purchased and costly inputs.

To accomplish this, the program’s scientists list these related objectives:

- Determine crop combinations and sequences for obtaining stable high yields.
- Develop—at minimum cost—land preparation, planting and effective pest and weed control methods that conserve the soil and ensure good plant development.
- Find methods that take advantage of biological nitrogen fixation and utilization of mycorrhiza to enhance phosphate nutrition and to control and avoid problems associated with excessive soil acidity.
- Design appropriate tools and machinery to save labor and minimize drudgery and develop techniques for their economic use in crop production systems.
- Conduct agro-economic surveys to ensure that the advantages and disadvantages of existing production systems are fully recognized and that the methods developed for their improvement are economically viable and acceptable to farmers.

Evidence of Progress

Farmers in Africa’s humid tropics traditionally follow a system of mixed cropping. They grow two or more crops on the same land at the same time rather than in single stands. Given the farmers’ circumstances, mixed cropping is more profitable, spreads and reduces risks and provides food the year around.

They want improved technology that will increase their returns under mixed cropping before they will accept more radical changes. In one field study the gross return from mixed cropping was 60 percent higher than when the same crops were grown alone, and insect and disease damage was less.

IITA’s research emphasizes intercropping and relay cropping systems that produce good yields, maintain soil fertility and cut down on disease and pest buildups. Progress has been made in finding the most appropriate combinations. No single system can be expected to be adaptable to different regions.

Scientists are identifying the best fertilizer formulations, combinations, application methods and timing necessary to maintain soil fertility and increase crop yields at the lowest cost to farmers. The same applies to plant protection chemicals, weed killers and control methods.

Research results show that with some inputs of fertilizer, suitable crop combinations and some irrigation to make year-around cropping possible, 50 to 100 percent production increases can be obtained on a sustained basis. Further increases are possible as more
adapted, higher-yielding, disease and pest resistant varieties become available.

A major achievement so far has been the convincing demonstration that minimum tillage techniques, with mulches of plant residues and live legume cover crops, can reduce erosion and high soil temperatures and substantially increase crop production. With mulches, maize yields on IITA plots were increased by 23 to 45 percent. Minimum tillage and mulches reduce heavy labor demands, especially for weeding which absorbs more hours of labor than any other farm operation—50 to 70 percent of the total.

Inexpensive farm tools, some of which can be made and maintained locally by village blacksmiths, have been adapted to fit African farming conditions. Designs developed elsewhere are effectively modified, improved and tested by agricultural engineers. One of these is a back-saving, hand-operated "jab" planter with an automatic feed mechanism that releases seed when the point is jabbed into the soil. Variations of this design make it possible to simultaneously inject fertilizer and some insecticides as the seeds are released. Other small mechanical planters have been designed for precision seeding into mulches.

Herbicide sprayers are being tested that use only 10 to 15 liters of solution per hectare instead of the 500 liters needed for conventional spraying. Most of this volume is water and availability and transportation of large quantities present a major problem for small farmers. Agricultural engineers are also improving small harvesters especially developed for rice and low-growing grain legumes such as cowpeas.

In the future, the use of high-yielding varieties—a prerequisite before farmers will adopt other improved production techniques—will justify the costs of applying fertilizers and plant protection. Also, new resistant lines will minimize the need for pesticides.

Low input technology will be further developed, and research results will continue to be tested in actual farming situations under local conditions. Within the humid and subhumid tropics of Africa, scientists will identify ecological zones in which specific techniques and plant materials may be used to best advantage.

More small farmers now practicing shifting cultivation and related bush fallow systems will move toward settled, continuous systems of land use. No giant leap from the hoe to the tractor is likely in Africa now or in the immediate future, but rather a progressive modernization with step-by-step improvements which do not require a large investment.
by farmers. An old African saying that "a farmer must bend down all his life just to eat" does not have to be true in the future.

Safeguarding Plant Genetic Wealth

Only about 1 percent of the world's genetic potential of cultivated plants has been used so far in plant breeding. The raw material, which consists of genetic diversity in numerous crop races and in their wild relatives, is becoming extinct under the pressure of cultivation of modern, improved varieties. One out of every 10 species is either extinct or in danger of extinction.

Africa is no exception. Native varieties on this continent, where natural diversity is among the richest in the world, are in danger of extinction. So that this does not happen, IITA became a partner in 1975 with the International Board for Plant Genetic Resources in a worldwide effort to collect, store and keep alive the genetic wealth (principally as seeds) of major African crops. They will be kept in "germplasm banks" in Africa and elsewhere.

Scientists are searching for and collecting various crop species and their wild relatives in various areas on the continent and evaluating the material to make it available to plant breeders. No substitute source of these materials exists, nor can it be created artificially. Therefore, existing resources must be regarded as a heritage to be preserved. A desirable future depends heavily on the success of this venture.

The Institute has a world collection of more than 7,000 cowpea entries, as well as a smaller number of several other food legume species. These African collections, plus those for root and tuber crops and rice, will continue to increase and contribute to improved food production.

From Research to Reality Through Cooperative Programs

IITA's Cooperative Programs encompass off-site research, field testing, planning and training in close collaboration with national governments, regional programs and other international centers. They contribute to strengthening African national and regional institutions and provide important feedback and new information to the Institute's scientists. Every effort is made to avoid duplication of efforts and facilities.

These programs are the vitally important outreach component basic to the international character of the Institute and become the link between research and reality. Its scientists are assigned in African countries where cooperative contracts and agreements exist, and they become members of research teams working to solve specific crop production problems. The scientists from the Ibadan headquarters frequently visit these programs, consult with their associates and cooperators, and bring back field problems for study and analyses to the larger core staff and to more fully equipped laboratories.

In 1977, IITA was a partner with six African nations under contractual arrangements: Cameroon, Liberia, Nigeria, Sierra Leone, Tanzania and Zaire. It has less formalized memoranda of agreements in Kenya, Bangladesh and elsewhere. Great importance is placed on strengthening these programs and developing new ones.

Planning, material assistance or training has been given to more than 50 nations on all continents. Through these and other channels the ultimate objective can be reached—use of research results by millions of farmers in the humid and subhumid tropics.

Some of IITA's activities also consist of special projects which are funded outside the regular core budget and have specific and short-term objectives. In a typical year, approximately 15 special projects are in progress. Financial supporters include the Canadian International Development Research Centre, Ford Foundation, International Minerals and Chemicals and World Rock Phosphate Institute. Cooperation with universities and other advanced institutions has been stressed since the beginning of the Institute. It started in 1971 when the British Overseas Development Administration made funds available to both IITA and the University of Reading for research projects in grain legume improvement and to both IITA and Letcombe Laboratories for physiology and root development studies. Then similar arrangements were made with the Universities of Nottingham and Durham in the United Kingdom and with universities in West Germany, Belgium, the Netherlands and North America. In addition, IITA has so far joined in collaborative research and graduate training programs with universities in Cameroon, Ghana, Kenya, Liberia, Nigeria, and other African countries. It has an especially close association with the University of Ibadan.
Strengthening International and National Linkages Through Training

Probably the most important and long-lasting means of strengthening linkages between international and national programs is through training. Those involved in this training accept the challenge to further develop national capabilities for agricultural research and food production.

The Institute trained 436 persons from 49 countries from 1970 through 1976 in several different types of programs ranging from six weeks to two years. In addition, hundreds of people attend workshops, seminars and professional conferences at IITA each year. Scores of reports of the effectiveness of the training programs come from participants, many of whom now staff regional, national and state agencies and are leaders in agricultural research and education throughout Africa and other parts of the world. One example involved the failure of cassava production on hundreds of small farms in Anambra and Imo States in Nigeria because of bacterial blight disease. The following year, local agricultural assistants trained by extension officers who, in turn, had just been trained at IITA, arranged for new blight-resistant strains to be planted on farms in their areas.

Courses for groups are designated for both research and extension personnel, and they are taught in the field as well as in the classrooms and laboratories.

Selected students from universities in Africa, Asia, Europe, Australia, Latin America and North America come to IITA to conduct their research portion of their degrees under the supervision of the Institute's scientists. (By the end of 1976, master's candidates numbered 31, Ph.D. candidates 23.) The dissertation research, within the scope of the Institute's objectives, is tropically oriented. In addition, non-degree research training is offered for employees of ministries and departments of agriculture, universities, research institutes, international organizations and private agencies.

The younger generation—African students on long vacation before their last year at university-level schools of agriculture—are also offered scholarships. (Approximately 90 from 1970-1976.) The Institute's scientists suggest research projects that can be completed in three to four months, and they supervise the students who are nominated by Deans of Agriculture.

IITA also has post-doctoral fellowships for agricultural scientists who have recently received their Ph.D. degrees. They work for two years with experienced scientists, adding to the manpower resources of the staff. Later they may join the IITA team or other research institutes and agencies. Thirty-three post-doctoral fellows from 13 countries were involved in research by the end of 1976. This program will be expanded with both core and special funding. Half of the post-doctoral fellows are expected to come from Africa.

Trainees learn in the field as well as in classrooms and laboratories, and hundreds of people each year attend professional conferences, workshops and seminars at the IITA Conference Center.

Left, the Institute has trained 436 persons from 49 countries in the past six years.
Staff and Facilities

The success of any organization depends on the caliber of its staff, and IITA recruits scientists and senior support staff with exceptional qualifications from anywhere in the world. Fifty-four scientists from 20 countries were on the research staff at the beginning of 1977. One out of every six came from Africa.

Counting laboratory technicians, clerical staff, maintenance workers and part-time farm labourers, the total personnel complement ranges between 1,000 and 1,200. With few exceptions, the technical, farm and general services staffs are Nigerians.

The Institute's scientists have well equipped laboratories and land at both Ibadan and Onne with a wide range of soil types for their experiments throughout the year. Support facilities also include a library, large conference center with simultaneous interpretation equipment, communications and information services and physical plant services which make it possible for the Institute to be largely self-sufficient for minor construction work on campus, maintenance of buildings, vehicles, farm equipment and laboratories. Standby facilities for water and electricity are also included.

Individual houses or apartments are provided on campus for most of the principal staff and dormitory rooms or flatlets for post-doctoral and research fellows and scholars. The International House area is the dining, social and recreational center with tennis, swimming and other recreational facilities for the staff, trainees and visitors.

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Art work: P. Obende
Printed in England by Balding + Mansell Limited, London and Wisbech

At the beginning of 1977, IITA had 54 scientists who came from 20 nations throughout the world.
The News Media in Nigeria

General

The Nigerian Press is among the largest and most dynamic in developing countries. There are over a hundred news publications in the country. These include about 33 daily and Sunday English-language newspapers, about 30 weekly and monthly magazines, a dozen quarterly and half-yearly periodicals, and scores of house journals published by companies and professional organizations.

Radio broadcasting in Nigeria is both a national and state responsibility. The national radio network, operated by the Nigerian Broadcasting Corporation (NBC), has both a public affairs and a commercial channel. Many of the 19 states in the Federation also operate local radio stations, and efforts are being made to start broadcast services in those states where they do not exist at the moment.

Television, which became a national responsibility in 1975, is also operated by the NBC.

Status of the Press

Editorially, the Nigerian press is relatively free, when compared with much of the press in the rest of Africa. There is no official censorship. But given the structure of ownership, together with the aura that surrounds a military government, newsmen in Nigeria exercise some form of self-censorship. Newspaper editors, however, circumvent editorial responsibility by giving space to articles or statements by intellectuals from the universities and influential people of all shades of opinion, particularly the old-time politicians and their would-be successors.

Since Nigerians have always enjoyed public debate, the newspapers seldom lack controversy. The current gradual movement towards a return to civilian rule, exemplified by elections to local councils and the Constituent Assembly, has returned some of the former vitality to Nigerian newspapers.

Newspapers and journals

Although most newspapers and periodicals are published in the states, all of them are trying to appeal to the national audience. The most influential is also the oldest and largest: the Daily Times, published in Lagos, with a circulation of about 350,000. Its Sunday edition runs over 410,000 copies. The two papers together form the flagship of the publishing fleet that is the Daily Times Group; a group that includes an evening edition, the Evening Times, and one weekly paper each day of the week: Headlines; Times International, Business Times, Lagos Weekend, etc.; and other magazines and periodicals. The Daily Times Group was a privately-owned independent institution until late in 1975 when the government decided to partici-
pate in its operations by buying, through a para-statal corpora-
tion, 60 percent of the Daily Times Group's shares.

Rivalling the Daily Times in influence, if not in circula-
tion, is the New Nigerian, published as a daily simultaneously in
Kaduna and Lagos, by a government-owned corporation, the New
Nigerian Newspaper Ltd.

Many of the remaining newspapers and magazines are also
run either by para-statal corporations or institutions. But a
few are independent and privately-owned. Most important of the
latter are the Punch, with its Sunday edition Sunday Punch (circu-
lation 100,000), the West African Pilot, the Daily Express, all

Nigerians are very interested in international affairs.
The news media try but very often fail to satisfy this need. The
level and choice of their reports and commentaries reflect a
dearth of newsmen who are really knowledgeable in foreign affairs.
There are a few exceptions, e.g., Times International, New Nigerian,
Afriscope Magazine, Sunday Punch and the Daily Times. The huge
demand for foreign news is partially being met by international
newspapers and magazines from Europe and America. These are readily
available in newstands and all good hotels.

Radio

National radio and television broadcasting are carried out
by the Nigerian Broadcasting Corporation, a statutory corporation
set up in 1957. It is financed by government subsidy, licence fees
and commercial advertising revenue. The NBC is charged with the
responsibility of providing, as a public service, independent and
impartial radio and television programs. The principal languages
used are English, Yoruba, Hausa and Igbo, with some programmes in
Efik, Ijaw, Fulani, Kanuri, Tiv, Edo and Urhobo. The NBC began an
external service, the Voice of Nigeria, in 1962. This service
broadcasts programmes in French, English, Arabic and Hausa for about
9 hours a day, beamed to all parts of Africa, Middle East, Europe
and the Mediterranean.

By the end of this year, virtually all the nineteen states
in Nigeria will have local radio stations. The existing ones cur-
rently operate in a dual capacity of a public service and a commercial
station.

Television

Television in Nigeria is national, operated by the NBC. Each
state, however, has the authority, and most of them the capacity, for
local program planning and production. A Nigerian Television
Authority was created recently to coordinate and supervise the opera-
tions of all efforts in public and future private television broad-
casting.
NBC-TV programs are beamed in both color and black and white, not only in the main languages (English, Yoruba, Hausa and Igbo), but also a number of other local languages.

Coverage of Bank affairs

The Nigerian press gave good and sometimes lengthy coverage this year to the Annual Report (coverage of the Annual Meetings is still be monitored). This is partly the result of IPA's resuming its public affairs missions to Nigeria, where the climate for this kind of work has improved. A Nigerian editor was invited in May 1977 to attend IPA's press seminar in Washington. And 13 Nigerian journalists attended a briefing and luncheon by IPA in October this year at the time of Lt.-General Obasanjo's visit to the U.S.

Information and Public Affairs Department
October 18, 1977
AF: mw
World Bank Annual Meet:
McNamara foresees bright future for capital flow

THE President of the World Bank, Mr. Robert S. McNamara, has forecast an improvement in his bank's net capital flow in the next five years. The net financing which stood at about 100 million Naira reached six billion Naira this year but by 1983, they should reach an annual rate of almost 9 billion Naira, the President said.

Mr. McNamara disclosed this in his speech he read at the World Bank Annual General Meeting held in Washington, United States recently.

In a wide-ranging survey of the state of the developing world Mr. McNamara, noted the continued economic progress of the middle-income countries, but called for special efforts to relieve the poverty and end the stagnation of the poorest countries where about one billion people live.

"We must design a development strategy that can both accelerate economic growth, and channel more of the benefits of that growth toward meeting the needs of the absolute poor," he said.

The projects assisted by the World Bank, especially in rural development, were reaching the poorest and helping them to become more productive.

Mr. McNamara called for policy shifts by both rich and poor nations alike towards much greater trade in goods manufactured in the developing countries. This would particularly benefit the middle-income-countries, which could continue to borrow extensively from commercial banks.

But the poorest countries would need increased amounts of concessional aid to make any progress towards that "abolition of absolute poverty by the end of the century" which Mr. McNamara set as a goal four years ago.

He urged that this concessional aid be directed to meeting the basic needs of the poorest people.
As many as 30 million rural poor may benefit from agriculture and rural development projects assisted with World Bank funds in fiscal year 1977, according to the Bank's Annual Report, published on Monday.

The Report emphasizes the importance of agriculture to the developing countries, concluding that increased agricultural production helped many of them survive the recession of the mid-1970s. Agriculture, the Report contends, still is the key to improving the living standards of the world's poorest people.

Eighty-four agriculture and rural development projects were approved by the World Bank and its affiliate, the International Development Association (IDA), during the past year -- the third year in succession in which the agricultural sector accounted for the most Bank and IDA assistance.

The total number of direct beneficiaries of Bank-supported projects in the sector during that three-year period, fiscal 1975-77, may number as many as 80 million, the Annual Report adds.

Rural development projects are defined by the Bank as those in which more than half the direct benefits are expected to accrue to the rural poor.

The Bank's rural development strategy was set in motion in September 1973, when Bank President Robert S. McNamara called for a target of 5 percent growth in productivity on small farms by 1985. The Bank, he set a goal of bringing improve technology and other inputs to over 100 million small farmers over the same time span.

In his September 1973 speech, Mr. McNamara said that neither the Bank, nor anyone else, had very clear answers on how to introduce improvements to the rural poor. "If some of the experiments fail," he said, "we will have to learn from them and start anew."

The Bank's 1977 Annual Report, through acknowledging that "rural development is no easy task," and that the Bank "has still much to learn from its problems as well as its successes," concludes, however, that the start made in the sector has been a promising one.

"It is possible to design projects that will assist large numbers of the rural poor to expand production and increase their incomes," the Report states.

The Bank and IDA lending for agriculture and rural development in the four years following Mr. McNamara's speech has totaled almost $6.750 million. Significantly, 61 percent of the 1977 total was earmarked for rural development, as compared with 50 percent in 1976 and 53 percent in 1975.
The World Bank and its affiliates, the International Development Association (IDA) and the International Finance Corporation (IFC), approved loans and investments totaling more than $7.2 billion for fiscal years 1977, according to the Bank's Annual Reports published today. The commitments made were $3.9 billion, higher than in the previous year.

For the Banks and IDA alike, commitments for fiscal years 1977 increased by $544 million dollars over fiscal 1976 dollars. This increase was nominal only, the Annual Reports note. Inflations during the year were taken into account, so commitments were $6.5 billion, or $46 million dollars below fiscal 1976 amounts.

The increase registered in fiscal 1977 remained as a result of increases in the developing world. The Bank's Annual Reports explain the decreases as due to the lessened availability of IDA funds during all of which had been exhausted by June 30, 1977. Since 1960, IDA's resources have been replenished at three-year intervals. When negotiations on a Fourth Replenishment were concluded in September 1973, commitments to IDA's member countries most of its funds to the poorest nations at no interest, totaled some $4.5 billion dollars. Primarily because of exchange-rate fluctuations, however, IDA's funds available for the three-year period ended June 30, 1977, or only $4.5 billion dollars. (The Replenishments of 1977 were pledged in terms of current U.S. dollars when the dollars of theollar fell in relation to other currencies, the values of funds available to IDA also dropped.)

In March 1977, agreements were reached on a Fifth Replenishment of $7.6 billion for the three-year period beginning July 1, 1977. The replenishment level provides for total commitments of $7.635 billion dollars for the period, or some 2.5 times the dollars a year. The figure represents a 54 percent increase, in nominal terms, over the funds available during the Fourth Replenishment. Some 20 donor countries are contributing to the Bank's Replenishment.
World Bank x-rays Africa's economic growth

With few exceptions, the real per capita income in eastern Africa today is hardly better than it was in 1973, the World Bank said yesterday in its yearly report.

The bank blamed various "crises" which had delayed economic growth and the unfavourable terms of trade since 1973, the year in which oil prices shot up.

The bank said that some countries, including Kenya and Tanzania, had reacted to the new situation by introducing austerity programmes and restructuring investment.

"In countries where the resource shortfall was large and short-term indebtedness increased rapidly, as in Zaire, the reduced import capacity retarded the successful recovery in the production of goods and services", the bank said.

"Despite this, however, harvests had been good, receipts from exports were higher and there had been a slight drop in the inflation of prices of imported goods."

"In the poorest countries in the area totalled three imports and invest-572 million dollars during 1977 financial year, a slowing down economic 14 per cent increase over growth", the bank said.
THE Federal Military Government has decided to shelve Nigeria's financial "generosity" to the African Development Bank (ADB), the Federal Commissioner for Finance, Major-General James Oluleye said at the week-end.

The commissioner said the decision was taken because of our present need for financial assistance to execute our development projects.

He said, "It is only logical that Nigeria should in the meantime focus more attention on the yet untouched ventures at home rather than thinking of how to renovate an already built house."

Major-General Oluleye was answering a reporter's question at Murtala Mohammed Airport, Ikeja, before he flew out at the head of a delegation to the 12th annual conference of the International Bank for Reconstruction and Development (IBRD) and the International Monetary Fund (IMF). The meeting is taking place in Washington DC, United States of America.

He said as of now, Nigeria controlled a total of about 13.4 per cent in the capital equity of the ADB and that the Federal Government had floated a Nigerian Trust Fund of 50 million Naira to assist the less privileged countries in the continent.

Commenting on a recent western press publication that Nigeria, "the oil-booming state now goes for loan," the commissioner said, "It is left for anybody to see us the way he feels like seeing us. But the fact that Nigeria goes out to seek loan did not mean that the country is broke, anyway."

The commissioner said he could not see anything wrong with any man who went out for assistance when it became necessary to develop himself.

Major-General Oluleye said no member of the oil-producing countries could boast of being self-sufficient in the provision of fund for all its development programmes, and held that "ours is not an exemption."

The commissioner added "in any case since the civil war Nigeria has not had the cause of hunting from the IMF to liquidate any bad debt."
Oluwelye to press for loan

NIGERIA'S LARGEST DAILY SALE

DAILY TIMES

*21,666 Monday, September 26, 1977 10k

N$150m AID PLEDGE REJECTED

'We need money too,' Nigeria tells the ADB

by EVANS ADUSE-POKU

NIGERIA, now tightening up the loose ends of its public spending, has shut the doors of its treasury against an international bank asking for money.

Federal Finance Commissioner James Oluwelye told reporters at the weekend that Nigeria last month rejected a loan request by the African Development Bank (ADB). The Abidjan-based bank had asked for N$150 million.

Major-General Oluwelye was speaking at Murtala Muhammad Airport, Lagos, on his way to Washington in America at the head of the Nigerian delegation to a World Bank meeting.

The meeting of the World Bank and the International Monetary Fund (IMF) opened today in the United States capital.

The 5-day conference is expected to end on Friday. On why Nigeria turned down the loan request, General Oluwelye said the Federal Government had earlier granted $6 million (about N$10 million) to the ADB apart from paying its equity share of 12 per cent of the treasury bearer bonds and the country could not afford to give any more money to the ADB because of the country's present rate of development. The heavy commitment facing the Federal Government had forced Nigeria to fall on the World Bank for another loan amid calls to finance its projects.

"A country which is looking for more loans to finance its projects will not be in a position to finance another financial institution," the General said.

Some time last month, the Ghanaian president of the African Development Bank, Dr. Konu Douala Fordwou, led a delegation to Lagos to negotiate with the Federal Government authorities for the N$150 million loan.

Dr. Konu Fordwou said on arrival at the airport that the ADB was facing serious problems and needed more aid to finance its numerous projects in many African countries.

Major-General Oluwelye, however, said that Nigeria was not asked for a World Bank loan but was in compliance with it that the bank be helped to the best of its ability.

The World Bank and the IMF meetings are held twice every year because they have virtually the same membership and identical constituencies.

It is mainly through these meetings that countries are made aware of one another. The Federal Government, Central Bank governors, top management of the World Bank and the IMF, also attend the meeting and discuss the need for change in lending conditions.

Developing nations are expected to put forward a number of proposals to change lending conditions, to ensure nations who were in the past considered for loans,

Nigeria is going to put pressure on the World Bank to approve the one billion dollar loan she has asked for.

<GENERAL OLUEYE SUSPECTS REPORTERS' QUESTIONS. To his right is Mr. A. U. Diamond, special assistant to the permanent secretary, Ministry of Finance.>
Nigeria: civilian rule by 1979

Government soon to make public the text of a draft constitution

By Arthur O. Ezenekwe
Special to The Christian Science Monitor

Nigeria's military government will soon make public the text of a draft constitution as part of its avowed plan to return the country to civilian rule by October, 1979.

The draft, submitted to head of state Lt. Gen. Olusegun Obasanjo recently by a hand-picked 49-man committee, is certain to recommend an American-type executive presidency to replace the British-type parliamentary democracy adopted at independence in 1960. That has been suspended since the military seized power in 1966.

Nigerians are waiting for public debate on the draft constitution to be opened. Heated discussion is clearly in the offing, as the constitution drafting committee itself split into two factions.

University lecturers Segun Osoba and Yusuf Bala Usman presented their own separate report to General Obasanjo. They said the report prepared by the other 47 members of the committee "has failed to provide for true democracy and does not provide for the politics of consensus."

A temporary constituent assembly with both elected and appointed members is expected to accept the new constitution. The assembly's work, as well as public debate on the constitution, will last until October, 1978.

This will represent the second stage of a five-part plan to transfer government back to the civilians. The first stage was the formation of seven new states, bringing the total to 19, and the drafting of the new constitution.

In drawing the new state boundaries, officials tried to cater to the country's minority tribes which had asked for their own states even before independence. But not everyone is happy about the outcome.

General Obasanjo recently reprimanded a new group of agitators and warned them the military authorities were in no mood to set up any more states.

The establishment of the new states and the reorganization of local government councils are almost complete. In all 19 states, local governments are being organized along guidelines issued by the federal government in consultation with traditional rulers and a cross-section of the populace.

Elections for local councils will be held in about half of the states this December. The other states have opted for indirect elections and will elect their leaders in November.

Some former politicians have criticized the system of indirect elections. Alhaji Aminu Kano, leader of the banned Northern Elements Progressive Party and a potential leader in the coming civilian government, argues that such a system "has taken Nigeria back 20 years." He expresses concern the councils will be filled with "yes-men and errand boys" of some state rulers. The system reverses the attitude that one part of the country is more developed than another, he says.

Nigerians have not shown much interest in what have been described as "elections without political parties." When voter registration closed in Lagos State, only 5 percent of those eligible had registered.

The federal guidelines for local reorganization are broad. As the governor of Sokoto State, Col. Umaru Mohammed said in an address to his constituents: "The aim is to agree on the basic essentials for a free, democratic, and effective local government system, and to allow each state choice to implement this system in a manner appropriate to its culture and history."

The cultural disparity in the various tribes has made integration very difficult in the past.

One question, at least, remains to be answered: Will women in the Muslim-dominated northern states be allowed to vote in the coming elections?

The third stage in the projected transition from military to civilian government is reactivating political parties in preparation for state and federal elections. The ban on political activities is to be lifted in October, 1978, allowing only one year for political reorganization before the election.

The relatively short time allocated for political activity and general elections has given rise to speculation the country might emerge with only one or two parties instead of the many allowed under the old constitution.

The fourth and final stages of the power transfer are to be the actual elections for state and federal legislatures.
Set at $1 Billion Over Seven Years

Nigeria Plans Large Euroloan

By JANET PORTER

Journal of Commerce Staff

LONDON — In its first-ever
fund-raising operation in the
medium-term Eurocurrency
market, Nigeria has obtained
terms which very few coun-
tries would be able to better.

Originally expected at $700
million, the country now plans
to borrow $1 billion over seven
years, at a spread of 1 per
cent over the London inter-
bank offered rate (Libor) on
six-month Eurodollar depos-
ts. The management group
consists of Chase Manhattan
Ltd., Deutsche Bank and Mor-
gan Guaranty.

Development Projects

The funds will be used for a
whole range of projects aimed
at broadening and developing
Nigeria's industrial base. With
its rapidly growing oil industry
and the country's proven
ability to manage its affairs
reasonably, Nigeria is consid-
ered "an excellent risk," a
Chase spokesman commented.
The terms are on a par with
those obtained by another oil
producer, Venezuela, on a $1.2
billion financing earlier this
year.

Although both Sweden and
Britain have been able to raise
large sums at a spread of
below 1 per cent, Nigeria's
terms are a considerable
achievement for a first-time
borrower which previously has
only raised funds through
short-term trade financings.

However, the managers are
"very confident that the loan
will be successfully received
by the market."

Indian Borrowing

Another first-time bor-
rower, although on a much
smaller scale, is India. The
Oil and Natural Gas Com-
mission has raised $50 million
through a seven-year financ-
ing which will also carry a
margin of 1 per cent over
Libor.

Malawi is another new-
comer to the Euromarket with
a $25 million loan currently
being arranged for the funding
of a new airport. This is for a
seven-year period and offers a
2 per cent margin.

A more familiar name in
the market is Poland, which is
now planning to raise $350
million, managers Chase Man-
battan confirmed Wednesday.

Having borrowed heavily in
the past, there has been some
concern about the country's
ability to meet its repayment
commitments. Thus, the latest
financing includes certain
safeguards. The fund will be
used to develop Poland's cop-
er industry, and the money
will be drawn down in stages
to be linked with the progress
of the project. In addition, the
lending banks will be allowed
to inspect the progress.

The fact that the borrower
is the Polish copper industry
rather than the central author-
ities is seen as an important
factor enabling the loan to go
ahead. The spread on the loan
will be 1½ per cent for the
first five years and 1½ per
cent for the last three years...

Other Loans in Progress

Other loans now being ar-
ranged include a $150 million
credit for Cie Financiere
Michelin, with a spread of ¾
per cent over seven years. A
Brazilian borrower, Rio
Metro, is raising $170 million
through two tranches, each of
$85 million. The five-year
tranche is at a spread of 1½
per cent, while the seven-year
portion is at 2½ per cent.

Loans signed recently in-
clude a $150 million, seven-
year loan for Trinidad and
Tobago, and a dual-tranche
$100 million financing for the
Algerian oil company, Sona-
trach.

But there has been a notable
lack of loan demand from
undeveloped countries — one
of the reasons why a new-
comer such as Nigeria has
been able to command such
favorable terms. Competition
among the banks for custom-
ers has been largely respec-
tible for diminishing margins;
although many banks are
known to be unhappy about the
situation.

If banks commit themselves
too heavily to developing
countries, it is feared they may
find themselves unable to
meet domestic demand if and
when it starts to revive. How-
ever, spreads have not yet
sunk to the levels touched in
1974 when the U. K., for ex-
ample, obtained a rate of only
¾ per cent over Libor on the
first two years of its $2.5
billion Euroloan. The banking
crisis set off by the collapse of
the German Herstatt Bank put
an end to such low rates.


Buoyed by Oil, Rags-to-Riches
Nigeria Fends Off Disaster

By Jonathan C. Randals
Washington Post-Foreign Service
LAGOS—Cantankerous, arrogant, impatient, hassling and hustling, Nigeria is Black Africa's richest and most populous state and, on paper, its best bet for large-scale, long-term success.

But its king-size problems make even optimists cautious about its future, despite its wealth as the world's seventh-largest oil producer.

Although Nigeria's gross national product is expected to outstrip South Africa's within a year, inadequate facilities and inefficient bureaucracy worry many Nigerians, who see the oil money as doing anything more than buying time to avoid another of its devastating periodic convulsions.

"Nigeria is simultaneously capable of producing the most sensitive writing and thinking on the continent and a role-model, rags-to-riches society," said one observer.

Yet in recent months, the military government has shown increasing signs of renewed self-confidence after a period of hesitation, xenophobia and acute security-consciousness. That in itself is no small accomplishment in light of Nigeria's 10 years as a sovereign entity marred by political crises, civil war, authoritarian rule, massive corruption and waste and gargantuan ambitions.

The recent welcoming of President Carter's Africa troubleshooter Andrew Young demonstrated a new foreign-affairs pragmatism and, in effect, let the Nigerians off the hook of their own devising. Not even an illusion was made to Nigeria's militant hostility to former Secretary of State Henry A. Kissinger, whose attempts to visit Nigeria last year were rebuffed.

This return to a more balanced view of the outside world has a parallel at home. The military recently staggered on its way hosting a month-long, African culture festival, a feat that to outsiders remains unimportant. But the often-postponed festival's mushrooming extravagance was sufficient to help justify the 1975 coup that replaced Gen. Yakubu Gowon with Gen. Muhammadu Buhari.

Two hundred days after that coup, Buhari was murdered in another takeover attempt and there is an odd feeling expressed here that his successor, Lt. Gen. Olusegun Obasanjo, wants to expedite the martyr's promise of a return to civilian rule more as a means of survival than out of puro principle.

A worldly-wise Nigerian remarked: "Mine is an odd country. The military want to honor their word and relinquish power in 1979. But, aside from the press, old pols and university professors, I bet 90 per cent of the ordinary people would vote to keep the military on."

It is not necessarily that the military is loved, however. For an underdeveloped country, the army is vastly overstrength at some 300,000 men—only slightly smaller than during the 1967-70 Biafran civil war—and eats up a disproportionate share of the national income.

Yet, despite their costliness and their often brutal, arbitrary behavior toward ordinary citizens, the soldiers are seen by many as the only force capable of bringing about positive change. Whatever their shortcomings, they are credited with trying hard to shore Nigeria toward nationalhood.

For much of the older generation, the politicians' free-for-all rule during the first five years of independence remains the nightmare that produced the Biafra secession.

The young, who make up a great proportion of a population estimated at 73 million, feel no nostalgia for a civilian rule they never knew. Nigerian cynicism, moreover, fear that civilian rule would prove so ineffective and venal that it would soon give way to renewed military government.

Many ordinary Nigerians seem convinced that only the military could achieve such feats as last fall's bullying through of compulsory elementary education. Civilian politicians would have fled to temporize, to question the wisdom of such radical action when teachers, schoolrooms and textbooks were lacking and jobs for the more demanding—if half-educated—graduates far from assured.

Similarly, only the military, its defenders argue, would have cut the Gordian knot of Lagos' traffic jams by instituting alternate-day driving for cars with odd- and even-numbered license plates.

So distant is the memory of civilian rule that the military is rarely blamed for not dealing earlier with these problems, as well as the inadequate roads, rickety housing, often nonexistent plumbing, food problems, an inefficient marketing and distribution system and wholesale corruption.

Since uncharacteristically Nigerian self-doubt about anything, much less civilian rule, reflects the Texas-plus size of the land that, despite its Biafran war slogan "One Nigeria," is still in the nation-building stage, at best.

A draft constitution, which must be approved by a constituent assembly this fall, calls for a strong American-style presidency, reminiscent of the British parliamentary model that came to grief in the early 1960s. But, in an effort to dilute the old major tribal jealousies among the northern Hausa-Fulani coalition, the western Yoruba and the eastern Ibo, the new-constitutional draft requires that at presidential elections win a majority in two-thirds of Nigeria's 19 states.

Murutal's creation of seven new states—brining the total to 19—was part of his effort to reduce sectional power. But the most discernible result so far has been to provide more patronage jobs amid fears that mushrooming state bureaucracies will leave relatively little cash for economic investment.

Regional rivalries were a major factor in the collapse of the first republic —after a controversial census, claimed the conservative Moslem north constituted more than half the country's population. A 1973 census was scrapped after Gowon's overthrow, largely because southerners refused to accept findings that showed that the north had increased its share to two-thirds of all Nigerians.
Nigeria's political stability must remain in doubt as long as successive governments prove incapable, as they have since independence, of carrying 'out a census acceptable to the entire nation.

Signs still abound that the Yorubas are distrusted by northern Moslems and eastern Ibos alike. Emerging from the shadow of the Biafra secession, the Ibos are still kept at arms' length in the federal bureaucracy's power jobs and especially in the armed forces and on the ruling Supreme Military Council.

Optimists—and there is a vitality to Nigeria that seems to justify them—hope the money Nigeria is receiving from the sale of its oil to Western countries including the United States, a chief buyer, will last long enough to build the roads, airports and schools that somehow must persuade Nigeria's 250 tribes to transcend their present acquisitive, clan-oriented horizons and accept the spirit of larger community and sacrifice associated with nationhood.

Obasanjo himself has tried telling Nigerians that despite the country's oil wealth—currently running just under $9 billion annually—they are not as rich as they think. But Nigerians seem to be so busy making money—or trying to—that they do not appear to have gotten his message.

Nigerian society seems impervious to the penchant of its lively press to recount apparent endless examples of grand and petty corruption, massive waste and mismanagement. Nothing shows any signs of abating Nigeria's continuing caricature of itself as a rapacious and insensitive, if dynamic, society.

It is as if the petty-trader tradition has discouraged productive investment in favor of conspicuous consumption. Typical is Lagos, the over-crowded, under-equipped capital where the lion's share of new sewers to replace open-drainage is earmarked for luxury residential areas rather than the slums housing 3.5 million inhabitants.

It is a city where the rich ride around in monstrous traffic jams in the most expensive Mercedes, and few price-gougers ever go to jail despite supposedly stringent regulations.

Pessimists fear a genuine social revolution—perhaps Black Africa's first, instead of the now classic revolving-door coups and their purely rhetorical radicalism.

"You know," a Nigerian intellectual lamented, "even state ownership isn't really a workable alternative when you look at the nationalized ports, airways or electricity authorities and see the mess they are in.

"We're in a period of capital accumulation," he said, "which is ugly, but not really different from 19th century Europe or the United States. For the next five years, if we're lucky, even the most exploited wrretch can still con himself into thinking he can make a killing."

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Nigerian Police
Detain Editor

LAGOS, Nigeria, Feb. 29—Nigerian magazine editor Chris Okolie was detained by plainclothes police Monday, according to his magazine Newbreed, which said that some "trial papers" and recent copies of the magazine had been taken by police.

The magazine's latest issue carried a cover story by Okolie titled "How United Is Nigeria?" Official sources hinted that while the cover story might be in contempt of the country's sedition laws, it was a second article, by a professor, that caused the trouble.

That article, argued against the introduction of a quota system in higher education designed to let populous northern Nigeria catch up with the rest of the country and called for castration and sterilization to decrease "the population in those areas where we have the largest population." The article also made a biting attack on Islam as a religion.

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A traffic jam on a main thoroughfare in downtown Lagos reflects the economic boom in the Nigerian capital.
ONE of the major problems in developing nations of Europe, North Africa and the Middle East has been poverty, a World Bank report said yesterday.

It said in its annual report that in a region by region survey of international economic conditions, the world's poorest nations still faced the problem of ensuring adequate food supplies and meeting nutritional standards.

The report was guardedly optimistic about economic progress in much of the world last year, describing conditions in Latin America, the Caribbean and South East Asia as generally favourable.

However, in East Africa, economic progress was held up in the past four years by a number of world crises.

This was compounded by drought and a plunge in copper prices, leading to higher food imports and a severe trade imbalance in the region.

The report said unemployment in Europe had increased in the past three years, largely because the recession in northern Europe meant a job squeeze affecting migrant workers from Portugal, Turkey, Greece and Yugoslavia.

But in the Gulf area, oil wealth had attracted large numbers of migrant workers from Egypt, Jordan, the Yemen Arab Republic and Afghanistan, the report said.

Economic developments in

New Nigerian
Sept 21, 1977
large numbers of the rural poor to expand production and increase their incomes, the Report adds.

Bank and IDA lending for agriculture and rural development in the fourth year following Mr. McNamara's speech has, however, increased to about $13,850 million.

In fiscal year 1977 alone, the Report states, 61 per cent of the Fund's lending was for agriculture and rural development, while 5 per cent of the IDA's was for the same purpose.

For the bank, it set a goal of bringing improved technology and credit terms to over 100 million small farmers over the same time span.

In his September 1973 speech, Mr. McNamara said that neither the bank, nor anyone else, had very clear answers on how to introduce improvements to the rural poor.

"In some of the experiments, he said, "we will have to learn from the experience of others.

The bank's 1977 Annual Report, though acknowledging that "rural development is an easy task," and that the bank's "has still much to learn from its problems, as well as its successes," concludes, however, that the start made in the sector has been a promising one.

It is possible to design projects that would become developing countries, in general, had higher growth rates than the rich countries during those same years.

They were able to sustain their momentum of growth during the mid-1970s through a combination of internal adjustments of fiscal, monetary, or price policies, and by borrowing heavily from private sources.

And the Report continues, "policy adjustments, launched in response to the mid-decade recession may well prove, for many, to be a springboard for continued growth in the future. For example, the World Bank's report, 'Incomes, productivity and growth in agriculture' published in 1975, addressed specific issues relating to the importance of the agricultural sector to the rural poor, as well as to the world economy as a whole.

"It appears that increased agricultural production is the key to improving the living standards of the world's poorest people.

Eighty-four agriculture and rural development projects were approved by the World Bank and its affiliate, the International Development Association (IDA), during the past year - an increase in the past 40 years - which the agricultural sector accounted for the most bank and IDA assistance.

SUPPORT

The total number of direct beneficiaries of the bank-supported projects in the sector during that three-year period, fiscal 1975-1977, was about 60 million, the Annual Report adds.

Rural development projects are designed to benefit those as in those in which more than half the direct benefits are expected to accrue to the poor.

The bank's rural development strategy was set in motion in September 1969, when the Bank President, Mr. McNamara, called for a target of 5 per cent growth in productivity on small farms by 1985.

But for the poor countries, in turn, and in them live more than 600 million people - growth remains so slow that poverty cannot be alleviated, much less eradicated, unless greater efforts by the poor, as well as rich countries, are made, the Report warns.

CRISP OF POVERTY

The three poorest countries cannot break the grip of poverty by themselves, however, the bank's Annual Report goes on to say.

The rich, industrialized countries can help, the Report concludes, by prudent management of their economies, through imports of goods from the developing world, by providing aid flows on concessional terms, and through access to their capital markets.

Aid in concessional terms declined in real terms in the calendar year 1976, the bank's Annual Report notes.

From preliminary statistics provided by the Development Assistance Committee (DAC) of the Organisation for Economic Co-operation and Development, it appears that concessional assistance (IDA - Official Development Assistance) totalled $73.712 million during the year - an increase of 5 per cent over 1975.

Total concessional undisbursed balances, stood at $717.912 million at the end of 1976, or about $2316 million (18 per cent) over 1975. Net borrowing in 1975 was $235 million, or an increase over 1974 of $847 million.

INFLATION

"As in 1974," the Report notes, "the increase reflected a rise in the borrowing countries' balance of payments deficit, on current account, as well as inflation."

According to the bank's Report, the current account surplus of nine non-reporting exporting countries, including Ecuador, Gabon, Indonesia, Iran, Iraq, Nigeria, Niue, Tonga and Vanuatu, declined sharply in 1975 and 1976.

By the end of 1975, the Report continues, it was evident that many of these countries, particularly the larger and poorer of them, for example, Indonesia, would not be, in the near future, in a position radically different from many other developing countries.

The World Bank's Annual Report for the fiscal year 1976 was published in English, French, German, Italian, Spanish, and Arabic.

The joint annual meeting of the bank and the International Monetary Fund will open in Washington on Monday, September 26.
Commitments of World Bank get higher

The World Bank and its affiliates, the International Development Association (IDA) and the International Finance Corporation (IFC), approved loans and investments totaling more than $2,725 million (about 315,349 million) to countries of the developing world in the fiscal year which ended June 30, 1977. According to the Bank's Annual Report, published recently.

The commitments made were $2,196.1 million (about 712.2 million) higher than in the previous year.

For the Bank and IDA alone commitments for fiscal year 1977 increased by $131.4 million to $7,066.4 million. This increase was nominal only, the Annual Report notes. If inflations during the year were taken into account, the Report adds, commitments were $5,566 million, or $46 million below fiscal 1976 amounts.

All the increase registered in fiscal 1977 lending came as a result of increased lending by the Bank.

At $5,759 million, lending by the institution for fiscal 1977 was $708 million over the year previous.

Commitments by the International Development Association (IDA), at $1,508 million, were down by $54.6 million.

The Bank's Annual Report explains the decrease as due to the limited availability of IDA funds, virtually all of which had been exhausted by June 30, 1977.

Since 1962, Bank's commitments have been replenished at three-year intervals.

When negotiations on a Fourth replenishment were concluded in September 1973, commitments to IDA, which lends most of its funds to the poorest nations at no interest, totaled some $4,541 million.

Primarily because of exchange rate fluctuations, however, IDA had funds available for the three-year period ended June 30, 1977 of only $4,151 million.

Fourth Replenishment commitments were pledged in terms of current US dollars, when the value of the dollar fell in relation to other currencies, the value of funds available to IDA also dropped.

In March, 1977, agreement was reached on a Fifth Replenishment of IDA resources for the three-year period beginning July 1, 1977.

The replenishment level provides for total commitments of $7,638 million for the period and some $2,104 million a year.

The figure represents an 8 per cent increase, in nominal terms, over the fund available during the Fourth Replenishment.

Some 20 donor countries are contributing to the Fifth Replenishment.

The IFC — its essential function is to assist the economic development of its member countries by promoting private sector growth — committed $208.7 million to 35 enterprises during the year.

Disbursements by both the Bank and IDA reached record highs in fiscal 1977.

Bank disbursements, at $2,626 million, were up $166 million over fiscal 1976 totals. IDA disbursements, up $46 million from fiscal 1976, amounted to $1,260 million.

From the start of its operations in December 1945, Bank disbursements have totaled $72,247 million; IDA's aggregate disbursements have now reached almost $4,559 million.

The five-year period, June 30, 1977, IDA disbursed $4,780 million, or equal to nearly four times disbursements in the previous five-year period.

Gross revenues of the Bank amounted to $1,617 million, up $303 million from fiscal 1976. Net revenues were at $159 million, down $11 million from fiscal 1976.

It was the twenty-ninth year in a row that the Bank has registered a net profit from its operations.

The Annual Report states that the decline in profits was due largely to the steep rise in 18 million in expenditures, most of which was caused by a $279 million increase in interest and insurance costs on the Bank's borrowings.

Most of the Bank's net income is allocated to its reserves (which now total more than $1,700 million) and to the operations of IDA.

Since 1964, some $1,125 million has been so absorbed in IDA, making the Bank the fourth largest contributor to IDA's resources.

Borrowings totaled, $4,781 million in fiscal 1977, or a $19 million above the record high of the year before.

Of the total, $3,806 million was borrowed in the United States.

The Bank also borrowed in the Federal Republic of Germany (16 issues), Switzerland (6 issues), South Arabia (4 issues), Japan (one issue), and Yugoslavia (one issue) during the year.

The principal source of borrowed funds to the Bank in fiscal 1977 was the capital markets, on which the Bank sold $2 billion of bonds, raising the equivalent of $5.455 million.

Government and central banks purchased $1,158 million of Bank issues during the year.

The Bank's authorized capital was increased in fiscal 1977 by $5,444 million to $41,016 million by means of a selective capital increase.

During the year, up to $3,560 million of selective increases in subscriptions to capital were allotted to 215 member countries of the Bank.

The selective increase follows "long-standing policy of the Bank that, when countries accept special increases in their quotas in the International Monetary Fund, they are expected to request special increases in their capital subscriptions in the World Bank."

A resolution to increase quotas in the Fund was approved in March 1976. Discussions by the Bank's Executive Directors during the current fiscal year (July 1, 1977 to June 30, 1978) will place on a General Capital Increase over and above that provided by the "selective" capital increase, the Annual Report adds.

A General Capital Increase would enable the Bank to increase its lending in real terms.

Currently, the Bank is able to sustain for the indefinite future, a level of lending of about $5.800 million.

The discussions will basically concentrate on the future role of the Bank and on the range of financial options which may be needed to support that role, the Report goes on to say.

"The discussions will be set against the background of significant changes in the size, regional distribution, sectoral composition and character of the Bank's operations," the Report notes.

It adds that before fiscal 1977 ended, the Bank's Executive Directors decided to set the institution's level of lending for fiscal 1978 at $6,700 million.

They also agreed to make their best efforts to reach an agreement by June 30, 1978, for concluding their negotiations on the Bank's General Capital Increase.

The change in the character of the Bank's operations can be noted by the fact that in fiscal 1979, the Bank and IDA committed a total of $2,772.5 million to the poorest of the developing countries — those whose inhabitants have annual per capita incomes of less than $200.

Eighteen per cent of Bank commitments — $1,041 million — were to such countries (they number more than 50).

Of total IDA commitments, 87 per cent — $1,313.5 million — were to these poorest countries.

In fiscal 1977, the agricultural and rural development sector received more Bank and IDA assistance than any other. A total of 84 projects, for a total lending volume of $2,758 million — or 53 per cent of total Bank and IDA commitments — were directed to the sector.

Lending in what are known as the "traditional" sectors — power, transportation and telecommunications — amounted to $2,159 million, or 53 per cent of total lending.

In fiscal 1976, lending in these sectors amounted to 64 per cent of the total.

The World Bank's Annual Report for the fiscal year 1977 is published in English, French, German, Japanese, Spanish and Arabic.

The joint annual meetings of the Bank and the International Monetary Fund will open in Washington next Monday, September 26.
About 30 million people to benefit from World Bank assistance

AS many as 30 million rural poor may benefit from agriculture, an improvement in rural development projects assisted with World Bank funds in fiscal year 1977, according to the Bank's ANNUAL REPORT, just published.

The REPORT, emphasizing the importance of agriculture to the developing countries, concludes that increased agricultural production helped many of them survive the recession of the mid-1970s.

As a result, the REPORT contends, it is the key to improving the culture sector.

Bank and IDA lending for agriculture and rural development in the four years following McNamara's visit has reached almost $12.8 billion. In fiscal year 1977 alone, lending in the sector amounted to $1.4 billion and 61 percent of the total was amid market or rural development, at commercial rates, per cent in 1976 and 53 per cent in 1975.

Agricultural productivity is clearly the key to improving living standards, both for the poor and the rich countries of the world, the Annual Report concludes.

The report adds that it was increased in agricultural production that helped the poorest developing countries from being overthrown by the economic fluctuations of the mid-1970s. Increased production was not merely due to better weather conditions, the report noted, productive investment made in the agriculture sector was an "overriding factor in helping many of the poorest countries ride out the recession years of 1975 and 1976."

The Agricultural Report states, discussions will be taking place during fiscal year 1978 among the bank's executive directors on a General Capital Increase, the fourth increase in 14 years.

The bank's 30 executives will then discuss the report, which is conceived to give the bank the total offsetting range of financial options and disburse of those countries which may be needed to assist with the surpluses of rich countries as well as those of poor countries, are made, the report writes.

PROBITY

The poorest countries cannot fight their way out of poverty by themselves, however, the bank's Annual Report goes on to say. The rich, industrialized countries can help, the report concludes, by prudent management of their economic policies, through imports of goods from the developing world, by providing aid flows on concessional terms, and through access to the capital markets.

Agricultural and industrial terms declined in real terms in the calendar year 1977, for the bank's Annual Report notes.

From preliminary statistics provided by the Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development, it appears that concessional assistance (ODA — Official Development Assistance) totalled 37.5 million during the year, a 28 percent gain in dollar terms.

A third member of DAC (a committee composed of 17 industrialized countries of North America, Europe, and the Pacific plus the European Communities) — Norway — reached the target of providing the equivalent of 0.7 percent of gross national product (GNP) in the form of ODA to Sudan and the Netherlands are the other two countries to have reached the target.

The DAC statistics also note that aid flows from the Organization of American States (OAS) to 11 Latin American countries (OPEC) fell slightly in 1976 from their 1975 heights.

Net disbursements by OPEC members amounted to approximately $45.2 billion in 1977, about $1.25 billion less than in 1976.

Agricultural development assistance by the bank and IDA for the fiscal year 1977 was $1.1 billion, compared to $1.5 billion a year earlier.

The report notes that the bank's executive directors, in resolving the question of concessional assistance for the fiscal year 1978, may have to decide between dividing the $1.5 billion of new concessional assistance for the fiscal year 1978 among the countries of the world, or keeping the bulk of the aid for the hard-pressed countries.
INTERNATIONAL FINANCE CORPORATION

BRIEFING PAPER

Current Matters

NIGERIA

8. Project Pipeline:

(a) Nigerian Euro-dollar issue. Following a request by Mr. Moussa Bello at the Annual Meetings, IFC has provided the Nigerian Government with advice on a draft loan agreement for a $1 billion Euro-dollar loan to Nigeria, which is about to be arranged.

(b) Internal Capital Market Development. The possibility of IFC's providing advice on the development of an internal market for Government bonds is being looked into. IFC will be writing to the Government shortly on this matter.

9. IFC's Investment Operations: During the Annual Meetings, the Nigerian delegation indicated that there was a need for IFC in Nigeria, partly because of the country's resource gap and partly to ensure that projects were viable. The possibility of IFC's reactivating its investment activities in Nigeria would, however, depend on Nigeria's interest rate policies. The authorities have indicated that they wish to postpone a decision on the Government's willingness to approve loans at IFC's normal interest rates, until after the Bank's DFC Appraisal Mission (in November), as such a decision would have broad implications for the Government's interest rate policies in general. Also, such a decision will influence the acceptability of IFC loans to potential borrowers, as local financing is presently available at interest rates substantially below IFC's. IFC intends to pursue discussions on its potential role in Nigeria, stressing the technical assistance that can be provided as part of its work in project financing.

10. Annex I provides details of existing IFC investments in the Ivory Coast, Liberia, Senegal and Nigeria. There are no IFC investments in Guinea (which is not a member country of IFC) or in the Gambia.
### Existing Investments

<table>
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<tr>
<th>Date of Commitment</th>
<th>Company</th>
<th>Business</th>
<th>Original Commitment ($'000)</th>
<th>Investment Held for the Corporation (7/31/77)</th>
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<tr>
<td>1964, 67, 70</td>
<td>Arewa Textiles Ltd.</td>
<td>Textiles</td>
<td>1,574.9</td>
<td>442.1</td>
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<tr>
<td>1973</td>
<td>Funtua Cottonseed Crushing Company, Ltd.</td>
<td>Cottonseed oil and by-products</td>
<td>1,580.3</td>
<td>864.5</td>
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<tr>
<td>1974</td>
<td>Lafiagi Sugar Estate</td>
<td>Sugar Prom. company</td>
<td>112.4</td>
<td>112.4</td>
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<tr>
<td>1964</td>
<td>Nigerian Industrial Development Financing Bank, Ltd.</td>
<td>Development Financing</td>
<td>1,400.0</td>
<td>0.0</td>
</tr>
<tr>
<td>1973</td>
<td>Nigerian Aluminum Extrusions, Ltd.</td>
<td>Aluminum</td>
<td>1,328.2</td>
<td>1,328.2</td>
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