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**REPORT OF THE THIRD BIENNIAL WARDA/NATIONAL
EXPERTS COMMITTEE MEETING**

11– 13 June 2002, M'be, Côte d'Ivoire

WARDA/NARS Partnership

An African Success Story

**BIENNIAL WARDA/NATIONAL EXPERTS
COMMITTEE MEETING Report No. 3**

About WARDA – The Africa Rice Center

WARDA – The Africa Rice Center – is an autonomous intergovernmental research association of African member states. It is also one of the 16 international agricultural research Centers supported by the Consultative Group on International Agricultural Research (CGIAR).

The mission of WARDA is to contribute to food security and poverty alleviation in sub-Saharan Africa (SSA), through research, partnerships, capacity strengthening, and policy support on rice-based systems, and in ways that promote sustainable agricultural development based on environmentally sound management of natural resources.

The *modus operandi* of WARDA is partnership at all levels. WARDA's research and development activities are conducted in collaboration with various stakeholders – primarily the National Agricultural Research Systems (NARS), academic institutions, advanced research institutions, farmers' organizations, non-governmental organizations, and donors – for the benefit of African farmers, mostly small-scale producers, as well as the millions of African families for whom rice means food.

The 'New Rice for Africa' (NERICA), which is bringing hope to millions of poor people in Africa, was developed by WARDA and its partners. The success of the NERICAs has helped shape the Center's future direction, extending its horizon beyond West and Central Africa into Eastern and Southern Africa.

The creation of NERICA is in harmony with the spirit of the World Summit on Sustainable Development (WSSD), the Tokyo International Conference on Africa's Development (TICAD), the Millennium Development Goals (MDG), and the New Partnership for Africa's Development (NEPAD) for sustainable development. The African Rice Initiative (ARI) was launched in 2002 to promote the dissemination of NERICA and complementary technologies throughout SSA.

WARDA hosts ARI, the Regional Rice Research and Development Network for West and Central Africa (ROCARIZ), and the Inland Valley Consortium (IVC).

WARDA has its headquarters in Côte d'Ivoire and regional research stations near St Louis, Senegal, at the International Institute for Tropical Agriculture (IITA) in Ibadan, Nigeria, and at the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) research station at Samanko, near Bamako, Mali.

For more information, visit www.warda.org

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11– 13 June 2002, M'be, Côte d'Ivoire

WARDA/NARS Partnership: An African Success Story

Logo

**WARDA – The Africa Rice Center
01 B.P. 2551, Bouaké 01, Côte d'Ivoire**

2003

Biennial WARDA /National Experts Committee Meeting Reports
*This series of publications contains the report of the Biennial
WARDA/NARS Experts Committee Meetings and highlights of papers
presented during the meeting.*

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1. Introduction

1.1 Background

The Third Biennial WARDA/National Experts Committee Meeting was held from 11– 3 June 2002 at WARDA Headquarters at M'be, Côte d'Ivoire, in accordance with the Resolution 4 adopted by the WARDA Council of Ministers during its Twenty-First Ordinary Session in 1997.

The Resolution “endorses the suggestion of the Director General of WARDA for Directors of NARS to meet at WARDA Headquarters during alternate years when meetings of the WARDA Council of Ministers are not being held.”

1.2 Major Developments (March 2000 to June 2002)

After the creation of the West and Central Africa Rice Research and Development Network (known by its French acronym of ROCARIZ) from the merger of the WARDA/NARS Task Forces and WECARD-CORAF Rice Network in 1999, the *First Regional Rice Research Review* (4Rs meeting) was held at WARDA Headquarters from 10 to 13 April 2000. The first 4Rs meeting drew over 100 participants from West and Central Africa, other parts of Sub-Saharan Africa, and beyond.

On 12–13 October 2000, WARDA took a first step in broadening its network of partners beyond traditional NARES, at a preliminary *Workshop on Partnerships between WARDA and Ivorian Non-Governmental Organizations* (NGOs) at Headquarters. Some 35 NGOs were represented, covering a range of interests, including rural and social development, farmers' organizations, and women's and child concern. WARDA presented an overview of its existing partnerships, and its participatory research and development activities. Possible areas of, and modes for, future collaboration were discussed.

On 14–16 March 2001, WARDA hosted a *Workshop on A Collaborative Platform for Agricultural Research in Sub-Saharan Africa*, which was co-organized with ISNAR, and sponsored by CTA. The meeting brought 13 university officials from 10 sub-Saharan countries, together with WARDA and ISNAR staff, and research managers from the Ivorian Ministry of Higher Education, and the *Centre Ivoirien de Reserche Economique et Sociale* (CIRES). The participants established a platform for collaboration among international agricultural research centers, universities, and national agricultural research organizations to maximize the advantages of each partner and improve efficiency in agricultural research and education.

On 2–4 April 2001, WARDA and WARF organized a workshop in Dakar, Senegal, to review, revise and validate a project proposal on *Participatory adaptation and evaluation of integrated crop management (ICM) options for irrigated rice* in Burkina Faso, Côte d'Ivoire, The Gambia, Mali, Mauritania, and Senegal. The 34 participants represented national research and extension partners from the target countries; WECARD/CORAF; Coordinators

of the FAO Special Program for Food Security from four of the countries; NGO representatives from two countries; Producer organizations from three countries; Winrock International, Senegal; FAO Rome (plus one FAO consultant from Australia) and FAO Africa Office, Accra; WARDA and WARF. The proposal was duly validated and passed for further processing by WARDA.

On 9–12 April 2001, WARDA hosted an international workshop on *NERICA-based Food Security in Sub-Saharan Africa*, at its headquarters. The workshop was attended by over 90 participants from African and Asian research institutions, including several Ministers and Vice-Ministers from West and Central African states, the President of the Rockefeller Foundation, senior officials from the World Bank, the African Development Bank, the United Nations system and WARDA. Participants unanimously agreed to form a Consortium to coordinate wide dissemination of NERICA to millions of poor farmers, many of them women, in Sub-Saharan Africa. Dr Gordon Conway, President of the Rockefeller Foundation, said: “NERICA rice varieties represent genuine new potential for resource-poor farmers throughout Sub-Saharan Africa and should be disseminated widely throughout the continent.”

The *23rd Ordinary Session of the WARDA Council of Ministers* met on 23–24 August 2001, in Dakar, Senegal. Among other items, the Council was presented with the draft *Strategic Plan for 2001–2010*.

On 21–22 September 2001, WARDA celebrated its *30th Anniversary* at its Headquarters. During the opening ceremony, honors were presented to five WARDA staff in the presence of His Excellency Mr Pascal Affi N’Guéssan, Prime Minister of the Republic of Côte d’Ivoire, including Director General Kanayo F. Nwanze, who was conferred with the title of *Commandeur dans l’ordre du mérite Ivoirien* (“Commander in the Ivorian Order of Merit”) for services to West and Central Africa through his leadership of WARDA since 1996. His Excellency the Prime Minister said: “Côte d’Ivoire, WARDA’s host country, feels it a duty to express its recognition on behalf of all the member states.”

The *Inland Valley Consortium Annual Meeting* was held at Abomey, Benin, from 11 to 15 March 2002. Nine member countries (of 10) and 6 international institutions discussed land development and technologies for profitable and sustainable development of inland valleys—alternatives to mineral fertilizers, diversification (livestock, aquaculture, vegetables), socio-economic aspects (land tenure, profitability of technology), and development of appropriate tools for forest zones. Scaling up was also discussed with reference to participatory learning and action research (integrated rice management), and use of benchmark areas.

The *African Rice Initiative (ARI)* was launched by His Excellency Mr Pascal Affi N’Guéssan, Prime Minister of the Republic of Côte d’Ivoire on 27 March 2002, at a ceremony attended by over 100 ministers, agricultural scientists, diplomats, farmers, representatives of donor agencies, NGOs and WARDA’s member states. On the previous day, delegates from the 27 participating

countries met to discuss and finalize the project document at WARDA Headquarters.

The *Second Regional Rice Research Review (4Rs)* was held at Headquarters from 9 to 12 April 2002. The first 'National Scientist Awards' were presented to Dona Dakouo *et al.* for Best Paper, M'baré Coulibaly for Outstanding Contribution to Rice Research, and Babou Jobe for Best Presentation. The meeting included the first meeting of the Technology Transfer Task Force. Subsequently, the ROCARIZ Steering Committee met and approved 96 small-grant research projects for ROCARIZ participants from the national research and development organizations of member states at a cost of US\$343,658 for the period 2002–2003 (the cost includes annual subvention of \$40,000 to the Rice Research Station, Rokupr, Sierra Leone, as implementing institution for mangrove-rice activities throughout the subregion, and host of the Mangrove Rice Task Force).

1.4 WARDA Core Research Expenditures Versus Support to NARS

As an Association of member states, WARDA directly and indirectly channels funds that supports rice research and training in all 17 countries. This is well recognized, as was the case in 2001 when WARDA was applauded by Burkina Faso for its support to the tune of CFA 22 million. A detailed analysis of our expenditures showed that, in 2000 and 2001, WARDA spent \$873,116 and \$771,475 respectively as direct grants to NARS. These amounts were equivalent to 22.45% and 20.56 of WARDA research program expenses (supplies & services) that went to NARS through ROCARIZ, IVC, PVS etc., in those years. These figures are in stark contrast to actual contributions received from member states in 2000 (\$297,898) and 2001 (\$147,505). Several NARS depend solely on these grants for their operational rice research budgets without which little activity occurs during the year. Given the trend in donor support and the development of CGIAR Challenge Programs (CP), the sustainability of this mechanism of support remains doubtful.

1.5 Visiting Scientists and Training Activities

The NARS Visiting Scientist (VS) scheme has been quite successful in placing 12 scientists from eight countries since its inception in 1998. Four VS are currently completing their 2001/2002 assignments at M'bé. The call for nominations for 2002/2003 is in progress. WARDA remains extremely active in the area of human capacity building. During the period under review, WARDA conducted 26 training courses, which attracted over 742 participants. In addition, 24 Doctoral, 3 Masters, and 6 other postgraduate students were attached to WARDA.

1.6 WARDA Director General's Vision

WARDA as a regional institution has been transformed into a vibrant ecoregional research and development "partnership" center with a strong commitment from its NARS and their governments. Ownership and political

support have provided the basis for a success story in regional integration. As an international institute supported by the CGIAR, WARDA has become an important information hub; positioned itself at a strategic point in the global agricultural dynamics, and a model in North-South and South-South cooperation – a true African success story.

Our new strategic direction should aim at sustaining us as a dynamic center of excellence by consolidating acquired knowledge, creating a vibrant pool of new knowledge and technologies that address more robust ecologies other than uplands, crop and income diversification, and post farm-gate value-added agro-processing interface.

Three interlocking themes describe our ecological focus: sustaining uplands, intensifying and diversifying lowlands, and optimizing resource-use efficiency in irrigated systems. Simultaneously, our ecological focus should be addressed within three interlocking and multi-disciplinary thematic domains, namely crop improvement, INRM and socio-economic and policy.

Because we have established our reputation for excellence and have succeeded in building a level of pride of ownership within the membership of our Association, it is all the more reason for us today to remain focused, to capitalize on our strengths and comparative advantages, to boldly accept our leadership role in rice R&D in sub-Saharan Africa and reflect it in our name, "WARDA – The Africa Rice Center".

2. Summary Report and Main Conclusions and Recommendations

2.1 Introduction

The third biennial WARDA/National Expert Committee (NEC) Meeting was held, 11 - 13 June 2002, at WARDA Headquarters at M'be, Bouake, Côte d'Ivoire.

The meeting was attended by Heads of National Agricultural Research Systems (NARS) institutions of WARDA member states: Benin (INRAB), Chad (ITRAD), Burkina Faso (INERA), Cameroon (IRAD), Côte d'Ivoire (MESRS and CNRA), The Gambia (NARI), Ghana (CSIR), Guinea (IRAG), Guinea-Bissau (INPA), Liberia (CARI), Mali (IER), Niger (INRAN), Senegal (ISRA), Sierra Leone (NARCC) and Mauritania (CNRADA). Nigeria (NCRI) was not represented at this meeting.

Dr Diomandé Mamadou, who recently ended his tenure on the WARDA Board and was former Chairman of the Board Program Committee represented the WARDA Board of Trustees.

WARDA was represented by its Director General; he was assisted by the Director of Research, the Director of Administration and Finance, the Deputy Director of Research, the Assistant Director of Corporate Services, Program Leaders, Heads of Support Units and Scientists.

See Appendix 9 for Participants' List.

2.2 Objectives

The objectives of the meeting were to:

1. Review the activities, achievements and future prospects of the Association since the second NEC meeting in March 2000.
2. Discuss and react to the changes at the CGAIR centers and their effects on the coordination and integration of CGAIR/NARS joint research projects.
3. Discuss the modalities of the functioning of the African Rice Initiative-NERICA Consortium.

2.3 Adoption of the Agenda

Participants adopted the agenda and work schedule (See Appendix 8).

Dr Jean Detongnon, Director of INRAB, BENIN, chaired the session with Dr Koffi Sie, Director General of CNRA, Côte d'Ivoire and Prof. Emmanuel Owusu Benoah, CSIR, Ghana, were elected rapporteurs. Philip Idinoba, IVC-WARDA and Somado Eklou, INGER-WARDA were asked to assist the rapporteurs.

2.4 Tuesday, 11 June 2002 – Morning Session

After observing a minute's silence in memory of Dr Andrew F. Payne, former Director of CARI and the 1999-2000 Chairman of NEC, the Director General of WARDA, Dr Kanayo F. Nwanze, welcomed the participants to the Third Biennial WARDA/National Experts Committee (NEC) meeting.

The Director General introduced WARDA senior management staff: the new Director of Research Dr G Hahne and the Director of Administration and Finance, Mr M Dube. He also introduced Prof. B Gue, the Ivorian replacement for Dr M Djemandé who just finished his term as a WARDA Board member and Dr Z Z Subah from CARI, representing Liberia following the death of Dr Payne, Dr A Agboli, Director General of ITRA, Togo who was participating for the first time.

Prof. N'guessan Yao Thomas, Director of Research, delivered the opening address, on behalf of the Côte d'Ivoire Minister of Higher Education and Scientific Research, Prof Séry Bailly, who was unable to attend the meeting. He congratulated WARDA on its research results, which he said transcend the West Africa's regional boundaries. He emphasized the importance of the present meeting in the reinforcement of the linkages between the regional NARS and WARDA. He congratulated WARDA and its DG for successfully passing through some difficulties in the last couple of years and rejoiced with WARDA on the findings of the Independent Audit Report on WARDA financial management, which cleared WARDA and its DG of all the allegations. Prof. N'guessan on behalf of the Minister, expressed the Ivoirian Government's pride, confidence and support for WARDA and its activities,

Following the opening ceremony, five presentations were made:

2.4.1 Main Issues and Conclusions from the Twenty-Third WARDA Council of Ministers Meeting of 24 August 2001 at Dakar, Senegal

The Twenty-Third Council of Ministers meeting can be summed up in seven main resolutions and other conclusions and suggestions. The Resolution 1 relates specifically to research, emphasizing the need for continued support in research and development work in the areas of mineral fertilization, improved seed, mechanization and conservation of plant genetic resources on sustainable high levels of rice production in the sub-region.

The need for regular and timely payment of contributions to WARDA by member states and the promotion of public awareness campaigns (Rice Days) at the national level to improve recognition of WARDA activities was highlighted.

2.4.2 Recommendations and Conclusions of the Second Biennial WARDA/ NEC Meeting

The first presentation by the WARDA Director General, Dr K F Nwanze was on the recommendations and conclusion adopted at the second biennial WARDA/NEC meeting. They are as follows:

- The nomination of the members states to WARDA Board of Trustees
- Overview of WARDA research program and the progress made by the Association
- Collaborative WARDA/NARS research projects
- Member states' financial contribution to WARDA budget
- The CGIAR vision for 2010
- WARDA Strategic Plan 2001 – 2010

2.4.3 The Director General's Report, April 2000 – May 2002

This report covered the following points:

- Activity reports of major events at WARDA
- WARDA financial environment
- WARDA research expenditure in relation to NARS support
- Visiting Scientist and training activities
- Regional integration within the CGIAR
- Geographical mandate
- Conclusion.

Some of the discussions on the two presentations included the following issues:

- **WARDA's Geographical Mandate**

Many participants raised questions on the opportunity to change the name of WARDA and expansion of membership of the association. It was generally agreed that the uniqueness of WARDA as a West Africa sub-regional association has to be maintained. The participants estimate that in view of the extension of WARDA geographic mandate, the best name will be WARDA – Africa Rice Center. However, the association is open to all countries that would want to be members but would have to follow the established procedures for this.

- **WARDA's Difficult Financial Situation**

The regular payment of member states' financial contribution is a motivation for international donors. It is recommended that member's contribution could be included in the annual budgets of the government of Member States to make payments. In addition, it was proposed that internal capacity to develop convincing and competitive project proposals to international donors should be strengthened. The WARDA established system of reward/ incentives to scientists with demonstrated ability to mobilize funds was encouraged. The possibility of private sector financial support of specific research projects was also envisaged.

2.4.4 Report of the Director of Research

Highlights from this report as well as from the report on the Overview of WARDA Research Program are presented in the Appendix 1. The discussions that followed the presentation led to the following recommendations:

Conclusions/Recommendations

- It was recommended that greater reinforcement of the collaboration between the NARS, Universities in the sub-region and WARDA be pursued.
- The establishment of an annual meeting between WARDA Director of Research and his/her counterparts in the NARS, thereby creating a forum to work together and to formulate joint competitive research projects for the purpose of attracting supplementary funds.

Overview of WARDA Research Program

The following presentations were made:

1. Rainfed Systems
2. Irrigated System
3. Rice Policy and Development Program

The discussions that followed these presentations led to the following conclusions and recommendations:

Conclusions/ Recommendations

- **The involvement of the universities in the sub-region in WARDA research agenda and Networks:**

WARDA should consider the involvement of the universities in the sub region in its research agenda and networks a priority. The proactive step already taken by WARDA by organizing in 2001, a successful meeting of vice-chancellors of universities in the sub-region to work out a common agenda on partnership was noted. This effort needs to be encouraged and pursued. However, this cannot be resolved at WARDA level alone. The NARS Directors need to sensitize themselves to the involvement of universities in the existing sub-regional networks.

- **The competitiveness of West African countries in rice production**

Though WARDA does not have recent data from all member states on rice competitiveness, it was noted that competitiveness is not a static phenomenon but variable with time and between countries. It can change rapidly with time due to economic factors like exchange rate. The reality is that some rice exporting countries have a range of programs for indirect

support of their rice economies, which is a valid argument to support investment in rice production in West Africa. It was also noted that discussions are being made at higher levels to harmonize rice production policy in West Africa.

- **Fund mobilization**

There are two possibilities, first, WARDA can utilize existing funds to optimize its activities or seek non-traditional donors (e.g. look for a private company to fund research on molecular biology). In the Challenge Program in sub-Saharan Africa, WARDA's intervention should not only be in West Africa but also in East and Central Africa. Therefore, the extension of WARDA mandate seems inevitable if the association wants to move forward in attracting available funds.

Tuesday, 11 June 2002 – Afternoon Session

Dr Bruce-Oliver from The Gambia chaired this session. WARDA DG gave the opening comments. The idea of this session arose from the 2000 meeting, which highlighted the multiplicity of projects in networking carried out with the same individuals in different countries. The question is, how can the association maximize its resources and not overstretch the absorptive capacity of the NARS partners.

2.4.5 WARDA Network Projects

The following presentations were made on WARDA-NARS Network projects Appendix 2: The Inland Valley Consortium, ROCARIZ, INGER-Africa, PADS/PATD and CBSS, PVS.

2.4.6 The African Rice Initiative, NERICA Consortium (Appendix 3)

2.4.7 Agriculture and Health, SWIHA/SIMA INITIATIVES (Appendix 4)

The discussions that followed these presentations led to the following conclusions and recommendations:

- There is room for better integration of the Network activities/projects carried out at WARDA.
- It is necessary to extend the research networks/project to the dissemination of the varieties developed by WARDA and to initiate expansion of post harvest research.
- Improve the collaboration between WARDA and the NARS for greater efficiency in the execution of common research projects, timely reporting, follow-up of meetings and the development of joint project proposals.
- The multiplication and diffusion of WARDA-developed improved varieties particularly the NERICAs across WARDA member countries should be given priority.

- Considering that the African Rice Initiative (ARI) is hosted by WARDA as a non-core WARDA program, NEC recommends that the ARI Consortium Management Committee should report to the WARDA Council of Ministers through the established mechanism existing at WARDA.

2.4.8 Wednesday, 12 June 2002 – Morning Session

Presentations were made on the following subjects (Appendix 5)

- Biotechnology
- Biosafety
- Intellectual Property Rights
- International Treaty on Plant Genetic Resources
- Rice – Food and Cash Crop: Political and Economic Implications
- WARDA Inc. – Serving the Seed Sector and Financing Rice research and Development

The following points were retained in the general discussion that followed the presentations:

Conclusions/ Recommendations

- Adopted a resolution inviting the authorities of member states to accelerate the development of a legislation on harmonized bio-safety regulations in West Africa.
- WARDA should organize without delay, a regional training workshop on the relevant issues on bio-safety and Intellectual Property Rights to develop the NARS capacity in this area.
- WARDA research products which are international public goods have to be protected from unauthorized use for instance for business use, where the profit will not benefit WARDA target audience.
- CNRA makes available its well-equipped biotechnology laboratory to NARS technicians and scientists. The lab is managed by IPGRI for the training of African technicians on biotechnology. CNRA invited WARDA and other NARS to use this lab.
- The proposals to create an endowment fund and build strong partnership with the private sector for sustainable seed production with a view to better finance research should be explored while preserving the primary mission of the institute, which is agricultural research. The experience of CNRA in generating funds for research is not necessarily transferable to other countries in the sub-region. Each country should be seen as a unique case.

2.4.9 Wednesday, 12 June 2002 – Afternoon Session

Three presentations were made:

- CGIAR Change Process, Regional Integration and the Way Forward (Appendix 6)

- CGIAR Challenge Programs – Next Steps (Appendix 7)
- Final Report on the Independent International Audit on the World Bank Investigation

Conclusions/ Recommendations

- The Directors of NARS confirmed their involvement in the priority setting of WARDA research programs. The NARS Directors request therefore that, the unique status of WARDA (Regional Association by Constitution) should remain absolutely intact.
 - The new vision and strategy at CGIAR should be applied to the other CGIAR Centers in the sub-region where the principle of involvement of regional NARS in priority setting in their research programs is still at the minimum level. In all conditions, harmonization of the intervention of these Centers in the sub-region is necessary to attain economy of scale, while guaranteeing efficiency, effectiveness and sustainability.
 - An extra-ordinary meeting of WARDA Council of Ministers was recommended to adopt a common position on the final report of the international independent audit of the World Bank investigations at WARDA. Such a Council should be held within 2 months. If this is not possible, it is proposed that the Chairman of the WARDA Council of Ministers should carry out an in-house consultation.
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Appendix 1

Overview of WARDA's Research Programs and Progress since the Last Meeting April 2000-May 2002

1. Introduction

A large part of WARDA research activities is centered on developing technologies. WARDA is particularly strong in varietal improvement. The successful introgression of genes from *Oryza glaberrima* into *O. sativa* and the development of the NERICAs has resulted in an improved genetic diversity thereby not only broadening the genetic base of cultivated rice, but also producing new plant prototypes with extremely interesting agronomic characteristics. The interspecific hybrid breeding approach is now being extended to irrigated and non-irrigated lowland conditions. The program's in-house capacity in modern science was significantly upgraded with the formal establishment of its biotechnology unit. We continue to make progress in the use of anther culture, molecular marker gene technology, and marker-assisted breeding that allows to tag and introgress genes, enhance early generation transfer and rapid fixation of traits.

WARDA is also very strong in developing effective collaboration with our NARES partners. We have strengthened our privileged relationship with NARES partners in the sub-region by developing a participatory research program that permits in-depth discussions with our NARES partners and development agents on scientific, programmatic and partnership relationships. The Participatory Varietal Selection (PVS), Community-Based Seed Production System (CBSS) and Participatory Learning and Action Research (PLAR) approaches are assisting in the rapid adoption and dissemination of NERICAs and other promising rice varieties throughout the region but particularly in Guinea, Côte d'Ivoire, Benin and Togo. Particular emphasis is given to the development and adoption of Integrated Crop Management (ICM) options. To ensure that momentum is maintained, WARDA is involved in detailed studies leading to the characterization of the socio-economic environment of rice production. Particularly interesting are the results on the relationship between intensification of rice cultivation and land tenure, and the influence of the introduction of new varieties on genetic diversity.

WARDA continues to play a leading role in several networks bringing together NARES and other stakeholders from West Africa. The Inland Valley Consortium, ROCARIZ and the African Rice Initiative (launched 27 March 2002) significantly contribute to the integration of research activities in West Africa.

2. Highlights from the Rainfed Rice Program

- WARDA breeding program for the rainfed and irrigated lowlands aims to develop new varieties for small farmers yielding more rice for the

same or less cost of inputs and effort. Notably, we identified 93 lines in the (irrigated) lowlands at M'bé that yielded significantly more than the local variety, Bouaké 189, in the range from 6-78% with a mean increase of 35%.

- Other interspecific hybrid lines introduced from WARDA Irrigated Breeding Program in the Sahel gave impressive yield increases in a farmer's field near Bouaké under irrigated conditions but with poor control over water management. Fifty-three lines significantly out-yielded Bouaké 189 with 28 producing two-three times as much rice as this variety.
- Preliminary investigation showed that yield levels of the fixed lowland interspecific progenies ranged from 5.5 to 8.5 t ha⁻¹ at 100 kg N ha⁻¹ application in the wet season. They will be tested in the experimental field in 2002 for various aspects such as yield and growth characteristics related to weed competitiveness.
- Several new interspecific lines developed in 2001 showed good response to anther culture. They showed the same level of blast tolerance as the *O. sativa* (Japonica) and performed better than the parents under both low and high input conditions.
- Several interspecific lines that performed well in farmers' fields, were evaluated with a set of microsatellite markers. The graphical genotypes showed an introgression of parts of the *O. glaberrima* genome on chromosome 6 and chromosome 2 for all lines. The introgressed fragment on chromosome 6 is located close to the sterility gene. Introgressed segments of *O. glaberrima* were dispersed on all 12 chromosomes indicating that recombination had occurred frequently and that there was no genome-wide barrier during meiosis. *O. glaberrima* fragments are small, thus interspecific lines are near isogenic lines and can be used to determine the functions contained in those specific regions.
- Promising results are being obtained from interspecific progenies developed through pedigree breeding, e.g. the WAB1159 series developed from a cross between WAB56-50 (*O. sativa*, japonica) and Shawhon (*O. glaberrima*). One F5 line had a highly bushy canopy similar to *O. glaberrima* with wide thin droopy leaves and a high tillering ability. Since segregation was still observed in the F5 generation, various types of plants could be developed from its progeny.
- The Participatory Varietal Selection (PVS) database is now operational and can be used by WARDA scientists and the NARES. NERICA varieties are being tested under the PVS scheme in 15 countries, but not all countries have completed the same number of PVS cycles yet. In general, PVS is making good progress but communication with NARES and maintaining continuity and a common quality standard in research is sometimes problematic.

- Many *O. glaberrima* upland cultivars were found to be highly drought resistant compared with most of the *O. sativa* tropical-japonica upland rice cultivars commonly grown in Africa, despite their generally larger leaf area index, specific leaf area, tillering rate and water extraction from the topsoil.
- *Oryza sativa*, *O. glaberrima* and their inter-specific hybrids were evaluated for drought tolerance in a screen house at the vegetative stage in order to appreciate the genetic diversity for this trait. Seven varieties were selected as candidate donors for that trait in future breeding programs. All of the selected varieties were *O. sativa*. This result must be confirmed in the field trials during the dry season.
- Four NERICA lines were selected for their resistance to the African rice gall midge from 300 lines screened under artificial infestation at WARDA/IITA, Ibadan, Nigeria. Studies on mechanisms of resistance to AfRGM showed that silica content of plants, internode elongation, leaf surface wetness, and leaf sheath compactness are important antibiotic and antixenotic traits in resistance to gall midge.
- New sources of resistance to blast were introgressed into NERICA lines from *O. glaberrima*. Except for NERICA 6, all 7 tested NERICA lines had a good level of resistance to the blast fungus.
- A positive and sustainable residual response of NERICAS to rock phosphate was observed three years after a unique application of rock phosphate on an acid soil of the humid forest zone. The yields under these conditions were comparable to those obtained with soluble P fertilizers (TSP) applied cumulatively during four years. Rock phosphate is expected to be economically more interesting for farmers than TSP.
- A long-term soil fertility trial continues to evaluate the productivity and sustainability of various soil fertility management strategies (pre-; incorporation of rice straw, and modest levels of N and P fertilizer) in a lowland rice field at the research station in M'bé. First results indicate that pre-flooding and rice straw incorporation improve both yield and nutrient uptake. Yields increased over a no-input treatment by an average of 0.5 to 1.0 t ha⁻¹ over three seasons. Highest yields were obtained with a combined inorganic / organic fertiliser treatment.
- For the peri-urban project the initial characterization of four key sites (Daloa, Sikasso, Bouaké and Korhogo) has resulted in a characterization of the rice-based lowland evolution from the rural to peri-urban gradient. It provides the project with a solid database to develop further project activities. The key site maps have also been digitalized and all lowland sites have been included. Based on the initial characterization, a lowland typology is being completed.

3. Highlights from the Irrigated Rice Program

- Some 200 new cultivars from intra- and inter-specific crossings are currently in the selection and screening process. Several of these lines have excellent properties with regard to yield, disease resistance, plant type and grain quality. They will contribute to an increased genetic diversity in intensified lowlands.
- Screened characters include weed competitiveness, their nutrient (NPK) efficiency, their salt tolerance and their photothermal constants. Weed competitive cultivars from intra- and inter-specific crosses are tested in farmers' fields. Before the end of 2002, 5 new varieties will be released in the Senegal River valley after 4 seasons of multi-location trials.
- Field trials were established to develop Integrated Crop Management options for intensified lowlands and are currently conducted with local partners in the Casamance and in the Gambia. These trials are accompanied by farm management surveys.
- 3200 copies of handouts for Integrated Crop Management options were distributed to farmers in two major production zones in the Senegal River valley. 70 village technicians were trained for ICM options (Training for Trainers). About 300 farmers are now being surveyed for their adoption and evaluation of the proposed ICM options.
- The evaluation of the technical efficiency in the irrigated rice cultivation in the Senegal River valley continues and is contributes, in combination with the development of Base Farm Models, to the development of a decision-making tool for optimal resource use.
- Degraded soil has negative effects on yield. In an effort to improve soil quality with cost efficient measures, the application of zinc and straw was tested with 29 farmers in the Sourou valley (Burkina). Both treatments resulted in a significant improvement of rice yields. Zinc application increased yields from 3.3 to 6 t ha⁻¹, whilst straw application resulted in yields of 5.3 t ha⁻¹. This finding was confirmed by similar results from Fom Gleita, where straw application on alkaline soils also resulted in a considerable yield increase (up to 2 t ha⁻¹). Intensive soil column studies accompany and underpin these empirical trials.

3. Highlights from the Rice Policy and Development Program

Adoption of New Technologies

- The macro-economic environment of rice in West Africa has changed drastically in the past decade. A comparative advantage study concluded that rice growing is indeed profitable in a competitive environment and that the competitiveness of West African rice has even increased. The competitive advantage is highest under rainfed conditions and is affected by factors at various levels (plot, sector and macro-economic). While the productivity at farm level remains an important factor determining the competitiveness of rice production, the cost effectiveness of technologies for productivity increase must be considered.
- Water control is a critical pre-condition for intensification and land tenure issues influence the adoption of technologies for intensification. A study on land tenure and the adoption of water control measures in urban lowlands concluded that irrigation canals indeed enhance profitability; that investment in water control measures is stimulated if it enhances security of land use; that secure ownership discourages such investment; that those who are secure need other incentives for additional investments; and that formal land titles do not necessarily induce investment.
- There is a need to conserve biodiversity and minimize the risk of loss of biodiversity due to the introduction of modern varieties. A study on the impact of modern varieties on genetic diversity concluded that farmers' practices contribute to the conservation of genetic diversity of their seed material and even increase biodiversity (varietal count), even when modern varieties are adopted. However, the impact of modern varieties on the genetic diversity depends on the mode of their introduction. The impact can be positive if new varieties are introduced as a pool of varieties and a basket of choices with alternative and complementary (agronomic and consumption) characteristics.

Capacity Building for NARS and Farmers

- A participatory learning and action research approach for integrated rice management was developed in two inland valleys under two distinct conditions in terms of social cohesion and water management in the Bandama valley. It took place near WARDA headquarters in collaboration with farmers and national agricultural extension services, ANADER, Projet National Riz (PNR) and the national agricultural research service (CNRA). The approach aims at strengthening farmers' capacity in observing and analysing their own rice management practices, and in taking their own decisions for improvements. The focus is on developing answers to site-specific problems, making best use of locally available resources and knowledge, combined with research-based analysis of the underlying principles. A curriculum has been developed for this participatory learning and action research program (PLAR) for Integrated Rice management (IRM), composed of facilitators' manual with 30 modules and technical reference material. Staff from national research and extension services and NGOs from

Côte d'Ivoire, Benin, Togo, Mali, Burkina Faso and Guinea are being trained in this approach and during the next cropping season, the approach will be implemented in 10 new sites in these countries.

- An external mid-term review for Participatory Adaptation and Diffusion of technologies for rice-based systems (PADS) was initiated by IFAD and conducted in November. The report was very positive about the results obtained by PADS. The work in relation to the set-up and functioning of the cyclic process approach for technology testing and evaluation, the partnership building activities among the various rice-stakeholders in the 4 PADS countries, as well as the assistance in the formation of farmer associations were especially appreciated by the review panel.

Plant Quarantine and Biosafety Unit

- The buildings housing the Plant Quarantine Unit at WARDA have been completed and equipped. This facility will be a corner stone in strengthening the domestic quarantine capabilities by providing assistance in meeting the plant health requirements in the West African region.
- Construction work for the containment facility for transgenic plants is almost finished. This facility will allow WARDA to become actively engaged in the testing and eventually the production of genetically modified rice, as soon as the legal framework will have been established in Côte d'Ivoire. WARDA continues to be actively involved in the process of developing the biosafety regulations.

Appendix 2

WARDA/NARS Collaborative Projects

1. Highlights from IVC

The activities of the Inland Valley Consortium (IVC) showed several highlights. The proceedings of the hydrology workshop and other workshops held from 1997-2000 were finalized. A CD-ROM on the diagnostic tool for improving water management (DIARPA) was released by CIRAD/IVC and is now available through IVC or CIRAD. The format of the West African Inland Valley Information System (WAIVIS) was defined and data entry is almost completed. Five NARS scientists from IVC member countries visited WARDA for 3-4 weeks to prepare scientific articles on their research conducted in Phase I. In 2001, a total of 13 research projects on development of inland valleys were financed by IVC for a total amount of about US\$ 75,000. IVC co-ordinators visited 7 out of the 10 IVC member countries at least once in 2001.

2. Highlights from ROCARIZ

The total number of ROCARIZ funded projects in 2000 was 78, compared to 67 projects in 2001. The Breeding Task Forces registered the largest decrease of 36.8%.

The WARDA/NARS multi-disciplinary monitoring team found that access to improved rice seeds by farmers remains a constraint to rice research and development within the sub-region. Opportunities for inter-country marketing of improved rice seeds exist between Senegal and Mauritania and possibly The Gambia, as well as between Togo and Benin, possibly including Ghana; Rice is increasingly becoming a significant food-security commodity in the sub-region. However, the in-country co-ordination of WARDA outreach program under the ROCARIZ scheme suffers from a lack of specific funding.

3. Highlights from Genetic Resources Unit/INGER Africa

The activities of the Genetic Resources Unit of WARDA including INGER contribute to the sharing and wide-scale testing of superior, stress-resistant varieties of rice in Africa. The capacity of NARS has been improved through information exchange and training. Five post graduate students from Côte d'Ivoire and one from Guinea completed their theses with support from the DFID-funded INGER project in the areas of impact assessment and biodiversity characterization and management. Sixty technicians from public and private institutions in Cote d'Ivoire were trained in seed production, certification and management in collaboration with the Ministry of Agriculture of Cote d'Ivoire and the GTZ regional seed project in Ghana. With small grants from INGER, more than 100 farmers participated in multi-location on-farm testing of new/improved germplasm conducted by NARS scientists throughout west, central and Eastern Africa. INGER disseminated improved germplasm through farmer/community based seed management,

multiplication and conservation. An effective system for monitoring the impact of new/improved rice varieties on farmer livelihoods is being put in place in Cote d'Ivoire, Guinea and Nigeria. Collection, characterization and storage of traditional varieties from Cote d'Ivoire and Guinea contribute to the understanding of the principles behind farmers' management of rice biodiversity. Activities are being consolidated, with new countries (Namibia, Zimbabwe, Zambia, Sudan, Gabon, and Rwanda) having joined the network in 2001.

4. Highlights from PADS/PTDP

4.1 Participatory adaptation and diffusion of technologies for rice-based systems (PADS): An IFAD funded project implemented through national partnership including NARES, NGOs and farmer groups and associations in Côte d'Ivoire, the Gambia, Ghana and Guinea. An external mid-term review for Participatory Adaptation and Diffusion of technologies for rice-based systems (PADS) was initiated by IFAD and conducted in November. The report was very positive about the results obtained by PADS. The work in relation to the set-up and functioning of the cyclic process approach for technology testing and evaluation, the partnership building activities among the various rice-stakeholders in the 4 PADS countries, as well as the assistance in the formation of farmer associations were especially appreciated by the review panel.

4.2 Participatory technology development project (PTDP): A BMZ/GTZ-funded project implemented in collaboration with NARES, NGOs and farmers association in Benin Republic and Nigeria.

The processes in both these include:

- Diagnosis: has been implemented in representative villages of the major agro-ecological rice-based systems. For PADS, due to time constraints farmers' involvement has been rather limited and the teams acquired little experience with the use of PRA tools. In the case of PTDP farmers were closer involved in the PRA.
- Planning: participatory planning takes place at the regional and national level. Farmer involvement can be improved in planning at the village level.
- Experimentation/implementation: mainly demonstrations of improved technologies or collaborative-type of experiments. Farmers' involvement in the design of the experiments can be improved and technologies need to be proposed as options for further adaptation by the farmers; consultative or collaborative experimentation.
- Evaluation: often emphasising bio-physical criteria. Farmers' involvement in the evaluation phase can be improved in order to better capture socio-economic criteria for technology adoption. Results of the experiments are discussed at regional/national level with all stakeholders and are used to start planning for the coming season.

5. Highlights from Participatory variety selection (PVS)

Started in 1996 in selected sites in Côte d'Ivoire, PVS is now extended to all WARDA member countries. PVS can be classified as type 1 approach and collaborative experimentation. Since 2001 a distinction is made between Research-PVS and Extension-PVS. Research-PVS is now implemented in more than 80 sites, involving about 30 to 50 farmers per site. Extension-PVS was for the first time experimented in 1 site in Danane, involving 35 extension workers, 52 villages and 460 farmers directly and about 500 indirectly. In 2002, the extension-PVS will expand to 7 other sites in Côte d'Ivoire and 6 other countries; it will involve about 6000 farmers directly and another 6000 farmers indirectly. In extension-PVS, farmers are selecting the varieties on their own.

6. Community-based seed (production) systems (CBSS)

This approach was developed at WARDA and is now fully taken up by the ministry of agriculture and extension services in Côte d'Ivoire and Guinea through UNDP/WB funded projects. WARDA provides support to these projects.

7. Participatory learning and action research (PLAR): The PLAR approach for integrated crop management (ICM) in inland valleys was set-up in 2001 in 2 sites in Côte d'Ivoire with distinct conditions in terms of social cohesion and water management; in collaboration with staff of ANADER and PNR and 2 farmer groups of 40 farmers each. A curriculum for farmer learning has been developed, composed of a facilitators' manual with 30 modules and a technical reference manual. Forty research and extension workers have been trained and the approach will be implemented in 11 additional sites in 2002.

Appendix 3

The African Rice Initiative

A new African Rice Initiative, to bring renewed hope to millions of peasant farmers who grow rice throughout Sub-Saharan Africa, was launched by Pascal Affi N'Guéssan, Prime Minister of the Republic of Côte d'Ivoire, on 27 March 2002.

The African Rice Initiative, or ARI, proposes to step up the dissemination of the New Rice for Africa, or NERICAs, developed by WARDA. ARI will also promote complementary technologies to improve soil fertility and make rice farming more sustainable in the fragile uplands and other ecologies of Sub-Saharan Africa. NERICA has been steadily gaining a reputation for itself and its developers both in the region of West and Central Africa, and internationally. ARI is in harmony with the New Partnership for Africa's Development (NEPAD).

Implementation

ARI will be the platform for an extended partnership among rice-development stakeholders, policy-makers, and donors through two major complementary components:

- A Stakeholders' Platform to promote dissemination of NERICAs and complementary technologies; stakeholders will include extension specialists, farmers, NGOs and scientists from national programs.
- A Research Network to further increase productivity and safeguard the quality of the natural resource base of rainfed rice-based systems. This network will facilitate information exchange between research and the ARI stakeholders.

ARI membership is open to any sub-Saharan African country, but the initial focus will be on seven West African pilot countries (Benin, Côte d'Ivoire, The Gambia, Guinea, Mali, Nigeria, Togo). NERICAs will also be promoted in 10 non-pilot countries in West and Central Africa and 10 in East and Southern Africa through Participatory Varietal Selection (PVS) activities.

The NERICA Consortium for Food Security in Sub-Saharan Africa will be the implementing body of ARI. ARI will be based at WARDA as a non-core program with a Management Committee reporting to WARDA Council of Ministers through its Management. A Consortium Management Committee will meet annually to review progress, set budgets, and plan activities.

Potential Donors

Donors of ARI who have so far expressed intent to support the Initiative are the Government of Japan, the UNDP, the World Bank, the Rockefeller Foundation, the African Development Bank, USAID, IDRC, FAO, and the NEPAD.

Appendix 4

Agriculture and Health: The SWIHA and SIMA Initiatives

Until recently, little or no importance has been placed on potential crossroads, and relationships between health and agriculture. Malaria kills over 3,000 people daily, mostly children. Ninety percent (90%) of the world's malaria cases occur in Sub-Saharan Africa. HIV/AIDS, a feared and dreaded disease emerged during the past 20 years and has become the greatest catastrophe ever to hit Africa. In Nigeria, 2.6 million people are infected; 11% of adult population in Côte d'Ivoire; and a predicted loss of 20% of the workforce in Burkina Faso by the year 2005.

The Initiatives

Mindful of the importance of HIV/AIDS for global agriculture and those whose livelihoods depend on it, in 2000 the CGIAR decided to develop the process to study the implications of HIV/AIDS for agricultural research and development. At the same time, it was also decided to improve the understanding of the linkages between malaria and agriculture. WARDA, in association with ISNAR and IFPRI, was asked to lead the process linking HIV/AIDS and agriculture, while the responsibility for malaria and agriculture was assigned to IWMI. These decisions led to the birth of two initiatives:

SWIHA: The Systemwide Initiative on HIV/AIDS and Agriculture, and
SIMA: The Systemwide Initiative on Malaria and Agriculture.

SWIHA was developed on four thematic areas:

- Understanding and communicating the bi-directional linkages between HIV/AIDS and rural, urban and peri-urban livelihood systems, agricultural production, natural-resource use, food and nutritional security, and social structures to a wide range of decision-makers;
- Developing and disseminating innovative gender-sensitive policies, technologies and methodologies emanating from experience gained through such research, in order to strengthen agriculture-based livelihood systems and R&D institutions faced with current or future HIV/AIDS impacts;
- Stepping up efforts in information sharing and capacity development for national and international R&D agencies in the context of the HIV/AIDS challenge;
- Ensuring that CGIAR centers have best workplace practices in place for its workforce, and can serve as a role model for national systems.

SIMA's activities broadly fall under four themes:

- Impact of agricultural practices on vector ecology and malaria transmission
- Impact of malaria on agricultural productivity
- Best agricultural practices to control malaria
- Anti-mosquito and anti-malaria products.

Outlook

WARDA will further develop its strategy on HIV/AIDS and agriculture, and the process to mainstream the challenge into core activities. WARDA will continue to develop and strengthen partnership and collaboration with public-health, social and demographic institutions worldwide, to address the challenges, but without losing track of our comparative vantage point as an agricultural research center.

Appendix 5

Strategic Issues

1. Biotechnology at WARDA

Biotechnology at WARDA aims i) to develop rice varieties for West and Central Africa that combine the high yield potential of *O. sativa* with the stress tolerance of *O. glaberrima* by using anther culture and molecular markers; ii) to assess the serological and molecular diversity of RYMV in order to evaluate the durability of the natural resistance of interspecific lines; iii) to understand, at the molecular level, the Blast population dynamics (in time, space and on different varieties) and the mechanisms underlying the role of avirulence gene(s) in pathogen evolution.

Anther culture techniques enabled the WARDA wide hybridization program to have the introgression of useful traits from *O. glaberrima* into improved *O. sativa japonica* genotypes. The molecular marker laboratory determines the informative PCR-based markers (SSR, EST and CAPS) for the two parents that were used in the haploidization process. Mapped molecular markers were also used to characterize alien variation in advanced breeding lines.

Serological variability of RYMV in West Africa received special attention in recent years. RYMV isolates from north, south, west and east Côte d'Ivoire were analyzed with polyclonal antibodies from Côte d'Ivoire in serological differentiation. Diverse serological differences were observed especially from Korhogo isolates. Similar results were obtained in the serological study of West Africa RYMV isolates with polyclonal antibodies from different West African countries. We still need to continue our work to understand the molecular and serological diversity of the RYMV in West Africa. In the near future we also expect to tag genes associated to important agronomic traits such as the ability to compete with weed, drought tolerance, disease and pest resistance. Marker-assisted selection is expected to facilitate improving some important agronomic traits and to develop new improved rice varieties that are well adapted to African conditions.

To build up the capacity of biotechnology, the WARDA Biotechnology Unit needs to be reorganized into an autonomous biotechnology laboratory with research activities that will generate information in various areas. This structure will provide an opportunity for training student and NARS partners in our member countries. In collaboration with advanced laboratories, we will continue to generate and transfer new tools into our laboratory.

We hope that the Biotechnology Unit would then facilitate the building effect of biotechnological research and act as a bridge between advanced laboratories and biotechnology in sub-Saharan Africa and the main objective is to provide NARS breeders with marker-assisted selection to help them develop new varieties well adapted to their environment.

2. Biosafety at WARDA

The development of genetically modified organisms (GMO) opened interesting prospects for food production. For instance, the production of transgenic plants resistant to rice yellow mottle virus (RYMV) appeared to be one of a rapid and practical solution for the management of this disease, which causes serious damage in irrigated and lowland ecosystems. It could, allow us to have varieties available to farmers rapidly—varieties that are similar to those they are used to, but which have the advantage of being resistant to RYMV.

The GMO raise highly legitimate concerns and questions on economic, social and environmental aspects. Hence, the International Convention on Biodiversity advocates in its articles a rational management and an adequate distribution of biotechnology advantages, but also the regulation and control of risks associated to the use of live genetically-modified organisms. Thus, the Director General of WARDA has set up an internal committee in charge of developing regulations in order to ensure that the products of the research conducted by the Association are not harmful to health or the environment, and that they meet international biosafety standards.

3. WARDA and the Issue of Intellectual Property Rights (IPR)

WARDA internal practice concerning IPR complies with the principles enacted by CGIAR; it ensures free access to its genetic resources and its research findings and does not claim any protection. Exceptional cases are: biological material used to develop this material, models of agricultural equipments, publications, databases, and software that can be the object of various forms of intellectual property.

WARDA actions with regard to IPR include:

- In 1999, WARDA undertook to formalize its internal policy. Although the document is still in a draft form, it lays down the guiding principles for the Center on IPR
- The systematic use of Material Transfer Agreement in exchanging genetic materials at the level of the genebank to ensure free access to this material
- An audit in 1999 on this issue. Some of the recommendations of this audit are being implemented, such as WARDA copyright on all its publications, including its website and trademark on its name and logo.
- A request for a joint patent with IRD was issued concerning a procedure to identify, by markers loci, an important gene of resistance to rice yellow mottle virus (21 June 2000)
- Trademark on the name and logo of the Association (27 November 2001)

- An inventory of innovations (ongoing) to establish WARDA property
- The protection of the name NERICA (ongoing)

The NARS constitute a key element in WARDA activities; it would be important to involve them in IP issues and to share with them acquired experience through special seminars or by the introduction of the issue in the programmes of certain WARDA meetings.

4. International Treaty on Plant Genetic Resources

Plant genetic resources for food and agriculture are crucial in feeding the world's population. They are the raw material that farmers and plant breeders use to improve the quality and productivity of our crops. The future of agriculture depends on international cooperation and on the open exchange of the crops and their genes that farmers all over the world have developed and exchanged over 10,000 years. No country is sufficient in itself. All depend on crops and the genetic diversity within these crops from other countries and regions.

After seven years of negotiations, the FAO Conference adopted the International Treaty on Plant Genetic Resources for Food and Agriculture, in November 2001. This legally-binding Treaty covers all plant genetic resources relevant for food and agriculture. It is in harmony with the Convention on Biological Diversity.

The Treaty is vital in ensuring the continued availability of the plant genetic resources that countries will need to feed their people. We must conserve for future generations the genetic diversity that is essential for food and agriculture.

The Treaty's objectives are the conservation and sustainable use of plant genetic resources for food and agriculture and the fair and equitable sharing of benefits derived from their use, in harmony with the Convention on Biological Diversity, for sustainable agriculture and food security.

Through the Treaty, countries agree to establish an efficient, effective and transparent Multilateral System to facilitate access to plant genetic resources for food and agriculture, and to share the benefits in a fair and equitable way. The Multilateral System applies to over 64 major crops and forages. The Governing Body of the Treaty, which will be composed of the countries that have ratified it, will set out the conditions for access and benefit-sharing in a "Material Transfer Agreement".

The Treaty provides for sharing the benefits of using plant genetic resources for food and agriculture through information-exchange, access to and the transfer of technology, and capacity-building. It also foresees a funding strategy to mobilize funds for activities, plans and programmes the help, above all, small farmers in developing countries. This funding strategy also

includes the share of the monetary benefits paid under the Multilateral System.

The Treaty recognizes the enormous contribution that farmers and their communities have made and continue to make to the conservation and development of plant genetic resources. This is the basis for Farmers' Rights, which include the protection of traditional knowledge, and the right to participate equitably in benefit-sharing and in national decision-making about plant genetic resources. It gives governments the responsibility for implementing these rights.

All benefit from the Treaty in many ways:

- Farmers and their communities, through Farmers' Rights;
- Consumers, because of a greater variety of foods, and of agriculture products, as well as increased food security;
- The scientific community, through access to the plant genetic resources crucial for research and plant breeding;
- International Agricultural Research Centres, whose collections the Treaty puts on a safe and long-term legal footing;
- Both the public and private sectors, which are assured access to a wide range of genetic diversity for agricultural development; and
- The environment, and future generations, because the Treaty will help conserve the genetic diversity necessary to face unpredictable environmental changes, and future human needs.

The Treaty will come into force 90 days after 40 governments have ratified it. Governments that have ratified it will make up its Governing Body. At its first meeting, this Governing Body will address important questions, such as the level, form and manner of monetary payments on commercialization, a standard Material Transfer Agreement for plant genetic resources, mechanisms to promote compliance with the Treaty, and the funding strategy. Countries may therefore consider it important to be among the first to ratify, so as to ensure that their national interests can be taken into account at the Governing Body's first meeting. Each country that ratifies will then develop the legislation and regulations it needs to implement the Treaty.

The CGIAR has placed its collections under the auspices of FAO within the International Network of Ex Situ Collections. The terms of the agreements signed between the FAO and CGIAR Centers, stipulate that the germplasm within the in-trust collections will be made available without restriction to researchers around the world, on the understanding that no intellectual property protection is to be applied to the material. Samples of the 'germplasm in trust' are thus made available by the individual Centers under a standard Material Transfer Agreement (MTA).

5. Rice — Political and Economic Implications

The particular importance given to rice in food-policies across the sub-region leads decision-makers to focus on production increase without giving

appropriate attention to marketing and processing issues. Rice differs from other staples in the West African food systems for two major reasons: the rapid increase in per-capita consumption and the share of imports in total supply.

5.1 The increasing role of rice in national food security: In recent decades, rice consumption has increased steadily to reach an average 30 kg per capita per year for the whole region in 2000; rice provides more than 12% of total calorie intake and 25% of total cereal calorie intake. Today, rice is a staple food not only in the traditional rice consumption areas of the south-west of the sub-region, but also in most of the coastal countries and in the cities of landlocked food-deficit countries as well. This change is largely explained by the fact that rice is easy to store and cook, and offers advantages compared to any other staple available in urban, and also rural, food markets.

5.2 Rice — a tradable food crop: The continuous availability of rice on the market resulting from supply of imports is another factor that has strengthened the central position of rice in the West African diet. It is also important to note that imported rice is increasingly consumed in rural areas, where it provides an alternative source of food during shortage periods. Although rice importations could be seen as an instrument to smooth rice supply, their increasing share in total rice supply (around 40–45% of the total rice supply) shows the high dependency of the sub-region on the world rice market. This situation is particularly worrying if one considers the limited share of world rice production traded internationally (less than 5% of total production) and the degradation of West African economies' terms of trade that hinder their import capacity. Therefore, since rice imports represent more than 25% of total food import in value for the whole sub-region, their reduction has been and is still a major objective of sub-regional food policy.

5.3 Rice marketing and intensification: West African governments have responded to the rice challenge almost unanimously through the implementation of public-led programs focusing on the development of high-input rice-based systems relying entirely on irrigation. This option was justified by the success of the Green Revolution in Asia and by the view that West African rainfed rice-based systems did not have the potential to produce the amount of rice needed to respond to the increasing urban consumption. However, beyond the success story of the Office du Niger (Mali), many initial investments in land improvement and in supporting the development of irrigated rice production did not meet expectations. This relative failure is due to both a weak mastering of the irrigation scheme complex (in particular the importance of farmers' organizations and ownership were underestimated) and the dramatic change in the macro-economic environment with the end of public support to the rice sector.

5.4 Determinants of rice competitiveness in an open economy: On one hand, with the liberalization of the rice market, consumers have the opportunity to purchase different types of imported rice corresponding to different tastes and levels of income; this imported rice also has homogenous and stable quality, which makes consumers more demanding in terms of

quality. On the other hand, the privatization of parastatal firms in charge of rice marketing and processing gave way to the expansion of small-scale processing units, which are more cost-effective but less efficient in supplying rice of adequate and stable quality. Thus, the ability of the local rice sector to compete will also depend on its capacity to deliver products that match consumers' quality requirements.

The catalytic role of rice marketing in system development: The fact that rice is considered as a food crop rather than a cash crop tends to minimize the importance of marketing in the design of rice development strategy. This is particularly true for the rainfed rice-based systems, where rice is held as a subsistence crop although a significant share of the production can be sold.

5.5 Conclusion: Whereas farm-level technology development remain the bottom line for increasing the competitiveness of rice-based systems, these efforts will not be effective if they are not combined with a stronger integration of rice-based systems into the rice market. Strengthening market linkages require the implementation of a comprehensive approach from the farmers' fields to processing and retailing stages that will respond to consumers' requirement in terms of quality. At the production level, it encompasses the reinforcement of farmers' organizations to reduce assembling costs in rural areas and the dissemination of crop management practices that maximize the quality and homogeneity of the outputs (seed purity, proper drying, threshing and handling of the paddy). Enhancing market linkages requires expanded assistance to traders and rice-millers in order to improve market and processing efficiency (information, training, credit for investments and marketing operation).

6. WARDA Inc. — Financing Rice Research and Development

WARDA would like to explore two ways of sustaining the efforts already gone into the development of the NERICAs and any future methodologies or technologies.

- Rice seed and policy have been identified as two major bottlenecks to sustained and improved rice production systems in West and Central Africa. Although the mandate of WARDA provides the framework for the Association to undertake this type of activity, it is limited by its scope and financial capacity. It is proposed that a self-financing subsidiary be created to provide this so much needed service. This subsidiary called "WARDA Inc." will call for strong private sector involvement to put in place (a) a sustainable seed production system and company; (b) a provider of laboratory services; and (c) a consulting body for intellectual property and policy advises with strong lobbying capacity to member states. Market access, distribution of agricultural inputs and rural credit will be addressed to contribute to WARDA mandate of increasing the competitiveness of African producers. A thorough study should be conducted to check the feasibility of this proposal within the framework of WARDA constitution and mandate. The investment for this study to be conducted is estimated at about US\$25,000.

- Research and development activities require assured long-term funding. The downward trend in funding within the CGIAR and the research community in general is of concern. While the first part of the proposal calling for a strong partnership with the private sector will bring about additional funds that can be fed to research, it is necessary to study an alternative for adequate funding to the association. Launching a campaign for an endowment fund is certainly a candidate for consideration. The creation of an endowment Fund will be WARDA come out of the dwindling-fund pathway. The Fund should target a total of US\$50 million within a 5-year period, but will require that WARDA commits and invests about US\$0.25 million initially for this effort.

6.1 Benefits

WARDA is cognizant of the fact that for the impact of its research and dissemination of NERICAs and other improved and new technologies to be fully felt, conditions such as adequate political support, sustainable agricultural financing, and a conducive policy environment are imperative prerequisites for the development of robust, viable and competitive agricultural sector in sub-Saharan Africa.

A range of benefits will be expected from the above-mentioned ventures:

- Minimization of rice production constraints leading to improved agricultural sector.
- Improved competitiveness of rice farmers in West and Central Africa.
- Creation and promotion of a sustainable agricultural private sector in Africa.
- Considerable value-added to WARDA research and development activities.
- Additional source of funding for WARDA and its national partners thereby reducing the dependence on already dwindling financing opportunities
- Sustainable source of funding for WARDA's core activities.

Appendix 6

CGIAR Change Process: Regional Integration and the Way Forward

1.1 Background

A series of meetings with NARS partners in 1999 (Meeting of Minds) resulted in the development of a “ strategy for the CGIAR for sub-Saharan Africa”. Although a well-articulated document that outlines priority areas of research and addresses the issues in the SPAAR/FARA Vision for African Agricultural Research, it remained as a framework for collaboration rather than a strategic Action Plan.

Subsequently, there have been calls for regional planning and priority setting, consistency in methodologies, program coherence, and integration of CGIAR activities in the various regions in order to achieve operational efficiency and programmatic effectiveness. At ICW 2000, the meeting endorsed regional approaches; a decision was taken to develop a database on CG activities; and African NARS leaders recommended the establishment of integrated regional centers.

In sub-Saharan Africa (SSA), the CDC-SSA subcommittee was charged with the responsibility for coordinating, planning and implementation of the Strategy in concert with NARS, SROs and FARA. Towards that goal, two interrelated activities were initiated at the end of 2000: (a) inventory and analysis of CGIAR activities and (b) consolidation/integration of CGIAR activities in SSA. Implementation of these activities is being undertaken at the sub-regional level: South and Eastern Africa (SEA) and West and Central Africa (WCA). These activities also involve meetings and brainstorming sessions at the centers, among centers, and with the NARS at the sub-regional (SROs) and regional (FARA) levels.

1.2 Consolidation and Integration

In WCA, discussions between IITA and WARDA pre-date a system-wide effort at institutional and programmatic consolidation of activities. As a result, while initially the three centers (ICRISAT, IITA and WARDA) located in WCA have been the key players, the process now involves all centers with programs in the sub-region.

Appendix 7

CGIAR Challenge Programs: Next Steps

Ever since the Strong Report on the Third System Review was submitted in October 1998, the CGIAR has explored and experimented several options to “re-invent” itself, or as it is often described, “to elevate the game”. These include: (a) the creation of an Executive Council and one Annual General Meeting (AGM) a year, replacing MTMs and ICWs (b) programmatic approach to research planning; regional approach to priority setting and formulation and implementation of Challenge Programs (CPs) (c) transformation of TAC into a Science Council and (d) establishment of a Systems Office.

WARDA has played an active role in advancing the process of regional priority setting, coordination and integration of programs and activities in West and Central Africa as well as in SSA as a region, the latter being facilitated by the DG’s position as Chair of the CDC-SSA Sub-Committee. While it appears that mergers of Centers may not occur in the immediate future, the new trend by which donors will fund the Centers through the sub-regional organizations (SROs – CORAF, ASARECA and SACAR), is indicative of a move in the direction of creating “consortia” of Centers in SSA. The EU and USAID already “channel” resources to Centers through ASARECA and CORAF to ensure that projects are in line with the strategies of the SROs and be approved by the latter before consideration by the donor. Other donors, AfDB and IFAD are likely to follow suit.

Challenge Programs (CP) are to be organized, coordinated research efforts focused on identified development issues in areas where the Centers are supposed to be making or have the comparative advantage of making a real difference. After initial uncertainties on a transparent and objective start-up process, three pre-proposals for CPs have been approved for full proposal development stage namely, Genetic Resources, Bio-fortified Foods, and Water for Food, the first two still being considered for possible integration into one CP. A second round of CPs will be considered in June including one on SSA and another on HIV/AIDS and Agriculture in which the WARDA DG plays an active role.

The World Bank has decided to hold back 30% of its matching funds to the CGIAR in 2002 as start-up money for the CPs, and the Centers also risk losing close to 50% of Japanese support due to the economic downturn of that country. The CPs will be very competitive and apart from several goals, are expected to phase out Centers that are unable to fit into the new way of doing business. They are also likely to replace some existing system-wide initiatives and ecoregional programs although efforts are being made to ensure the survival and sustainability of viable and productive ones.

WARDA is not one of the lead/initiating/convening Centers of the three approved CPs although we have expressed interest in all three. In order to benefit from the large resources that will be attributed to CPs, we must be pro-active participants and or leaders in themes or sub-themes of the CPs. A

good case can be made for inland valley development and water management within the Water and Food CP. And so can we through the NERICAS in the CP for Bio-fortified Foods. NEC members need to be fully informed of these developments as active NARS involvement is viewed as an essential element in the conduct of CPs.

The Challenge Program for Africa still needs to be developed. Deadline for submission is end July. The CGIAR Centers are looking up to the SROs and FARA to take leadership in the development of this CP and have designated an overall coordinator (Ralph von Kauffman of ILRI) and representatives from each interested Center to work closely with Ralph and the NARS organizations.

Appendix 2

Agenda and Program of Work

Tuesday, 11 June 2002

Plenary Session

- | | |
|-------------|--|
| 08h00-08h30 | Arrival and Registration |
| 08h30-08h40 | Welcome Address by Kanayo F. Nwanze, DG WARDA |
| 08h40-09h00 | Opening Address by Prof. N'guessan Yao Thomas, Representative of the Minister of Higher Education and Scientific Research, Côte d'Ivoire |
| 09h00-09h10 | Adoption of the Agenda and Work Schedule, and Election of Chairs and Rapporteurs |

Morning Session

Corporate Overview

- | | |
|-------------|---|
| 09h10-09h30 | The 23 rd Council of Ministers: Main Conclusions and Recommendations |
| 09h30-9h50 | Director General's Report (2000-2002) |

09h50-10h30

Discussion

- | | |
|-------------|--------------|
| 10h30-11h00 | Coffee Break |
|-------------|--------------|

WARDA Research and Development Programs

- | | |
|-------------|---|
| 11h00-11h30 | Overview of WARDA research programs and progress since the last meeting (Günther Hahne, Director of Research) |
|-------------|---|

11h30-12h30

Program Reports

- Rainfed Systems (M P Jones, Rainfed Rice Program Leader)
- Irrigated Systems (K Miézan, Irrigated Rice Program Leader)
- Rice Policy and Development (T Defoer, Acting Program 3 Leader)

12h30-13h00	Discussion
13h00-14h00	Lunch
Afternoon Session	
14h00-15h30	WARDA-NARS Collaborative Projects: Round Table Discussion; IVC, ROCARIZ, INGER, PADS, PATD, PVS, CBSS Coordination, Sustainability, Reporting
15h30-16h00	African Rice Initiative (M P Jones)
16h00-16h30	Coffee Break
16h30-17h00	Agriculture and Health: The SWIHA/SIMA Initiatives (F Abamu)
17h00-17h30	General Discussion
17h30	Depart for Bouaké

Wednesday, 12 June 2002

Morning Session	<u>Strategic Issues</u>
8h30-9h30	Biotechnology, Biosafety and IPR Issues (G Hahne, Y Séré and M N N'Djondjop, S Dao)
9h30-10h00	International Treaty on Plant Genetic Resources and its Implications (G Guei, INGER Coordinator))
10h30-10h30	Discussion
10h30-11h00	Coffee Break
11h00-11h45	Rice: Food and Cash Crop – Political and Economic Implications (F Lançon and A Diagne)
11h45-12h30	WARDA Inc – Serving the Seed Sector and Financing Rice Research and Development in West and Central Africa (P J Kouka and T Defoer)
12h30-13h00	General Discussion
13h00-14h00	Lunch
Afternoon Session	Business Meeting

14h00-14h30	CGIAR Change Process, Regional Integration and Way Forward (Ndiaga M'baye and Kanayo F Nwanze)
14h30-15h00	CGIAR Challenge Programs: Next Steps: Regional or sub-regional Approach (Ndiaga M'baye & K. F. Nwanze)
15h00-15h30	WARDA Strategic Plan 2001-2010 (G Hahne)
15h30-16h00	Discussion
16h00-16h30	Coffee Break
16h30-17h30	Final Report of the Independent International Audit on the World Bank Investigation (M Dubé)
17h30	Depart for Bouaké
19h30	Official Cocktail/Dinner

Thursday, 13 June 2002

Concluding Session

08h30-10h30	Synthesis and Report Writing Tour of WARDA Main Research Center and Headquarters
10h30-11h00	Coffee Break
11h00-11h30	Presentation of Final Report
11h30-12h15	Discussion
12h15-12h30	Closing Remarks
12h30-13h30	Lunch
14h00	Depart for Bouaké and Abidjan

Appendix 9

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