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**WEST AFRICA  
RICE  
DEVELOPMENT  
ASSOCIATION**



# **ANNUAL REPORT**

**JANUARY - DECEMBER 1975**

WEST AFRICA RICE DEVELOPMENT ASSOCIATION

ANNUAL REPORT  
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January - December 1975  
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Monrovia, June 1976

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FOREWARD

The 1975 Annual Report of the West Africa Rice Development Association (WARDA) gives an account of the progress made by the Association since December 1974.

Staffing has improved considerably and most of our programmes have started. Encouraging results are being obtained from WARDA's Coordinated trials at 31 locations in our member countries and Guinea Bissau. The specialists in our Development department are in high demand by WARDA member countries in planning new rice projects and in evaluating on-going projects. It is our hope that our Regional Training Centre at Fendall, Liberia will be functional as from April, 1976.

Progress so far made has been largely due to the support received in kind and cash from our member countries, Cooperating countries and Organisations; and to the cooperation of many international organisations and the entire staff of WARDA. We shall continue to try to live up to expectation.

Jacques Diouf  
Executive Secretary

MEMBERS OF THE GOVERNING COUNCIL.

CHAIRMAN                    H.E. Adrien Senghor  
                              Ministry of Rural Development and  
                              Water Resources  
                              DAKAR

Benin

Mr. Janvier Y. Capo-Chichi  
Director General of SONIAH  
B.P. 312  
PORTO NOVO

The Gambia

Alhaji Yaya Lang Ceesay  
Minister of Agriculture & Natural Resources  
Ministry of Agriculture & Natural Resources  
The Quadrangle  
BANJUL

Ghana

Dr. Joe E. Kuansah  
Executive Director  
Grains Development Board  
KUMASI

Ivory Coast

Mr. Kouame Otchounou  
Director of Studies & Programmes  
Ministry of Agriculture  
ABIDJAN

Liberia

Dr. Nah-Doc P. Bropleh  
Deputy Minister  
Ministry of Agriculture  
MONROVIA

Mali

Mr. Moriba Sissoko  
Director of Cabinet  
Ministry of Rural Development  
BAMAKO

Mauritania

Mr. Amadou Bachirou Baro  
Director  
National Centre for Agronomic  
Research & Agricultural Development  
B.P. 180  
NOUAKCHOTT

Niger

Mr. Amadou Cisse  
Secretary General  
Ministry of Rural Economy  
NIAMEY

Nigeria

Mr. B.S. Oloruntoba  
Permanent Secretary  
Ministry of Agriculture & Rural Development  
LAGOS

Senegal

M. Medoune Diene  
Director General of Agricultural Production  
Ministry of Rural Development & Water Resources  
DAKAR

Sierra Leone

Hon. S.A. Kebe  
Deputy Minister of Agriculture & Natural Resources  
Ministry of Agriculture & Natural Resources  
FREETOWN

Togo

Mr. Baguilma Ywassa  
Director of Forestry  
Ministry of Rural Equipment  
LOME

Upper Volta

Mr. Joseph Kabore  
Director of Agricultural Services  
B.P. 7028  
OUAGADOUGOU

MEMBERS OF THE SCIENTIFIC AND TECHNICAL COMMITTEE

Dr. Mah-Doe P. Bropleh  
Deputy Minister of Agriculture  
Monrovia, Liberia

Mr. Zakary Garba  
Director General  
National Institute of Agronomic Research  
INRAN, BP 429  
Niamey, Niger

Dr. R.A.D. Jones  
Acting Director  
Rice Research Station  
Rokupr, Sierra Leone

Mr. L. Sauger  
Director General  
Senegalese Institute of Agricultural Research  
B.P. 312  
Dakar, Senegal

Dr. Bakary Toure  
University of Abidjan  
B.P. 4322  
Abidjan, Cote d Ivoire

Mr. B.L. Ywassa  
Director of Forestry  
Ministry of Rural Equipment  
Lome, Togo

Dr. L.J. Marenah  
Director of Agriculture  
Cape St. Mary  
The Gambia.



STAFF LIST  
As at 31/12/75

EXECUTIVE SECRETARIAT

Mr. Jacques Diouf	Executive Secretary
Dr. Lekan Are	Deputy Executive Secretary
Mr. P. G. de Boer	FAO Team Leader
Miss B. Jagne	Bilingual Secretary
Mrs. B. Phillips	Secretary
Mrs. C. Woods	Secretary
Miss G. Houemavo	Administrative Assistant
Mr. Peter Daniells	General Development Officer

RESEARCH DEPARTMENT

Dr. H. Will	Research Coordinator (CGIAR)
Mr. O. Koffi	Soils & Fertilizer Trials Coordinator (CGIAR)
Dr. D. Das Gupta	Variety Improvement Coordinator (CGIAR)
Mr. F. Faye	Agronomist (CGIAR)
Mr. M. Larinde	Seed Superintendent (CGIAR)
Mr. J. Dallard	Associate Breeder at Bouake (France)
Mr. D. Moss	Rice Research Assistant (Peace Corps)

DEVELOPMENT DEPARTMENT

Mr. D. Aw	Production Agronomist & Head (FAO/UNDP)
Mr. C. E. Tagoe	Production Agronomist (FAO/UNDP)
Mr. G. Poirmeur	Rural Engineer (France)
Mr. A. Britton	Extension Officer (USAID/FAO)
Mr. H. van Ruiten	Rice Processing Specialist (FAO/UNDP)
Mr. H. P. Rozeboom	Associate Rice Processing & Storage (FAO/Neth)
Miss Audrey Cox	Administrative Assistant

TRAINING DEPARTMENT

Mr. O. Mafolasire	Training Officer (USAID)
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DOCUMENTATION DIVISION

Miss K. Hoppe  
Miss G. Peterson  
Mr. B. Guindo

Documentalist & Head (FAO/UNDP)  
Librarian (Peace Corps)  
Indexer (FAO/UNDP)

COMMUNICATIONS DIVISION

Mr. G. Boccara  
Mrs. T. Martin  
Mrs. M. Kosek

Translator & Head (FAO/UNDP)  
Associate Translator (France)  
French Teacher (Peace Corps)

STATISTICS DIVISION

Mr. P. Garnier  
Mr. W. H. Williams

Agricultural Statistician (France)  
Data Processing Assistant (Peace Corps)

ADMINISTRATION & FINANCE DIVISION

Mr. K. A. Djadoo  
Mr. G. Miquel  
Mr. J. Dupuy  
Mr. H. G. Ankoma-Sey  
Mr. C. B. Dunbar  
Mr. S. J. Merchant, Sr.  
Mr. C. Kumodzi  
Mr. P. Steratore  
Miss A. Borghi  
Mr. C. Morrison

Chief, Administration & Finance  
Advisor to Chief, Administration  
& Finance)  
Associate Expert-Administration  
& Finance (France)  
Finance Officer  
Personnel Officer  
Liaison Officer  
Procurement Officer  
Inventory/Insurance Officer  
(Peace Corps)  
Administrative Assistant  
(FAO/UNDP)  
Assistant Accountant

## MANAGEMENT

The activities of the Association have continued to expand steadily during the period under review. Staffing of the various departments and divisions improved considerably. Efforts to initiate action at the Regional Research Stations have begun with the training of Research Assistants for Mopti and Richard Toll. The Research Assistants for the Rokupr station have also been recruited and two are being trained.

The Executive Secretary continued to maintain close contacts with Member Countries. He has also improved on the friendly and profitably relationship between WARDA and its many cooperating countries and organisations.

The rate of contribution by the member countries to the Administrative budget of the Association has been rather slow. As of the end of October 1975, only \$240,320.45 representing 48.2% of the approved budget for 1975 had been paid. The situation however improved as at the end of December 1975 when \$367,096.25 representing 73.8 per cent of the budget had been paid. The Secretariat has appealed once again to member countries to kindly take necessary steps to ensure that contributions are paid in good time.

## ADMINISTRATION AND FINANCE DIVISION

Activities of this Division revolved mainly on the consolidation of the structures established during previous years and the introduction of modifications dictated by experience or required to achieve better efficiency.

Further to the decision taken at the Fourth Session of the Governing Council in Ibadan, Nigeria, a new Chief, Administration and Finance, Mr. Antoine Koffi Djadoo was recruited effective July 1, 1975. Mr. Djadoo has had on the job training for three months. Thereafter he underwent a 6-week intensive training at the FAO headquarters, Rome, the World Bank and at CIAT, Colombia. He took over full responsibility for the Division on returning to Monrovia on November 17, 1975.

The Staff Appointments, Promotions and Disciplinary Committees for Professional Staff and General Service Staff met regularly. The Staff Welfare Committee also met regularly. Regular meetings between the WARDA Executives and the staff assisted in boosting the morale of the staff.

Prior to September 10, 1975, there were two Appointments, Promotions and Disciplinary Committees which dealt with both Professional and General Service staff matters; and a Procurement Committee which reviewed all procurement matters. The various committees were however re-organised for effectiveness and with a view to enable more members of staff to participate in their deliberations. The Appointments, Promotions and Disciplinary Committees were reconstituted as follows:

(a) Staff Appointments, Promotions, and Disciplinary Committee dealing with Professional staff matters:

Dr. Harry Will, (Head, Research Department)	- Chairman
Head, Development Department	- Member
Senior Agricultural Advisor	- Member
Head, Administration & Finance	- Member
Personnel Officer	- Member.

(b) Staff Appointments, Promotions and Disciplinary Committee dealing with General Service Staff matters:

Head, Administration & Finance	- Chairman
One Head of Division under the Deputy Executive Secretary	- Member
One Head of Division in the Development Dept.	- Member
One Head of Division in the Research Dept.	- Member
Personnel Officer	- Member
One General Service Staff representative	- Member.

In each case, the Head of a Department or Division for which a candidate is being recruited is always invited to meetings whenever that Department or Division is not represented on either committee. The Procurement Committee was reorganised as follows:

(a) Procurement Committee for Contracts above \$5,000

Deputy Executive Secretary	-	Chairman
Head, Development Department	-	Member
Head, Research Department	-	Member
Senior Agricultural Advisor	-	Member
Procurement Officer	-	Member

(b) Procurement Committee for Contracts below \$5,000

Head, Administration & Finance	-	Chairman
One Head of Division under the Deputy Executive Secretary	-	Member
One Head of Division in Research Department	-	Member
One Head of Division in Development Department	-	Member
Procurement Officer	-	Member.

Peace Corps Programme

In July 1975 we received Peace Corps Volunteers as members of our staff. From preliminary observations, it appears that they are not happy with office work but would prefer field assignments. Unfortunately those sent did not have requisite agricultural qualifications to enable them to be posted to the field. Their assignments were as follows:

Mr. Mark Johnson	-	Budget Officer
Mr. Patrick Steratore	-	Insurance/Inventory Officer
Mrs. Mary Kosek	-	French/English Teacher
Miss Christine Peterson	-	Librarian
Mr. W. Williams	-	Data Processing Assistant
Mr. D. Moss	-	Rice Research Assistant
Miss Hillary Krist	-	Assistant Documentalist

## Finance Section

As a direct result of enlarged operations in general accounts, budgets and reporting, this section was split into two units: Accounts and Budgets.

Accounts and Finance: The accounting staff has been strengthened with the recruitment of additional accounting clerks and an accounting assistant to help cope with the added duties.

The coding system has been streamlined to embrace the requirements of all the Projects under the various Grants. The modifications and refinement in the accounting codes were also to facilitate the change over from the use of NCR Class 31 accounting machine to a new NCR 299 electronic accounting machine which latter one was commissioned into use in September 1975.

The introduction of this new machine which possesses a much bigger capacity and a high accuracy and reliability rating has enabled the accounts unit to further its mechanization programme by converting the preparation of payrolls and the recording of the staff provident fund accounts from a manual to mechanized operations.

Budget: Although this unit commenced operations only in August, 1975, it has brought a considerable impact on budgetary control by providing statements and reports which serve as important management tools. A budget officer from the Peace Corps and a budget assistant were appointed to form the core staff of this new unit. By bringing the budgetary needs of the WARDA Intergrated budget under the new coding manual, an attempt was made to computerise the preparation and reporting of the Intergrated budget due to the complexities encountered in the manual system. Groundwork in this direction was done up to programming stage. However, due to several constraints including finance, expertise and facilities, this whole idea has been shelved for the time being.

The overall impact of all these improvements in staffing, equipment, organization and methods, generally, to match the increased level of operations, has been a marked improvement in the efficiency in accounting and reporting to the Executive Secretary, the various departments, and all the donor agencies, on the status of the different budgets and grants.

### Personnel Section

A new Personnel Officer took over the work of the section from Mr. A.B. Naah who resigned from the Association in June, 1975. The section was visited for about two weeks in November, 1975 by a Consultant from the FAO, Mr. Chacho. Mr. Chacho's suggestions for improving the output of the section are already yielding dividends.

Major accomplishments directly or indirectly brought about by the Personnel Office were:

- (i) Improving the physical appearance of the office - made two letter hole type book shelves for classification of forms and other documents which were stacked together.
- (ii) Revising and up-dating many of our existing forms.
- (iii) Systematically arranging personnel and other files for ease of reference.
- (iv) Devising an information form which simplifies proceedings of both the Professional and General Service Appointments, Promotions and Disciplinary Committees. This approach has helped to save time because Committee members receive the information needed on a candidate at least a day prior to meetings. Maintaining and updating files of consultants, interpreters, translators and other prospective candidates.
- (v) Preparing an organizational chart listing staff and vacant posts in Departments and Divisions.
- (vi) Assisting the Liaison Section in requesting and negotiating for additional floors (Office Space) in the E.J. Roye Building for the Secretariat.

- (vii) Assisting the Liaison Section in negotiating and following up the issue of a Telex for WARDA.
- (viii) Scrutinizing and assisting in negotiating lease agreements for staff members.
- (ix) Identifying staff problems and helping to solve them.

The section functions with a Personnel Officer and a Clerk/Typist.

### Separations

During the period under review, there were many separations due mainly to the fact that the Phase I of the UNDP support had come to an end. Below is a list of those separated:

31/ 3/75	Mr. E.A.R. Neblett	- Technical Photographer
2/ 5/75	Mrs. J. Fascione	- Bilingual Secretary
1/ 6/75	Mr. W. Bach	- Land & Water Management Engineer
16/ 6/75	Mr. A.B. Naah	- Personnel Officer
30/ 6/75	Mr. W. Sachers	- Associate Data Processing Specialist
31/ 7/75	Mr. O. Wild	- Economist
4/ 8/75	Mr. Y. Djang	- Irrigation Specialist
30/ 8/75	Mr. P. Sessou	- Quantity Surveyor
23/ 7/75	Dr. R.E. Parker	- Rice Processing & Storage Engineer
15/11/75	Mr. M. Johnson	- Budget Officer
30/11/75	Miss J. Thomas	- Administrative Assistant
17/12/75	Mr. P. Gerard	- Data Processing Specialist
18/12/75	Mr. J. Vianen	- Associate Economist.

### Appointments

3/ 1/75	Mr. A. Britton	- Extension Specialist
15/ 1/75	Mr. P. Garnier	- Agricultural Statistician
3/ 3/75	Mr. G. Poirmeur	- Rural Engineer
6/ 5/75	Miss A. Cox	- Administrative Assistant
16/ 6/75	Mr. S.J. Merchant Sr	- Liaison Officer
1/ 7/75	Dr. D. Das Gupta	- Variety Improvement Coordinator



Appointments (continued)

4/ 7/75	Mr. A.K. Djadoo	- Chief, Administration & Finance
30/ 7/75	Mr. J. Dupuy	- Associate Administration & Finance
16/ 8/75	Mr. H. van Ruiten	- Rice Processing Specialist
18/ 7/75	Mr. D. Djang	- Irrigation Specialist
18/ 7/75	Mr. H. Williams	- Data Processing Assistant
18/ 7/75	Mr. M. Johnson	- Budget Officer
18/ 7/75	Mr. P. Steratore	- Insurance/Inventory Officer
18/ 7/75	Mr. D. Moss	- Rice Research Assistant
18/ 7/75	Miss M. Kosek	- French/English Teacher
18/ 7/75	Miss C. Peterson	- Librarian.

Procurement Section

This section deals with others activities outside procurement. It now functions as more or less a general services section. It is becoming unwieldy, hence a study is needed to streamline its functions to ensure efficiency and smooth operation. The various activities of the section are:

Procurement activities:

An agreement has been signed with the Institute of International Education (IIE), New York, U.S.A. for WARDA external procurement activities. For this reason Mrs. Joan Murray of IIE visited WARDA Headquarters early last year as consultant in Procurement. Her visit was very rewarding, in that she submitted to the Executive Secretary, very valuable recommendations after reviewing the Procurement section with a view to improve on how it functions.

Our procurement activities cover both local and foreign procurements as follows:

- (i) Processing Purchase Requisitions.
- (ii) Obtaining prices or quotations.
- (iii) Going to Procurement Committee for all purchases above \$500 except in exceptional cases.

- (iv) Raising of Purchase Orders after Committee's approval and availability of funds is ensured from the Budget Officer.
- (v) Maintenance of accurate system of filing for all outstanding Purchase Orders and their status, e.g. with foreign orders, we have Order No. Date, Supplier, Specification of goods ordered, Date of Shipment according to shipping instructions, Actual date of arrival of goods at port, Entry forms, Clearance through Customs, Insurance Claims if any etc.

Besides normal routine work in connection with purchases, we maintain an up-to-date set of catalogues from the most important suppliers of vital equipments.

Stations or Projects:

For the year 1975, procurement has covered the following Stations or Projects:

- (i) Training Centre, Fendall, Liberia.
- (ii) Seed Storage Centre, Fendall, Liberia.
- (iii) Rice Processing Laboratory, Fendall, Liberia.
- (iv) WARDA Research Project at Rokupr, Sierra Leone.
- (v) WARDA member states - support to the WARDA Coordinated Trial Points.

The foreign orders have been successfully implemented, except for some minor delay or breach in communication.

Clearance through customs at Robertsfield Airport in Liberia has been very easy and smooth. Clearance is however, still very difficult, complicated and rigid at the Freeport of Monrovia.

Inventory and Insurance:

Periodical or monthly report is very necessary at least for (a) incorporation and (b) writing off. Recruitment of a qualified officer is very vital to ensure that this job is done properly as this involves a lot of money in material/equipments.

### Procurements of services

(i) Service Contracts: are received from suppliers for action and implementation. This covers all WARDA Air Conditioners, Calculators, Typewriters, Duplicating and Photo-copying machines.

(ii) Pool of vehicles: Control of WARDA vehicles is done with regards to records of gasoline consumption and maintenance. These records are submitted to the Chief, Administration and Finance (CAF) on weekly and monthly basis.

(iii) Maintenance of Premises. This covers the Executive Secretariat, residences of the Executive Secretary, the Deputy Executive Secretary and the houses of WARDA specialists. Maintenance of premises takes a lot of time, and sometimes in an emergency, the procurement section finds it rather difficult to solve problems promptly. Although contacts are usually made with plumbers, electricians or even a carpenter, it has proved rather difficult on most occasions to obtain prompt services from these people.

The recruitment of a maintenance officer, who will also control the WARDA vehicles, is being seriously considered with a view to improve on these services and reduce costs as well.

In view of the expansion in WARDA activities, the Procurement section with a staff of three will soon be unable to cope with its assignments. Efforts are being made to correct the situation with the recruitment of an Inventory/Insurance Officer and a General Maintenance Officer.

### Liaison Section

This unit has operated smoothly during the year except for transport limitations on a number of occasions. The Liaison Officer contacted the appropriate Government Ministries as necessary, especially the Bureau of Immigration and Naturalization for visas, residence permits etc. The Liaison Officer also assisted in the clearing of goods, equipment and personal effects of newly recruited officers from the ports.

The activities of the section also covered preparations for meetings and seminars, organization of official receptions, location of suitable houses for newly recruited staff and renewal of licenses for WARDA vehicles and those of its staff.

The Liaison Officer is the only member of staff serving in this section. It is hoped that additional staff will be added to assist in undertaking the increasing activities of the section.

### Funding

Negotiations for the financing of projects by Cooperating states and organizations were more encouraging than in the previous year.

USAID: As a follow-up to the first Grant of \$625,000 a new grant agreement between WARDA and the USAID was concluded for a total funding of \$1,182,000 covering 1975 and 1976 financial years. The financial assistance under this grant is being devoted basically to training of rice specialists and project W4 under the following activities:

#### Training at Johnsonville Centre

Personnel	\$140,000	
Consultant services	45,000	
Operating costs	95,000	
Construction costs	335,000	
Commodities (Equipment)	116,000	
Training of Research Staff	<u>131,000</u>	
		862,000

#### Rokupr Research Project

Personnel	77,000	
Construction	105,000	
Operating	45,000	
Equipment	<u>71,000</u>	
		298,000

#### Sahel Mission and Consultants

	<u>22,000</u>
	<u>\$1,182,000</u>

CGIAR: The Consultative Group of International Agricultural Research (CGIAR) continued its financial support to the W1 Coordinated Trials project in the sum of \$555,000. Contributing donors were:

Canada	\$100,000
France	125,000
Nigeria	80,000
USAID	120,000
Netherlands	75,000
Belgium	55,000
	<u>\$555,000</u>

France: Due to delays in the start-up of the project Quantification division of the Development department as well as the Seed Multiplication centre, Richard Toll, Senegal, the French assistance for the implementation of these projects in the sum of \$404,693.79 is still on going.

Saudi Arabia: The first of the three years assistance to WARDA from the Royal Kingdom of Saudi Arabia in the sum of \$100,000 was received during the year. There will be similar contributions in 1976 and 1977 to complete the pledge for the 3 year period.

Abu Dhabi: Another member of the Kingdom of Arab Emirates was kind enough to donate an amount of \$50,000 in support of WARDA projects.

U.K.: The British Government's financial assistance came into operation effective 1975 with an amount of \$100,000 to support the implementation of parts of W2 and W3 research projects and for the acquisition of some materials and equipment for these and the entomology project.

UNDP: The UNDP has financed and continues to finance the personnel and equipment costs of the Documentation Centre, project design division of the Development department, and has also provided a Chief of Administration and Finance,

a translator a documentalist, technical photographer, an indexer and an administrative secretary.

There is a second phase-extension to support the WARDA regional project to cover the period 1975-78 with a tentative approval for an amount of 777,000.00.

## MEETINGS

For the first time since WARDA's inception, the Scientific and Technical Committee meeting was held a month before those of the Advisory Committee and the Governing Council. This approach is considered more satisfactory and also takes the strain out of protracted sessions when all three meetings are held one after the other.

A. Scientific and Technical Committee

The Fifth Session of the Scientific and Technical Committee was held from November 10 to 12, 1975, in Monrovia, Liberia. It was attended by six of its seven members, six observers from IITA, IRRI, IRAT etc. and WARDA staff. Dr. Robert F. Chandler, Jr., also attended the meeting. The officers elected were:

Chairman:	:	Mr. Zakary Garba
Vice Chairman:	:	Dr. N. D. Bropleh
Rapporteur	:	Dr. B. Toure

The activities and programmes of the Research Department, Development Department and Training, Documentation and Communication, as well as, a paper on strengthening the national capacities for research, training and development in member countries, were reviewed and appropriate recommendations made to the Advisory Committee.

The Committee observed one minute's silence in memory of the late Mr. J. N. Bassil, a volunteer of the French National Service assigned to Richard Toll, Senegal, who was killed in a road accident.

B. Advisory Committee

The Fifth Session of the Advisory Committee was held in Dakar, Senegal on December 8 and 9, 1975. It was attended by delegates from member countries, cooperating states and organizations, observers from ADB, FED, Switzerland and WARDA staff.

Officers elected were:

Chairman	:	H.E. S.A. Kebe (Sierra Leone)
Vice Chairman:		Mr. Peter Daniells (United States)
Rapporteur	:	Mr. A. A. Timitie (Ivory Coast)

The Committee considered the summary progress report submitted by the Executive Secretary, the report of the Scientific and Technical Committee, programmes of the Association for 1976, as well as the implementation of the 1975 budget and the financing of the 1976 projects. The various reports were adopted with minor amendments.

The French delegate announced that his country would provide 2.7 million French Francs for financing the second phase of the seed multiplication project at Richard Toll, Senegal. France was also going to support the training programme. Concern was expressed by the Committee over the fact that many experts left the Association during the year. The Executive Secretary explained that personnel filling positions financed through external sources were available for only one to two years whereas those from member countries to release qualified, experienced staff to WARDA for stability.

### C. Governing Council

The Second Extraordinary Session of the Governing Council was held at the City Hall, Monrovia, Liberia, from March 20 to 21, 1975. It was attended by all member countries. Most member countries were represented by their respective Ministers. The meeting:-

- i) agreed to the creation of a WARDA Special Fund for research, training and development projects. A draft agreement on the Fund was examined, amended and taken away by each delegate for ratification by member countries;



- ii) was unable to find a single formula for remunerating WARDA personnel assigned to projects in their own countries. It was advised that the Executive Secretary should negotiate with each Government for the formula of remuneration to be adopted for each individual country within the framework of the principles of the paper submitted by the Secretariat;
- iii) accepted the kind gesture of the Government of Senegal to host the Fifth Session of the Governing Council any time in November-December 1975.

The Fifth Session of the Governing Council was held in Dakar, Senegal, from December 11 to 13, 1975. It elected the following officers:

Chairman	H.E., Adrien Senghor Minister for Rural Development & Hydraulics Republic of Senegal
First Vice Chairman:	Hon. Yaya Ceesay Minister of Agriculture & National Resources, Banjul, The Gambia
Second Vice Chairman:	Mr. B. Ywassa Ingénieur Principal d'Agriculture Ministere de l'Equipement Rural Lome, Togo
Rapporteur	: Mr. Amadou Baro Director, National Centre for Agronomic Research & Agricultural Development, Nouakchott

The Council welcomed the observer from Guinea Bissau to its meeting. The representative thanked WARDA for sending missions and supplying improved seeds to his country and hoped that such assistance would be strengthened.

The Council considered and adopted the Activity Report of the Executive Secretary, the report of the Scientific and Technical Committee and the report of the Advisory Committee.

After considering other items on its agenda, the Council took the following decisions:

- i) The Council asked the Executive Secretary to do everything possible to ensure the financing of a language training programme for national researchers.
- ii) The Council asked the Executive Secretary to inform member countries sufficiently in advance of visits by consultancy missions and to transmit the mission reports to the countries visited on completion of such visits.
- iii) The Council recommended that particular emphasis be placed on the training of seed production specialists.
- iv) The Council stressed the need of limiting the increase of administrative costs provided that this did not endanger the effectiveness and efficiency of the Organization's continuously growing activities.
- v) The Executive Secretary informed the Council that seven member countries had ratified creation of the WARDA Special Fund - Benin, Liberia, Mali, Niger, Nigeria, Senegal and Upper Volta. The Council requested the Executive Secretary to contact the countries which have not yet ratified the Agreement creating the Special Fund.
- vi) The Council asked the Executive Secretary to study with specialized institutes (ORSTOM, IRAT, IRRI, IITA, etc.) the establishment of a research programme on nematodes.
- vii) The Council recommended strengthening of WARDA's relations with international research institutes. It requested the Executive Secretary to keep in touch with the Consultative Group on International Agricultural Research which also aimed at strengthening national research capabilities and facilitating

- exchanges among international research centres.
- ix) The Council noted with thanks the generous assistance of the Government of Switzerland which is providing WARDA with a financial expert and \$50,000 for an irrigation and drainage training course in 1976.
  - x) The Council recommended to the member countries with rice stocks for export to provide all the data required by the Executive Secretariat which would disseminate them to importing member countries. It asked the Secretariat to draw up terms of reference for a study on prospects for intra-regional rice trade and to submit them to the next session of the Governing Council, as well as to establish the necessary contacts for undertaking such a study.
  - xi) The Council recommended the installation of telex facilities at WARDA Headquarters to speed up communications between Headquarters and the member countries and to reduce costs.
  - xii) The Council approved that the Executive Secretary and the Deputy Executive Secretary should from now on travel first class, like other heads of inter-governmental organizations.
  - xiii) The Governing Council unanimously approved the Administrative Budget for 1977 with the amendments made by the Budget Committee.
  - xiv) The Governing Council unanimously approved the report of the External Auditor, covering the financial year 1974 and the period from January 1 to October 31, 1975.
  - xv) On the new scheme of contributions to the administrative budget, the Council recommended that the member countries inform the Secretariat of any proposals within three months. In the following six months, the Executive Secretary

was requested to send a new document on the basis of the member countries' comments. In view of the importance of the matter, the Council recommended that the delegations to the next session be empowered to settle the problem definitely.

- xvi) The Council decided to abolish the Advisory Committee and asked the Executive Secretary to transmit the amended text of the Constitution to the member countries.
- xvii) After several statements on the usefulness of the Credentials Committee, the Governing Council decided that the Committee will meet only on request by a Member States. In future, the credentials of delegations will be transmitted to the Secretariat by letter, telex or any appropriate form and will be made available to the delegates when the session opens.
- xviii) The Council accepted by acclamation the kind invitation of the delegate of Ghana to hold the sixth Ordinary Session of the Governing Council in November-December 1976.
- xix) The Council expressed satisfaction at cooperation between WARDA and CILSS (Inter-State Committee for the Struggle against Drought in the Sahel) and hoped that it would continue and be strengthened.
- xx) The Council invited the Executive Secretary to take necessary steps to protect WARDA against dissemination of information that may be false and/or harmful to the best interests of the Association. It also invited the Executive Secretary to take adequate disciplinary action if any WARDA staff member collaborates in such an act.

The Council also adopted unanimously seven resolutions. One made an appeal to member countries to pay their contributions to the WARDA administrative budget as soon as possible after the initiation of the financial year but not later than June 30.

As the Advisory Committee was meeting for the last time, Council expressed its sincere gratitude to its officers, members and all the observers who had served on it, for the effective work done and for their devotion to duty.

## DEVELOPMENT DEPARTMENT

### A. Task and Organization of the Department

The main tasks of the Development Department can be described as follows:

- (i) To give advice to the Executive Secretary of WARDA and to assist him in the preparation of the budget and in the management of various WARDA operations.
- (ii) To assist in programme and budget planning using network analysis.
- (iii) To assist member states with consultancy services for preliminary studies, identification studies, and case studies of general or specific problems relating to rice. The development specialist team could undertake feasibility studies for small scale projects usually requiring only internal financing. The team could help in preparation of feasibility studies of projects to be submitted to external financing sources. One of the specialists in the team will be appointed as head of the Development Department.
- (iv) To carry out general or selectorial studies such as the construction of rice production models or studies summarizing the situation on research and progress on a given subject (rice mechanization and rice processing, fertilizer or water use economics).
- (v) To carry out case studies to assess and spread experience acquired and results obtained by some carefully selected projects.
- (vi) To cooperate with bilateral and multilateral financing institutions (World Bank, ADB, European Development Fund, USAID, FAC, CDC, etc.) and regional or international development organizations (Economic Commission for Africa, West Africa Economic Community, OMVS, etc.). This cooperation can assume different forms: exchange of information joint studies of missions, etc..

- (vii) To study continuously international policies and regulations relating to rice production and marketing.
- (viii) To maintain and up-date data for the annual rice statistics of West Africa; world reference on rice literature: West Africa rice bibliography and indexes of world rice literature: On-going rice development projects in the region and results of research on varietal improvement, fertilizer use, plant protection, mechanisation and water management.
- (ix) To assist in the processing and computer analysis of data collected by all WARDA Departments.
- (x) To organize or prepare seminars on the many aspects of rice cultivation in order to bring together officials of member states, representatives of cooperating nations and institutions to exchange views and coordinate work.
- (xi) To participate in the training courses for rice production specialists and field assistance to the national extension services by preparing and publishing extension manuals.
- (xii) To operate a question and answer service for the benefit of member states, agricultural and planning institutions and all organizations concerned with the improvement of rice production in the region.

To fulfil these various tasks, the Development Department is divided into specialized divisions as follows:

- Agronomy and Extension
- Irrigation and Rural Engineering
- Economics and Financing
- Rice Processing and Storage
- Statistics and Data Processing

## B. Activities

During the first half of the year, the activities of the Development Department were maintained at the high level achieved in 1974. Unfortunately, in the following months, the Department's capacity was reduced because of staff leaves and movements. The last quarter of the year, however, saw a return to intensive activities which were, in part, due to the transfer of the Statistical and Data Processing Division to the Development Department.

### 1. Assistance to member states

Requests for assistance were received from the Gambia, Ghana and Guinea Bissau, while assistance to Mali and Senegal continued in the field of further development and improvement of the rice culture at the Office du Niger, Mali and the redefinition of the Matam PROJECT in Senegal.

#### a) Mali

On the basis of the terms of reference proposed by the preliminary mission carried out in 1974, a pre-feasibility study was proposed to the Malian authorities. A succession of stages for development was proposed at the same time with a view to improving information on the physical (soil and water resources) and human aspects, as well as, on research results already gathered, in order to successfully attain the goals that have been set out.

WARDA has offered its services to Mali in the form of a team to help in defining the best methods for carrying out levelling - an operation which would act as a catalyst for increased development of the rice industry under the conditions of the Office du Niger. WARDA has also offered services to Mali in the field of the use of animal drawn equipment for seed drilling which should pave the way for easier weed control in the area covered by Office du Niger.



Concerning the Lake Horo area development project, the Department is still waiting for the results of pedological, meteorological and hydrological studies being actively undertaken by the Malian authorities before starting work on the programme of the development of this area.

b) The Gambia

The Gambian Government felt the need for a closer look at mechanization in the appraisal of the second Phase of the MacCarthy Island Project and requested that WARDA should send a team of mechanization and milling experts to reinforce the FAO/IBRD appraisal team. WARDA willingly obliged and sent a two-man mission to reinforce the appraisal mission during the third week of March 1975. The mission's recommendations were sent to the FAO/IBRD Centre in Rome.

c) Ghana

Towards the end of 1974, Ghana requested for WARDA's advice in assessing the milling needs of the rapidly expanding rice industry in the Northern part of the country. The Grains Development Board of Ghana had been concerned not only with the performance of the Government mills under the control of the Rice Mills Unit of the Board, but also with the siting of the present and future mills in the Northern and Upper Regions of the country where most of the increasing production was taking place. The Government of Ghana requested WARDA "to help draw up a coordinated rice development programme aimed at avoiding the recurrence of the present situation where excess milling capacity exists side by side with inadequate milling capacity in the same region".

The mission took advantage of the occasion, while in Ghana, to discuss comments received on an earlier WARDA report on the performance of the Government rice mills in the two regions. This report had been submitted earlier in the year.

The first draft report of the mission was submitted to the Government of Ghana in May 1975. The report projected that by 1978, there would be the need for an additional milling capacity for around 169,000 tons of paddy in the two regions taking into consideration present total capacity as well as a projected 4 TPH mill in 1976. The report made recommendations on sizes, locations and phasing for the following three years, as well as on storage needs.

We have received information that the recommendations and justification given in the report for a parboiling rice plant at the Bolgatanga mill at least, has been accepted by the Government and that orders placed for most of the new government mills for the two regions include modern parboiling units.

d) Guinea Bissau

Following a visit to Bissau by the Executive Secretary, the Development Department was charged with a mission to Guinea Bissau to examine how WARDA can best aid the country in its efforts to increase rice production as rapidly as possible to fulfill an estimated gap of 30,000 tons of rice per annum. Before sending a multi-disciplinary team for this study, it felt that an exploratory mission was first necessary to decide on the terms of reference and composition of the multi-disciplinary team which would visit the country during the cropping season.

The Government of Guinea Bissau had also requested the Executive Secretary for a consignment of improved foundation seed and fertilizers, which was sent in June. But in addition to these, WARDA sent a number of seed varieties together with the layout for the coordinated variety trials in hope that this would give the country an early start in selecting from among the promising varieties in the region.

As a result of the findings of the exploratory mission, it became necessary to send the Varietal Improvement Coordinator himself to Guinea Bissau in August to help in the establishment of the trials and multiplication plots. The findings of both the exploratory mission and that of the Varietal Improvement Coordinator led to the decision to send a three man mission to Bissau in the second half of November to examine and advise the Bissau Government on policy issues relating to general development strategy, strengthening of research and extension capabilities and land reclamation.

The multi-disciplinary mission to the country took place during the latter part of November and the first week of December. It was made up of the Head of the Development Department, the Rural Engineer and two experts from the Research Department. It turned out to be a most successful mission which showed that with relatively little input, Guinea Bissau should soon become an important rice producing country because of its high standards of rice husbandry practices.

e) Senegal

The Matam project in Senegal was given the urgency it required. The project was examined and completely redefined to increase the effective area to be developed with water control from 10 to 15 thousand hectares. In addition, a phased programme for development giving definite timing for each phase was proposed. The modified project has been submitted to the Government of Senegal.

## 2. Case Studies

### a) Upper Volta

The comments of the Government of Upper Volta were received on the draft report of the Kou Valley Project. There were incorporated in the final draft which has been accepted by the Government of Upper Volta and distributed to member countries.

### b) Ghana

The mission to Ghana in November/December 1974, had a dual purpose. The first was to advise on the future rice milling requirements in the Northern and Upper Regions as outlined and, secondly, to carry out a case study of large scale mechanized rice production in those two regions.

Although mechanized rice production in Ghana started in the early 1950's, it wasn't until 1970 that it started attracting credit from the financing institutions. Since then acreage under mechanized production has been increasing at such a fantastic rate, both in terms of individual and total regional acreages, that it was considered necessary to study the factors responsible for this.

The study showed clearly how credit, together with a reasonable guaranteed minimum price, assured markets and to a large extent government subsidies and services have come together to exploit the vast potential of naturally flat and periodically inundated wide valley of the area to produce a staggering phenomenon in agricultural development.

While it was felt that serious problems still existed, it was heartening to find that a number of people in all sectors of the industry were aware of them and trying to find solutions.

The draft report has been submitted to the Government of Ghana. for comments before distribution to member states.

It was noted in the study that there was an extremely wide margin between farmgate price for paddy and retail price of rice in Ghana. As a result it was felt necessary to prepare a separate paper on rice marketing for submission to the Government. This paper is intended to give the Government a breakdown of costs within the marketing and milling process and to show where it is felt that cuts can be made to increase efficiency that would permit better pricing and subsidy policies.

This draft report has also been submitted to the Ghana Government for their comments.

c) The Gambia

Because of other important assignments including the Ghana case study and cooperation with international financing agencies, the report on the MacCarthy Island Pilot project had to be delayed a little bit. It was however, completed and submitted to the Government of the Gambia in April 1975.

d) SODERIZ

The scheduled case study of SODERIZ as an institution for the promotion of rice development also had to be postponed as a result of Mr. Aw's involvement in the Sahel mission, which of course, is in the long run a very profitable use of his time formWARDA as a whole.

3. General Sectorial Studies

a) Fertilizer Studies

The number of sectorial studies scheduled for 1975 had to be cut down as a result of staffing problems and the fact that most members of staff of the Development Department had to take their home leave during the year. The studies on the rice production model was shelved because of staffing constraints. Nevertheless, the study in the use of fertilizer which involves the analysis of the fertilizer policies in member states and the economic implications of the results of the 1973 WARDA Coordinated Trials was completed.

Considering the rather low quality low quality level of the trials, it was not too easy to make detailed specific recommendations. However, it was evident that in some countries because of the high cost of fertilizers in recent years, lower application rates were more economic than the higher rates.

b) Sahelian Countries

Pursuant to the recommendations of the Governing Council at its December 1974 Session that WARDA should study and define a framework for a stepped up development programme for rice cultivation in the Sahelian countries, WARDA organized a multidisciplinary international team which visited the seven CILSS (Comite Permanent Inter-etats de Lutte Centre la Secheresse du Sahel) member countries from March 23 to April 26, 1975, after going through documents available at WARDA's headquarters. The team later spent another two weeks in Monrovia writing their report. The mission was composed of:

Mr. Djibril Aw, Head of the WARDA Development Department  
Mr. Mohamed Georges Fasha, USAID Consulting Economist, and  
Dr. Hellenius ten Have, Research Agronomist & Lecturer  
at the University of Wageningen (The Netherlands).

Mr. Maurice Rossin, former Director General of the Ministry of Agriculture and former Director of the National School of Rural Engineering, Water Resources & Forestry and member of the French Academy of Agriculture joined the mission in processing and collating the information gathered.

The mission's terms of reference were as follows:

- to appraise the state of the rice economy in the region as a whole and by country;
- to appraise the progress of rice research;
- to assess rice cultivation potential and to review plans, projects and project ideas;
- to estimate medium and long-term rice needs;
- to make recommendations for an accelerated rice production programme directed towards self-sufficiency.

The result of this mission was very encouraging. It not only managed to gather enough information to give a good picture of the situation of the rice economy in the various countries and to catalogue the projects being carried out or planned, but it was also able to diagnose the problems facing the growth of rice industry in the zone and proposed solutions for them.

The report of the mission also made some recommendations for short term action and studies as follows:

- i) Inventory of possibilities for small scale irrigation works at the village level for rice growing along the fertile lands not subject to flooding which occur in many of the places along sizeable permanent streams crossing the area. These could be based on a number of small pumping, or even gravity fed, schemes requiring less complex studies and no movement of population and thereby resulting in easier and quicker implementation than larger schemes.

The mission recommended that the inventory should start with the Senegal River Valley (for Senegal, Mali and Mauritania), the Niger River Valley (for Mali and Niger) and the Chari River Valley (in Chad).

- ii) Establishment of Regional Rice Research Institutions and the development of National Research capabilities. The need for the early launching of the WARDA Regional Research Programme at Richard Toll and Mopti for irrigated rice and floating and deep flooded rice cultures respectively are emphasized and also the need for building into rice development projects, the national research programme.

- iii) Evaluation of training needs for rice growing in relation to the WARDA Regional Training programme which, of necessity has to concentrate on the training of rice production specialists. Since intensive rice growing will involve changes in traditional techniques, intensive and competent supervision is required. There is a need to study the extension and supervision requirements and the establishment of training centres to cope with the demands for personnel.
- iv) Activation of the Kogoni Rice Training Centre in Mali, whose facilities are presently not utilized because of lack of manpower resources, for the needs of all rice development projects in Mali.
- v) A systematic study of the rice potential of the Niger River Valley in the Republic of Niger taking into account projected dams in Mali and Niger. This is necessary in view of the fact that the Niger River represents the entire rice growing potential of Niger, which, because of its distance from ports and the state of communications, has to incur heavy transport expenses for its imports.
- vi) Inventory of possibilities for rainfed rice cultivation, not requiring investments in irrigation facilities, in Southern Upper Volta by adopting the spectacular strides made in Northern Ghana by the exploitation of the very flat plains which become inundated by a very thin layer of water for about three months of the year. This system is becoming important in Northern Togo as well and it will be very interesting for Upper Volta to draw up an inventory of areas with similar characteristics.



- vii) The study of an adequate mechanism to support and stabilize the prices of paddy and other grains in Mali and Chad where very low prices hamper the development of rice growing and encourages grain smuggling. Since in practice the problem is more complicated than it might seem, because of complex issues involving incomes, wages and purchasing power of the various income groups, a detail study is required to determine price levels for producers and consumers in order to promote local production and reduce imports.

As a follow up to this mission, WARDA together with CILSS, will initiate the process by which the recommendations can be implemented as early as possible. All the information gathered by the mission will be of vital importance to WARDA in guiding cooperating financing institutions.

#### 4. Cooperation with Financing Institutions and Regional and International Organizations

##### a) IBRD

In January a WARDA Agronomist joined the World Bank mission for the appraisal of the Integrated Rural Development project for upper Lofa County in Liberia.

Mention has already been made in Chapter 1 (para.b) of the mission of a Rice Processing Engineer and a Mechanization Specialist to support the FAO/IBRD mission in appraising the second phase of the MacCarthy Island project, which is intended to cover other crops as well as rice.

The FAO/IBRD group had requested the support of an agronomist, an irrigation engineer and an economist for the preparation of a rice mechanization project for Sierra Leone in June/July, of 1975. It was unfortunate that this period coincided with the end of the Phase I of UNDP assistance to WARDA and the beginning of the Phase II, which seriously affected the staff situation in the Development Department.

With the staff situation in irrigation engineering and economics still not at full strength, it was impossible to help even when the project study was shifted to the end of September.

The West Africa regional office of the World Bank requested for the services of an agronomist for five weeks beginning mid-September, to help in the difficult task of deciding which of the three alternative production techniques, namely rainfed (upland) with crop rotation, partial or full irrigation, to emphasize, to bring about a gross increase in yield of about 300,000 tons of paddy by 1980. It is credit to WARDA that our services were asked for in this important task and WARDA was very happy to oblige despite other pressing commitments of the Agronomist.

In fact IBRD had requested WARDA's participation in some seven projects for 1975 out of which WARDA had agreed to participate in five. However it appears as if their schedules have had to be changed and that the number would be cut down drastically and many of the planned projects appraisals postponed to 1976. These involve projects in Senegal (Casamance Project), The Gambia (the Phase II project,) Mali (Mopti Project), Togo (Rural Development Project) and Nigeria.

b) African Development Bank

The African Development Bank (ADB) has requested future WARDA involvement in the preparation of terms of reference for consultants and the supervision of their work. In this respect two terms of reference: one on the Fosseaux Lions in Togo and the other on the Rhombe Swamp Area Project in Sierra Leone were sent to WARDA for comments and these were made and sent. It is very certain that WARDA will be called to play an important role in the preparation of the new Fosseaux Lions project during 1976.

In August. 1975, a WARDA Agronomist was supplied on request to the ADB or a supervision mission of the Nasia Rice Project in the Northern Region of Ghana.

Concerning the Rhombe Swamp Area Project in Sierra Leone, another request was received in October 1975. In order to prepare an identification study for that project, the Bank asked for a special WARDA mission to Sierra Leone.

In answer to this request, the Rural Engineer visited Freetown and the Project area from October 18 to November 8, and spent six days in Abidjan for further discussions at ADB's Headquarters. The final report, however, was not immediately drafted because it was felt that the findings of the December mission to Guinea Bissau (see Chapter 1 para. d) are of great interest to the Rhombe Swamp Area as well.

c) UNDAT II (ECA) Studies on Self-Sufficiency in Rice

As a result of representations made by the delegate of WARDA to an UNDAT 2 conference, the latter agreed to finance the collecting of data required for the study on the economics of rice production, with a view to the attainment of self-sufficiency in the region. This study, which was proposed jointly by FAO, ECA and WARDA, soon after the inception of this Association, has had to be shelved because of problems of finance and human resources.

A three man mission, organized by UNDAT 2 arrived in Monrovia in early May 1975. After staying in Monrovia for two weeks gathering all available information from WARDA, the team set out, each to visit a certain number of countries, to collect additional data in the field. Although the programme required that the members should re-assemble in Monrovia and to complete their report, delays in the field did not allow them enough time in Monrovia to complete their report which is still awaited.

The terms of reference for the mission were as follows:

- to estimate rice requirements in each country and in the region by 1980 (or beyond that year if possible);

- to evaluate whether plans and projects under way or those being prepared which are now at various stages can realistically attain self-sufficiency in the medium term;
- to spell out options for approaching this target at national or regional level by appropriate strategy and policies.

5. Studies on International Policies and Regulations Relating to Rice

No specific studies were undertaken in this respect although in the process of writing the paper on economics of fertilizer use, a great deal of data on international policies and marketing of fertilizers were collected and some of it included in the paper. In addition, all the case studies carried out by the Department contain some elements of policy in rice production and marketing in the countries studied.

6. Statistics

The draft of the first statistical Yearbook, submitted to the Governing Council at Ibadan in December 1974, was sent to member countries for their comments. The final edition incorporating all the comments received, was completed, printed and released to member countries. The Statistics and Data Processing Division is currently examining the possibility of expanding the subjects covered for inclusion in the 1976 edition of the Yearbook.

The index of Rice Development Projects is currently being examined and a review of available material and the shape of the document is underway.

## 7. Data Processing

The Statistics and Data Processing Division analyzed and processed the results of the dry season 1973/74 and the main season 1974 coordinated trials during the year. The two were handed over to the Research Department in February and April respectively. The computer programme for this type of analysis is now finalized and will be used for subsequent analyses.

The Division also completed for processing, an index of current bibliography accordingly to the FAO system and successfully tested it on the Bong Mine computer. This made it possible to bring out the index of current bibliography in November 1974 and the release of a second one in June 1975.

Another very useful work done by the division was the processing of census data on yields carried out by the Office du Niger, Mali, during the 1973/74 season. This opens up a field of activity in which WARDA can offer its services to member countries which have facilities for collecting agronomic data, but do not have facilities for analysis and processing. Mention has also been made already of the work being done on the WARDA integrated budget.

Lastly, although it was planned to publish quarterly bibliographical index, it was found that apart from the expenses involved in such an undertaking, it was not really worthwhile because there was not enough material coming in to justify it. Instead only one bibliographical index is to be produced each year supplemented by a KWIC (Keyword in Context) index of documents on rice each year.

## 8. Participation in Training (and Research)

a) The Department prepared a justification for the need of a rice processing laboratory for training and research, as well as, for checking the performance of mills in the region as a whole. On the basis of this justification, the USADI approved the construction of a Rice Processing Laboratory and all the equipment needed for it.

The building was begun in July 1975, and is scheduled for completion in February 1976. Arrival and installation of equipment and testing may take another six to seven months. It is therefore hoped that the building can be in operation by July-August 1976 to enable the department to test the milling qualities of samples submitted for testing by the Research Department, as well as, field samples of rice from member countries.

b) The Department has been helping in the preparation of training material for the training centre. All available training manuals refer to rice growing conditions outside West Africa. Since the manual has to reflect growing conditions in the region, it has been necessary for the Department to be fully involved in its preparation.

#### Development of the Seed Multiplication Programme, Richard Toll

In the first annual report (May 1975) a description was presented on the initial stages of the project. The production of high quality seed from high yielding rice varieties adapted to the prevailing conditions of West Africa is considered an important strategy to reach self-sufficiency in rice.

The multiplication of lines is not a feasible task for the centre. All line materials will therefore be handed over to the WARDA nursery farm in Suakoko.

The varieties listed as WARDA recommended varieties for West Africa will be taken up in the multiplication programme on at least 400 m<sup>2</sup> plots (over 50 varieties).

There are a number of varieties at the centre which are not shown on the WARDA list, but which are performing very satisfactorily. There are 23 varieties available in this group.

Out of these 23 varieties, a number will be multiplied on a larger scale. In 1975 special attention was paid to the multiplication of IR 442 (requests from Ghana), Jaya (requests from Senegal

and is originally from Ivory Coast) and 1 Kong Pao (from Senegal). Those interested in the exact list of available varieties should contact WARDA for further information.

### Production

The production figures are much less than anticipated primarily because of damage by birds, especially during the main season harvest when some plots were totally destroyed.

During the off season the production was:

<u>Varieties</u>	<u>Area</u> <u>(ha)</u>	<u>Production</u> <u>(kg)</u>
Varieties on small plots	3.1	2810
IR 442	3.4	7841
IR 20	1.2	3955
Total	7.7	14606

Another 0.7 ha was used for experiments on bird control. The production from these fields has not been measured. Visual evaluation of the effect of the methods applied was sufficient to assess the success or otherwise. During the main season, the production was:

<u>Varieties</u>	<u>Area</u> <u>(ha)</u>	<u>Production</u> <u>(kg)</u>	
Different varieties	4.22	5889	5160
IR 442	3.40	1844	1125
I Kong Pao	5.20	2507	1020
Jaya	5.25	10714	7720
Total		20954	15033 (71.7%)

### Certification

All the seeds were checked by the Senegalese Seed Service in the field and afterwards. The tests for the off season crop were satisfactory.

Varieties	Specific Purity	Foreign Matter	Varietal Purity	Other Seeds per Kg		
				Cultivated crop	Weeds	Wild rice
IR 20	99.5	0.5	98.6	0.0	0.0	0.0
IR 442	99.6	0.4	99.64	0.0	0.0	2
SE 302G	98.55	1.4	99.4	0.0	0.0	27

IR 20 and IR 442 gave satisfactory results, but SE 302G was taken out of production. Part of the SE 302 G seed was cleaned by hand thus separating it from the wild rice. The cleaned seeds were made available for experiments in member countries.

#### Seed Export

In the 1974 - 1975 season, the following quantities of seed were exported:

<u>Destination</u>	<u>Variety</u>	<u>Quantity in kg</u>
Senegal	OS 6	5
	IR 442	175
	IR 20	350
Mali	IR 442	875
Ivory Coast	IR 442	875
Ghana	IR 442	910
Togo	SE 302 G	56
Benin	D7684 D	10
	SE302G	10
	SML Alupi	10
	Thin Thiou Way	10
Guinea Bissau	IR 442	385
	IR 20	385
	IR 5	385
	SE 302G	70
	D7684 D	245.

The seed quality was good, except for green grains due to the bird damage.

By the end of the year, 27,667 kg seed from 98 varieties and lines was in stock. 35 lines will be removed from the collection. 10 varieties belonging to the recommended varieties for West Africa will be added to the collection.



## RESEARCH DEPARTMENT

A detailed research report is issued in two volumes and is available at the WARDA Secretariat. This report is therefore a summary of progress made by the research department.

### Research Coordination and Coordinated Trial-Progress

This is a continuous activity. Greater part has now been implemented and future improvement will be largely in the area of the regional screening programme (IET), regionalization of activities and linkages and support to national testing programmes.

#### a) Research Coordination

A lot of progress has been made particularly in project planning and formulation. Efforts have been made to implement past recommendations. With the assistance of consultants, particularly Dr. Chandler, WARDA Research Advisor, further suggestions have been made to improve the efficiency and impact of the regional trials.

The Special Research Projects at Mopti, Rokupr and Richard Toll were recently reviewed by a team of consultants representing the National Governments International research centres (IRRI, IITA, IRAT) and WARDA, so as to set project priorities for the next few years.

The Rokupr project has been implemented and it is planned that the Mopti and Richard Toll projects will also become implemented during the course of this year. Training Research Assistants which started last year so as to enable them to take positions on these projects has ended effectively for Assistants for the Mopti and Richard Toll projects while that for the Assistants for the Rokupr project has just started. The yearly field Assistants training continued by the training of 22 Assistants at IITA in January/February.

The appointment of a Breeder at Headquarters has produced a marked improvement on the variety introduction programme; the nursery farm and the nomination of materials for the IETs and the variety trials

### Research Review Meeting

Thirty one delegates from member countries and Guinea Bissau attended the Third Annual Research Review Meeting. Five delegates represented the cooperating states and organizations - IRAT, FAO, IRRI, IITA, FAO Quelea quelea project and Dr. R. F. Chandler who represented IDRC apart from being Advisor to WARDA. There were also three observers, from CIBA Geigy, I.C.I. and Sofaco. The Conference which examined the results and progress made with the WARDA Coordinated trials; National research programmes, International linkages and the special Research project as well as planning for the next year, arrived at the following main conclusions:

a) The proposal that WARDA's coordinating activities be sub-regionalized into four zones based on:

- i) efficient ecological network of trials;
- ii) closer supervision of field trials by WARDA and National staff
- iii) bridging the communication gap between WARDA and member countries and among the member countries;
- iv) better idea of national research problems and the support that WARDA can give;
- v) WARDA participation on farm trials;
- vi) provide more rapid feed-back with the International Centres.

b) That as part of the special research programmes, technology transfer to farmers should be emphasized.

c) The process of nominating varieties for the various trials was revised so that seeds reach member states by early March; some countries had been receiving their seed supplies late.

d) there were requests to increase both the trials sites and number of trials; the procedure for approving these was agreed on; this is largely based on the collection of adequate information from the field, real needs and the availability of qualified personnel to conduct such trials successfully; member states were urged however to undertake relevant trials through their national programmes.

e) It was realized that member countries can provide adequate information regarding the national research policies and areas of need. It will take a very long time for WARDA to work out plans for support to national research; delegates were however warned that support though based on the needs of individual countries will be confined to items or areas that cannot be provided locally.

f) IRAT offered assistance in training if requested by WARDA.

g) To cut down the accounting problems now experienced and to establish uniform standards of costing the trials from country to country, delegates approved the idea of a Block vote for each trial on agreed conditions.

h) Delegates felt that WARDA should initiate on-farm or applied research trials on farmers' field.

i) The need to incorporate the desirable characteristics of O.glaberima in high yielding varieties in breeding programmes was agreed upon.

j) Delegates agreed that in furtherance of the Inter-Africa phytosanitary convention, all introduced rice materials should be channelled through the Regional plant quarantine centre at Ibadan and that these should go through WARDA and IITA who will then distribute them to member states as required. WARDA was made to provide the assurance that it will take steps to avoid delays in introducing materials into the region.

k) The report of the joint meeting among IRRI, IITA, IRAT and WARDA on collaborative action on Germplasm collection and Preservation as well as the IRTP programme was approved by delegates with the addition of Moor Plantation, Nigeria to the IET/IRTP test sites and Kpong, Ghana to the IET test sites: the report recommended that in view of its past experience and planned activities of IRAT/ORSTROM in rice germplasm collection, these institutions should take leadership in rice germplasm collection; both WARDA and IITA should assist IRAT and have storage facilities at varying levels. Samples of all materials collected will be sent to IRRI and this institution in exercise of its global mandate should assist in implementing this programme.

l) It was decided that the Preliminary Variety Trials should be conducted only at National levels but that promising materials from the IET sites which would have already been homogenous before entry into the IETs should centre directly into the coordinated variety trials.

m) It was proposed that WARDA should look into the possibility of including fungicidal test as part of the crop protection trials.

n) In furtherance of an earlier decision, WARDA was urged to monitor a mission to assess the incidence of diseases and pest problems in rice cultivation in West Africa; it was agreed that a combined team of scientists from IRRI, IITA, IRAT and WARDA can start such a survey this year.

o) For the Sahelian countries such as Mauritania, urgent rice production problems which needed study were agreed upon as varietal behaviour during the cold dry and hot dry seasons; the control of rat.

#### Coordinated Trials Programme

A quick short-term impact on rice development in West Africa can be made through an efficient regional test programme. To be able to do this, as was reported last year, certain basic supporting institutions are necessary. Both the Seed Nursery Farm at Suakoko and the Plant Quarantine Centre at Ibadan are now functioning through the effective liaison between the Seed Laboratory and the Plant Quarantine Centre at Ibadan, WARDA has in stock 1735 varieties/lines of which 1489 are from outside West Africa. Most of these are now under observation and multiplication at the Suakoko Nursery Farm. After the initial multiplication, they will be entered into the IET and subsequently the coordinated variety trials. The quality and quantity of seeds now distributed to the trial sites from the seed laboratory has improved greatly.

Last year's targets for setting up 15 IET test sites have not been met mainly as a result of staffing and logistical problems as well as the availability of ready test materials.

AVERAGE YIELDS-VARIETY TRIALS

IN KG/

1974 & 1975

	Dry Season	Rainfed	Irrigated	Mangrove	Deep Flooded	Floating
1974	3116	2151	4414	2284	4146	3955
1975	5450	2798	4643	2203	4460	ALL WITH HIGH CV

TOTAL TRIALS & RETURNS FROM 1975 TRIALS

	Variety	IET & PVT	Ferti- lizer	Herbi- cides	Insec- ticide	Total/ Mean
Planned	89	18	33	9	10	159
Conducted	87	14	31	6	7	145
% Return	97.8	77.8	93.9	66.7	70	91.2

TOTAL TRIALS & RETURNS FROM 1974 TRIALS

Planned	77	13	24	19	13	146
Conducted	77	5	20	12	7	121
% Return	100	38.5	83.3	63.2	53.8	82.9

The tables show an averagely general increase in yield in 1975 as compared with the 1974 season. There was an increase of 8% (83% to 91%) of trials conducted of total trials planned for 1974 over those of 1975.

Last year there was a marked improvement on the standards of management and reporting from most stations and very outstanding results from same. These improvements may be largely due to the decision taken last year to limit trials to areas where the results would provide useful information and where capable scientists exist. There was however, still great concern over the poor standard of financial accounting for the trials.

#### Special Research Projects: Progress

Regional Research Projects on deep water/floating, Mangrove rice and dryland irrigated rice designed to fill gaps in rice research information in West Africa and adapt information that is utilizable in the regional testing programmes and national extension services are presently financed from bilateral sources.

#### Mangrove/Rokupr

Of the three projects, only the Rokupr project has become operational with the appointment of Mr. E. Jones, Soil Scientist, provided under the U.K. assistance as team leader. An Entomologist has been identified. This post is financed by USAID. The Breeder (U.K.) is being actively recruited. Meanwhile, the infrastructure mentioned last year i.e. laboratories, cold room, electricity generator, green house and screen house are being developed. In spite of the availability of funds, difficulties arising from administering the projects tended to delay its full implementation.

The technical review team which studied the original project document set out the following main research priorities for the next 2-3 years.

a) Variety Improvement - high yields, high photosynthetic efficiency under low light intensity, salt tolerance, soil toxicity tolerance, plant height of 1-1.4m and medium duration. The emphasis was placed on screening and to be followed later by hybridization.

b) Agronomy - land preparation and other cultural practices; an investigation into water control systems, soil management and mechanization.

c) Weed control - cultural practices and screening of herbicides.

d) Technology transfer - farmer's field trials with improved and modern farm practices.

e) Crop protection - varietal resistance and screening of insecticides;

- i) yield losses to diseases and insects
- ii) crab control
- iii) monitoring salt concentration and routine laboratory determination.

Local management of the programme is through a Coordinating Committee consisting of a Government Agricultural Ministry Representative; Director of the Rokupr station; UNDP project Leader and WARDA team Leader. Apart from anything else, this ensures integration of activities and prevents duplication.

#### Deep Water/Floating Rice-Mopti

This project is to be funded mainly by USAID with minor funding from Saudi Arabia. The project allows for greater investment in infrastructure - houses, laboratories, land development etc.

The team leader for the project has already been recruited. On the return of the four Malian research assistants from training, the project will start at least at the experimental level.

Agreements between WARDA and the Government of Mali have been signed for the implementation of the project. The project which will initially have a team leader and his deputy in addition to Malian research assistants, will have the following main priorities according to the March 1976 review team:

a) In Varietal Improvement work: the development of high yielding varieties with fertilizer responsiveness, rapid elongation abilities, submergence tolerance, basal tillering and harvesting, tolerance to drought during the early grown stages, insect resistance and appropriate maturity periods: to make rapid progress in the selection of materials with the desired characteristics, immediate attention should be given to genetic material in segregating generations as well as fixed lines available from various sources. Limited amount of hybridization should be resorted to only if considered necessary.

b) Insect control: identification of genetic material with resistance to stem borers and other insects should be given major emphasis. Evaluation of insecticides, method and time of application should also be given some attention.

c) In weed control: emphasis should be on identification of most economic method and effective development of chemical, mechanical and cultural practices.

d) Agronomic research should concentrate on land preparation, method of sowing, time and rate of fertilizer application. Mechanization using animal power should be strongly emphasized in Agronomic Research.

e) Intensification of technology transfer to the farmer is essential in order to increase rice production. This can be accomplished through farm trials, and increased surveys to determine real farm problems.

f) The team felt that mechanization of rice operations will be extremely important for increased production. Operations such as sowing, weeding and threshing will require the development and testing of machines which are practical, efficient and simple to operate - at the small farmers' level.



### Richard-Toll/Fanaye Project

Like the Mopti project, this project is expected to become implemental with the return of the four Senegalese research assistants. Funds are expected from IDRC and CIDA for infrastructural and operational costs. The activities are being fully integrated with the Rice Research activities of the Senegalese Government in the Sahelian zone. This project is becoming increasingly more important in view of the massive agricultural development project due to start in the Senegal river valley.

The review team made the following main recommendations for the implementation of the project:

a) in rice breeding work, the development of high yielding varieties with fertilizer responsiveness, photoperiod insensitivity, tolerance to cold, insect and blast resistance and appropriate maturity periods requires emphasis. In order to take 2 to 3 crops, varieties should be suited to different planting times. In fact, the best planting time to make maximum use of solar radiation and to avoid cold damage needs to be investigated. There is need for surveillance to monitor diseases that may become important with intensive rice production.

To make rapid progress in the next 2-3 years, immediate attention should be given to established genetic material, in segregating generations as well as fixed lines available from various sources, and limited amount of crossing work should be resorted to only if considered necessary.

b) In weed control: developing chemical, mechanical and cultural practices should receive primary attention while work concerned with inventory of weeds and residual effect of herbicides should be given a low priority.

c) in insect control work, identification of lines possessing genetic resistance and identification of insecticides giving effective control and standardization of application methods to reduce cost and improve efficiency should be given major emphasis. Work should include developing packages of priorities which integrate varietal resistance with chemical control of insect pests. Research on biological control of insect pests is time consuming, complex, has limited chances of success and should be given low priority.

d) Work in the area of soil science and water management should focus on:

- i) time and method of fertilizer application
- ii) different kinds of fertilizers
- iii) efficient use of water, and
- iv) irrigation and drainage practices in relation to soil salinity and nitrogen conservation. Also lines possessing tolerance to soil salinity should be identified.

e) Trials on farmers' fields to develop packages of practices for farmers' adoption should be given attention. Such tests should form part of the network of the WARDA regional trial, so as to extend relevant results to other member countries either through the regional or national farm trials.

#### General

It is important to note certain common factors emphasized by the review team for all the projects.

- a) Strong experienced scientific leadership at the site was recommended as essential element for even the initiation of the project.
- b) integration of activities with national research efforts while not losing sight of the regional roles of the projects.

- c) the transfer of technology was considered a major constraint as in several instances results were available but had not been tested at the production level.
- d) a minimum of infrastructure and social facilities that can attract capable scientists.
- e) a detailed annual work plan can only be drawn by scientists on the site in consultation with non-resident scientists.
- f) Variety screening was regarded as a priority over breeding.

#### Support to National Research Activities

While supply of equipment to national stations as part of the coordinated research activity has been initiated, definite plans for the establishment of training plans for national research workers and starting field trials on farmers fields need to be established. Each member state has been approached both by means of questionnaires and visit by WARDA research team to countries to determine national rice research policies, achievements and the level at which WARDA can intervene. At the outset, one should take into consideration that member countries are at varying stages of development and research capabilities and the sizes of countries vary and consequently, the nature of the support to countries would vary accordingly.

#### Linkages with International Centres

The IITA, IRRI and WARDA have now signed a "tripartite letter of understanding" so as to re-delineate the specific roles of each institution in rice research, development and training in West Africa and how to cooperate in mutually enhancing the activities of each institution.

Cooperation with these institutions is not new. Already both IITA and IRRI have been involved in training the WARDA Research Assistants and IITA has conducted the last two WARDA field assistants training. (In future the latter course will

be conducted at the Johnsonville training centre). IRRI, IITA and IRAT staff were recently involved in the evaluation of the WARDA special research projects as reported earlier.

Before the last WARDA Annual Research Meeting, scientists representing IITA, IRRI, IRAT and WARDA discussed.

- a) WARDA participation in the international Rice Testing Programme of IRRI
- b) The collection and preservation of Rice Germplasm in West Africa

WARDA had previously decided to participate in the IRON (international Rice observation Nursery of IRRI). However, due to photosanitary limitations, available staff and facilities, WARDA did not undertake this direct responsibility last season.

The following main recommendations which were approved by the recent WARDA Research Review Meeting were arrived at:

- a) The desirability of centralization of introduction of materials into West Africa using both IITA and WARDA as contact points
- b) Participation of WARDA in seven international rice testing nurseries viz:
  - i) International Rice Observation Nursery (IRON)
  - ii) International Upland Rice Observation Nursery (IURON)
  - iii) International Blast Nursery (IBN)
  - iv) International Rice Sheath Blight Nursery (IRSBN) .
  - v) International Rice Salt Tolerant Observation Nursery (IRSTON)
  - vi) International Rice Cold Tolerant Observation Nursery (IRCTON)
  - vii) International Rice Deep Water Observation Nursery (IRDWON)
  - viii) Stem borer Nursery.

3. Six trial points (approved last year) were agreed for West Africa, namely:
  - a) Suakoko (Liberia)
  - b) Rokupr (Sierra Leone)
  - c) Mopti (Mali)
  - d) IITA, Ibadan (Nigeria)
  - e) Richard Toll (Senegal)
  - f) Sapu (The Gambia)
  - g) Bouake was agreed upon as a new addition.
4. WARDA's participation in IRTP should be carried out a year behind the IRRI schedule - this is to allow enough time for clearance of materials through the plant quarantine and seed increase if required.
5. In view of the fact that agreement has been reached on the desirability of centralization of materials introduction, the feed-back to IRRI should also be centralized.
6. There should be exchange of IRTP trials results between WARDA and IITA.
7. The title "West Africa Initial Evaluation Tests/International Rice Observational Nursery (WAJET/IRON)" as the case may be should be given to the fusion of WARDA's IET and IRTP of IRRI and duplication of materials in these trials should be avoided.
8. IRRI would prepare instruction books etc to be able to accommodate the IET entries as addition to the IRTP entries. On the germplasm question, the meeting agreed on the following:
  1. IRAT be given financial and technical support to complete its work on germplasm collection and that it should undertake the leading role for West African germplasm collection.
  2. Ivory Coast Government be assisted to improve the storage facility at Bouake for short and medium term germplasm storage.

3. IITA should be responsible for the long-term-storage of African germplasm which it receives from any source - provided that financial support for these activities is obtained
4. IITA may collect rice samples, whenever possible, during its general germplasm collection undertaking in Africa under IBPGR auspices.
5. The group appreciated the global leadership that IRRI has taken for rice germplasm collection and evaluation and its role of helping other institutes and countries for these activities. The meeting felt that the IRRI should support the plan of collection in West Africa at all levels possible.
6. WARDA establish a storage facility for germplasm at Fendall, its present rice laboratory where all samples of materials collected by IRAT and IITA would be sent for short term storage.
7. WARDA should provide administrative and logistic support and help coordinate the collection activities of IRAT and IITA.
8. There should be free flow of materials amongst all these institutes.
9. The various bodies concerned should prepare budget requests to cover their individual activities. These requests should be exchanged and then forwarded to IRRI for support so that feed back is obtained before or by the September meeting of WARDA's Variety Improvement Seminar at Bouake.

## Highlights of the Results of the 1974/75 Coordinated Trials

During the dry season of 1974-75 and wet season of 1975, twenty coordinated trials were conducted in 26 locations. The trials comprised of eleven variety trials, five fertilizer trials, two herbicide trials and two trials with insecticides.

### 1. Dry Season of 1974-75 - short duration trial

IR20 had the widest adaptability in the region. It yielded 10.02 t/ha at Sapu and 2.78 t/ha at Mange, which shows that under good natural environment and management practices, it can produce very high yields while under poor management and diseased conditions it can still give reasonable yields. It showed great insect resistance in these trials.

### 2. Dry Season of 1974-75 - medium duration trial

IR1529-680-3 appeared to be the most promising variety. Its highest yield of 11.31 t/ha at Sapu and lowest yield of 6.50 t/ha at Mission Tove support its high yielding ability under varied conditions. IR5 also showed good adaptability compared with IR1529-680-3 but the latter was superior in yield, disease resistance and grain quality. Under poor environmental and diseased conditions, SML Alupi was found to have good adaptability. Its highest yield of 7.43 t/ha at Suakoko and second best of 6.58 t/ha at Mission Tove indicate that it can be a good variety under diffused sunlight and diseased conditions that prevail in Sierra Leone, Liberia and Togo. This can be probably profitably grown in addition to IR1529-680-3.

### 3. Rain-fed short duration trial

I Kong Pao was identified as a highly promising early maturing variety for rainfed condition. It maintained relatively high yield at all the locations and did not show any adverse performance in terms of resistance at any place.

High yield potential varieties gave higher yields irrespective of their height or plant architecture. Their yields increased at higher fertility level. Tall varieties, although have some advantages under poor light, failed to compete with semi-dwarf or semi-tall varieties, both under low and high fertility levels. All tall varieties lodged at high nitrogen level.

Including semi-dwarf to conventional tall varieties in this trial created management problems. Low nitrogen was good for the tall varieties but was not enough for semi-dwarf or semi-tall varieties. Higher nitrogen application caused the tall plants to lodge. Under low nitrogen, semi-dwarf varieties did not express their optimum yield. However, at intermediate level of nitrogen when tall plants did not lodge, varieties like I Kong Pao and SE302G produced better yields.

#### 4. Rainfed-medium duration trial

Considering plant type, grain, yield and life cycle, IR442-2-58 was found to be the best performer. It gave the highest average yield of 3.55 t/ha and matured in 135 days. It is known to have some drought tolerance, is semi-tall and has long, medium, slender grain. It has the potentiality of giving high yield under good management. IR442-2-58 has already been adopted for upland production in some countries although in some areas, it shows high susceptibility to blast.

#### 5. Irrigated short duration trial of main season

IR1529-677 had the highest average yield and rank and showed marked superiority over the other varieties. Its highest yield was obtained at Sapu, 8.72 t/ha, and its lowest of 3.48 t/ha at Mange. Sapu had the best management conditions supported by good environmental factors, while Mange had poor natural conditions along with management problems



Under good natural and management conditions, yield was increased, life cycle was decreased and plant height slightly increased. The reverse was true for poor conditions.

Wider spacing of 25 x 25 cm gave high yield at certain locations but closer spacing could be still better for all varieties. In addition to higher yield, closer spacing helped uniform maturity and weed control.

6. Irrigated medium duration trial of main season

IR1529-680-3, which is a sister line of IR1529-677 gave the best average yield. This has wider resistances diseases and the grains are good. This variety has proven its merits also in many Asian and Latin American countries (international rice yield nursery, 1974 and 1975).

Correlation between high yield and increased plant height and decreased life cycle was demonstrated in this trial also, so also was wider spacing.

7. Deep flooded/mangrove swamp - medium duration trial

Spacing of 25 cm x 15 cm was found to be too wide for the tall low tillering varieties. BH2 and ROK5 showed promise.

8. Deep flooded/mangrove swamp - long duration trial

Inclusion of salt tolerant, elongating and just tall varieties in this trial posed a management problem for determining the merits of the varieties for each condition, like deep flooding, or mangrove swamp.

9. Floating - long duration trial

Nineteen entries were found to be too many for one experiment. IR442-2-58 and T442 varieties were not found to be suitable for floating conditions. Further testing may be required.

10. Initial Evaluation Test

Six early maturing and 19 medium maturing lines were identified for yield trials in 1976.

11. Preliminary varietal trial

Four early maturing and five medium maturing varieties were identified as potential varieties. These would be included in the yield trials of 1976.

12. Fertilizer trials - Off season 1974-75

In five countries where the fertilizer trials were conducted, NPK extension rate or NPK optimum rate failed to give the estimated best economic returns from fertilizer use. In most countries, the effect of N alone was strong and there was either NP or NK synergism. Except in Benin where lowest economic returns from fertilizer use were obtained, all other countries exhibited very promising results. The economic rates of N, P and K varied between 40 and 90kg N/ha, 20 and 40 kg P<sub>2</sub>O<sub>5</sub>/ha, and 30 and 40kg K<sub>2</sub>O/ha respectively.

In general there was high coefficient of variation.

13. Fertilizer trials - rainfed Main season 1975

Rainfed fertilizer trials were carried out in seven countries. Only three countries exhibited promising economic returns from fertilizer use. It showed again that nitrogen alone played an important role in increasing grain yield and that either NPK extension or NPK optimum rates failed to give the best economic returns from fertilizer use. The economic rate of nitrogen varied between 40 and 60 kg N/ha.

The coefficient of variation, in general was very high (CV varied between 19.6 and 28.2%).

14. Fertilizer trial - irrigated rice Main Season 1975

Out of seven trials, only two trials showed economic benefits from fertilizer use.

With the limited available information, it might be noted that the N-P synergism in increasing grain yield was very strong. On the other hand there seemed to be no yield response to potassium application. The economic dose of NP combination varied between 26 kg N + 56 kg P<sub>2</sub>O<sub>5</sub>/ha and 40 kg N + 30 kg P<sub>2</sub>O<sub>5</sub>/ha.

The coefficient of variation varied between 16.1 and 21%.

15. Fertilizer trial - Deep flood/mangrove Main Season 1975

Deep flooded - Only one trial was conducted in Mali.

Although various combinations of NP and NPK produced significantly greater grain yield than the control, none of the treatment combinations gave any economic advantage.

Mangrove - Only one trial was conducted in Sierra Leone.

In all three years (1973, 1974, 1975) nitrogen alone gave economic benefit from fertilizer use. In 1973 and 1974 the best treatment was 40 kg N/ha and in 1975 it was 60 kg N/ha.

16. Fertilizer trials - Floating rice condition

Only one trial was conducted in Mali. The trial showed that phosphorous at the rate of 30 kg  $P_2O_5$ /ha was the best economic dose.

17. Herbicide trial

Rainfed conditions - some herbicides were as good as hand-weeding with regard to grain yield and control of weeds (for example, AC-92553 in The Gambia, Upper Volta, A-820 and Propanil + 2,4, 5-TP in Senegal, and USB3584 and STAM F34-T in Upper Volta).

18. Insecticide trial

In Ghana (Dawhenya) Furadan 30 at the rate of 1.2 kg a.i./ha gave the highest yield increase (46%) over control.

In Senegal (Djibelor), Furadan (0.8 and 0.4 kg a.i./ha) and Sau 155 exhibited good control of insect pest and produced significantly greater grain yield than the control.

Variety Stability studies

Among the common entries tested at various locations and growing conditions, the following varieties have tended to exhibit high yield potentialities and wide adaptability.

- a) Rainfed:
  - i) Short duration - SE302G and I Kong Pao
  - ii) Medium duration - TX5210 (ROK1) and A2xF4.6 (ROK2)
- b) Irrigated
  - i) Short duration - IR20, CICA4 and I Kong Pao
  - ii) Medium duration: IR5, IR442, IR269-26-3-3-3, IR1529-680-3, Vijaya and Jaya.
- c) Common for Rainfed and Irrigated
  - i) Rainfed short duration: I Kong Pao and IR442
  - ii) Irrigated short - I Kong Pao
  - iii) Irrigated medium - IR442.

## TRAINING

Training is one of the major activities of WARDA. The other two are Research and Development. Three different aspects of training are reported upon:

- a) implementation of the WARDA Training Centre at Fendall, Liberia.
- b) The training of WARDA staff, and
- c) High level training programmes.

Without doubt, training at all levels can assist WARDA in making a significant impact on rice production in the region and thus assist in fulfilling our main objective of making West Africa self-sufficient in rice.

### A) IMPLEMENTATION OF THE WARDA TRAINING CENTRE, FENDALL, LIBERIA

At its third session held in Abidjan, Ivory Coast in December 1973, the Governing Council of WARDA mandated the Executive Secretary to negotiate the setting up and financing of a permanent Training Centre. Consequently a Training Consultant, Mr. Vernon Ross, Head of the Training Centre at IRRI was hired. He later submitted a report which was tabled at the Fourth Session of the Governing Council held at Ibadan, Nigeria, in December 1974. Bearing in mind the various types of rice cultivation in the region and the need for training of rice workers at different levels and for various aspects of the rice industry, the WARDA Secretariat proposed the establishment of a Regional Training Centre to run the following courses:

#### Training of Rice Production Specialists

This is envisaged as an annually recurrent programme for 40 extension officers of a calibre that is likely to demand and receive support for their own national programmes. Initially, most of the trainees would be those receiving such an intensive training in a single crop for the first time. Later on,

however, more and more would be those coming in for refresher courses.

The duration of this course is six months, i.e. long enough to allow for a full rice growing cycle, and also to allow for some practical extension training with farmers in Liberia.

While it is the intention of the course to increase the general level of technology of the trainees, a substantial part of the course will be devoted to extension methods and communications.

The course will be based largely on the curriculum that had been designed by IRRF and used in the 1973 training course sponsored by WARDA at IITA, except that it is to be modified to reflect more of the needs of the region than it presently does.

#### Specialized Training Programmes for Production, Processing and Marketing Staff

Every year, there will be one such course lasting for about six weeks, but that the courses would be rotated over the various specialized fields. For instance, in April 1976, a course is being planned for Water Management. The following year it might be on rice milling and in the third year it might be on seed technology or marketing, etc.

In addition to increasing technological level of trainees in this field the courses would emphasize also the economic aspects. For instance, in courses on water management not only will the optimum needs be stressed but also cost of providing water and the need for constant measurements both of water supplied artificially and that which comes down naturally. For many regional projects this would lead to substantial savings in costs.

### Training of Field Assistants

This is biased towards the research needs of WARDA and will be mainly concerned with raising levels of technology of the staff and with experimental care of research plots. The first two courses, i.e. one held at the University of Liberia Farm, Fendall in 1973 consisted of general courses meant for the staff who are manning WARDA trials. Since January 1975 however, the courses have become specialized. For instance, the 1975 course attended by twenty-two (22) trainees at the IITA, Ibadan, stressed field experimentation and plant protection measures.

This course will be an annually recurrent one because of the increasing number of research and trial points and the need to make those officers, who are in day-to-day touch with the trials, more and more aware of the objectives of the research programmes.

The duration of the course will be about six weeks and it will be held in January/February, when these assistants are least engaged.

### WARDA Training Centre, Fendall

An important decision of the Governing Council of WARDA in December 1974 at Ibadan, Nigeria, is the approval of a Training Centre to be located at the University of Liberia Farm, Fendall, Liberia. With the substantial financial assistance from the USAID and the generous donations of land by the Government of Liberia and the University of Liberia, the turning of the sod for the construction of the dormitory and offices of the ARDAA Training Centre was performed on September 3, 1975 by the Hon. James T. Phillips, Jr., Minister of Agriculture, Republic of Liberia. The ceremony was watched by members of the Liberian Government, Members of the Diplomatic Corps, University lecturers and many distinguished people from all walks of life. Steady progress is being made on the buildings and they should be ready for occupation by mid-April 1976.

The buildings of the WARDA Training Centre will have dormitory facilities for housing a maximum of 40 students at a time. The dormitory will be fully equipped with provisions for two resident instructors. It will however use the dining and kitchen facilities of the University of Liberia Farm. The building also has adequate storage space for keeping its materials and supplies, three offices and two classrooms; a big one for 40 students and a small one for 20 students. Provision is also being made for a standby electric generator in view of frequent power cuts at the farm. This will also help to protect various items stored at the farm e.g. seeds stored for their viability. Electricity is also being installed for WARDA. In addition, clean, safe drinkable water is to be provided for use by trainees, staff and in the. Construction costs for the dormitory, storage building, water system etc. is estimated at \$255,000.

Articles of furniture for the dormitory, classrooms and offices which include beds, office desks and chairs, vehicles (a bus and a pick-up), office and laboratory equipment and farm machinery and equipment were ordered as from July 1975 and a lot had arrived Monrovia by December 1975.

Land preparation of the teaching farm of the WARDA Training Centre, Fendall started towards the end of December 1975. Both upland (rainfed) and irrigated rice fields are being prepared in readiness for the 1976 Rice Production Specialist Course which starts on June 1, 1976. Although nearly fourteen acres have been given to WARDA by the Liberian Government and the University of Liberia, more land will be made available later as a total of fifty acres (20 acres of irrigated land and 30 of upland) have been requested bearing WARDA's future needs in mind.



The report of the Training Consultant hired by WARDA recommended a minimum staff complement of five persons specializing in crop science, soil science, entomology, plant pathology and weed science. Although WARDA's Training budget makes provision for three full time members of staff, only the Training Officer (Anglophone) assumed duty by December 1975. Efforts are being intensified to recruit the Head of the Training Department and the other Training Officer (Francophone). In order that the course would be adequately covered and properly implemented, WARDA will make use of many of its professional staff based at its headquarters as resource lecturers. Already, the Association has a Research Coordinator, two Agronomists, one soil scientist, one seed technologist, one extension specialist, two crops specialists, one rural and irrigation engineer, one rice processing and storage engineer assisted by an Associate, one Associate economist, one statistician, one data processing specialist and a mechanization specialist to assist from time to time as resource lecturers. The trainees would probably benefit from their accumulated field experience which will be utilized to provide good illustrations to lectures. In addition, WARDA intends to invite world-renown specialists from the International Institutes and elsewhere as guest lecturers.

#### Training Manual

Dr. O. F. Esuruoso of the Department of Agricultural Biology, University of Ibadan, Nigeria, was appointed a consultant initially for thirty days starting from August 1975 to prepare the WARDA Training Manual for the Rice Production Specialist Course. The manual is to be West African in outlook but will draw upon the recent advances made in rice technology elsewhere. The completion of the writing of the English version of the manual was not finished by November 30, 1975 as scheduled. It is hoped that it can be finished early in 1976 to permit sufficient time for its translation into French and its printing before the course starts on June 1, 1976.

b) Training of WARDA Staff

At the Fourth Session of the Governing Council held in Ibadan, Nigeria, in December 1974, the Council asked the Executive Secretary to pay special attention to the training of WARDA staff and to submit a progress report on the subject to each session of the Council. In pursuance of the above mentioned directive, the training of WARDA staff was intensified in 1975.

Compared with 1974 when only two of its staff underwent some form of training, a total of fourteen professional officers and all its seven drivers were exposed to various training courses in 1975. In 1974 for instance, Mr. C. E. Tagoe, Production Agronomist attended the Agricultural Projects Course jointly sponsored by the Economic Development Institute of the IBRD, ADB, ECA and the Institute for Economic Development and Planning in Abidjan, Ivory Coast. The course focussed attention on techniques of investment analysis as applied to the rural sector.

Mr. M. A. Larinde, WARDA Seed Superintendent, also underwent a three month seed technology course at the Mississippi State University, U.S.A. in 1974.

In 1975, Mr. Jacques Diouf, Executive Secretary, underwent a two-month top management course at the American Management Association in New York, U.S.A.

To improve their French capability, Dr. Lekan Are, Deputy Executive Secretary and Dr. Harry Will, Research Coordinator, utilized FAO Fellowships to take courses in the French language at the Institut de Francais, Ville-franche-sur-mer, France, for two months and one month respectively.

Mr. O. Mafolasire is to become a Training Officer at the WARDA Training Centre, Fendall, Liberia. To make him effective and adequately prepared as a teacher at the Centre, he was the recipient of an award from IRRI where he underwent the six-month Rice Production Specialist Course. He returned to the WARDA Training Centre in December, 1975.

Eight newly recruited Research Assistants from Franco-phone member countries were first given a four-month intensive English course in the U.S.A. from February to May 1975. Thereafter, three of them were sent to Bangladesh Rice Research Institute (BRRI), IRRI, Thailand and IITA and the other five to IRRI for general training and specialized training to acquire basic knowledge on rice cultivation and experimentation. The first group will spend six months at BRRI for training in floating rice culture. They will tour floating rice experimental stations in Thailand for a week, be at IRRI for three weeks and spend three months at the IITA on their way back to Monrovia. The five going directly to IRRI will spend a year there. They will devote equal time to general and specialized research training.

Mr. Charles Dunbar, Personnel Officer, took a one-month course at the FAO Regional Office, Accra, Ghana, while Mr. Charles Kumodzi, Procurement Officer, underwent a one-month course in procurement at the FAO, Rome.

Mr. Djadoo, the new Head of Administration & Finance, took one and half months training at FAO, Rome, the World Bank in Washington, D.C. and at CIAT, Colombia in administration.

In addition, all WARDA Headquarters drivers underwent half a day training every week for six months at the CFAO garage in Monrovia, Liberia. The WARDA fleet is 70 percent Peugeot hence the choice of CFAO garage for the training of our drivers. The training programme is geared to the improvement of the maintenance of WARDA vehicles. It would also permit the drivers to undertake emergency and minor repairs.

It is also hoped that this will assist WARDA in reducing the cost of maintenance of its cars.

The language laboratory approved by Council for improving the language capability of WARDA staff became functional in September 1975. Three daily classes in French and two daily in English are conducted for a total of fifty members of staff. Each class lasts for one hour. The system used in the WARDA laboratory is non-intensive but is considered adequate for our staff. As of now, there is only one teacher handling all the classes. Two teachers, one each for French and English are foreseen for the laboratory. As soon as we are able to get a second teacher, it is hoped that all the staff at the Headquarters can be covered by the programme.

c) High Level Training Programme

WARDA plans to assist scientists and development officers in member states to undergo high level training in various fields through bilateral arrangements with donor countries and agencies. It is WARDA's hope that this can be executed along the following lines:

i) Training of Research Personnel

Agricultural research needs to be intensified in member countries with a view to compliment WARDA's regional research effort. To make meaningful contribution, member countries would need assistance in the training of high level scientists. WARDA intends to assist scientists in member countries by soliciting for training fellowships from donor countries and organizations. WARDA will also attempt to locate suitable institutions where the scientists could undergo their training. Trained scientists are expected to return to their countries to strengthen their capacity for agricultural research.

ii) Training of Development Personnel

WARDA envisages post graduate training for agricultural planners, agronomists, economists, milling engineers, marketing specialists and irrigation and drainage specialists etc.

Again, needs will vary from one member country to another. Training of personnel in this category is to be financed from funds to be negotiated with bilateral donors.

iii) Language Training for Rice Scientists in West Africa

Any effort made to make rice scientists in the WARDA region learn another language e.g. English or French will definitely be mutually beneficial to the scientists and WARDA staff. It will definitely be a step in the right direction as it will enhance communication between WARDA staff and the scientists scattered over many stations in the region with whom they have regular contact.

The limited facilities of the WARDA language laboratory in Monrovia cannot unfortunately be extended to rice scientists in the WARDA region. This is firstly because it is being used to full capacity and for about seven hours daily. Moreover, the course is non-intensive as each participating WARDA staff attends classes for an hour a day. In addition, the present system is collective.

In view of the above and bearing in mind that rice scientists wishing to learn English or French would need an intensive course of about eight hours per day for a period of not less than four months, WARDA intends to develop a separate programme for scientists in the region to locate bilateral financial assistance possibly in USA, U.K. France, Belgium, Canada and Switzerland for intensive language training of 4 to 6 months.

## DOCUMENTATION DIVISION

Up till August 1975 the Division functioned with the Documentalist, an Indexer and a Bilingual Typist. A Librarian assigned by the Peace Corps arrived in August 1975.

The Photographer resigned at the end of March 1975. A new Photographer has not been recruited yet. In the meantime a Consultant Photographer from FAO was recruited for three months from the beginning of July to the end of September.

Since the 30th of September, Mr. Neblett, the former Photographer of the division, was recruited as a Technical Support personnel.

### The Index

The second issue of the "Current Bibliography" (253 documents) was ready at the beginning of June 1975, but delayed for release by the printer till August 1975.

The Retrospective Index of 500 documents have been prepared.

The documents analysed in these publications deal with all technical and economic aspects of rice production in the member countries.

### The World References

The World References No.2 (186 references) were ready only by the end of August instead of in July 1975, because the bilingual typist of the division was assigned temporarily for 1½ months to Administration.

The World References No.3 could not be published at the end of December as planned, the secretary of the division having resigned for personal reasons on the 18th of December, 1975.

The "World References" include documents dealing with rice production outside the WARDA region, but of interest to WARDA member countries.

Both the Indexes and the "World References" have been sent to the member countries and cooperating agencies.

### Microfiche Laboratory

600 microfiches of non-indexed documents were duplicated and sent to the Ministries and all Research Stations collaborating with WARDA in the member countries. They are divided into two. The first part deals with aspects of research for the Research Stations, while the second part deals with development and economic aspects for the decision making Ministries.

62,820 pages (representing 1,047 microfiches) were microfilmed of documents analysed in the Indexes and given in the "World References". These microfiches are sent on request, free of charge.

The consultant photographer from FAO spent one month and half of his assignment microfilming documents relevant for rice production at the BIS in Bangui.

Thirteen microfiche readers have been distributed to research stations in the WARDA member countries (Senegal, Gambia, Sierra Leone, Liberia, Ghana, Nigeria, Mali, Mauritania). Twenty-five more have been ordered for those stations which are yet to receive theirs (Ivory Coast, Togo, Benin, Niger, Upper Volta, Guinea-Bissau).

### Library

The librarian completed the card catalogue of the documents available at the Documentation Centre according to the Agris classification. The library includes about 1,000 books, a third of which are on rice production. The library is also receiving about 100 periodicals, most of them on exchange basis.

### Missions

The documentalist took part in the meeting of West African Librarians and documentalists at IITA, Ibadan in January 1975. The purpose of the meeting was to establish a network of Agricultural Libraries and Documentation Centres of West Africa (Aglinet), in order to strengthen cooperation and exchange of information among West African countries.

The indexer and the specialist in information system visited the OMVS Documentation Centre at Saint Louis, Senegal in February 1975.

In April 1975 the documentalist also visited the River Niger Commission Documentation Centre at Niamey, Niger to establish better cooperation in the collection and exchange of documents.

The documentalist also participated in October 1975 in a Seminar in Niamey, Niger meant to strengthen collection and exchange of information between member countries of River Niger Commission and WARDA.

The documentalist participated at the meeting on Agris Tropical in Rome, in December 1975, the purpose of which was to establish an information network on tropical agriculture for developing countries.

#### Exchange of Documents

We already have agreements for the exchange of documents with the West African countries members of WARDA. Also the seminar held in January 1975 in Ibadan on Aglinet has been yielding fruitful results because the inflow of information from the participating West African countries has become more regular. Publications are also regularly received from IRRI, IRAT, ODA and Asian countries such as Japan and India.



## COMMUNICATIONS DIVISION

The Fourth Session of the Governing Council, held in Ibadan, Nigeria, in December 1974, approved the following fields of activity of the Communications Division: translation, editing, printing of publications, public relations of the Association. These were all continuing activities. Three new specific tasks were, in addition, assigned to the Division: the establishment, at WARDA's Headquarters, of a language laboratory, the compilation of a bilingual glossary of terms relating to rice, and the establishment of a more elaborate printing unit, including offset equipment, to improve the standard of the Association's publications.

It was hoped that, by the end of 1975, the Division would be fully staffed, the optimum being defined as three translators, two scientific editors, two language teachers and one graphic artist, as well as, the necessary supporting staff in the general services category. Unfortunately, it has not been possible to achieve this objective, and the staff of the Division still consists of an English-French translator who is heading the Division, a second English-French translator, and the English teacher.

A request put forward to the UNDP/FAO for the financing of a French-English translator and of a French speaking scientific editor, under the Phase II of the assistance to WARDA, was not approved. The Peace Corps had agreed to provide an English speaking scientific editor, but it was not possible to locate a suitable candidate. Temporary assistance has been secured, in the translation field, when the workload was too heavy, but this stop-gap solution cannot be considered as satisfactory. The recruitment of a graphist is essential if public relations activities are to be expanded, and also in view of the impending establishment of an offset printing equipment.

During the year, the equipment for the language laboratory was installed. It includes a tape recorder, the control console for the teacher, headphones for ten students, a film strip projector, as well as tapes, film strips and books. As far as the printing equipment is concerned, it has not been possible to reach an agreement with UNDP/FAO (which was to finance its purchase) on the type of equipment to be bought. Moreover, the present liquidity crisis affecting the UNDP has resulted in a freeze of new purchases, and it is now unlikely that this equipment will be ordered before the middle of 1976.

#### Activities

a) Translations. The year under review has been very busy for the Communications Division, which has seen its activities and output increase considerably. The main single activity carried out during the period has been the compilation and the publication of the "Rice Vocabulary", which includes, in its first edition, more than 2,500 words in English and French and, for insects and weeds, their latin scientific names. About a hundred books and documents were used as references in this systematic effort to assemble in a single document all the terms used in the field of rice cultivation, processing, marketing etc. It is hoped that this document, which has been widely distributed within and outside the region, will prove useful to research workers, translators and interpreters, and generally to all those concerned with the different aspects of the rice industry. Compilation of the "Rice Vocabulary" started in January 1975, and the document was published in July 1975.

The translation team had also to deal with the Rice Research Review Meeting, for which twenty conference papers were translated, in addition to the two volumes of the WARDA Annual Research Report. Among the main translations, mention can be made of the report on the "Development of Rice Cultivation

in the Sahel Countries", and of the Case Study N° 1, "The Irrigated Rice Area of the Kou Valley, Upper Volta", as well as the second issues of the World Rice References and of the Bibliographic Index. Documents were also translated for the meetings of the Scientific and Technical Committee, of the Advisory Committee, and of the Governing Council.

The translation unit prepared the first draft, in French, of the proceedings of the seminar on Plant Protection for the Rice Crop, and of the seminar on soils and fertilizers use. The English editing for these, as well as for the seminar on Socio-Economic Aspects of Rice Cultivation in West Africa, was done by the Deputy Executive Secretary. The assistance of IRAT, Paris was obtained for the final French editing.

b) Language Laboratory. The language laboratory started operation in September 1975. Courses are given five hours a day, five days a week for fifty members of staff.

c) Communications. The Division has undertaken a systematic exploitation of information contained in the 90 odd papers (dailies from member states and international magazines) received every week. These papers are scanned for relevant information which is, after circulation among the expert staff, kept on file.

d) Public relations. The Head of the Division carried out in October, an exploratory mission to Senegal, in view of the preparation of an exhibition to be held during the Governing Council meeting. A second mission was undertaken at the end of November for the actual preparation of the exhibition. This included five large panels with texts, photographs, histograms, and documents covers, illustrating WARDA's activities in the fields of research, development, training, documentation, communications and statistics. The exhibition also included a collection of 14 rice varieties grown at the Seed Multiplication Centre, Richard Toll, presented in bundles,

and a larger collection of rice seeds samples, in glass jars. The Communications Division has prepared a short brochure, entitled "What WARDA Can Do for You", which has been widely distributed within and outside the region.

e) Publications. A large number of publications were released in 1975. The Communications Division has prepared layouts and designed covers for them, and ensured their printing and distribution. The main documents are listed below:

1. "Socio-Economic Aspects of Rice Cultivation in West Africa", February 1975, English
2. "Rice Varieties Recommended in the WARDA Region", April 1975, English and French
3. "What WARDA Can Do For You", April 1975, English and French
4. "WARDA Integrated Programme and Budget", April 1975, English and French
5. "Case Study N° 2, the MacCarthy Island Division Pilot Irrigation Project in The Gambia Economy", April 1975, English
6. "Report of the Assistance to the World Bank/FAO Mission in The Gambia for the Preparation of the Phase II of the IDA Agricultural Development Project", April 1975, English
7. "Future Rice Milling Requirements of Northern Ghana", April 1975, English
8. "Annual Research Report", Volumes 1 & 2, May 1975, English & French
9. "Regional Seed Multiplication Centre, Richard Toll, First Annual Report", May 1975, English and French
10. "Development of Rice Cultivation in The Sahel Countries", June 1975, English and French
11. "Final Report of the Rice Research Review Meeting", June 1975, English and French
12. "Rice Vocabulary, English-French-Latin", June 1975
13. "Case Study N° 1, The Irrigated Rice Area of the Kou Valley, Upper Volta", July 1975, English and French
14. "Senegal: Projet de mise en Valeur du Perimetre de Matam", July 1975 French
15. "World Rice References for West Africa, Volume 2", August 1975, English and French

16. "Case Study N° 3, Large Scale Mechanized Rice Production in Northern Ghana", September 1975, English
17. "Conflicts between Farmer's Income and Cost of Living: a Quantitative Analysis of a Paddy Price Increase", September 1975, English
18. "Annual Report, December 1971-December 1974", October 1975, English and French
19. "Rice Statistics Yearbook, First edition, July 1975", November 1975, Bilingual
20. "Economic Aspects of Chemical Fertilizers used in Rice Production in the WARDA Region", October 1975, English
21. "Etude Comparative de Differents Systemes de Riziculture en Cote d'Ivoire", November 1975, French