



Report of the 5th Biennial Regional Consultative
Meeting of the National Experts Committee (NEC V)
Cotonou, Republic of Benin
19–20 June 2006

Celebrating 35 Years of Research Partnership

Africa Rice Center (WARDA)/NARS Collaboration

Biennial Africa Rice Center/NARS Experts
Committee Meeting Report No. 5

About Africa Rice Center (WARDA)

Africa Rice Center (WARDA) is an autonomous intergovernmental research association of African member states. WARDA is also one of the 15 international agricultural research Centers supported by the Consultative Group on International Agricultural Research (CGIAR).

WARDA's mission is to contribute to poverty alleviation and food security in Africa through research, development and partnership activities aimed at increasing the productivity and profitability of the rice sector in ways that ensure the sustainability of the farming environment.

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, nongovernmental 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 Africa into Eastern, Central and Southern Africa.

WARDA hosts the African Rice Initiative (ARI), the West and Central Africa Rice Research and Development Network (ROCARIZ) and the Inland Valley Consortium (IVC). It also supports the Coordination Unit of the Eastern and Central African Rice Research Network (ECARRN) based in Tanzania.

Since January 2005, WARDA has been working out of the International Institute of Tropical Agriculture (IITA) Benin station in Cotonou, having relocated from its headquarters in Bouaké, Côte d'Ivoire, because of the Ivorian crisis. WARDA has regional research stations near St Louis, Senegal and at IITA in Ibadan, Nigeria.

For more information, please visit www.warda.org

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1. Introduction

The 5th Biennial Regional Consultative Meeting of the National Experts Committee (NEC V) took place on 19-20 June, 2007 in Cotonou, Benin.

Attendance

The Directors of the National Agricultural Research Institutes (NARIs) or their representatives from the following countries attended the meeting.

WARDA Member Countries

Benin, Cameroon, Chad, Côte d'Ivoire, Ghana, Guinea, Togo, Sierra Leone, Mali, Nigeria, Niger, Senegal, The Gambia.

Observers

Ethiopia

Uganda

Tanzania

DR Congo

Republic of Congo (Brazzaville)

Kenya

SG 2000

IITA

CORAF

Songhai, Benin

Chair of WARDA Board of Trustees

WARDA member countries absent

Liberia

Burkina Faso

Guinea Bissau

Mauritania

2. Synthesis report and main conclusions and recommendations

Dr A.A. Ochigbo, Director of the National Cereal Research Institute of the Federal Republic of Nigeria, chaired the discussion.

2.1 Opening ceremony

Remarks were made by INRAB Director General Dr David Arodokoun and WARDA DG (Dr Kanayo Nwanze) before the opening address by a representative of the Minister of Agriculture, Animal Production and Fisheries of the Republic of Benin.

2.1.1 Opening remarks by INRAB DG

Dr Arodokoun appreciated the response of NEC members in attending WARDA meetings. He encouraged the WARDA DG to mobilize all NARS to execute the agenda for rice self-sufficiency in the region. He noted the strong points of WARDA's DG as a man of tolerance and justice. He restated his position that the NARS DGs were available to support WARDA in executing its agenda.

2.1.2 Remarks by WARDA DG

Dr Kanayo Nwanze (WARDA DG) thanked all participants for attending the meeting and appreciated the presence of the DGs from NARIs in East and Central Africa (Ethiopia, Kenya, Tanzania, Uganda, DR Congo and Republic of Congo). He touched on his duty tour of ten years at WARDA and expressed satisfaction for having transformed the Institute into a pan-African one

2.1.3 Opening address

The Director of Cabinet at the Ministry of Agriculture, Animal Production and Fisheries of the Republic of Benin, Madam Jocelyne Julie Zinsou, performed the Opening Ceremony. She brought solidarity messages from the President of the Republic of Benin, His Excellency Dr Boni Yayi, and from the Minister of Agriculture, Animal Production and Fisheries of Benin. She charged the gathering to take steps to tackle the gap between rice production and consumption.

2.2 Overview of recent meetings

Conclusions and resolutions of the 25th Council of Ministers (COM); Decisions and recommendations of the 4th Biennial Regional Consultative Meeting of the NEC

The conclusions, motion and resolutions of the 25th COM were presented by WARDA. The major decisions made were listed. Questions on heavy metal presence in rock phosphate, maintaining WARDA's identity and recent information on the merger of the CORAF Cereals network were discussed. The need to strengthen rice policy work and advocacy in the sub-region was emphasized. The place of biotechnology research and opportunities for training also discussed.

2.3 WARDA DG report (Annex I)

This covered the 10-year period (1996-2006). The networks and their contributions to the output of WARDA's programmes were presented. History of the development of NERICAs, their evolution and dissemination in member countries and the status of the ASI technology were elaborated by the DG. The receipt of awards by WARDA scientists, particularly those received by Drs Monty Jones and Sié Moussa was appreciated. Changing trends in the staffing at WARDA and the current status of WARDA as Africa Rice Centre were presented. Efforts at resource mobilization and the management of the Ivorian crisis were also detailed, while the recent CGIAR reforms and the impact on WARDA were highlighted. He was satisfied with his tenure, especially because of the achievement of the geographical expansion of the Institute. Dr Nwanze noted that there has been a systematic increase in the annual budget of WARDA from US\$ 9.6m (1996) to US\$ 11.4m (2006). However, he further noted that WARDA needed to achieve an US\$ 15m budget level. In his future perspective, he encouraged WARDA to pursue policy advocacy, and pay attention to seed demands from stakeholders as well as working hard on international exposure, especially the need to go beyond NERICAs. He thanked all who had supported both him and WARDA during difficult years.

NEC requested WARDA to go further in discussing the institute and its achievements with the political leaderships in the respective member countries. The need for WARDA to diversify its funding sources was discussed as was the decision of COM that WARDA

should not merge with another institution. In order to defend this decision more strongly, a panel was put in place to deliberate and produce strong comments, and to develop a document to be sent to the CGIAR.

2.4 Strategic issues

2.4.1 Report on the WCA MTP (Annex II)

Dr P. Kormawa (ADPL2) presented this report on behalf of Dr Keya. It traced the evolution of the processes leading to the development of the MTP for WCA. The consultations to date and the status of the final document to be presented to the ExCo of the CGIAR were presented. NEC expressed the hope that comments, made at the last CORAF AGM in Banjul have been incorporated in the final document.

2.4.2 Performance Measurement of Impact Indicators and WARDA NARS partnerships (Annex IV)

This was presented by Dr O. Youm (ADPL1). The importance of the PMI to the general health and future of the Institute was emphasized. Recent data on WARDA PMI were presented to NEC along with the different aspects, the processes and philosophy. NEC noted with interest the processes involved in the rating of CGIAR institutes and the effect on the general future direction and health of WARDA as a Center of Excellence.

Mr K. Geerts (ADG, Corporate Services) reported that because of the recent PMI, WARDA has been upgraded from Satisfactory to Superior and for that reason the World Bank has increased its contribution to WARDA by US\$ 250 000. NEC expressed its satisfaction to WARDA about the briefing, but requested that more emphasis be placed on capacity development, stakeholder intelligence and the involvement of the private sector. NEC also suggested there was a need for WARDA to scale-up and scale-out many of its technologies.

2.4.3 Preparing for the 2007 EPMR

Dr Kormawa (ADPL2) presented this report on behalf of the ADG (R&D) Dr Keya. The extent of preparation and the choice of panellists were explained. Documents to be used for the EPMR process and the Terms of Reference (TOR) were elaborated. NEC members expressed their readiness to take part in the EPMR, and suggested that a NARS DG be fully engaged with the evaluation process.

2.4.4 Implementation of WARDA Inc. (Annex III)

Mrs Samira Hotobah During (Head of Donor Relations) presented the programme of implementation. The philosophy and evolution of the processes that necessitated the formation of the seed company were explained. Consultants are to be hired to suggest the modalities for the establishment of the company. It was explained that WARDA was only facilitating the process of the formation of the enterprise, but not necessarily moving away from its role in generating International Public Goods (IPG).

NEC expressed concerns about the project. However, it was decided to pursue the process and to keep NEC informed on the subsequent developments

2.5 Report of network activities

The coordinators (and Heads) of IVC, ARI, ROCARIZ, GRU and ECARRN presented their activities and achievements during the period under review. These presentations (Annexes V-VIII) were followed by questions and recommendations.

It was suggested that the networks should reinforce their interaction. The African Rice Initiative (ARI) should extend its activities to further countries, interact with the AfDB to speed up funds disbursement but coordinators should also respect the Bank procedures. In future, presentations should be based on concrete outputs and lessons learned rather than on activities.

2.6 Research & Development reports

Two presentations were made on: “Focus on WARDAR & D activities in Nigeria” (Dr P. Kormawa) and “Progress on biotechnology research” (Dr Marie-Noëlle Ndjioudjop). See Annexes IX and X.

The presentations covered WARDA activities and achievements in Nigeria and activities and achievements in biotechnology research at the Center and in the strengthening of NARS in biotechnology research.

During discussions, it was suggested that an economic analysis of biotechnology in agriculture should be carried out. It was also suggested that the Center should join hands with NARS to establish a common biotechnology laboratory because this was

deemed to be more cost effective. Possible genetic erosion and sterility of NERICA lines were discussed.

2.7 Decisions and recommendations

Recommendations made by the National Experts Committee (NEC) at its 5th Biennial Meeting (19–20 June, 2006)

1. NEC appreciates the work of WARDA and its networks, but urges the networks to work together harmoniously to avoid duplication, and to make concrete efforts at conducting ex-post and ex-ante studies on how their technologies are being adopted in the member countries.
2. NEC strongly reiterates the decision by WARDA Council of Ministers (COM 05) opposing any merger between the International Institute of Tropical Agriculture (IITA) and WARDA and wishes to document its position in support of this decision to be sent to the Executive Committee of the CGIAR (ExCo) through the Director General of WARDA.
3. NEC expresses its appreciation to WARDA for steps taken in implementing COM 25 Resolution # 12 on seed and urges WARDA to undertake a thorough market study on the proposed seed company, taking into consideration the various national seed legislations and structures.
4. NEC understands the need for member countries to pay their contributions to WARDA, but encourages the Center to carefully compute other intangible contributions into the general WARDA output (travel costs incurred by NARS Directors on WARDA-related missions, diplomatic status contributions to WARDA and her sub-stations by host countries) and ensure that this is reflected in subsequent WARDA Annual Reports.
5. NEC encourages all member states to devise all possible strategies to pay their contributions.

6. NEC congratulates WARDA on its efforts to conduct high-level biotechnology research and capacity-building activities within the member countries, but urges it to do so in concert/harmony with respect to processes taking place within CORAF and other related bodies
7. NEC expresses its satisfaction on the status of implementation of the conclusions and resolutions of the 25th COM and urges WARDA to ensure that continued emphasis be maintained in the area of rice policy work and advocacy in the sub-region.
8. NEC expresses satisfaction with progress made in the consultations and in development of an integrated Medium Term Plan (MTP) for West and Central Africa (WCA), especially the roles played by CORAF and member countries, and expects that these partners will be fully involved in the execution of the research activities that will subsequently be launched.
9. NEC expresses support for resolution 16 of the 25th COM that the COM confers a distinguished service award on Dr Kanayo Nwanze, for distinguished and faithful service to Africa during his tenure at WARDA as Director General.

ANNEX I

Report of the Director General – synopsis of 1996–2006

Dr Kanayo Nwanze

Introduction

The West Africa Rice Development Association (WARDA), now known by its new appellation the Africa Rice Center, was founded as an autonomous intergovernmental research association in 1971 by 11 far-sighted African countries, with the assistance of the United Nations Development Program (UNDP), the Food and Agriculture Organization of the United Nations (FAO) and the Economic Commission for Africa (ECA). WARDA was born in 1971 out of a desire of governments to collaborate for the greater good of reducing poverty and achieving food security. The year 2006 is WARDA's 35th anniversary. In recognition of 35 years of research and development activities carried out principally in collaboration with the national agricultural research systems of sub-Saharan African countries, the theme for the 5th Biennial Regional Consultative meeting of the WARDA National Experts Committee is 'Celebrating 35 Years of Research Partnership'.

For the last 10 years of WARDA's 35 years of existence, I have been at the helm of this institution. My term as Director General of WARDA comes to an end in November. Allow me therefore, to deviate from the tradition of reporting on highlights of WARDA's activities over the intervening two years since the last consultative meeting (NEC IV) in 2004 in Yamoussoukro, Côte d'Ivoire. It would be a more fitting tribute for my last meeting with NARS colleagues in this expanded National Experts Committee, which includes observers from the Eastern and Central African (ECA) region, to present a synopsis of WARDA's achievements for the 10 years (1996–2006) I have served this Association.

Under my leadership, WARDA has reached the pinnacle of success resulting from the development of the New Rice(s) for Africa (NERICAs), now truly recognized as the flagship of the CGIAR. The many accolades received by the Association and its scientists include several prestigious awards (e.g. the 2000 King Baudouin Award, 2004 World

Food Prize, and the 2006 Koshihikari Rice Prize). The UK's Department for International Development (DFID) recently cited NERICAs as one of three CGIAR outputs in its just published book on development success stories. Yet amid all this euphoria, WARDA has been forced twice to flee the crisis in its host country of Côte d'Ivoire and has to be ever mindful of the recent call for a merger of CG Centers in West and Central Africa. In this synopsis of my 10 years of stewardship of WARDA, I have tried to capture these momentous events, some key achievements and strategic issues that will define WARDA for many years to come.

Research and Development highlights: outputs of WARDA activities

As an autonomous intergovernmental research association that grew after 16 years to become a member of the Consultative Group on International Agricultural Research (CGIAR), the essence and the very core of WARDA's existence is producing global public goods through its research and development activities. WARDA's most valued contribution has been through varietal improvement, witness the birth of the NERICA varieties in late 1990s and before that the WAB series of rainfed upland and lowland rice varieties, WITA series of rainfed and irrigated lowlands, the Sahel varieties (designated 108, 201 and 202) and the ROK series of salt-tolerant rice varieties from Rokupr in Sierra Leone.

The NERICA story

Some call it the "NERICA Revolution" "while others call it the" "NERICA Conundrum". Whatever believers choose to call it, NERICA refers to germplasm derived from interspecific crosses of *Oryza sativa* (Asian rice) and *Oryza glaberrima* (African cultivated rice) and is the brainchild of former senior WARDA scientist, Dr Monty Jones. In 1991, Jones and a team of WARDA scientists started trying to cross indigenous African rice with the introduced Asian species with the objective of gaining access to new genetic combinations, which bring together the best characteristics from each parent (tolerance/resistance to stresses, weed competitiveness, shorter growth cycle and desirable eating qualities from the African parent; yield potential from the Asian parent). Indeed, there were a number of earlier attempts to access the *O. glaberrima* genome through interspecific crossing. However, most of these attempts floundered because of sterility and stability problems in the interspecific progeny. In 1994, the first-ever fertile (true breeding) interspecific rice progeny were produced from hybridization of African

(*O. glaberrima*) and Asian (*O. sativa*) rices. WARDA's contribution to this scientific breakthrough was to use anther culture and embryo rescue techniques to circumvent the sterility problems, thus unlocking an exciting new source of genetic variation.

In December 1996, the Interspecific Hybridization Project (IHP) was the major outcome of a WARDA-hosted international workshop bringing together institutions already involved in interspecific research and donors (Japan, UNDP) for upstream research and development. As a triangular South-South partnership, IHP brings together three CGIAR Centers (WARDA, IRRI and CIAT), Cornell University (USA), the *Institut de recherché pour le développement* (IRD, France), Tokyo University (Japan) and the Yunnan Academy of Agricultural Sciences (China) to advance the development of interspecific progeny.

Naming the interspecifics – what's in a name?

The interspecifics have gone through several 'incarnations' in terms of naming since the first lines were fixed in 1994. However, the decision to use 'New Rice for Africa', first in 1998, then as the standard from early 1999 was crucial. After all, WAB-450-1-B-P-38-HB really does not mean very much to a lay person and it's simply too long.

In early 2000, seven upland NERICAs (1–7) were released on a wide scale in Côte d'Ivoire and Guinea. Eleven new upland NERICA lines have since been characterized, bringing the total number of NERICAs to 18. The new NERICAs have been named NERICAs 8 to 18. This exciting development provides farmers with more choices of NERICA material. With NERICAs, rainfed rice yields, which have been stagnant at 1 tonne per hectare or less, have risen sharply by about 35% with no fertilizer input. Low levels of fertilizer can raise upland NERICA yields to 2 tonnes and moderate inputs to 5–6 tonnes.

A new dimension is being added to the NERICA success story in the form of the lowland NERICAs, another scientific breakthrough, with yield potential of 6–7 tonnes per hectare and good resistance to major lowland stresses. Given the high potential of the lowlands in Africa, the new rice is expected to make an even bigger impact than the upland NERICA varieties.

Spread and impact of NERICAs in SSA countries

Four lowland NERICA varieties were released in Burkina Faso and two in Mali in early 2005. About 60 of the new lowland varieties have received farmers' stamps of approval in several African countries through the Participatory Varietal Selection (PVS) process – an approach that was used successfully in accelerating the dissemination of the upland NERICAs.

NERICA dissemination is receiving a major boost in seven pilot countries (Benin, Togo, Mali, The Gambia, Ghana, Nigeria and Sierra Leone) in the multi-country NERICA project funded by the African Development Bank through a combination of soft loans and grants of over \$30 million. To reinforce this effort, the Japanese Government has seconded two specialists in technology dissemination and in grain quality to WARDA and the African Rice Initiative (ARI).

Across SSA, the cropping area under NERICA varieties continues to grow in leaps and bounds. Guinea, Côte d'Ivoire and Uganda are countries that have greater than 10,000 ha of land under NERICA cultivation. Guinea has already shifted its NERICA rice production from the experimental cultivation phase to dissemination and commercialization with 100,000 ha being cultivated with NERICAs.

The Government of the Federal Republic of Nigeria recently allocated one billion Naira for NERICA seed multiplication.

In Benin, 68% of those farmers who have been exposed to NERICAs have adopted them in 2004. In farming households that have adopted NERICA, there has been a 3% increase in school attendance and school retention rates, and a 2% reduction in frequency of child illness.

In Guinea, Togo, Côte d'Ivoire and The Gambia, farmers have been highly enthusiastic about NERICA and used the cash from selling NERICA to build houses, pay tuition fees and medical expenses for their children. Nericulture is the new term coined in Guinea for rice farming.

Results of NERICA production have been remarkable in Uganda within three years of its introduction. More than 10,000 hectares are now under cultivation thanks to

successful public-private sector partnerships among the national program, NGOs, seed companies and farmers.

Critical success factors

Why have NERICAs been so successful and in so short a time, given the usually long lag between development and adoption of new technologies? The key contributing factors that can be cited are:

- Committed partnership at all levels in the research-development-extension continuum and across the whole range of partners
- African-led research operating through multidisciplinary task forces and networks
- Technologies designed to fit the environment instead of vice versa à la Green Revolution in Asia
- Emphasis on participatory approaches integrating farmers' wisdom and perceptions
- Nurturing of the technologies through to dissemination and advocating their cause at the highest political level
- Sustained funding from visionary donors and NERICA champions

Participatory Varietal Selection (PVS)

The time from an initial cross to the dissemination of a line can be as long as 14 years using conventional varietal release methods. WARDA scientists developed Participatory Varietal Selection (PVS) as a simple and fast-track approach to anchor and amplify the NERICA outputs of WARDA's germplasm improvement research. PVS has been used as a dual mechanism for obtaining feedback on farmers' preferences in new rice varieties and for technology transfer. The basic PVS is a three-year program. In the first season of PVS, farmers select from a range of new breeding lines perceived as best adapted to their own farms and with agronomic characteristics appropriate to their farming activities. During the following two seasons of on-farm evaluation, farmers identify lines best adapted to their production system and with quality characteristics suitable for home consumption or marketing. Within an agroecological zone, the most popular four or five lines selected are multiplied and diffused to up to 500 farmers for evaluation over two seasons. Lines most appreciated by farmers are then recommended for zonal release. PVS has revolutionized the scientist-farmer interaction across SSA and unleashed the NERICA adoption wave.

A 2005 Gatsby and Rockefeller Foundations-funded study on NERICA adoption in the Kaduna province of Nigeria reports that 42% of farmers in PVS villages compared to 19% in near-PVS villages are estimated to have cultivated NERICA 1 in 2005.

ROCARIZ (West and Central Africa Rice Research and Development Network)

ROCARIZ is a merger of the WARDA-NARS Rice Task Forces and the CORAF/WECARD Rice Network. It was created in 2000 to strengthen NARS research, development and technology transfer capabilities through small grant funding of these activities, sharing of results in review meetings, joint monitoring and evaluation tours, and training. ROCARIZ is organized around seven Task Forces (Breeding, Mangrove Swamp Rice, Natural Resource Management, Sahel natural Resource Management, Integrated Pest Management, Economics and Technology Transfer) and is overseen by a Steering Committee. A major achievement of ROCARIZ has been the institutionalization of the Biennial Regional Rice Research Review (4Rs), where NARS rice research and development activities are reported. In a 2004 review of USAID-supported networks, ROCARIZ was rated as the best and cited as a model for regional collaborative research. Unfortunately, with the recent decision by CORAF/WECARD to merge its cereal networks, WARDA has no choice but to explore other means of continuing its rice R & D partnership with the NARS.

Complementary technologies (ASI)

Haphazard harvesting and rudimentary post-harvest handling were identified in the mid-1990s as major problems in the Senegal River Valley by field surveys which attributed post-harvest crop losses of up to 35% to the inefficiency of manual threshing. Poor harvesting means not all grain or potentially useful straw is harvested. Such losses are compounded if threshing is inefficient at separating the grain or produces damaged and split grains susceptible to storage damage and of lower marketable value.

A partnership between WARDA, NARS and private sector organizations in Senegal is lessening the load of drudgery and improving the usable yield and marketability of rice. Partnership first between WARDA and scientists at IRRI in the Philippines identified a prototype Asian rice thresher-cleaner, and then embraced national researchers in ISRA

and SAED, local master craftsmen and end-users to develop an affordable, locally-constructed and acceptable thresher-cleaner, called the ASI. The ASI, which takes its name from ADRAO-SAED-ISRA, produces 6 tonnes of paddy per day. With a grain-straw separation rate of 99%, no additional labor is required for sifting and winnowing.

Since its commercial release in 1997, ASI has become quite popular in the Senegal River Valley. More than 50% of the total paddy produced in Senegal is now threshed with the ASI thresher-cleaner. Apart from Senegal where there are greater than 250 ASI machines in use, more than 50 ASI machines are currently in use in Mauritania, over 100 in Mali, 11 in Ghana, 10 in Burkina Faso and seven in Côte d'Ivoire.

Awards

The most visible manifestation of the recognition and appreciation for WARDA's work as a Center of Excellence in rice research has been the numerous awards and honors bestowed on the Association and its scientists by countries and institutions around the world.

King Baudouin Award of the Consultative Group on International Agricultural Research

The prestigious CGIAR King Baudouin Award was presented to WARDA on October 26, 2000 during CGIAR International Centers Week in Washington DC, USA. The citation read "The King Baudouin Award of the CGIAR presented to West Africa Rice Development Association (WARDA) for the development of high yielding upland rice varieties (called the New Rice for Africa) which contribute to agriculture and human welfare in West and Central Africa". The Technical Advisory Committee (TAC) of the FAO and the CGIAR recognized NERICA as a major scientific breakthrough from three perspectives: high quality science, impact and partnership. TAC cited in particular the use of cellular biology techniques in interspecific hybridization to overcome hybrid sterility barriers, rapid adoption of the new varieties by over 20,000 farmers in Guinea alone, and close and effective partnerships by WARDA with farmers, NARIs, other Centers and advanced research institutions.

Government of Côte d'Ivoire

The Director General and four WARDA staff (Kouamé Miézan, Monty Jones, Sitapha Diatta and Mark Etsibah) were conferred national titles and decorated with medals by His Excellency, the President of the Republic of Côte d'Ivoire during the 30th Anniversary celebrations of the Association, 21–22 September 2001, in recognition of services and WARDA's role in West and Central Africa. The Director General was conferred the title of 'Commander in the Ivorian Order of Merit' whereas the four staff were conferred the title of 'Officer in the Ivorian Order of Merit'.

Dr Kouamé Miézan, leader of the Irrigated Rice Program, was honored by the Government of Côte d'Ivoire on July 18, 2003 for his long service to rice research and development at WARDA since 1983. He received the title "Commander in the Ivorian Order of Merit".

On the occasion of the 23rd World Food Day (October 16, 2003), WARDA received the 'Diplome d'Honneur' from the Ivorian Government for its effective contribution to the fight against hunger in Côte d'Ivoire.

Senegalese President's Award for Science

On 30 June 2003, WARDA received the 'Grand Prix du President de la Republique pour les sciences', Senegal's highest award for science and technology, for the adaptation and dissemination of the most widely-used rice thresher in Senegal, the ASI. President Wade presented the award personally to the WARDA team (led by Dr Miézan) in St. Louis, Senegal, and its partners.

2004 World Food Prize

Dr Monty Jones, former WARDA scientist, was co-recipient of the 2004 World Food Prize for developing the high yielding, drought- and pest-resistant NERICA varieties through the successfully crossing of African and Asian rice species. Dr Jones was lauded as a World Food laureate in October 2004 for his breakthrough scientific achievement, which has significantly increased food security for millions of people in Africa.

2006 Fukui International Koshihikari Rice Prize of Japan

WARDA lowland rice breeder, Dr Moussa Sié, is co-winner of the 2006 Fukui International Koshihikari Rice Prize of Japan. He was honored April 15, 2006 in Fukui City, Japan, for his significant contribution to rice production in sub-Saharan Africa through the development of New Rice(s) for Africa (NERICAs) for the rainfed lowlands. This breakthrough work conducted as part of the Irrigated Rice Program at the WARDA Sahel station in Senegal follows in the footsteps of the groundbreaking work of Dr Monty Jones in developing NERICAs for the uplands.

Four lowland NERICAs were officially released in Burkina Faso and two in Mali in 2005. About 60 lowland NERICA lines with yield potential of 6–7 tonnes per ha and with good resistance to major lowland stresses have already been tested in PVS trials in several African countries.

Staffing

Since taking over as Director General more than nine years ago of a Center that is considered among the smallest in the CGIAR, WARDA has witnessed a remarkable growth in the number of internationally-recruited staff (IRS). In 1998, a former member of the Senior Management at WARDA declared at a regional meeting in Africa that Africa lacked top-class scientists and consultants to move agricultural R & D forward. Humbled by this, it became my mantle and my challenge. The IRS complement inherited in 1996 stood at 32. Since then WARDA has experienced a larger than average influx of new IRS. In 2001, five years into my first term of office as Director General, the number of IRS at WARDA almost doubled, reaching a peak of 59. Since then, the number of IRS has hovered around the 45 mark only dipping below this mark to 44 after 2002. With the Ivorian crisis situation affecting departures and recruitment, there was a lower intake of IRS during the latter period.

Gender and diversity

WARDA bears the distinction of being the most diverse CG Center in terms of nationality of its internationally-recruited staff (Figure 2). Over a 10-year period, 27 different nationalities have been employed at WARDA in the IRS cadre. Since taking over as Director General of WARDA nine years ago, there has been a remarkable shift in

composition of internationally-recruited staff. While at the beginning of my term in 1996, the IRS strength was predominantly from northern countries, the tide started to swing strongly towards staffing from the South (Figures 1a and 1b). The ratio of scientists from the South has increased from 44% in 1995 to 73% in 2005. This is in line with the regional focus of the Center and solidifies WARDA as an African institution serving African farmers.

WARDA has made tremendous strides in addressing gender balance in staffing. There was only one female IRS when I took office in 1996. Today, WARDA can boast of eight female IRS. The spouse employment scheme implemented since my arrival is quite innovative and is credited for a total of four IRS having their spouses currently working at WARDA in various capacities.

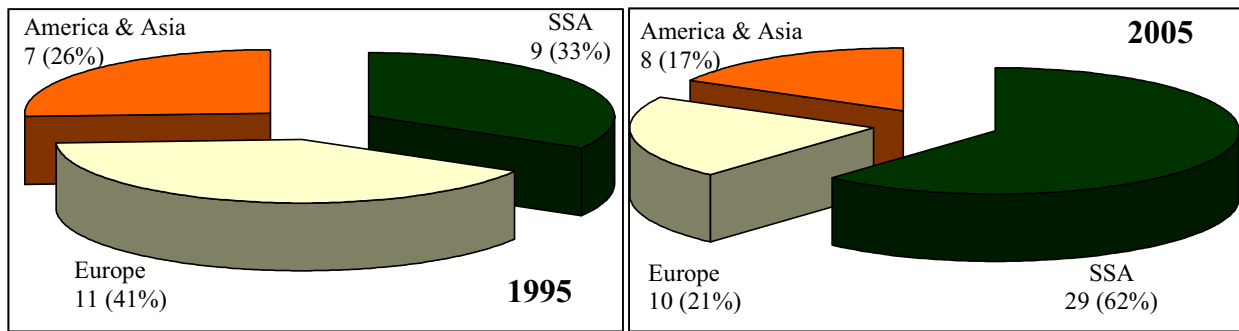


Figure 1a. Ratio of IRS from SSA, Europe and the Americas and Asia at WARDA, 1995 and 2005

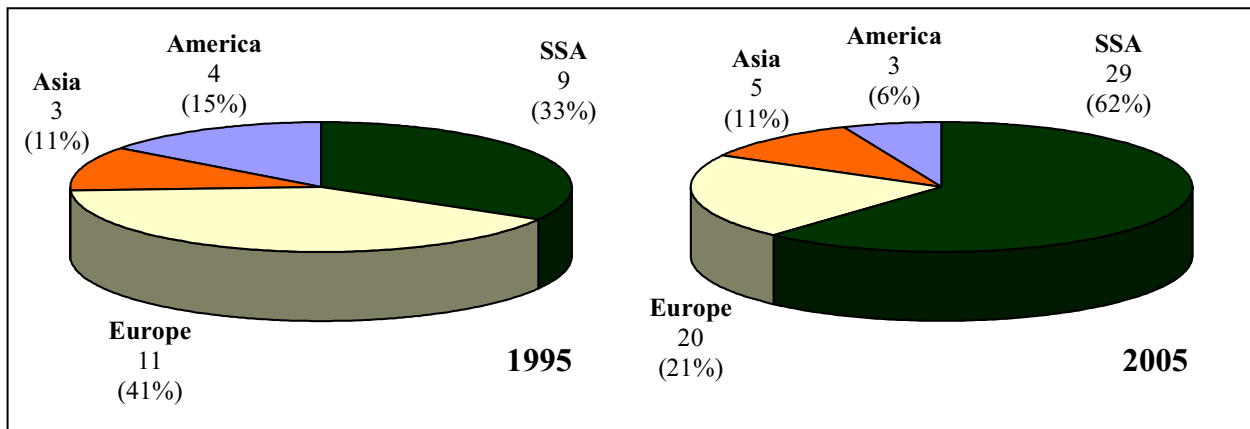


Figure 1b. Changes in internationally-recruited staff composition between 1995 and 2005

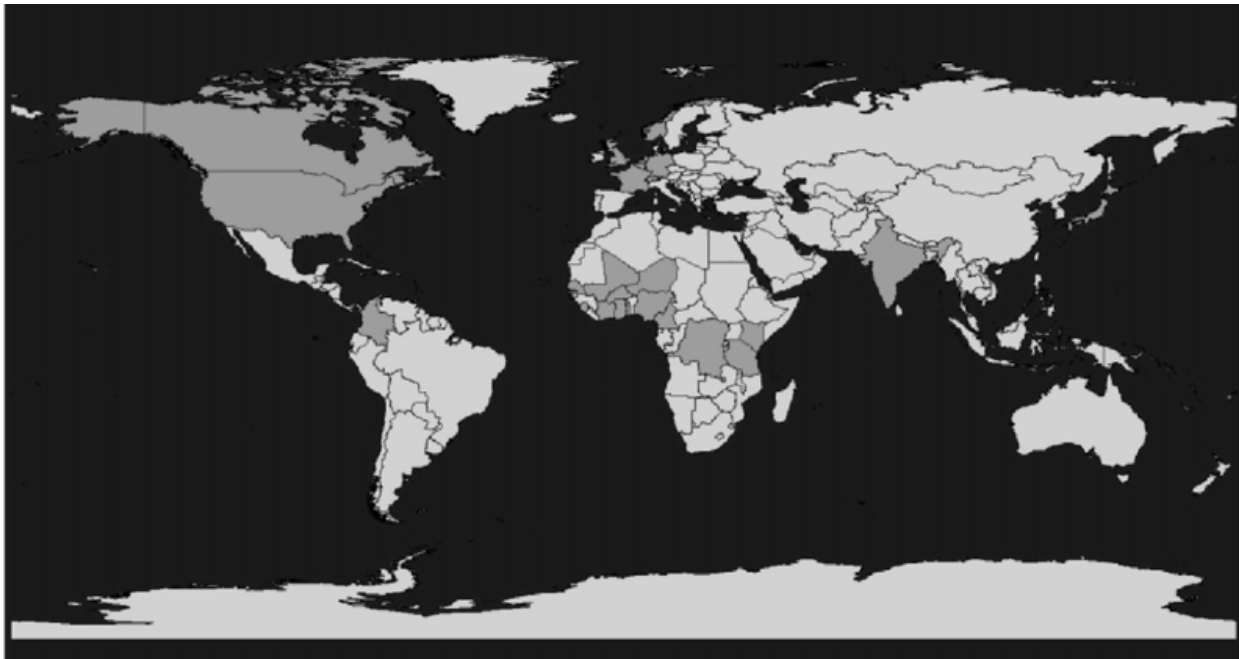


Figure 2. Diversity of WARDA IRS showing 27 countries of origin (1995–2005), America (3); SSA (15); Europe (7); Asia (2)

Training

The National Agricultural Research and Extension Systems (NARES) are WARDA's principal partners and partnership is a key element of WARDA's research strategy and *modus operandi*. The development of new technologies, their evaluation and effective transfer require well-trained professionals. Additionally, for a partnership to be sustainable, it requires that partners have a similar knowledge base to ensure mutual trust and equity. For these reasons, WARDA has made human resources development one of its priority activities, indispensable for strengthening rice cultivation capacities of member country NARES. WARDA has continued its efforts in postgraduate training and institutional strengthening of the full range of national partners. From 1997 to 2004, a period of eight years, an impressive total of 38 PhDs, 17 DEAs, 15 DAA, 9 MSc, 2 Ingénieur Agronomes, 1 MA and 2 BTS have been trained in affiliation with various universities and tertiary institutions worldwide (Table 1). A variety of training courses offered by WARDA during the same eight-year period (1997–2004) total 59 and attracted 1,589 trainees. Yearly training courses have depended on need and have varied from impact assessment methodologies to Participatory Learning and Action Research (PLAR).

Table 1. Postgraduate trainees and training course participants at WARDA, 1997–2005

	1997	1998	1999	2000	2001	2002	2003	2004	Total
PhD	4	4	7	6	5	10	1	1	38
MPhil	1								1
MSc/MA		2		1		3	2	2	10
DEA		5	2		2	8	2		17
DAA		1	2		2	5	1	4	15
Ingénieur									
Agronome						1	1		2
BTS						2			2
Training courses	6	4	7	8	15	9	6	4	59
(participants)	(100)	(19)	(186)	(315)	(518)	(177)	(91)	(183)	(1 589)

Positioning WARDA as the Africa Rice Center

The West Africa Rice Development Association (WARDA) was renamed the Africa Rice Center (WARDA) in January 2003 in recognition of the increasing role, relevance and demand for WARDA's outputs outside its 17 member states in West and Central Africa. Why not? The desire to push the frontiers of WARDA beyond West and Central Africa to becoming a *bona fide* Africa-wide institution had become a reality, given that there are only eight sub-Saharan African countries with which WARDA has no direct linkages and that WARDA had been providing rice germplasm to Eastern, Central and Southern Africa through the International Network for Genetic Evaluation of Rice (INGER-Africa) for many years.

In recollecting the history of the Consultative Group on International Agricultural Research (CGIAR), the International Rice Research Institute (IRRI) headquartered in Los Baños, Philippines, had the global mandate for rice research and development, whereas WARDA was confined to West and Central Africa. IRRI essentially covered the rest of Africa in collaboration with the International Institute of Tropical Agriculture (IITA). During this period, with their sub-Saharan Africa office located in Madagascar, the achievements of IRRI in Africa were exemplary in the training of many African rice scientists. However, with a decline in resources in the '90s, IRRI slowly reduced its efforts and presence in Africa. At one point, a single IRRI scientist was based in Madagascar. The IRRI program

in Madagascar was finally closed in 2001. INGER-Africa, which was initially housed at IITA in Ibadan, Nigeria, was transferred to WARDA in 1995. With the arrival of INGER-Africa, the gates were open for WARDA's services to spread to other parts of the continent and for partners and potential partners to discover the relevance of indigenous African technology for rice farming.

With increasing demand for WARDA's involvement in rice research and development beyond its traditional sub-region of West Africa, particularly encouraged by the development of the NERICAs, WARDA management explored Eastern and Southern Africa through personal visits to several countries in the sub-region. Similarly, with scientist visits and exchanges, donor interests and invitation by ASARECA, our first entry point was Uganda, where NERICA varieties had been introduced. A MOU between Uganda's National Agricultural Research Organization (NARO) and WARDA was signed in October 2003. This was followed by an MOU in April 2004 linking WARDA with ASARECA. An omnibus MOU was signed between International Agricultural Research Centers (IARCs) represented by the DG of WARDA and the New Partnership for Africa's Development (NEPAD) in March 2004, a draft MOU was developed in January 2004 for signing between WARDA and the Common Market for Eastern and Southern Africa (COMESA), and a WARDA-Sasakawa Africa Association MOU was signed in November 2004.

WARDA offered to provide seed money to reactivate the ASARECA rice network (ECARRN) with support from the Canada Fund for Africa (CFA) grant. The position of coordinator for the network would be provided by WARDA. The ASARECA Committee of Directors decided that the ECARRN Secretariat be hosted by Tanzania and on December 1, 2004, Dr Ashura Luzi-Kihupi was posted as a WARDA staff member to Tanzania with offices at the IITA Station near Dar es Salaam.

Since the reactivation of ECARRN, the European Commission finally approved a long-standing proposal (dating from 1998) for three years of initial support to ECARRN. Rice research and development in Eastern Africa is moving steadily forward, close collaboration with ROCARIZ has been established and scientist-to-scientist exchanges have increased. It should be underlined that support to rice research and development in Eastern and Southern Africa comes from additional funds provided by Canada and the European Commission, which could normally not be available to WARDA or its NARS partners in West Africa.

The 2004 IRRI External Program Management Review (EPMR) made several specific recommendations on IRRI activities in Africa. Consequently, the Science Council and the Executive Council of the CGIAR jointly recommended that IRRI and WARDA meet and decide on how to move forward on activities in SSA. Specifically in September 2004, ExCo recommended that:

- i) IRRI should expand its activities in SSA with the proviso that it work closely with WARDA, the leading rice research institution in SSA
- ii) IRRI should not abandon research on upland rice, instead it should work with WARDA on joint activity on this subject

WARDA recognizes IRRI's expertise in genomics and biotechnology and hopes that IRRI will contribute to an increase in the productivity of rice systems in Africa. With the revision of existing MoUs, IRRI has posted a rice breeder to the WARDA team at IITA station and a joint IRRI-WARDA project proposal for work to be done in East and Southern Africa is being considered for funding by IFAD and Japan. The countries targeted are Madagascar, Mozambique, Uganda and Tanzania. As the Africa Rice Center, WARDA will continue to take leadership in rice research and development in SSA.

The idea of calling WARDA the Africa Rice Center was first raised at the 2002 meeting of the National Experts Committee in M'bé, Côte d'Ivoire and warmly endorsed. Further endorsement came from the WARDA Board of Trustees. The regional and sub-regional organizations (FARA, CORAF/WECARD and ASARECA) welcomed the name change and the Council of Ministers gave the name change its blessing at the Extraordinary Session of Council in Cotonou, Benin in 2003.

Renaming an institution is a bold move and suggesting that by such a name change that an institution is increasing its sphere of influence is even bolder. I share a sense of satisfaction with colleagues on the National Experts Committee that the trend that was started by INGER-Africa and then capitalized upon by the re-establishment of the Eastern and Central Africa Rice Research Network (ECARRN), and the increasing demand for WARDA's involvement in rice research and development in the Eastern and Central African countries of Uganda, Ethiopia, Kenya, Tanzania, Congo DRC and Congo-Brazzaville. Fueled by the breakthrough technology of the NERICAs, all this suggests that WARDA has truly arrived in the ECA region and can rightfully claim the appellation of Africa Rice Center.

Resource mobilization and financial matters

Since joining WARDA in 1996, total revenue has risen from USD 9.6 million to USD 11.4 million in 2005 (Table 2). The revised total revenue for 2006 is projected to reach an all time high of USD 12.3 million. WARDA's financial health has improved steadily from 1996 to date. The growth in WARDA's budget could be attributed to steady unrestricted core support (averaging USD 5.9 million) from donors. Total contributions from WARDA's main donors have increased due to management's aggressive resource mobilization activities, viz:

- i) Japan - \$1.57 million in 1996 to \$1.68 million in 2005
- ii) UK - \$188 000 in unrestricted core in 1996 to \$950 000 in 2005
- iii) Canada - \$612 000 in 1996 to \$1.2 million in 2005
- iv) Belgium - no funding in 1995 to \$230 000 in 2005
- v) Norway - \$255 000 in 1996 to \$768 255 in 2005

Some other positive financial trends are worth mentioning despite the fact that the target of growing WARDA to a medium-sized \$15 million Center has not been reached:

- a) The Center's operating budget increased from \$9.9 million with a deficit of \$0.5 million in 1995 to \$11.2 million in 2005.
- b) The Center's reserves have risen from a deficit (\$2.7 million) in 1996 to a positive balance of \$3.68 million.
- c) WARDA's performance with respect to two indicators of financial health (working capital and equity) has been positive and within CGIAR-recommended guidelines. Short-term solvency reflected as number of days of liquidity currently stands at 101 days and is within the CGIAR recommendation of 90–120 days. WARDA's equity position of 137 days surpasses the 75–90 days recommended by the CGIAR.

WARDA will continue its hitherto successful financial management policies (strong unrestricted support, strong expenditure controls and aggressive indirect cost recovery) and continue to generate annual surplus as key instruments in addressing the short- and long-term financial position of the Association.

Table 2. WARDA’s total revenue (unrestricted core, restricted and totals) from 1995 to 2005

Year	Restricted(USD)	Unrestricted ‘core’(USD)	Total(USD)
1995	4 027 753	4 528 096	8 555 849
1996	4 189 100	5 419 516	9 608 616
1997	4 153 020	5 385 590	9 538 610
1998	2 813 333	6 332 339	9 145 671
1999	2 557 817	6 995 527	9 553 344
2000	3 407 242	5 383 104	8 790 376
2001	4 796 839	4 986 457	9 783 296
2002	5 158 657	5 116 800	10 275 457
2003	4 411 405	6 329 316	10 740 721
2004	4 220 726	6 618 460	10 839 186
2005	5 191 938	6 229 323	11 421 260

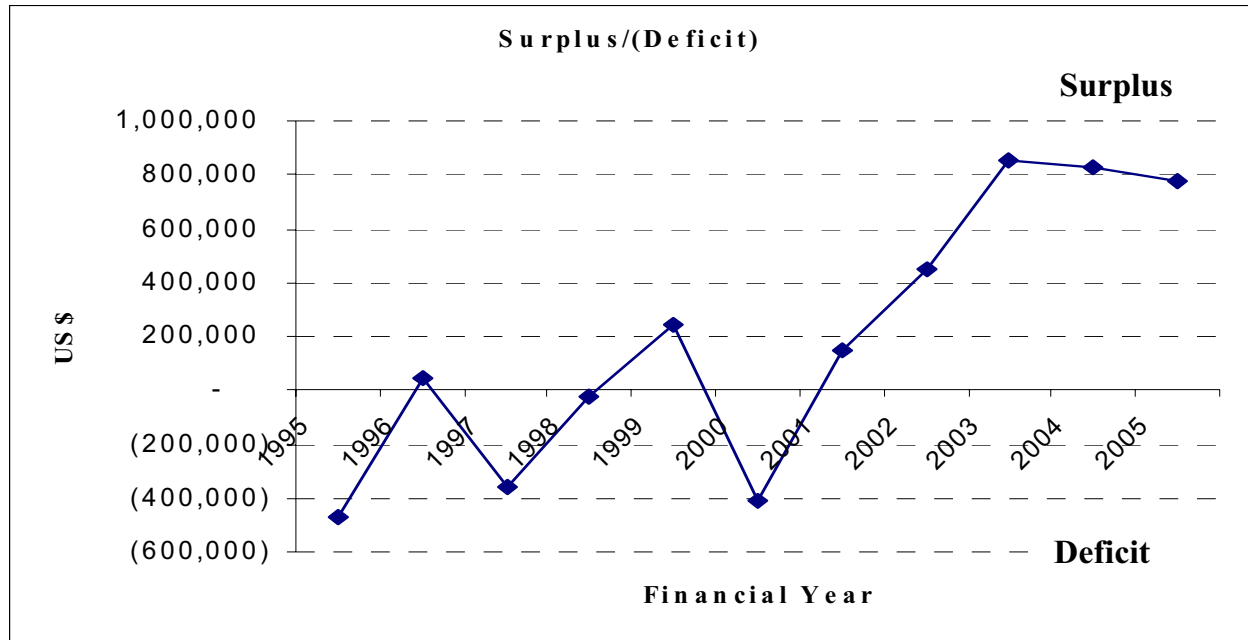


Figure 3. 10-year trend of expenditure performance at WARDA

Managing the Ivorian crisis

A recounting of events during a decade of stewardship of WARDA would be incomplete without remarks on the sociopolitical disturbances of September 2002 and November 2004 that rocked Bouaké/M'bé, Côte d'Ivoire, where WARDA headquarters is located. The fateful events, which epitomize a country in crisis, will be forever etched in the minds of WARDA staff and families who were provided safe passage out of Bouaké.

The September 2002 putsch by the New Forces divided Côte d'Ivoire into a rebel-held North with Bouaké as its capital and a Government-run South, administered from Abidjan. Without delving into the details of the 2002 upheaval, suffice it to say that its consequences are that WARDA suffered immense losses. More than 80 WARDA vehicles were stolen. Essential staff were temporarily relocated to rented offices in Abidjan and Bamako at great cost. Non-essential staff were laid off. Staff lost property and belongings and the headquarters was unoccupied for the next two years. Because of the uncertainties of returning to WARDA headquarters, recruitment of quality staff became more and more difficult.

The September 2002 upheaval in Côte d'Ivoire has affected WARDA staff in various ways. The psychological wounds and the trauma experienced by staff caught in the fighting in Bouaké and the resultant geographical dispersal of the staff engendered a loss of team spirit and cohesion. As a consequence, a post-crisis team building exercise was embarked upon in May/July 2004 to identify differences, misunderstandings and frustrations within WARDA and to restore trust and team spirit among staff and between staff and management.

Almost two years removed from the putsch but with Bouaké still under the New Forces, WARDA returned to its Bouaké headquarters with security guarantees provided by the Ivorian Government and the UN Forces. The Government and the rebels had been negotiating and it seemed that the country was slowly but surely moving towards a peaceful resolution of the conflict. The bombing of Bouaké by Government Forces in November 2004 came as a rude shock. One of our senior scientists lost his life in the bombing. Once more the resurgence of civil strife required the evacuation of internationally-recruited and senior non-Ivorian support staff from Bouaké and from Côte d'Ivoire. WARDA has regrouped and since January 2005 has been operating from temporary headquarters in Cotonou, Benin.

Twice in three years, WARDA has had to evacuate its headquarters in M'bé and relocate to another country to be able carry out its mandate of conducting rice research and development to benefit the poorest of the poor in sub-Saharan Africa. How is WARDA able to rise from the ashes each time and deliver on its mission as a fully functional research and development institution?

For the first time since autumn 2002, all the main elements of Africa Rice Center are together again at one site in Cotonou, which we call our temporary headquarters. Staff have undergone group counseling to help them deal with the trauma experienced in Bouaké. A synergy is being developed with host Center, IITA, and Cotonou is well situated for developing and maintaining links, particularly with our NARS partners. It is a testament to the integrity of WARDA's programmatic reform and commitment to working closely with its traditional partners that the Center's progress is in no way jeopardized by the Board's decision not to return fully to the main research site in Bouaké, Côte d'Ivoire for at least five years. The deep and underlying layers of partnership that bind WARDA with the administrators of its member countries, with NARES leaders, universities and other academic establishments, small and medium-sized agribusiness operators, NGOs, farmers' organizations and with sister CG Centers have always come to the rescue when WARDA has been under fire.

The spirit of resilience

In the midst of evacuation, relocation and resettling, WARDA developed a new Strategic Plan 2003–2012, restructured its overall set up into two major divisions, Research and Development and Corporate Services, and wrote a brand-new MTP with two well-defined Research and Development programs and eight consolidated MTP projects, which were widely acclaimed by the Science Council and the CGIAR. Activities were never closed down even at the height of the 2002 and 2004 events. New NERICAs were being developed and disseminated. WARDA moved into East and Central Africa and established a new 'station' in Tanzania. Credit must go to the staff and families for their tenacity, dedication and hard work.

Recent CGIAR reforms

The implications for WARDA of the CGIAR Sub-Saharan Task Force recommendations calling for a merger between IITA and WARDA continue to be a central point of debate,

especially after the WARDA Council of Ministers' unequivocal resolution at the 25th Ordinary Session of the WARDA Council of Ministers held in Ouagadougou, Burkina Faso, 23 September 2005.

Resolution # 5 passed by the Council asserts that WARDA must be maintained as an autonomous entity. It reads:

The Council of Ministers,

- noting once again that the basic principles and philosophy which underpin the operations of WARDA meet the expectations of member countries and users,
- decides that WARDA maintain its identity and autonomy while strengthening its relationship with CGIAR Centers, including IITA.

WARDA's unique institutional context as an Association of African member states and as an international Center supported by the Consultative Group on International Agriculture Research (CGIAR) has attracted a long history of frequent attempts at its dissolution or closure. Because it is the only CGIAR-supported Center that was created and established by the political will of African Governments, making it the only Center with political legitimacy, the Council has repeatedly intervened by using its constitutional powers to thwart dissolution, closure or merger attempts.

As WARDA's highest governance structure, the decision of the Council must be respected. The CGIAR cannot choose to show a blatant disregard and lack of respect for the WARDA Council resolutions.

Perspectives

After providing a synopsis of the many achievements of WARDA over the decade, one cannot but ask, "What about any weaknesses? What could we have done better?"

Several issues stand out above all else in terms of their importance for WARDA in the immediate future:

1. Policy advocacy

WARDA has not been able to impact on policy advocacy in the member states. There has been only one major rice policy study and that has been the Nigeria policy study. With political will and savvy, WARDA should be able to change this and create greater awareness in the area of rice policy. Policy and social science are being reinforced and their role is being strengthened and given some prominence.

2. NARS have not been active interlocutors

How does WARDA galvanize its NARS constituency to speak to the member Governments on behalf of WARDA and in essence be active interlocutors? WARDA needs to do a better job at this.

3. Need to do more in terms of visibility (International Press)

WARDA has not penetrated the international press. There needs to be a consolidated campaign in this area. In the absence of a public relations person, there has been a lot of press on NERICAs. What would have happened with a seasoned public relations person?

4. Growing WARDA into a medium-sized \$15-million Center

A \$15-million budget target was set for WARDA in 2000. Despite positive trends, WARDA's budget still remains below this target. While unrestricted core has been on the increase, restricted projects have been on the decline for the last several years. Therein lies the answer.

5. Meeting NERICA seed requirements

After almost 10 years since the breakthrough technology of NERICA was developed, the problem of unavailability of seed to meet the demand still remains a bottleneck. Whose responsibility is it anyway to produce seed? If WARDA does not do it, nobody will. WARDA is therefore, challenged to start addressing the NERICA seed issue as a topmost priority.

6. Beyond NERICAS

After NERICA, what next? This is a constant refrain that comes with any successful product. It is a formidable challenge that calls for WARDA to move beyond its traditional focus and towards new frontiers of research, development, scope and recognition.

7. Miscellaneous

The next WARDA administration must focus on i) reactivating INGER-Africa, ii) resisting the demise of ROCARIZ and reactivating the Task Forces mini-network mechanism, iii) biosafety is weak, and iv) training could be more proactive. The Visiting Scientist scheme needs reinvigoration and more research scholars must be attracted to the Center.

Conclusion

The 5th and last Biennial Regional Consultative meeting of the National Experts Committee (NEC V) under my watch offers me the opportunity to say goodbye and thanks to colleague Directors General from West, East and Central Africa. In my two terms as WARDA DG, I have met and interacted with many NEC members. I have received tremendous support even during the very worst of times, and none could be worse than the damaging accusation and investigation of fraud against the Association and me. I seize this opportunity to express my heartfelt gratitude. The fraud investigations coupled with the insurrections of 2002 and 2004 in Côte d'Ivoire could have destroyed any institution but thanks to the resilience and steadfast support of members of the National Experts Committee, the WARDA Board, management, staff and donors, these monumental events have come to pass and are left for the history books to record. Each time, WARDA has been reborn, hopeful, energized and stronger than ever to continue its mission of rice research and development for food security and alleviation of poverty. It reminds me of the Energizer Bunny commercial, where the rabbit just goes on and on and on marching and beating the drum.

As I reflect on almost 10 years at WARDA, two of my principal challenges when I took office were the desire to grow the WARDA budget to \$15 million and to extend the frontiers of WARDA beyond West and Central Africa thereby giving it recognition as a

truly Africa-wide institution. I take pride in saying that at least I achieved one of the two goals I set myself. That is, the renaming of WARDA as the Africa Rice Center and increasing its sphere of influence. I share this sense of satisfaction with both old and new members of the National Experts Committee.

My parting thoughts are that we have to push our frontiers beyond the present horizons. Our successes of today are the challenges of tomorrow. It is not enough to remain the best in your disciplines or fields in Africa because we must also be highly competitive with our peers in the rest of the world. Quality, relevance, transparency and accountability should be the hallmark of our operations—in science, in administration and in financial management. We should never lose our vision for Africa. Our conviction must remain strong. We must remain principled and yet flexible. Stand off when things do not work our way, but remain watchful, innovative and at attention for the right opportunity to strike. We should select our battles, the ones we can win, and not waste our energies chasing shadows. At the end, it is not the number of battles we have won but whether we won the war. We should never lose focus.

Thank you for having provided your expert advice to WARDA and for supporting me through this journey to transform WARDA into a veritable pan-African Center of Excellence for rice research and development.

ANNEX II

Report on the WCA MTP development

Shelleemiah Keya

Assistant Director General - Research & Development

Introduction

Agriculture remains a key economic sector of the states in WCA. On average it contributes around 35% to the region's GDP. Almost two thirds of the active population is working in the agricultural sector. Most countries are still at very low levels of the human development index, indicating poverty and food insecurity. In many countries of the region, the share of public spending on agriculture does not reflect its importance in the economy. The rural infrastructure is often inadequate, which leads to high costs of securing inputs, storing and transporting produce to markets. The rural infrastructure needs to be developed to attract investors, to improve producers' access to markets, and to be competitive. The rural poor are constrained by insufficient access to resources, information, knowledge, skills, and technology. Structural adjustment and downsizing of the public sector has left farming and rural development without effective extension, credit and inputs provision services. They suffer most from weaknesses in the institutions – including entrepreneurial deficits in agricultural marketing and other services and an inadequate voice for and poor organization of the producers themselves.

The CGIAR Task Forces on programmatic and structural alignment concluded that:

- 1) Programmatic alignment between CGIAR Centers and SROs/NARS is weak,
- 2) Programmatic alignment and collaboration between CGIAR Centers is insufficient,
- 3) Some CGIAR activities are unlikely to produce international public goods,
- 4) High priority activities are yet to be incorporated into the agenda,
- 5) Four types of programmatic overlaps reduce the effectiveness and efficiency of CGIAR research: mandates, activities, location, geographical range of intended impact.

In responding to the Task Forces' analysis, the Future Harvest Alliance with WARDA as a convening Center has embarked on developing a Medium Term Plan for the WCA

region. The main features of the WCA MTP are:

- 1) A more coherent vision and strategy for the CGIAR in WCA, based on the new System Priorities, and developed in close association with all stakeholders,
- 2) A description of the key domains for international agricultural research in West and Central Africa (WCA), designed by all CGIAR Centres working in the region (regardless of their headquarter location),
- 3) Low-cost structural arrangements for implementation and oversight of the MTP, ensuring that all types of unnecessary overlap are avoided,
- 4) Effective arrangements for monitoring, evaluating and improving the quality and impact of the research activities of the CGIAR Centers in SSA.

This report provides the National Experts Committee (NEC) with an update on progress made towards the development of the Medium Term Plan for West and Central Africa (WCA) led by WARDA. It is based on a series of formal and informal discussions in various fora, all of which expressed support for the development of the WCA MTP. The urgent need for the CGIAR Centers to have a common framework enabling capitalization of comparative advantages, integration of research programs and support services, harmonization of policies and governance structures and consolidation of partnerships with NARS was wholeheartedly accepted and supported by those contributing to the MTP discussion. It was said that a new kind of partnership is expected to emerge from the development and implementation of this sub-regional Medium Term Plan, one that will assist the countries of the sub region to realize the Millennium Development Goals. Dr Kanayo Nwanze, the DG of WARDA, expressed the expectation that a realistic and tangible outcome of integration would emerge and consolidate the CGIAR research agenda in order to realize more synergies in the collaboration of the various partners.

Process

The development of a regional Medium Term Plan (MTP) for West and Central Africa was undertaken in close consultation with all the CGIAR Centers based in and operating in West Africa. A total of 12 CGIAR Centers (WARDA, IITA, ICRISAT, ILRI, IWMI, ICRAF, IPGRI, CIAT, CIFOR, IRRI, IFPRI and WorldFish) embarked on collective action towards programmatic integration based on CGIAR System Priorities 2005–2015. WARDA is leading the process in close collaboration with CORAF who attended all the meetings/workshops held up to date in the framework of developing the WCA

MTP. ILRI is responsible for East and Southern Africa in close consultation with ASARECA.

Guiding the WCA MTP process, and as part of its responsibility, WARDA reported to EFC and BoT, NEC and CoM in 2005 as well as in 2006. Updates on the development of the WCA MTP are duly submitted by WARDA to CDC now AE, ExCo and CGIAR. During the CGIAR-NARS consultation in Entebbe June 2005, the need to involve FARA was expressed, particularly to ensure that the sub-Saharan Africa Challenge Program (SSA CP) is reflected in the MTPs. Between May 2005 and May 2006, a series of CGIAR Centers–CORAF–Stakeholders’ workshops and meetings have taken place.

- IITA IBADAN (May 2, 2006)
- CORAF Scientific Partners meeting in Dakar (18-22 May, 2005)
- on the Occasion of the second FARA general assembly in Entebbe (June 6, 2005)
- stakeholders meeting hosted by FARA (Accra, Ghana, 26-28 October, 2005)
- planning workshop held at Novotel Hotel (Dakar, Senegal, 27-28 February 2006)
- CORAF Scientific Partners meeting (Banjul, The Gambia, 22-30 April 2006)
- synthesis group meeting held at ILRI (Nairobi, Kenya 23-24 May 2006).

During the AGM05 in Marrakech, the MTP was discussed at four different levels, namely CDDC (Center Deputy Directors Committee), CDC (Center Directors Committee), Stakeholders’ Forum and at the Business Meeting. Progress reports have been presented to the CGIAR ExCo in October 2005 and May 2006. Feedback from these meetings has been incorporated as the MTP advances. To date, more than 200 people have participated in the meetings that brought together scientists from CGIAR Centers, CORAF researchers, representatives of NARS, NGOs and the private sector. Dr Henning Baur from Germany started work as a consultant for WCA MTP on 25 July 2005. His major assignment is to assist with the process of developing the regional Medium Term Plan.

Framework of alignment

The conceptual basis of the regional MTP framework components consists of: (i) alignment of CGIAR research, (ii) integrated regional programs and (iii) platforms. The MTP document should be produced in accordance with the SC guidelines.

On the basis of center submissions and a review of individual Center MTPs 2006-2008, the Consultant made a draft compilation of all on-going work based on CGIAR outputs planned for West and Central Africa. An assessment and analysis of the strategic plan and the MTPs of CORAF and the CG priorities were conducted. These were done with the view of identifying common areas of actions and thrusts and possible synergies. A common framework for integration, related to agenda setting, research collaboration and impact monitoring was designed for ESA and WCA. Research approaches of the CGIAR Centers are enriched by the strategies of other research partners in the sub-region. This finally led to the identification of thirteen (13) CORAF Priorities areas. Having done a fair amount of the analytical work, the next steps was preparation and implementation of a workshop with research partners and stakeholders in WCA to find a common ground for future partnerships and develop a framework and procedures required for enhanced collaboration. To this end, three major results were achieved from the stakeholders meeting in Dakar at the end of February 2006:

- 1) There was agreement that the alignment/rationalization of CGIAR activities in WCA should be guided by the structure provided by the five priority areas of the CGIAR
- 2) Based on the portfolio of outcomes that had been aggregated from the MTPs 2006-8, suggestions for further alignment were proposed
- 3) From the CORAF priorities, three areas were chosen for developing possible joint programs. These are markets and trade, natural resources management, conservation and sustainable utilization of plant and animal genetic resources. The group felt that these three priority areas might represent a somewhat narrow choice of priorities and considered two further possibilities for future joint programs that were not further discussed. However, science and technology policy, innovation and extension and diversification and competitiveness of agricultural production were also considered.

Status as at 30 May 2006

- in the workshops in Accra and Dakar stakeholders developed a shared understanding of what the MTP shall be and its objectives
- suggestions for governance and management of the MTP have been accepted by CORAF

- lists of outputs/ongoing CGIAR work structured by system priorities have been assembled by focal-point persons, based on inputs from all interested Centers
- suggestions for the development of new integrative projects
- a major outcome of the meeting in Nairobi is that participants agreed on nine aligned projects and 11 integrated projects based on the submission of the domain templates and views gathered from various consultations
- it was agreed that for each of these projects, focal-point persons should provide minimum detail on outputs, output targets, and outcomes by 2 June 2006
- this information should include:
 - (a) a well spelled-out project title,
 - (b) rationale of the project,
 - (c) goal,
 - (d) purpose,
 - (e) key objectives
 - (f) output targets for 2007,
 - (g) suggestions of what will be required until end of 2006 to develop the project further.

Additional key points to highlight are as follows:

- most of the alignment projects are likely to be transitional. They can provide a basis for integrated projects to be developed later
- the meeting suggested that a small number of projects could be identified and fast tracked for early action. A business plan specifying potential outputs and outcomes will be drawn up when appropriate projects are identified for action in 2006
- comments from the 7th CORAF General Assembly were discussed at the Nairobi meeting and most of them have been taken into account as the final document is prepared.

Governance and implementation

The main guiding principles and behaviours that are required for conducting the integration process and implementation of the MTP emphasized that partners should agree to adhere to:

- (a) common regional and sub-regional goals and objectives,
- (b) the partnership will be partnerships of equals,
- (c) joint ownership in developing proposals and writing papers and not having names merely appended,
- (d) avoid competition for financial resources to the disadvantage of another partner,
- (e) accept asymmetry as a means of strengthening the capacity of less well-resourced partners,
- (f) common rules of engagement between the parties, i.e. with the same terms and conditions for collaborating staff,
- (g) common standards in receiving, handling and disseminating data to ensure equal unhampered access to all partners,
- (h) commitment to the impact of the partnership as a whole,
- (i) appropriate sharing of facilities to meet the goals of the partnerships,
- (j) respect of the different mandates of the partners,
- (k) common standards of accountability for the agreed deliverables of the partnership,
- (l) respect for intellectual property,
- (m) common rules for attributing credit.

The DGs of IITA and WARDA proposed that governance should be all-inclusive (all partners having something to offer). The MTP program manager or coordinator at senior scientist level will be funded from additional sources. Discussions on the suggestion of the DGs led to further recommendations:

- it is agreed that the Alliance Executive and Board ensure oversight. The main oversight functions are to:
 - (i) provide guidance in terms of policy, strategy, implementation, and inclusiveness
 - (ii) annually review and comment on the sub-regional plan and past year performance based on indicators provided by CORAF, FARA and other stakeholders
 - (iii) provide an annual report to the AGM of the CGIAR for both ESA and WCA.
- the tasks of the MTP manager should be: coordination of MTP implementation, facilitation of planning and review processes and secretariat of the MTP

- it was accepted during the Nairobi meeting that ultimate governance of the MTP implementation should lie with the Sub-Saharan sub-committee of the Alliance Executive
- to ensure the technical and scientific integrity of the MTP implementation it was agreed that a full-time coordinator/facilitator backed by a technical group is essential
- using the existing WARDA task force mechanism as a model, the technical group could comprise a chairman and other core members, supplemented by additional scientific members according to the priority area being developed or discussed
- concerns were raised in the discussions about ‘ownership’ of the MTPs, transparency by the lead partners and the need for a clear business model outlining how the MTP will be implemented. These points will be taken into consideration in the drafting of the final WCA text.

Plans and activities after July 2006

- The SC has been requested to review the SSA MTP by 15 July
- The final draft submitted to SC will be posted on a dedicated website as proposed at the 7th General Assembly of CORAF
- DDGs will be requested to popularize the MTP within their individual Centers and CORAF to do the same among its members
- A plan is being put in place to continue the exercise between July and November in anticipation that implementation is scheduled for June 2007
- The target is that by AGM06 we shall have a more advanced MTP with a logframe, refined outputs, outputs targets and budget.

Support to MTP

CDC–AE allocated funds in 2005 (USD 70 000) and in 2006 (USD 100 000) to support the development of the WCA MTP through meetings and a workshop at which CORAF and NARS participation was sponsored. CGIAR Centers participating in the exercise met their individual expenses (air tickets, accommodation, etc.). The consultant and preparation of the MTPs has been supported by these funds.

Conclusion

- the WCA MTP has been developed in parallel with those of Centers. Ideally it would have been better if the Center MTPs were first completed before embarking on the regional MTP. However, this option was at hand.
- the one-year development phase has been short considering that the exercise involves 12 Centers, CORAF, NGOs, the private sector and others. Nevertheless, the commitment expressed by these collaborators has been strong and encouraging.
- the exercise has produced some new and useful information. For the first time we now know what each Center is doing. Some gaps have been identified and the information provides use material for alignment.
- this document is not perfect and would be improved as more information is gathered and as collaborating Centers make further commitment towards alignment.
- there is clear determination to implement the MTP even in a modest way starting from 2007, provided there are additional resources for coordination.

ANNEX III

Proposal for a seed production, distribution and marketing company

Samira Hotubah During

Head, Donor Relations

Background

- i. The demand for the dissemination of NERICAs and other technologies that will assist rice farmers in maximising their production and profit has outstripped the capacity of the Africa Rice Center to deliver. The success of NERICA dissemination will primarily depend on the availability of good quality seeds. The Africa Rice Center, taking into account the constraints of production, cannot at present produce enough seeds to satisfy the current demand from farmers and governments while at the same time ensuring seed purity. *A commercial vehicle which can intermediate will be in a position to provide a steady supply of high quality seeds that will take some of the pressures off the Africa Rice Center.*
- ii. The African Rice Initiative (ARI), a network based at the Africa Rice Center, was created to assist in the dissemination of NERICA and other technologies developed at the Center. However, the capacity of ARI, as a non-profit making entity dependent on donor funding, is currently inadequate to enable it to deliver its mandate to create an enabling environment for various stakeholders to cash-in on this revolutionary breakthrough in rice production in Africa. *As a broker and intermediary in the seed sector, the proposed company will leverage the work of the ARI.*
- iii. There is currently an over-reliance on rice imports. This current dilemma presents the Africa Rice Center with the perfect opportunity to assist in the creation of a company that will intervene in a brokerage capacity to leverage the impact of the benefits of current and future ground-breaking research in rice. *The single most important consequence of this intermediation will be a long-term increase*

in rice production with attendant benefits such as import substitution, reduction of the dependence on scarce foreign exchange in Africa, sub-regional trade in rice and, ultimately, poverty reduction.

- iv. Rice policies have not been consistent and are almost non-existent in many African countries. *The proposed company will seek to play a policy advocacy role to create enabling environments for rice production and distribution.*
- v. The company will offer its clients a competitive edge by drawing from a combination of experience and availability of first-class technologies and knowledge from the Africa Rice Center. *This access to rice technology will enable the company to respond rapidly to client demands and build a reputation for offering accurate and customized solutions to clients.*
- vi. Cooperation with reputable public and private institutions and individuals will provide leverage for positioning the company as the main rice seed and related services provider in Africa.

Aim

- i. The proposed company aims to provide seed production, distribution, business advisory and intermediation services to the public and private sectors, and policy advocacy services to the public sector within the rice seed sector in Africa, in order to achieve a positive impact on the economies of rice-growing countries in Africa.

Objectives

- i. The general objective of the company is to contribute significantly to improved human nutrition, food security and poverty alleviation, especially in sub-Saharan Africa, through an increase in more profitable production, increased incomes and jobs and improved human nutrition.
- ii. Specific objectives include:
 - to provide a steady supply of NERICAs, high-quality rice seed and other technologies to the rice sector in SSA

- to develop and promote public-private partnerships aimed at creating sustainable seed production facilities in Africa with the primary focus of increasing the supply of rice seeds in SSA
- to increase opportunities for trade and competitiveness of rice farmers in the local market through advocating for policy environments that will encourage and support national rice production as well as advising on entrepreneurial activity, business development, including bank credit, and assisting with grant and loan negotiations
- to decrease rice importation in Africa, especially SSA, as a result of increased production thus increasing farmers' income
- to contribute, significantly, to national efforts to reduce poverty and address food insecurity.

Rice market study

A full market study will be conducted to determine demand and market size.

Groups of potential customers for the company will include:

- large rice producers
- government and/or national programs and extension agencies
- seed production companies
- medium to small rice farmers
- individual customers
- NGOs
- donor partners

ANNEX IV

Performance Measurement Indicators and WARDA-NARS partnership

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*Assistant Director of Research &
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Background

This paper deals with performance measurement indicators (PMI) and Africa Rice Center (WARDA)-NARS partnership, taking into account the relationship between the two. In light of the decreasing resources in support to agricultural research and the increased donor demand for impact and accountability, as well as the generation of International Public Goods (IPGs), there is a need for a rigorous monitoring and evaluation system. The CGIAR has embarked on processes to develop PMIs that are now implemented online. An implication in this is that NARS and WARDA are bound to deliver products and high performance through their long-term partnership. Such true collaboration and partnership reflect positive outcomes in terms of PMI. The products resulting from the partnership, including developed and released varieties, training and capacity building, joint development and implementation of research activities, and joint publications, feed directly into the Performance Measurement Process.

WARDA's impact and performance, as measured by identified indicators described below, reflect to a large extent the NARS contributions and close collaboration. This paper highlights PMIs and partnership and draws inferences on how this true partnership will continue to make WARDA not only a unique center in the CGIAR, but also continue enhancing the partnership for continued impact. In other words, Africa Rice Center's achievement is a reflection of NARS ownership, and Center performance is continuously enhanced through strong partnership with NARS.

Performance Measurement Indicators

Introduction

The Performance Measurement Indicators are an essential component of the CGIAR Monitoring and Evaluation System. It is a tool for the self-evaluation of Centers, assists Centers and Boards in performance management, and it comforts many Donors. It also helps Centers with fund allocation decisions. Piloted for the first time in 2005, lessons have been drawn from that exercise and the system has been refined. The PM System generally focuses on two kinds of indicators: the indicators of result (Outputs, Outcomes, and Impacts) and the indicators of potential to perform (Quality and Relevance of current Research, Institutional Health and Financial Health).

Indicators of result

Outputs and output targets

CGIAR agreed that Centers can have 20-25 outputs. WARDA has a total of 24 outputs deriving from 8 projects (7 from 2007) forming the 2 programs of the Research Division.

- outputs are by definition “products” of research with a defined timeline, contributing to reaching the Center goals by offering solutions to problems identified.
- output targets are the annual deliverables, defined by quantity and type, expected in a specific year and contributing to achieving the MTP Project Outputs.

The Output table for the CGIAR includes:

- (1) technical – scientific production, e.g. articles in refereed journals, articles in congress proceedings, research & development bulletin, books, media, etc
- (2) development of technologies, products and processes, e.g. new varieties released, varieties tested and recommended, practices and agricultural inputs, agro-industrial processes, scientific methodology, machinery equipment, software, mapping, etc
- (3) technology transfer/exchange, e.g. field days, graduate and undergraduate trainees, courses offered, videotapes produced, etc.

Outcome

Outcome is the external use, adoption or influence of a Center output(s) by partners, stakeholders, clients, etc. Centers such as WARDA are generally requested to report

on the five most significant outcomes resulting from outputs that the Center produced in the last three years. At WARDA, indicators for outcomes include the percentage of achievements of MTP goals, percentage of NARS/Advanced Research Institutions (ARI)/Private Sector (PS) partners using CGIAR material, citations per researcher, technologies or varieties developed /co-developed with CG /NARS materials and released by NARS/Partners.

Impacts

“Impacts are the longer-range social, environmental and economic benefits that are consistent with CGIAR goals and the center’s mission and objectives”. Centers are requested to specify or document the ex-post impact assessment activities, outputs and outcomes related to various subjects: impact assessment studies, communication, dissemination and capacity enhancement, etc. SC/SPIA (Science Council Special Panel on Impact Assessment) (SC/SPIA) rates the overall Impact Assessment Performance (Indicator 3A). Centers are also invited to provide the best impact studies completed during the last three years (Indicator 3B)

Indicators of potential to perform

Quality and relevance of current research

Centers’ potential to perform is assessed through:

- (1) the number of peer-reviewed publications per scientist,
- (2) the number of peer-reviewed publications per scientist that are published in journals listed in Thomson Scientific/ISI,
- (3) percentage of scientific papers per scientist that are published with developing country partners in referred journals, conference and workshop proceedings, and
- (4) EP MR rating of Center research quality (this indicator will be piloted from 2006).

In particular, the quality of research staff is assessed through the percentage of Center top-choice candidates accepting senior positions, the number of national, regional and international awards per researcher, the percentage of research staff getting a PhD in the last 5 years, the gender breakdown in international position and management, and the North/South balance in management, etc.

Institutional health

Centers' institutional health is measured through scoring on a Governance–Board checklist, assessment of board statements, score on culture of learning and change checklist, board-approved gender diversity goals, percentage of women in management, IRS nationality concentration and diversity in recently-awarded PhDs. Partnership is also an important point to consider (number of joint programs/proposals with the South or North per researcher, number of program/proposals with other centers per researcher, number per researcher of joint publications with the South or with the North, contact and level of interaction with NARS, etc.)

Financial health

The following indicators are computed for measurement of Centers' financial health: short-term solvency (liquidity), long-term financial stability (adequacy of reserves) and efficiency of operations and cash management on restricted operations.

Stakeholders' perceptions

Every two years, measurement of stakeholders' perceptions involves:

- donor rating of Center performance,
- rating by partners and potential partners of center technical competence and center competitive advantage.
- centers will be requested to provide contact information of their partners.

In view of these new developments in the CGIAR and their implications for WARDA, and given that the center has a unique model of partnership and governance mechanism that includes the NEC in addition to BOT and COM, it is even more important that the biennial meetings add another dimension in enhancing WARDA performance. This should include a strong process for feedback from NARS of NEC and others in the SSA regions where WARDA is involved in rice research and development, and mechanisms through which WARDA's performance can be measured via the indicators outlined above. In this context, schemes of both strategic and applied research, visiting scientists, post-doctoral fellows, research scholars and joint programs are all important processes leading to improved performance. These are not only common to WARDA but also to NARS partners as we can see further in this document and through the presentation.

WARDA-NARS partnership

WARDA, from the very beginning represented a symbol and a partnership between West and Central African Countries. From 1991 to 1999, WARDA-NARS collaborative research was mostly coordinated through thematic Task Forces, which enabled regional coordination of research activities to maximize the benefits of individual research activities and to avoid duplication of effort among partner countries. This contributed to maximizing the use and effectiveness of the limited resources available for rice research in the region. WARDA's research and development activities are conducted in collaboration with various stakeholders – primarily the national agricultural research and extension systems (NARES), universities in Africa, advanced research institutions, non-governmental organizations, farmers' organizations and donors – for the benefit of African farmers, as well as the millions of African families for whom rice means food.

The Center has explored a range of partnership models that cover strategic to adaptive research and development. For upstream research and development, the Interspecific Hybridization Project (IHP) model, a triangular South-South partnership was developed to bring together the pool of expertise from advanced research institutes to national programs. IHP was key to the advancement of the upland NERICAs in SSA. The partnership model that has been most acclaimed by our national partners is the task force mechanism of the ROCARIZ rice network, which has played a central role in the development of the lowland NERICAs. It facilitated the shuttle-breeding approach to accelerate the selection process and achieve a wide adaptability of the lowland NERICAs. As a significant outcome of the task force model, the Center has reinforced SSA's capacity for rice research in less than 20 years.

Basically, the model rests on five inter-related pillars based on genuine partnership and shared vision among national programs, advanced Centers, NGOs and WARDA with emphasis on credit to all partners. The five pillars are:

1. African-led research operating through multidisciplinary task forces and networks combining conventional and advanced science
2. Designing technologies that fit the environment, unlike the Green Revolution technologies that require costly inputs
3. Emphasis on exploitation of indigenous genetic resources and participatory approaches integrating farmers' perceptions and wisdom;
4. Nurturing of the technologies until their dissemination, and advocating their cause at the highest political level; and

5. Sustained funding from visionary donors, such as the CGIAR, in particular Japan, which is one of the foremost NERICA champions.

WARDA is a major hub for partnerships, and hosts the central coordination of the ROCARIZ, International Network for Genetic Evaluation of Rice in Africa (INGER-Africa), the Inland Valley Consortium (IVC), and the African Rice Initiative (ARI). It supports the Coordination Unit of the Eastern and Central African Rice Research Network (ECARRN), based in Tanzania. All of these operate on the basis of linkages with many countries in the region. WARDA also has strong bilateral collaborative links with other CGIAR Centers (IITA, IWMI, IRRI) and with Japan (JICA, JIRCAS), and UK (NRI), France (CIRAD, IRD), Canada (IDRC), etc., as well as SROs such as CORAF, ASERECA, SADC/FNR and FARA.

For accelerated dissemination of improved technologies, the system has developed and adapted several participatory models, such as Participatory Varietal Selection (PVS), Community-based Seed Production Systems (CBSS) and Participatory Learning and Action Research (PLAR).

Introduced for the first time in SSA, PVS has revolutionized the scientist-farmer interaction across SSA and unleashed the NERICA adoption wave. This is being further advanced through the African Rice Initiative (ARI) coordinated by the Center to disseminate NERICAs and complementary technologies across SSA.

The most widely used rice thresher in the Senegal River Valley, ASI – an acronym of the joint partnership ADRAO-SAED-ISRA – is a highly successful product of the partnership-owned R4D system. ASI is lessening the load of drudgery and improving the usable yield and marketability of rice. The success of the low-cost threshers can be seen as the beginning of a commercialization path for smallholders. Labor is the number one issue in SSA agriculture, and machinery magnifies labor efficiency.

Based on lessons learnt from West Africa and in response to the increasing demand for its services and products, which have been spurred by NERICA's popularity, the Center is adopting an appropriate R4D partnership model for Eastern and Central Africa (ECA) where it launched the ECARRN rice network of ASARECA in 2005.

The SWIHA systemwide initiative on HIV/AIDS and agriculture has provided targeted technical expertise to deal with the agriculture, food and livelihood security issues in the region. We are pleased that the CGIAR Science Council has endorsed this initiative hosted by WARDA. A pan-Africa network (ANEHA) was launched last year to facilitate knowledge spillovers across regions and rapidly increase the scale and scope of activities and resources aimed at mitigating the effects of the pandemic on farming communities in SSA.

Through the partnership-owned R4D system, the Center is serving as an ideal hub for capacity building in rice R4D in SSA. More than 100 university students, including about 80 doctoral students have been trained over the last 10 years. Furthermore, WARDA provides grants to NARS partners for R&D activities through networks and consortia, particularly the Inland Valley Consortium and ROCARIZ, ARI etc. The total amount disbursed to NARS partners for the five-year period 2000–2004 was USD 2.85 million, with an average of USD 150 000 received per country. This represents a significant contribution to the research budget of some of the NARS.

In addition, a recent move in supporting NARS research through collaboration with NARS-led proposals have been achieved through IFAR (International Fund for Agricultural Research) small-granting mechanisms. In 2005, one grant (USD 10 000) was approved by IFAR in collaboration with Burkina Faso, while in 2006, three out of four submitted proposals were approved and these were led by NARS of Côte d'Ivoire, Sierra Leone and Senegal in collaboration. These grants (USD 33 000) provide additional resources that enhance NARS-WARDA partnership and performance in delivering products.

The true scientific collaboration between WARDA scientists and researchers in the national systems frequently results in joint publication of the fruits of that research, whether led by WARDA or national scientists. As well as papers accepted by peer-reviewed international journals, the collaborating scientists nearly always present their work in other published forms, through workshop proceedings, poster presentations or project reports.

WARDA and NARS have, for example, co-published several papers between 2000–2005 (Table 3), including 49 in peer-reviewed journals, 23 books and book chapters, 23 in workshop and conference proceedings, giving a total of 95 publications. These

joint publications as stated in the PMI play a key role in assessment of WARDA's performance and level of partnership.

Table 3. Recorded publications co-authored /co-published with NARS partners in 2000–2005, showing joint authored papers and the percentage of total WARDA publications

Publication type	YEAR														Total	
	2000		2001			2002		2003		2004		2005				
	Jnt	%	Jnt		%	Jnt	%	Jnt	%	Jnt	%	Jnt	%	Jnt	%	
Peer-reviewed Journals	5	14	2	9		7	54	4	17	14	38	17	33	49	27	
Books & book chapters	3	14	15	28				1	11	1	20	3	9	23	18	
Proceedings								11	58	11	44	1	6	23	25	
Total	8	13	17	19		7	22	16	31	26	39	21	21	95	24	

The partnership has also allowed effective sharing of genetic material through networks, such as INGER. As an example of the partnership with NARS, an overview of the progress and achievements in germplasm sharing and utilization through INGER over the last 10 years is shown below.

Increased varietal nominations by NARS

Initially, international centers were the main sources of new germplasm accessions in Africa. Nonetheless, since the creation of the African wing of the international network for the genetic evaluation of rice (INGER-Africa) at WARDA, the level of interaction and participation of national breeders in regional germplasm exchange has increased. NARS scientists stepped up the utilization of the new mechanism to evaluate their own materials in a wide range of environments. There were also significant improvements in the nomination of NARS-developed or -selected lines into the regional nurseries (Figure 4, below). From very few before 1994, varietal nominations from national program scientists reached over 60% in 1996. The annual fluctuations indicate the rates of improved-line generation and availability from NARS. This improvement in NARS participation clearly indicates that germplasm exchange and evaluation in Africa is no longer essentially a one-way flow from international centers to the national programs.

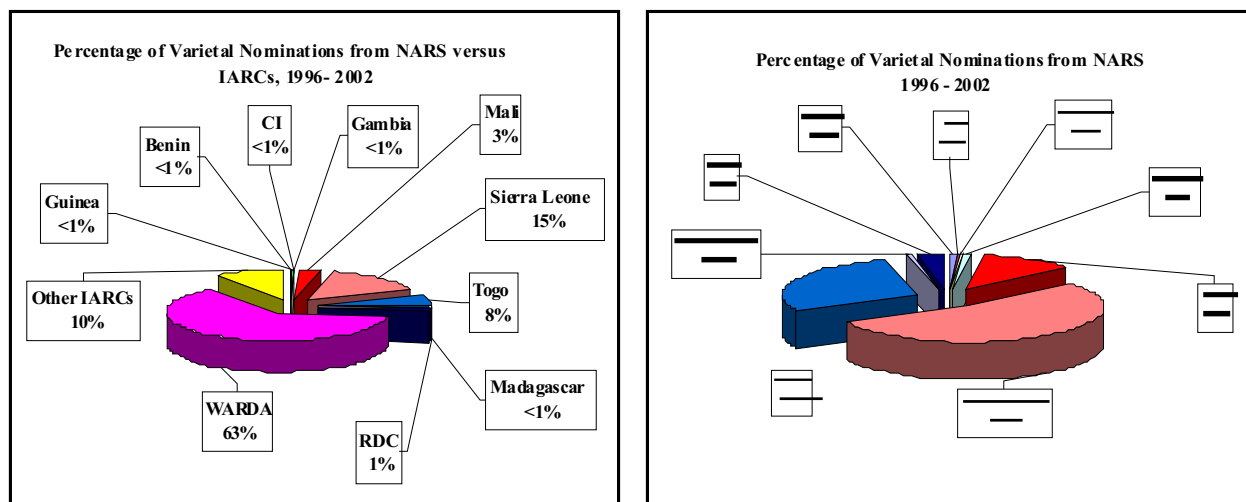


Figure 4. Nominations of NARS-developed lines, 1996–2002

Fast release of new improved varieties

Germplasm impact studies

The Consultative Group for International Agricultural Research (CGIAR) germplasm impact studies conducted by the Africa Rice Center (WARDA) in 1999 in West Africa's seven most important rice-producing countries indicated that despite limited regional resources invested annually in varietal improvement, 197 improved varieties have been released with more than 122 targeted for release in the next five years. It was noted that regional collaboration produced a considerable number of new varieties for all ecologies. Out of the 197 varieties, 60% were the product of international collaboration involving international research centers. Some of the varieties were lines introduced and selected as varieties or varieties developed by NARS with parents obtained from international research centers.

Varietal spread

Results also show that out of 197 released varieties, 150 varieties (76%) were released in 20 years, from 1975 to 1994, with an average of seven varieties per annum. Within five years of the new germplasm exchange unit being set up in WARDA, 47 varieties (24%) were released from 1995 to 1999 with an average of 12 varieties per annum, with a projection for the release of 122 varieties during the period 2000 to 2004. This is expected to amount to an average of 30 varieties per annum. These results concern only seven out of 17 WARDA member countries, and indicate the efficiency and

effectiveness of the partnership model used in the germplasm exchange and evaluation at WARDA. This also shows that better varieties are being bred or selected by scientists for a sustained yield increase, yield stability and stress tolerance.

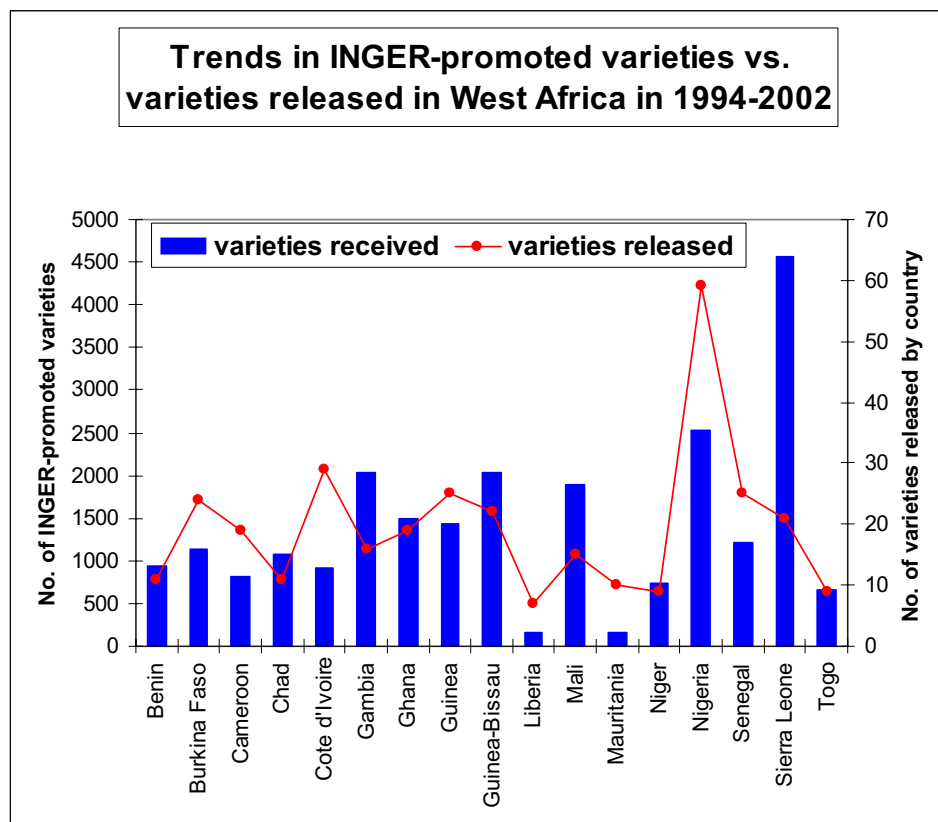


Figure 5. Trends in INGER-promoted varieties versus varieties released in West Africa in 1994–2002

INGER-Africa has been a vital mechanism linking NARS programs in West Africa with their counterparts in the ECSA sub-region, and both with the IARCs. The network has, within a short span of eight years (1994–2002), also accelerated the release of many improved varieties in West and Central Africa (Fig. 5). These varieties are being widely cultivated and are contributing to the improvement of farmers’ well-being in the region.

In germplasm exchange, from 2000 to 2005, a total of 12 620 varieties have been dispatched to 14 countries in WCA including Benin, Burkina Faso, Côte d’Ivoire, The Gambia, Ghana, Guinea, Guinea Bissau, Mali, Mauritania, Niger, Nigeria, Sierra Leone, Senegal and Togo. For the same period, a total of 5 444 varieties have been dispatched

to countries in East, Central and southern Africa, including Burundi, Cameroon, Central Africa Republic, Tchad, Congo, Ethiopia, Kenya, Malawi, Mozambique, RD Congo, Sudan, Tanzania, Uganda and Zimbabwe.

West and Central Africa Medium Term Plan

The Center's rich experience of developing and managing impact-oriented institutional arrangements and partnership R4D models has given it a comparative advantage to be entrusted with the task of developing a regional MTP as part of CGIAR's SSA strategy for greater programmatic and structural alignment. The WCA MTP is being developed in close consultation with CGIAR Centers, regional and sub-regional organizations, national programs and NGOs engaged in agricultural R4D in the region. The Regional MTP is expected to help stakeholders to have better research coherence, efficiency and impact in the region. We have achieved convergence of CG and CORAF priorities, developed thematic framework for aligned and integrated programs and potential platforms for program implementation.

Thus WARDA has effectively become an ever-growing system of scientific partnerships, a knowledge-based hub of networks. The Center's scientists are the first Africans to receive world-class awards, such as the World Food Prize 2004 and The Fukui International Koshihikari Rice Prize of Japan in 2006.

Training and joint field schools and workshops with NARS

More than 1000 scientists, extension agents, trainers and progressive farmers have benefited between 2000–2005 from workshops organized by WARDA for NARS personnel, or from joint training sessions and field schools where WARDA and relevant NARS have cooperated to train early adopting farmers to lead new technology dissemination, particularly those technologies classified within integrated genetic resource management (Tables 4, 5 and 6). Additional capacity building within NARS has taken place in specialist workshops involving, for example, socio-economists or engineering technicians. About 170 – or 16% – of the participants have been women.

The way forward

Africa Rice Center's excellence, achievements and impact are strongly linked to strong performance, which in term is largely dependent on the health of its partnerships. Strong

partnership in turn largely depends on the model, content and implementation of such partnership. Some key elements (not exhaustive) include:

- excellent communications mechanisms
- joint planning of collaborative activities, programs, projects and ventures
- strong schemes for visiting scientists, training
- mutual respect and equality in partners
- shared credit on successes and lessons learned from failures
- built-in trust, etc.

A successful partnership includes: cooperation or collaboration between several individuals or organizations in jointly implementing a project or venture through sharing of financial, intellectual, human resources and materials. To use the French acronym of a recent web-based publication, partnership here referred to as PARTENARIAT means: *Partage* (sharing), *Animation* (stimulating), *Rentabilité* (Productivity/Profitability), *Technologie* (Technologies/products), *Enrichissement* (Enriching in knowledge, content and experience), *Nouveaux public* (reaching out), *Appropriation* (empowerment), *Réseautage* (networking for multiplier effect), *Image* (improved organizational image), *Apprentissage* (continual learning and training), *Téléaction* (taking advantage of ICT).

It is clear that most if not all these apply to successful partnerships. Since successful partnership translates in most cases into a better institutional performance, both WARDA and NARS partners have a lot to gain from this close collaboration. NEC is a unique mechanism, model and tool through which an enhanced performance for WARDA and NARS can continue to be achieved. It is truly binding, and as we expand to East and Southern Africa, let us together strengthen this partnership in order to continue shaping Africa Rice Center (WARDA) as an Africa-wide Center of Excellence in rice research and development.

Table 4. Training courses and seminars/workshops in IGNRM-related disciplines and topics 2000–2005

Type of course and date	Location	Languages	Male participants	Female participants	Total
Training: community-based seed systems 17–19 Jan 2000	Korhogo, Ivory Coast	French, Dioula, Senoufo	25	15	40
Rice production for farmers. 10 August 2000	Bodokro, Ivory Coast	French, Baoulé	45	7	52
Rice production for farmers. 8 September 2000	Dabakala, Ivory Coast	French, Senoufo	17	12	29
Rice production for farmers. 14 September 2000	Bondoukou, Ivory Coast	French, Dioula	27	22	49
Rice production for farmers. 18 September 2000	Bouna, Ivory Coast	French, Dioula, Lobi	27	25	52
Rice production training for WFP and ANADER supervisors. 20–23 November 2000	Bouaké, Ivory Coast	French, English	32	3	35
Training in rice growing for ANADER trainers. 28–29 Nov 2000	Bouaké, Ivory Coast	French, English	32	1	33
Training of innovative farmers and trainers. 27–31 March 2001	Bouaké, Ivory Coast (ANADER)	French	35	7	42
Improved rice cultivation techniques for lowland & rainfed rice. 7–8 June 2001	Bouaké, Ivory Coast	French	16	1	17
Production techniques, seed commercialization, quality control. 11–22 June 2001	Bouaké, Ivory Coast	French	35	6	41
ICM for irrigated rice (for farmers). July–October. 4 days/site 2001	Boundoum and Podor, Senegal	Wolof	80	0	80
Participatory learning and action research for integrated rice management (for farmers). July 2001 to January 2002 (weekly)	Bamoro, Ivory Coast	French	30	0	30
Participatory learning and action research for integrated rice management (for farmers). July 2001 to January 2002 (weekly)	Lokapli, Ivory Coast	French	25	5	30
Participatory technology development. 26 August–14 September 2001	Abeokuta, Nigeria	English	23	9	32
Construction of the thresher-cleaner. 1–26 October 2001	Accra, Ghana	English	10	0	10
Training on rice yellow mottle virus. 29 Oct–9 Nov 2001	Bouaké, Ivory Coast	French, English	17	0	17
Sustainable crop-livestock production for improved livelihoods and NRM in West Africa. 19–22 November 2001	Ibadan, Nigeria	English	70	20	90
Participatory rice research and seed production (for national partners). 27–30 November 2001	Kigali, Rwanda	French, English	29	2	31
PVS-Extension. 19–21 Dec 2001	Bouaké, Ivory Coast	French	20	1	21
Training workshop for CBSS facilitators. 19–28 Dec 2001	Bouaké, Ivory Coast	French	42	8	50
Training of innovative farmers and trainers. 27–31 March 2002	Bouaké, Ivory Coast (ANADER)	French	35	7	42
Improved rice cultivation techniques for lowland & rainfed rice. 7–8 June 2002	Bouaké, Ivory Coast	French	16	1	17

Production techniques, commercialization and seed quality control. 11–22 June 2002	Bouaké, Ivory Coast	French	35	6	41
Workshop on iron toxicity in rice-based cropping systems. 19–21 March 2003	Cotonou, Benin	French, English	19	0	19
Impact assessment methodology. 5–16 May 2003	Conakry, Guinea	French, English	12	0	12
PLAR for IRM. 16–21 June 2003	Sikasso, Mali	French	22	3	25
PLAR for IRM. 23–28 June 2003	Kumasi, Ghana	English	20	0	20
Training on NERICA for Bouake and Korhogo universities (students, Professors). 27–29 January 2004	Abidjan, Ivory Coast	French			97 21
PLAR for integrated rice management (scientists, extension workers, NGOs, development projects). June 28–6 July 2004	Banjul, Gambia	English			25
PLAR for integrated rice management (scientists, extension workers, NGOs, development projects). June 28–6 July 2004	Conakry, Guinea	French			25
Foundation seeds production techniques (scientists in charge of seed production). 26–31 July 2004	Yamoussoukro, Ivory Coast	French			15
Planning workshop on marker-assisted selection (MAS) for rice improvement against RYMV. 11–13 May, 2005	Bamako, Mali,	French, English			9
Training on analysing nursery variety trials (scientists, extension agents). 14–16 June 2005	Cotonou	French			12
Training on analysing nursery variety trials (scientists extension agents). 5–7 July 2005	Bamako, Mali,	French			25

Table 5. Number of interns, PhD students and other trainees receiving IGNRM-related training at WARDA 2000–2005

Discipline	PhD	MSc	DAA/DEA	Other	Total
Agronomy	2	2	1	2	7
Breeding	1		1	2	4
Entomology	1		2		3
Genetic Resources		1	7	3	11
IVC				1	1
Molecular Biology/Genetics	9	1	1	1	12
Natural Resources Management	2	2		2	6
Plant Pathology	2	1	1	3	6
Plant Physiology	1	1	1	2	5
Soil Science	9	2		1	12
Technology Transfer		1			1
Vegetable production				1	1
Total	27	11	14	18	70

Table 6. Numbers trained in conjunction with NARS 2000–2005

Year	2000		2001		2002		2003		2004	2005
	M	F	M	F	M	F	M	F		
Number of participants										
Training for farmers/ technicians in conjunction with NARS	144	81	186	12	18	0	42	3	118	10
Training for NARS staff and technicians	89	4	67	11	143	16	44	2	65	106
Total M & F	318		276		177		91		183	116

ANNEX V

IVC activity report

Dr Paul Kiepe
Coordinator

Introduction

During its 12 years of operation, the Inland Valley Consortium has generated scientific and technical focus on lowlands through a platform of exchange between partners at national, regional and international level in each member country. The IVC stimulated national capacity building of lowland characterization, development approach issues and the development of inland valley ecosystems. Thanks to developing this expertise, IVC has contributed to the national dynamic on the sustainable development of lowlands.

The Consortium Steering Committee (CSC) met twice since the last report to the NEC: once in September in Cotonou to discuss and approve the budget and once during the annual workshop, which was hosted by NARI in Serekunda in May 2006.

The principal donors are still funding IVC, although the French contribution has diminished considerably. The Netherlands has retained its level of funding, while France closed the position of Regional Coordinator as per 31 December 2005.

Activities continue in the 12 member countries and the National Coordination Units (NCU) have mounted a number of research projects. However, despite the recommendations of the external evaluation to IVC to focus on transboundary and multi-annual projects by the NCU, the number of transboundary project proposals is still not satisfactory.

Decisions of the Consortium Steering Committee

The Consortium Steering Committee unites once a year during the annual workshop, but if necessary a second meeting is called. When the annual workshop was held in April 2005 the budget was not yet released by WARDA management. Therefore, the

CSC came together once more in September 2005 to discuss budgetary issues and project proposals. The dates of the meetings were:

- 9 and 10 September 2005 in Cotonou, Benin
- 3 and 4 May 2006 in Serekunda, The Gambia

A second CSC meeting is foreseen this year because the budget was not released by WARDA management at the time of the 2006 annual workshop. Major decisions taken by the CSC were:

September 2005

1. Preparation of responses to the Challenge Program Water and Food (small grants) tender. An initial draft could be submitted to the RCU before the end of September;
2. The Chairman of the CSC attended the FARA meeting in Entebbe (Uganda) and met representatives of the Netherlands Cooperation (discussion on WARDA funding mechanisms);
3. The 2006 annual workshop will be held in the third week of the month of April and the central theme will be the presentation of Phase II products and commissioning of Phase III. Prior to that date, the following stages must be observed:
 - a. appointment by WARDA of STCC members (scientific and technical consultative committee) on the basis of a proposal by the RCU, which will take into account the various disciplines (of research and development) and propose terms of reference for their mission,
 - b. project reports as well as new project proposals will be sent to the RCU, which will analyze them,
 - c. these documents will be forwarded to the STCC;
4. The need for beneficiaries of IVC funds (projects, operations) to justify their activities for previous years with accounts, reports and records;
5. The urgent need to inform the NCUs on projects funded this year, on setting up regional projects, and on funds utilization for 2006 (value-added products);
6. In the case of Cameroon, a discussion with IRAD's DG is planned for the NEC meeting;
7. Under the current IVC regulations the president is chosen from the NCU coordinators, while the CORAF scientific coordinator is the vice-president. As the SC of CORAF did not attend the last five meetings, the seat of vice president was taken away from CORAF.

May 2006

1. The president finished his term (two years; one year renewable) and the presidency changed from Benin to The Gambia;
2. Terms of reference for the CCST to be drafted by RCU;
3. SC to contact the DG of IRAG in Cameroon;
4. RCU will send 3,000 USD operational funds to the NCUs;
5. SC will write a budget for World Bank funds;
6. Finalize draft for the new Collaboration Agreement (RCU)
7. SC will contact WARDA DG about recruitment of RC;
8. SC will contact absentee international members and raise the concern of the CSC about their absence;
9. SC to contact Moïse Sonou about the FAO Inland Valley network in EA;
10. President to contact the DG of WARDA expressing his concern about the late release of the budget;
11. CSC Members send their comments on the new IVC MTP to the SC before 31 May;
12. All CSC members should respond to communications that ask for actions.

Workshops and meetings

The IVC Annual Workshop 2006 was hosted by NARI and held from 2-5 May in Serekunda, The Gambia. The meeting was very constructive and a big success, due to an excellent collaboration between NARI, IVC and WARDA.

The end-of-project workshop of the Lowlands Development Trajectory Project was held in Cotonou from 7-9 June. This is in fact not an IVC but a WARDA project, but executed with IVC partners from Burkina Faso, Ghana and Togo.

Organization and funding of IVC

The principal donors are still funding IVC, although the French contribution has diminished considerably. The Netherlands has retained its level of funding, while France has closed the position of Regional Coordinator as per 31 December 2005. WARDA Management has generously offered to provide a visiting scientist position for two years, renewable once, to fill the gap. The announcement was sent to the directors-general of the NARS

and a copy was sent to the NCU coordinators. Three candidates applied for the position and the selection process started. We hope to welcome the successful candidate soon as a member of the WARDA family.

For the year 2006 IVC received World Bank support of USD 155 000. The money is targeted to facilitate the launching of the third phase, to host an inland valley workshop in East Africa and for mounting transboundary multi-annual projects.

The Community-based Fish Culture in Seasonal Floodplains and Irrigated Systems was launched in Penang, Malaysia. It is a collaborative project between IVC, WARDA, WorldFish, IFPRI, IER, Projet Valorisation des Ressources en Eau de Surface, Office Riz Mopti, Direction Regional de la Pêche and the Coordination Regionale ONG and is being directed by IER, Mopti. Site selection and field work started in May 2006, during a joint mission between the project coordinator from WorldFish, the scientific coordinator of IVC and the team of the fishery department of IER.

Funding of research projects

Operational funds NCU in 2005

Country	Project	Amount
Benin	Operational funds	3,000 USD
Burkina Faso	Operational funds	3,000 USD
Côte d'Ivoire	Operational funds	3,000 USD
Ghana	Operational funds	3,000 USD
Guinea	Operational funds	3,000 USD
Mali	Operational funds	3,000 USD
Nigeria	Operational funds	3,000 USD
Sierra Leone	Operational funds	3,000 USD
The Gambia	Operational funds	3,000 USD
Togo	Operational funds	3,000 USD
Senegal	Starting IVC activities and organization of NCU	3,000 USD

Value-addition projects funded in 2005

Country	Project	Amount
Benin	Elaboration de référentiels technico-économiques et opérationnalisation de la base de données sur les bas-fonds du Bénin	5,000 USD
Burkina Faso	Contribution à la réalisation d'un manuel technique et d'un support visuel sur la démarche et les techniques d'aménagement des bas-fonds au Burkina Faso	5,000 USD
Guinea	Capitalisation et diffusion de l'information sur les bas-fonds en Guinée à travers une cellule de documentation spécialisée	5,000 USD
Mali	Valorisation des acquis de la recherche pour la mise en valeur durable des bas-fonds en zone Mali-Sud	5,000 USD
Togo	Finalisation et valorisation de la base de données sur les bas-fonds au Togo à travers l'organisation d'un atelier national	5,000 USD
WARDA	Printing of Proceedings Iron Toxicity Workshop	5,000 USD

Research projects funded in 2005

Country	Project	Amount
Benin	Appui à l'organisation des femmes pour une amélioration la productivité du bas-fonds de Odo-Otchèrè (Département des Collines au Bénin)	5,000 USD
Burkina Faso	Etude comparative des performances techniques et socio-économiques des modèles d'aménagements de bas-fonds pratiqués au Burkina Faso	7,000 USD
Côte d'Ivoire	Recherche sur la rizipisciculture dans les systèmes de production en zone de bas-fonds : cas des régions du Centre Ouest et du Sud Ouest de la Côte d'Ivoire	8,500 USD
Togo	Appui à la mise en valeur après aménagement du bas-fond de Nogyiog au nord Togo (deuxième année)	8,500 USD

Future perspective

In line with the recommendations of the external review, the small-scale projects have come to an end. For 2006 money has been set aside by the CSC for so-called validation projects where the NCU should bring forward their major research findings of the last 12 years of inland valley research, for mounting transboundary projects and for finishing

some final in-country projects, such as collection of inland valley data as well as characterization of the two new members, The Gambia and Senegal.

A new workplan and budget (WPB) are being written for the Sustainable Productivity Increase of Rice in the Inland Valleys of West Africa (SPIRIVWA) project that is funded by CFC. The SPIRIVWA project came to a standstill due to a variety of reasons, but there is still an unutilized budget. The new West Africa coordinator of CFC approached the RCU and inquired about the feasibility of restarting the project. A new WPB has been drafted with input from the implementing partners (CNRA, INERA and NCRI). The remainder is scheduled to run for another two years.

For 2007 an inland valley symposium is scheduled. Planning sessions will start as soon as the new regional coordinator is on board. IVC members called for capacity-enhancing training workshops and singled out courses in proposal writing and scientific writing.

Conclusion

Despite its age, IVC is still going strong. It has staunch support from its donors as well as from WARDA, the convening center. The strength of IVC lies in its partnership and the ability to renew itself. The new way forward is now transboundary projects, which gives our stakeholders the unique opportunity to collaborate regionally as well as internationally. It is a challenge for our members to join us in new ways of doing research, but it will lead inevitably to better science and tangible results to the benefit of the national researchers themselves and the inland valley users.

ANNEX VI

African Rice Initiative Coordinator's Report 2005

Dr Inoussa Akintayo

Network coordinator

Since our last meeting in 2004, tangible progress has been made in setting the stage for large scale NERICA dissemination. Seed production has received due attention leading to the production of several tonnes of foundation seeds. This was made possible by the launching of the AfDB-funded NERICA dissemination project, the release of funds for the project implementation in all ARI pilot countries, the contribution of JICA experts, UNDP support and funds made available by the Rockefeller Foundation for seed production.

Status of the African Development Bank-funded NERICA dissemination project.

The project was officially launched in Accra and Conakry in May 2005. The launch was followed by a training course on AfDB project implementation procedures (fund request, purchase and fund justification). As of today, funds have been made available to all participating countries, including grants to WARDA and NARS.

The NERICA stakeholders met in all countries to identify constraints and opportunities and to prioritize activities. Where possible, the regional coordination attended the meetings.

The recruitment procedures for a consultant for rice policy analysis are completed. We have also taken necessary steps for the baseline study at each participating country's level through ROCARIZ. Purchase of equipment and goods approved in the project is in progress at WARDA and in the participating countries.

Seed production and distribution

Seed availability was the key issue addressed by the coordination unit during the period under review:

- more than 5 tonnes of foundation seed of NERICA 1 to NERICA 7 were distributed to the pilot countries at the beginning of 2005 cropping season and more than 13 tonnes during 2006.
- more than 16 tonnes of foundation seed of released NERICAs were produced by the coordination unit in Cotonou and Deve (130 km from Cotonou) (Table 7)
- we have also facilitated the production of more than 2,000 tonnes in the pilot countries (Table 8).

Table 7. Production and distribution of NERICA foundation seed by ARI Coordination Unit

Year	Seed produced (kg)		Seed distributed (kg)			Beneficiary countries	
	B.S ¹	F.S ¹	Total	B.S	F.S		Total
2003	75	350	425	65	350	415	Mali, Togo
2004	151	1 063	1 214	100	1 000	1 100	Burkina Faso, Mali, Togo, Nigeria
2005/2006	1 474	14 102	15 576	1 400	13 900	15 300	Benin, Burkina Faso, DR Congo, Ethiopia, The Gambia, Ghana, Guinea, India, Kenya, Mali, Nigeria, Liberia, Mozambique, Philippines, Sierra Leone, Tanzania, Togo, Uganda.
Cumulative Total	1 700	15 515	17 215	1 565	15 250	16 815	

1. B.S: Breeder Seed, F.S: Foundation Seed

Table 8. Production of seed in pilot countries in 2005*

Country	Quantity (tonnes)	Seed category
Benin	15	Foundation
Ghana	36	Foundation
Gambia	986	Certified seed & Foundation
Mali	50	Foundation
Nigeria	250	Foundation
Guinea	806	Certified seed & foundation
Sierra Leone	260	Certified and foundation seed
Central Coordination Unit	16	Foundation & Breeder
TOTAL	2 619	

* Only seed produced by or through national co-ordination units is included

Besides the above results, foundation seed was multiplied during the 2005 off-season by the Regional Coordination Unit and by national coordinators, notably in Benin, Guinea, Mali, Ghana, B. Faso, Nigeria and other neighboring countries using funds provided by the Rockefeller Foundation, JICA, AfDB and UNDP. More than 60 tonnes of foundation seeds are expected.

Introduction of new NERICA lines to farmers – PVS

In order to increase adoption rate and boost production, ARI facilitated the introduction of more than 400 NERICA lines to farmers through PVS. By the end of 2005, 11 new NERICAs were named (Table 9), of which three have been released. The newly named materials are mainly extra early (e.g. NERICA 8, 9, etc.). ARI also contributed to the introduction and release of lowland NERICA lines; up to 60 have been named, of which five have already been released.

Table 9. Performance of newly-named NERICAs

Varieties	Plant height (cm)	Potential yield (kg)	Harvested yield (kg)	Maturity (days)	Grain length (mm)
NERICA 8	101	6 000	4 200	86	10
NERICA 9	110	6 000	3 900	86	10
NERICA 10	110	5 000	3 000	93	9
NERICA 11	105	7 000	5 500	95	10
NERICA 12	105	6 000	5 000	94	10
NERICA 13	124	6 000	4 000	94	10
NERICA 14	110	4 500	3 100	82	10
NERICA 15	129	5 000	3 200	97	10
NERICA 16	131	5 000	3 300	93	9
NERICA 17	117	6 000	3 600	94	9
NERICA 18	112	5 000	3 300	97	10

Status of NERICA dissemination in SSA

ARI activities were initially restricted to pilot countries but have been extended progressively to further countries. By 2005, NERICA lines had been tested in nearly all SSA countries. Thirteen NERICA lines have been adopted/released in 13 countries (Table 10), the number of varieties per country ranging from one to seven. In 2005, NERICA varieties were produced on more than 150 000 ha.

Table 10. NERICA lines adopted/released in selected countries

COUNTRY	NERICA																Total
	1	2	3	4	5	6	7	8	10	11	12	13	14	15	17	18	
Benin	x	x															2
Burkina Faso											x	x		x	x	x	5
Congo Brazzaville									x								1
Congo DRC				x		x	x										3
Côte d'Ivoire	x	x	x	x	x												5
Ethiopia	x			x		x											3
The Gambia	x	x	x	x	x	x	x										7
Ghana	x																1
Guinea	x	x	x	x	x	x	x										7
Kenya										x							1
Mali				x				x					x				3
Nigeria	x	x	x														3
Sierra Leone	x	x	x	x	x	x											6
Togo	x		x	x													3
Uganda				x													1
Total	9	6	6	9	4	5	3	1	1	1	1	1	1	1	1	1	1

Development of complementary technologies

ARI has sponsored intensive research on technologies such as fertilizer rate, weeding regime, sowing depth and sowing date. ARI has also developed new NERICA-based recipes using NERICA flour and concluded that NERICA flour could easily replace that of wheat in many confectioneries.

In collaboration with SG2000, protein content of NERICA 1-4 and 6-8 has been determined. The results show that the protein content of NERICA lines is higher than that of imported rice by 20-25%. Comparing parboiled to non-parboiled NERICA, the results indicated that protein content of parboiled rice is higher by up to 10% (Table 11).

Table 11. Average of protein content per variety

Variety	Protein content (%)	
	Parboiled	Non-parboiled
NERICA 1	11.03	10.05
NERICA 2	11.81	10.49
NERICA 3	11.14	10.20
NERICA 4	9.51	8.87
NERICA 6	10.76	10.34
NERICA 7	11.69	10.43
NERICA 8	10.14	9.49
Imported rice	-	7,94

Varietal maintenance and characterization

In order to keep all released varieties and those in the pipeline true to type, intensive varietal maintenance activities are ongoing. Parallel to maintenance activities, the varieties are characterized. To date, NERICA 1 to 8 are characterized and results made available to users.

Workshops, capacity building and public awareness

- workshop on implementation procedures of the African Development Bank-funded NERICA dissemination project was conducted in Ghana and Guinea for pilot countries.
- NERICA dissemination platforms in pilot countries conducted their planning and priority setting meeting with the regional coordinator in attendance.
- 20 selected farmers from a rice farmers' organization in Benin were trained in NERICA seeds production.
- field day was conducted for farmers, NGOs and scientists to expose them to NERICA seed technologies in all pilot countries by the regional and national coordination units.

Resource mobilization

- in collaboration with other WARDA scientists, proposals have been developed and submitted to ECOWAS and World Bank.

- requests submitted to UNDP for additional funds for ARI project and extension of the UNV specialist attached to ARI have been approved.
- Rockefeller Foundation has approved USD 40 000 for seed multiplication in four countries
- contact has been established with IDRC for a possible intervention.

Monitoring

During the period under review, we have visited selected countries, notably: Ghana, Liberia, Guinea, Mali, Togo and Benin. Visit to other countries are planned for 2006.

Steering Committee meeting

The steering committee of ARI took place during the week of April 18-20 with the participation of all national coordinators, UNDP and AfDB.

The committee made an array of recommendations among which seeds production and resource mobilization were the major ones.

Other activities

Partnership Development

Partnership has been developed with a farmers' organization in the area of seed production. We have also developed a partnership with Songhai (NGO) in NERICA-based processed product development, seed production, post-harvest and training.

Contribution to rice sector rehabilitation in war-affected countries

More than 3 tonnes of foundation seed are made available to Liberia and Sierra Leone. The seeds will be multiplied in partnership with FAO and concerned countries. It is expected that by the middle of 2007 more than 2000 tonnes of good quality seeds will be available from this initiative in both countries.

Conferences/ workshops attended

Table 12 shows the various workshops/conferences that we have attended during the period under review.

Table 12. List of conferences/workshops attended in 2005

Event	Objective	Venue	Date
NERICA dissemination in Africa	Take stock of NERICA dissemination in SSA	Nairobi	Feb 2005
WARDA Council of Ministers Meeting	Review of WARDA Activities	Ouagadougou	Sept 2005
Seed regulatory framework workshop	Validate the seed regulatory framework document for West Africa	Accra, Ghana	14-17 September, 2005
Biotechnology, breeding, and seed system	Information exchange among experts	Nairobi	Jan 2005
West and Central Africa Regional meeting on implementation of CAADP	Launching of the Comprehensive African Agriculture Development Programme	Bamako	19-23 Mar 2005

Publications

Passport data of selected upland NERICAS

Conference papers

Developing the paths to prosperity: NERICA dissemination in SSA. JICA seminar on Rice in Africa. Nairobi 11-13 February, 2006.

Posters

More than 20 posters on NERICA performance developed

Outlook

1. Making seed available to farmers will continue to be our main target in 2006. While producing breeder and foundation seed at WARDA and in collaboration with NARS, partners among NGOs, farmers' organizations and individual seed growers will be identified and encouraged to produce certified seed.
2. In collaboration with upland breeders, GRU and the biotechnology lab, we will continue to address varietal segregation issues observed in farmers' fields in recent years.
3. Post-harvest and processing issues will receive due attention through collaboration with the Songhai NGO
4. NERICA complementary technologies issues (agronomy-related) will continue to be tested
5. Resource mobilization will remain a preoccupation

ANNEX VII

ROCARIZ status report

Dr Lawrence T. Narteh

Network coordinator

Introduction

Since October 2004, the network has been running an interim phase in anticipation of a five-year programme under a unified cereals network. This has meant a gradual scaling-down of ROCARIZ network activities. For example, the usual Competitive Grant Scheme with the national research scientists and related training programs are not likely to be a feature in this year's activities. In spite of the lack of funds for field-related activities, WARDA through the Canada Fund for Africa (CFA) has continued to pay the salary of the coordinator. This payment will terminate in June 2006.

Collaborative Research Activities

(a) Competitive Grant Scheme

Funds were provided for forty-two (42) projects for the cropping season of 2005 for eleven (11) countries. As shown in Table 13 below, the ROCARIZ member countries have not all submitted the technical and financial reports.

Table 13. Status of reporting and compliance by countries receiving ROCARIZ competitive grants

Country	Status
Benin	Submitted
Burkina Faso	Submitted
Mali	Submitted
Niger	Submitted
Guinea	Submitted
Nigeria	Not submitted
Senegal	Not submitted
Togo	Not submitted
The Gambia	Not submitted
Sierra Leone	Not submitted
Cameroon	Not submitted

(b) Monitoring Tour

The Chairman of the Steering Committee of ROCARIZ led an eight-member multi-disciplinary team from Sierra Leone, The Gambia, Niger, Burkina Faso and Mali to visit three countries (Niger, Burkina Faso and Mali) on 10-21 October 2005.

The team was happy with the quality of research, and noted the strict adherence to the research protocols as determined by the Steering Committee. They observed that the late release of funds from the secretariat (WARDA) was a source of worry and needed to be improved upon. The team was satisfied with the level of integration of non-research organizations in the research outputs of the countries visited.

(c) Marker-assisted Selection

The network scientists in Burkina Faso, Republic of Guinea, The Gambia and Mali are currently involved in a project entitled ‘Marker Assisted Selection (MAS) against Rice Yellow Mottle Virus (RYMV)’. The project involves the identification of biotechnological tools for the breeding and selection of rice varieties against the RYMV menace in lowland ecosystems. Capacity development and an upgrading of laboratory facilities are all components of the project.

(d) ARI baseline studies

As part of WARDA’s efforts at disseminating NERICAS to small-scale farmers in Africa, the Center – through the African Rice Initiative (ARI) – received funding to support the dissemination of improved rice seed to seven pilot countries. ROCARIZ provides a useful avenue by which to conduct research on baseline studies entitled: *Ex-post and ex-ante impact of the NERICAs and complementary technologies*. ROCARIZ had earlier trained national scientists on impact assessment methodology and it was agreed the network has a comparative advantage to carry out this research activity. Therefore, the Economics Task Force received and distributed forty-two thousand dollars (USD 42 000) through the secretariat to the seven pilot ARI countries in the sub-region. Each of the research institutes received USD 6 000. The grants went to: The Gambia, Guinea, Sierra Leone, Ghana, Benin, Mali and Nigeria.

(e) Building resilience to HIV/AIDS

The networks’ scientist from the Nigerian National Cereals Research Institute (NCRI) in Bida, participated in a preparatory meeting of the project ‘Building Resilience to

HIV/AIDS amongst smallholder farmers in Nigeria. The project will be based in Makurdi, Benue State. The WARDA-led project is sponsored by the Canada Fund for Africa and will be launched at a workshop in May 2006.

(f) Workshops

The Coordinator presented two papers at a workshop in Addis-Ababa, Ethiopia (25 Feb-2 March). The workshop was organized jointly by Sasakawa Global 2000 and the Ethiopian Agricultural Research Organization to assess the possibility of how to increase rice production in Ethiopia through research.

Preparations for the 4th Biennial Regional Rice Research Review (4Rs)

ROCARIZ has decided to join in the Africa Rice Congress. The Network’s Biennial Regional Rice Research Review (dubbed 4Rs) will be held in conjunction with counterparts of the East and Central Africa Rice Research Network (ECARRN) and under the auspices of the Africa Rice Centre. The event takes place in Dar es Salaam, Tanzania on 31 July-4 August, 2006. Sixty-eight (68) abstracts have been received from twelve (12) West African countries. They are currently being evaluated for selection. The list of countries whose abstracts are currently being reviewed are shown in Table 14.

Table 14. List of ROCARIZ countries whose scientists have submitted abstracts for the Africa Rice Congress

Country	Number of abstracts
Benin	2
Burkina Faso	8
Cameroon	2
Cote d’Ivoire	5
The Gambia	4
Ghana	7
Guinea	3
Mali	6
Niger	4
Nigeria	11
Sierra Leone	6
Togo	6
Senegal	4
Total	68

Perspectives

The network is expecting an upsurge in activities by October 2006 by which time the steps being taken to re-structure the cereals networks of CORAF will be completed. We look forward to the launching of the next phase of ROCARIZ with anxiety. It is satisfying that our partnership with other related projects within WARDA is yielding the desired results, as shown by the collaboration with ARI and the United States Agency for International development (USAID) sponsored project on RYMV. This bodes well for an exciting future for the network.

ANNEX VIII

Eastern and Central Africa Rice Research Network Progress Report (September 2005–May 2006)

Dr Ashura Luzi-Kihupi
Network Coordinator

Introduction

Eastern and Central Africa Rice Research Network (ECARRN) is a new ASARECA network whose office was established in 2005 at the Mikocheni Agricultural Research Institute, Dar-es-Salaam. The Africa Rice Center (WARDA) backstops the network. The Coordination office is now established, with a minimum of office furniture, equipment, support staff and regular disbursement of funds.

The goal of ECARRN is to increase economic growth and improved livelihoods through rice research for development in the ECA sub-region, while the purpose is to enhance productivity, value addition and competitiveness of the regional rice sector. ECARRN's mission is to contribute to enhanced productivity, value addition and competitiveness of the rice sector in the ECA sub-region through the development and dissemination of demand-driven knowledge and technologies.

In order to contribute to the overall objective of ASARECA, ECARRN has four main expected results:

- demand-driven rice technologies/innovations generated and promoted
- regional and national policy options for enhancing rice systems facilitated
- regional and national capacity for IAR4D in rice research strengthened
- availability of information on rice research and development enhanced

Progress achieved during reporting period

At the Africa Rice Centre, ECARRN is nested within MTP Project number 8 (Partnership through Networks) together with the African Rice Initiative (ARI) and ROCARIZ.

The following activities were undertaken by ECARRN during the reporting period.

Output 1: Functional stakeholders platform to promote national rice sector development

The Coordinator represented WARDA at a number of meetings, including those with the African Seed Trade Association and the CGIAR Consortium for Agricultural Research and Rehabilitation in Southern Sudan. Fact-finding missions were undertaken to Madagascar and Mozambique, and workshops and symposiums attended in the Philippines (Fifth Rice Genetics Symposium and 3rd International Rice Functional Genomics Symposium) and Kenya (Inter-Center Workshop on MTP-ESA, ILRI, Nairobi, 7-9 March 2006).

Stakeholders' workshop for priority setting

This workshop took place on 19-21 December 2006, followed by the second Steering Committee meeting. The workshop was attended by 33 participants, representing various stakeholders such as members of the Regional Steering Committee, NARS, Universities, Community-based organizations, private sectors, rice seed producers, IRRI, WARDA, CIRAD, ASARECA, NGOs and Rice Farmers' Associations. During the workshop, the participants identified and prioritised the main themes and sub-themes for the regional rice research for development portfolio.

Availability of information in the region: an inventory of rice scientists and technicians in ECA sub-region was prepared.

Output 2: Rice technologies developed, validated and disseminated by national partners

Seeds of 90 upland rice varieties were received from the Africa Rice Center; these were multiplied at the Agricultural Research Institute, KATRIN, Ifakara, Tanzania. The seeds were harvested and replanted again to increase the amount for distribution to interested parties within the region.

A one hectare plot at the Ruvu Rice farm about 90 km from Dar es Salaam will be used for network activities. We received 18 upland NERICA lines and 60 lowland NERICA lines from WARDA which together with other improved lines from Tanzania were planted

for demonstration during the Africa Rice Congress. NERICA and other improved rice varieties are being evaluated in other ECA countries.

Output 3. Enhanced capacity building and resource mobilization for sustainability of national rice sector

Four participants from ECA, including ECARRN's Technical Assistant, attended a training workshop on Computer application and statistical analysis in agricultural research in Cotonou.

Rockefeller Foundation offered fellowships for East African candidates who would like to pursue studies leading to either an MSc or PhD in plant breeding. Already there are two PhD students undertaking their studies in KwaZulu Natal and two students doing their MSc studies at the Sokoine University of Agriculture. The foundation has also funded a rice scientist from Mozambique to learn practical plant breeding in Tanzania from June 2006 under the supervision of the ECARRN Coordinator. The Foundation helped establish a website for ECARRN at www.africancrops.net/ricenetwork. Another website was opened by WARDA at www.warda.org/partnership/ecarrn.

ECARRN Coordination Unit held a training workshop for ECA rice scientists on concept notes and proposal writing. Subsequently, four concept notes for ASARECA CGS Stream A and one note for Stream B were developed and submitted to ASARECA. WARDA also prepared and submitted a concept note for Stream C.

Network, program and project management

The Eastern and Central Africa Rice Research Network (ECARRN) is managed by a Regional Steering Committee (RSC), which has a maximum of 14 members of which 10 are from member countries. *Ex-officio* members include: a representative of the ASARECA Secretariat; a representative of WARDA as a host-institution; a representative from IRRI. Donor representatives; and representatives from other advanced research institutes can be co-opted. The structure of this committee is decided and regularly reviewed by the Regional Stakeholders' Forum to ensure adequate representation of the member countries as well as categories of Stakeholders that are members of the network. The stakeholders include members of Regional Steering Committee, NARS, Universities, community-based organizations, the private sector,

rice seed production companies (private and public), IRRI, WARDA, CIRAD, JICA, ASARECA Secretariat, NGOs and Rice Farmers' Associations.

The Chair of the RSC rotates among the member countries on an annual basis in conformity with the practice within ASARECA. Each year the Steering Committee elects a Vice-Chair who assumes the Chair in the following year. The Chair, Vice-Chair, one member and the Regional Coordinator constitute an Executive Committee that can be called to make decisions on behalf of the RSC in case of urgent matters between meetings of the RSC.

The Regional Coordinator reports to the Regional Steering Committee. The following serve as members of the ECARRN Regional Steering Committee:

Country	Name	Role
Burundi	Mr Zenon Kabiro	Member
Congo DR	Mr Joseph Baibinge Mateso	Member
Ethiopia	Dr Gatachew Alemayehu	Vice Chairperson & Member of EC
Eritrea	Mr Tesfamichael Abraha	Member
Kenya	Mrs Winfred A. Okore	Member
Madagascar	Mr Raymond Rabeson	Member and member of EC
Rwanda	Mr Elie Rene Gasore	Member
Sudan	Dr Ahmed Mohamed Mustafa	Member
Tanzania	Mr Nkori J.M. Kibanda	Member
Uganda	Dr George Bigirwa	Chairperson & Member of EC

Note: EC = Executive Committee

Major problems, constraints and challenges

At the beginning of the project implementation, there were several obstacles such as difficulties in remitting funds to Tanzania from WARDA. However, this problem has now been solved after the MoU between WARDA and IITA-Tanzania was signed. ECARRN is faced by the challenge of mobilization of resources to implement its R4D priorities that were determined by the Stakeholders in December 2005.

ANNEX IX

WARDA Research and Development activities contributing to develop the Nigerian rice sector

Patrick Kormawa, Olumuyiwa Osiname and Francis Nwilene

Background

Rice in the Nigerian economy

Nigeria is the largest rice producing as well as consuming country in West Africa. Annual demand for rice in Nigeria is estimated at 5 million tonnes, while production level is 3 million tonnes of milled rice resulting in a deficit of 2 million tonnes. Over the years the country had resorted to imports to bridge this deficit. In 1999, the value of rice imports was USD 259 million and this increased to USD 655 million in 2001 and USD 756 million in 2002.

Rice consumption increased much more rapidly in Nigeria than in any other country in West Africa. Its consumption is driven principally by population growth and urbanisation. During the 1960s Nigeria had the lowest per capita annual consumption of rice in the subregion (about 3 kg). Per capita consumption has grown significantly at 7.3% per annum over the past 40 years. Per capita consumption during the 1980s averaged 18 kg and reached 22 kg during the period 1995–2000. The average Nigerian as at 2003 consumes about 25 kg of rice per year representing about 9 percent of his/her total calorific intake.

Why WARDA's focus on Nigeria?

Nigeria is the largest producer of rice in the West Africa subregion, accounting for about 45% of total rice produced, and cultivated in an area representing about 40% of the total rice area in West Africa.

Rice remains one crop in which Nigeria can easily become self-sufficient given the potential that abounds in the country. Potential land area for rice production in Nigeria is about 5 million ha. Out of this, only about 2 million ha or 35 percent of available land area is cropped to rice. Cultivable land to rice is spread over five ecologies, namely

rainfed upland, rainfed lowland or shallow swamp, irrigated rice, deepwater or floating rice and tidal mangrove swamp. The commonly-used ecosystems and share of rice area for the rice ecosystems are presented in Figure 6.

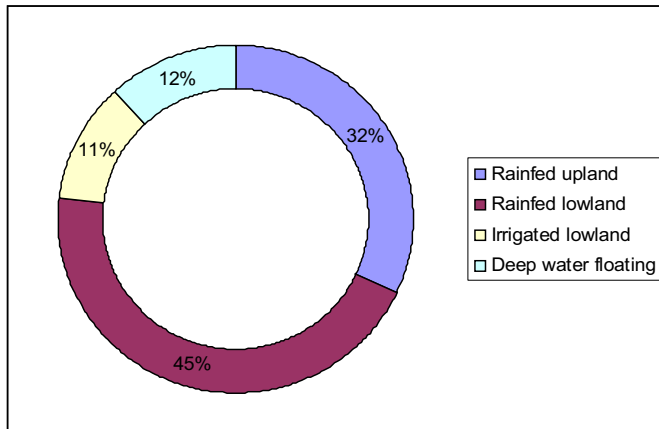


Figure 6. Share of rice area by ecosystem

Yields are highest for the irrigated systems followed by the rainfed lowland systems and lowest in the deepwater/floating systems. Together the rainfed upland and lowland account for a 77 percent share of the national rice producing area in Nigeria. As production is dependent on rainfall, the lowland and upland areas present the greatest opportunities for developing cost-effective and profitable rice production schemes in the Northcentral development zone in the absence of irrigated facilities.

On the basis of 2003 rice production estimates, the Northcentral zone is the largest producer of rice in Nigeria, accounting for 47% of the total rice (Figure 7). This was followed by Northwest, Northeast, Southeast and the Southwest. On a state-by-state basis, Kaduna state is the largest rice producing state in the country, accounting for about 22% of the country's rice output, followed by Niger State (16%), Benue State (10%) and Taraba State (7%).

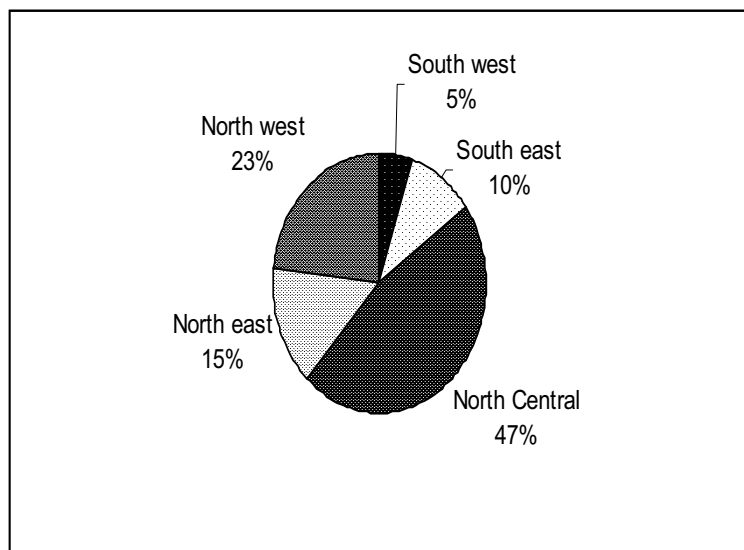


Figure 7. Estimated rice production by development zones in Nigeria

Given the importance of rice in the Nigerian economy and availability of all rice growing ecologies and diversity in production systems, WARDA places a special focus on Nigeria. With rice varieties and complementary technologies adapted to all the ecological zones of the country and production systems, there is a huge potential for testing WARDA rice germplasm and technologies in Nigeria. Thus, WARDA has major activities in the country coordinated from the WARDA station, located within the IITA campus in Ibadan, Oyo state.

WARDA's R&D Focus on Nigeria

Goal of WARDA's research in Nigeria

The goal of WARDA in Nigeria is to develop a range of technology options, especially improved rice varieties and complementary technologies that are appropriate for the diverse production ecologies and systems. In terms of integrated crop management research, focus is on high yield, stresses such as drought, diseases (blast, blight, leaf scald, RYMV), insect pests (gall midge) and iron toxicity that affect Nigeria rice systems specifically. The WARDA-Nigeria Station also offers excellent opportunities for agronomic research, particularly on-farm adaptive research in all the ecological zones present in Nigeria. There are *Striga* endemic zones in the moist Guinea Savanna for research on *Striga* control and tolerance by rice varieties. In the area of social sciences, research focus is on farm management, economic assessment of technologies, impact and policy studies.

Station capability

The WARDA-Nigeria Station offers excellent facilities for both rainfed and irrigated lowland rice breeding activities. The research site within the IITA campus comprises eight hectares suitable for rainfed lowland research. There are three principal scientists at the station.

Research and Development activities

Breeder seed production

Following the successful field demonstration of the NERICAs during the International Year of Rice in October 2004, the Federal Ministry of Agriculture and Rural Development commissioned WARDA to produce breeder seeds of NERICA 1 and other recently-released rice varieties. This activity was supported with about UD 35 000. The process was jump-started with plant and panicle selections on hand. A serial process consisting of plant selection, panicle selection and bulking of true-to-type seeds from single row plantings of single panicles for breeder seed production.

Activities spanned the dry season – December 2004 to April 2005. Supplementary sprinkler irrigation was provided for the breeder seed fields under upland conditions. Plant selection and panicle selections were done under irrigated lowland condition. During the rainy-season cropping, four hectares of land were sown to NERICA 1, one hectare to WAB 189-B-B-B-8-HB and another hectare to WITA 4 to produce Foundation 1 (Basic) seed to fulfil the terms of agreement with the Federal Government of Nigeria.

Technology assessment:

Screening and evaluation of screening lines

Evaluation of rice lines at Ibadan starts from the Pedigree Nursery (PN) through Advanced Yield Trials (AYT) for rainfed lowland, rainfed upland and irrigated rice systems. Data are collected in response to biotic (diseases and insect pests) and abiotic (Fe toxicity for rainfed lowland or Fe deficiency for rainfed upland rice) stresses, for lodging, earliness and grain quality. Main activities on lowland rice are carried out at IITA, with outposts at Edozhigi (Bida) in the Guinea Savanna and Abakaliki in the humid forest zone. Outstation facilities for rainfed upland rice are located at Ikenne in the humid forest zone.

On-farm evaluation of elite lines - PVS

A new technology transfer methodology – Participatory Varietal Selection (PVS) – is employed in assessing adaptability, acceptability and farmer preferences of new rice lines from WARDA. The PVS provides pathways for farmers and other user groups to influence research, and it also allows research to identify niches and categorize groups by the importance they give rice varietal characteristics when making their selection decisions.

This methodology has been used to disseminate the NERICAs in Nigeria. The NERICAs and other promising varieties have been tested in virtually all the States of the Federation in collaboration with the ADPs and the NCRI. These activities have culminated in the release of six improved rice varieties from WARDA in the last three years. Names of the rice varieties and their main characteristics are presented in Table 15.

Table 15. Recent released varieties in Nigeria

Variety	Main characteristics
CISADANE (FARO 51)	Rainfed lowland variety tolerant to AfRGM
WITA 4 (FARO 52)	Rainfed lowland variety tolerant to iron toxicity and drought
ITA 321 (FARO 53)	High-yielding rainfed upland variety resistant to blast
WAB 189-B-B-B-8-HB (FARO 54)	High-yielding early maturing rainfed upland variety
NERICA 1 (FARO 55)	High-yielding early and drought tolerant variety, which yields better than existing varieties under low input.
NERICA 2 (FARO 56)	High-yielding rainfed upland rice variety
TOX 4004-43-1-2-1 (FARO 57)	High-yielding rainfed lowland rice variety tolerant to both drought and iron toxicity

Three other promising lines are currently attracting farmers' attention, viz. WAB 450-1-B-P160-HB, WAB 450-1-B-P-28-HB and WAB 880-1-32-1-1-P2-HB. These three lines will be tested widely across Nigeria in collaboration with the NCRI in year 2004 to determine extent of adaptability.

In the rainfed lowland environment, new elite lines – 4303-13-3-1-1-2, TOX 4004-8-1-2-3, BW 348-1 and WITA 12 – have undergone three years of evaluation with farmers. These lines are tolerant to iron toxicity and drought stress.

Response of NERICAs to fertilizers

Soil fertility trials are being conducted in Nigeria to determine response of NERICAs to various soil fertility regimes. These trials are being carried out at Ikenne and Borno

State. The trials in Borno state are being conducted in partnership with the IITA-implemented PROSAB project in Borno State.

African Rice Gall Midge research

The AfRGM is the most important insect pest of rice in Nigeria. A study of the management of the pest was initiated in 1993 with funding from the Centre for Agriculture and BioScience International (CABI). Achievement of this project was the identification of the variety CISADANE released as FARO 52 in Nigeria. Currently, management of friendly weeds and insects to control AfRGM is being studied.

Nigeria is currently the principal outpost for the African Rice Gall Midge. There are two large screenhouses for screening varieties for resistance/tolerance to AfRGM and adequate laboratory space from IITA for rearing insects. Abakaliki is the hot spot for the African Rice Gall Midge (AfRGM) while Edozhigi is used for both AfRGM and iron toxicity screening. Other screenhouse facilities include a large one for RYMV screening and two open ones for screening rice lines for blast resistance/tolerance. The IITA has allocated two hectares of land for rainfed upland rice research at Ikenne in the humid forest zone.

There is also a strong partner for development in the NCRI whose outstations in Edozhigi, Bende and Abakaliki offer good facilities for joint on-farm screening and other agronomic activities.

Rice strategy development

WARDA undertook a major study with financial support from USAID to implement the project ‘The Nigerian Rice Economy in a Competitive World: Constraints, Opportunities and Strategic Choices’. Following recommendations from the study and a national rice stakeholders’ workshop, WARDA recently produced a strategy for rice sector revitalization in Nigeria. The strategy draws from numerous studies implemented within the context of a rice sub-sector study which describes and analyzes the Nigerian rice economy and identifies various opportunities and challenges for its development. The rice sector study establishes the major underlying constraints for developing the rice economy, their causes and their effects – including rice consumption, rice production, rice processing, rice markets and rice policy. The strategy document provides a strategic framework and outlines the main elements in terms of strategic objectives, priorities and implementation. The three priorities and complementary interventions needed to

develop the Nigerian rice sector are:

- Increasing efficiency;
- Improving quality and management;
- Creating an enabling policy environment.

Rice Alliance

The Rice Alliance consists of different agencies – WARDA, IITA, NCRI, Union Bank, IFDC, SG2000, HANIGA, RIFAN, ADPs, Global Summit on Nigeria Rice, Vee Tee Rice, CANDEL and Golden Fertilizer – put together by the USAID to actualise a model for rice production that can help Nigeria to achieve her goal of self-sufficiency and competitiveness through an integrated market-driven, private sector approach. The strategy of the Rice Alliance is to develop linkages between farmers and new technologies, input and credit, market, support services. WARDA's improved rice variety FARO 52 (WITA 4) was selected as a suitable variety for inclusion in the R-box. WARDA also provided training of farmers on rice production at the pilot sites. The project was implemented in three states – Niger, FCT and Bauchi. A total of 1,681 farm households were involved in the pilot project.

Policy and market research

In collaboration with NISER, the rice policy and market studies unit is carrying out a study to trace the policy effects on institutions and structural arrangements of rice production and marketing. This is a multi-country research project involving five countries in West Africa. Output from this activity will be used to inform policy on strategies to promote competitive rice production and marketing in West Africa.

Capacity building and training

A strong contribution to Nigeria is in the field of training. Over 100 Nigerian NARS personnel have benefited from WARDA training courses. In partnership with the African Development Bank, WARDA sponsored seven (7) Nigerian students through PhD degrees while another three (3) did their Master's degrees. More than sixty (60) Nigerians are involved in WARDA-NARS Task Force projects. Under the collaborative PTD project between the University of Hohenheim and WARDA, two UNAAB students obtained their PhD degrees.

WARDA Collaborators in Nigeria

National Cereals Research Institute (NCRI): the principal NARS collaborator with WARDA in Nigeria. Besides collaboration on varietal improvement and integrated rice crop management (ROCARIZ), NCRI houses the National Coordination Unit of the Inland Valley Consortium (IVC). The goal of the IVC is to promote the sustainable development of inland valley ecosystems in Africa by designing and implementing a collaborative program of research and technology transfer activities.

The NCRI is also coordinating activities of the Common Funds for Commodity (CFC) project – Sustainable Production Increase of Rice in Inland Valleys of West Africa (SPIRIVWA). The SPIRIVWA is a technology transfer activity aimed at teaching farmers methods of water management and efficient use of the entire valley system.

Agricultural Development Projects (ADPs): the ADPs are the main extension channels in Nigeria. As such WARDA works closely with them in rice-growing States to involve farmers in participatory varietal selection activities. WARDA works closely with ADPs in Oyo, Ogun, Osun, Ekiti, Kwara, Kaduna, Ebonyi, Nassarawa, Benue, Kano and Abia. This collaboration has resulted in the adoption of the CISADANE rice variety (FARO 51) for control of AfRGM in Ebonyi State, and the wide adoption of the NERICAs in other States.

University of Agriculture, Abeokuta (UNAAB): WARDA has signed an agreement with UNAAB for collaboration on rice research and training. UNAAB is actively involved in the Participatory Technology Development project and the PVS activities.

Institute of Agricultural Research (IAR) Zaria: the IAR is our partner in on-farm testing of irrigated rice varieties in Nigeria. The Institute has access to facilities and farmers around the Bagauda Dam in Kano. Promising rice varieties from WARDA Sahel region are being evaluated through the IAR.

Nigerian Institute of Social and Policy Research (NISER): is the premier policy research and advisory institute in Nigeria. WARDA collaborates with NISER in rice policy studies. The Nigeria Rice Competitiveness Project funded by the USAID was implemented in close collaboration with NISER. Presently WARDA is collaborating with NISER to study policy and institutional effects on rice production and marketing in Nigeria.

Non-governmental Organizations (NGOs): WARDA is working closely with the following NGOs in the pursuit of improvement of production through transfer of modern technologies: SHARE Foundation, Watershed Initiative in Nigeria and WIN-2001, and Village Development Support Activities (VIDSA). These NGOs are experts in training farmers on Community-based Seed Production. They have been WARDA partners in seed production for rapid dissemination of the NERICA seeds.

Private sector: the most vibrant private sector collaborator of WARDA in Nigeria is Premier Seed Nigeria Ltd in Zaria. This organization is forging ahead with the multiplication of the recently released rice varieties – NERICA 1 (FARO 54) and FARO 55. Premier Seeds is in a position to supply tonnes of seeds to farmers.

New partnerships: WARDA is forging new partnerships with the Green River Project (GRP) of the Nigerian Agip Oil Company (NAOC) and the Ministry of Agriculture and Natural Resources (MANR) to position Bayelsa State for sustainable rice production and marketing.

WARDA is also forging partnership with the Niger Delta Development Commission (NDDC) to improve rice production and promote market development activities for the benefits of smallholder rice farmers, processors and consumers in Akwa Ibom, Bayelsa, Cross River, Delta, Edo and Rivers States.

Conclusions

Nigeria has all the rice growing ecologies in West Africa. The country is also the most important for rice, being the largest producer, consumer and importer in West Africa. Given this background, the Nigerian government has the objective of self-sufficiency in rice high on the agenda. This can be seen from the high import duty on imported rice and the declaration of a Presidential Initiative on Rice. As part of its support to member countries, WARDA's support for Nigeria is as part of its corporate responsibility to member countries to attain self-sufficiency in rice through the application of scientific knowledge, policy advice and capacity building. Given the diversity in production areas and systems, any success in Nigeria can easily be adapted to similar growing conditions in other countries.

The Federal Government recognizes the important role WARDA is playing in rice sector development in Nigeria. Thus, the FGN has continued to support WARDA both financially and politically. However, sustaining the political will and increasing support to rice technology dissemination within a market-driven approach remains the key to Nigeria's attainment of rice self-sufficiency.

ANNEX X

Progress in biotechnology activities at WARDA

Marie-Noëlle Ndjiondjop
Head, Biotechnology Unit

The Biotechnology Unit of the Africa Rice Center (WARDA) was created in September 2002 but its activity in the first three years was severely constrained by the lack of an equipped laboratory and the crisis in the Ivory Coast. A lot of time has been spent setting up the biotechnology laboratories at M'bé (Côte d'Ivoire), Bamako (Mali) and Cotonou (Benin), and in strengthening the Unit's staff. Currently, the Unit's laboratory is fully functional and has four PhD holders, with four support staff and PhD students.

Research topics addressed by the Unit in the last two years were (1) estimation of genetic proximity among the most commonly-used parents for breeding at WARDA, (2) molecular characterization of NERICAs 1 to 18, and (3) estimation of the proportion of *Oryza glaberrima* (cultivar CG14) genome content in 70 interspecific lines that have not yet been named by the Variety Nomination Committee. The main results from such studies, published in two peer-reviewed journals with a third manuscript pending submission, were (a) the presence of a wide range of genetic differences among all NERICAs except NERICAs 8 and 9, which were found to be identical; (b) distinct genetic differentiation of NERICAs 1 to 7 from NERICAs 8 to 18; (c) a wide range of variation in the proportion of CG14 genome content among interspecific lines (range: 1.2 to 19.6%; overall average 6.4%); (d) the presence of at least one heterozygote and non-parental (derived from neither of the parents) locus in about 43% and 86% of the interspecific lines, respectively.

The Unit's current activities are limited to WARDA's strategic research plan to support plant breeding. Within WARDA's medium term plan (MTP), the biotechnology unit is involved in both project 2 (Output 1- High yielding and stable lowland rice lines and varieties with good quality) and project 4 (Output 2- Improved drought tolerant lines and cultivars with higher and stable yield). The Unit's role in project 2 is associated with a marker-assisted selection project, funded by the USAID West Africa Program, to: (i) use previously-mapped molecular markers for facilitating the introgression of the rice

yellow mottle virus (RYMV) resistance gene from a donor cultivar ‘Gigante’ into several elite lines selected from four West African countries (Burkina Faso, Guinea, Mali and The Gambia); (ii) setup molecular laboratories in the four NARS countries; and, (iii) increase capacity building in molecular techniques by providing short-term training to scientists and technicians from these four countries, and also PhD training.

About 2000 BC₁F₁ plants were developed from 14 different crosses, and selection of progenies to become the parents in developing BC₂F₁ is underway using three microsatellite markers close to the resistance gene on chromosome 4. Eight scientists from the four NARS countries attended two-weeks of intensive, hands-on course training in molecular techniques in April 2006 and three PhD students are currently working at WARDA, with the fourth expected to start next month. Part of the equipment for setting up the molecular laboratories has been purchased and pro forma invoices have been collected for the remainder.

In project 4, the Unit has developed a mapping population that segregates for several useful traits. In addition, other mapping populations that segregate for drought tolerance were obtained from the International Rice Research Institute (IRRI). The mapping populations have been evaluated for drought tolerance and other related traits under field conditions for one season, and such evaluation will continue for at least two additional seasons. Genotyping (molecular characterization) of one of these mapping populations is ongoing.

ANNEX XI

Genetic Resources Unit (GRU)

Ines Sanchez

Head, GRU

The Genetic Resources Unit (GRU) comprises two entities (Figure 1) – Genebank Operations (GO) and the African wing of the International Network for Genetic Evaluation of Rice (INGER-Africa). GO conducts activities such as rice germplasm collection, conservation, management and utilisation. INGER-Africa, however, caters for germplasm exchange and evaluation, with a mandate to ensure a large and rapid diffusion of rice germplasm in sub-Saharan Africa (SSA). GRU plays an important strategic role in germplasm improvement for WARDA, its NARS partners and for subsistence rice farming in SSA. It also contributes to strengthening WARDA collaboration with other Centers or advanced research institutions in germplasm issues and related matters.

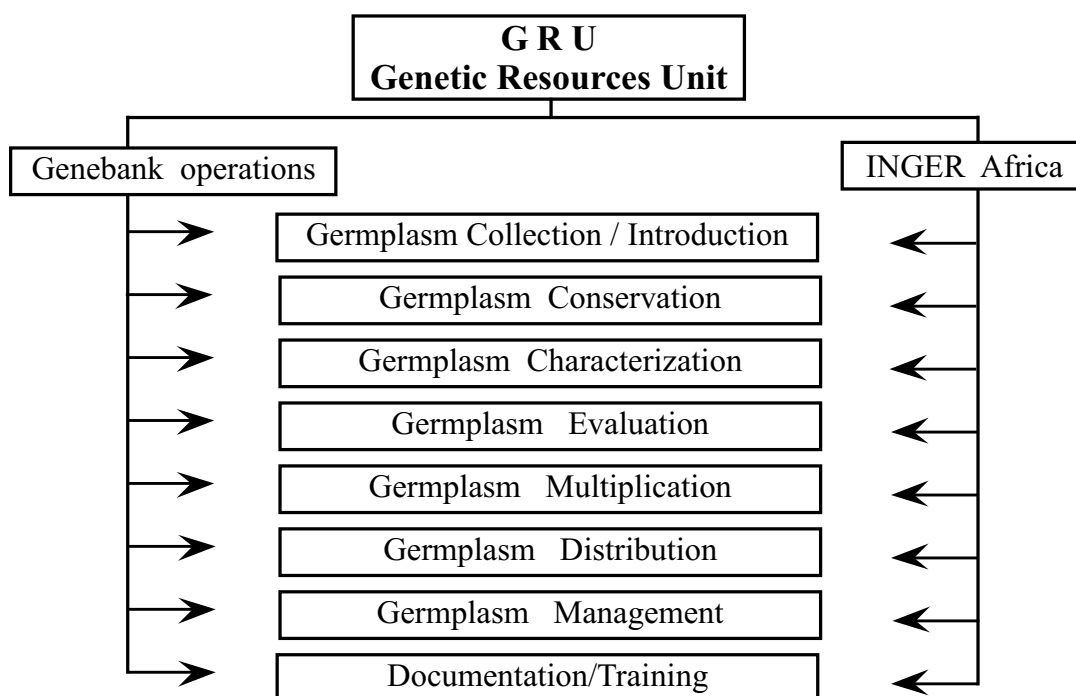


Figure 8. Activities of WARDA's Genetic Resources Unit.

Genebank operations

In the wake of political upheaval in the Africa Rice Center's host country in September 2002, WARDA set about an urgent security duplication of about 18 000 germplasm accessions at the IITA, Ibadan, Nigeria to safeguard these collections previously stored in the Genebank and breeding stocks at M'bé, Bouaké.

Between July 2004 and June 2006, a total of 14 358 accessions, including designated material, were cultivated at the IITA, Ibadan, Nigeria, for regeneration and long term storage at the IITA, Ibadan. Designated germplasm comprises plant accessions that CGIAR centers including WARDA have put under the aegis of the FAO and are holding in trust as international public goods (IPG) for the benefit of present and future generations. Since June 2006, about 18 000 germplasm accessions have been regenerated before duplication to establish a security stock in a secure country, probably outside Africa, as well as being returned to medium-term storage in WARDA's Genebank. Construction of medium-term storage facilities is underway at WARDA's temporary headquarters in Cotonou, Benin, and is almost completed.

Over the same period, almost 1000 accessions of the African rice species *O. glaberrima* were withdrawn from M'bé, Côte d'Ivoire and IITA, Ibadan for cultivation and agromorphological characterization on WARDA demonstration farms at Dédé, Benin.

The database of the WARDA Genebank information sharing and management system (WAGIS) has been developed and converted into a MySQL server to ensure its interoperability with other electronic data processing systems. Updated web pages have been added to the WAGIS website. Passport data of all regenerated materials have been archived and can be easily accessed now the database is connected to WARDA Intranet.

INGER-Africa: Germplasm exchange and evaluation network

The African wing of the International Network for the Genetic Evaluation of Rice (INGER-Africa) is the most important germplasm exchange and evaluation network on the continent. From July 2004 to June 2006, INGER-Africa satisfied the rice germplasm needs of 15 sub-Saharan countries and six other countries in Asia, America

and Europe. This was made possible through the multiplication and purification of about 3000 multiple-stress-resistant cultivars adapted to the main rice production ecologies in sub-Saharan Africa, namely, rainfed uplands, rainfed lowlands and irrigated ecologies. This germplasm was mainly supplied by WARDA and NARS breeders as well as other worldwide sources.

Over the period under review, a total of 1063 accessions, including NERICA rice varieties, were sent upon request for evaluation by scientists in several West African (WA) and East, Central and Southern African (ECSA) countries, while a total of 294 cultivars containing germplasm were sent to research institutes outside Africa, in the United Kingdom, the United States of America, India, Chile, Belgium and Japan.

The 17 sub-Saharan African countries where seed samples were sent over this period include 12 WA countries (Benin, Sierra Leone, Niger, Nigeria, Mali, Ghana, Guinea, Guinea-Bissau, Côte d'Ivoire, Senegal, Liberia and Togo) and 13 ECSA countries (Cameroon, Central African Republic, the Democratic Republic of Congo, Congo (Brazzaville), Rwanda, Malawi, South Africa, Kenya, Ethiopia, Tanzania, Uganda, Sudan and Zimbabwe).

These varieties were sent to national research program breeders for evaluation and the best adapted lines were released for cultivation by local farmers.

Under WARDA core projects involving the implementation of rapid reaction strategies for the reestablishment of livelihoods in post-conflict countries, GRU made a seed contribution of 75 improved varieties, including upland and lowland NERICAs, to restore lost germplasm and to improve rice production in countries emerging out of conflict such as Rwanda, Sierra Leone and the Democratic Republic of Congo.

WARDA seed treatment procedure

To make sure that the quality of the seed distributed by WARDA complies with international standards, the GRU laid down a procedure, cross-checked by PMC and approved by EMC. Regardless of the origin of the request, all WARDA outgoing seeds must be tested for viability and varietal purity. They must also be systematically fumigated and appropriately treated for seed-borne diseases. Before receiving seed samples, the

requester must sign a copy of the Material Transfer Agreement (MTA) provided by the Head of GRU on behalf of WARDA. The MTA sets out the terms and conditions for using the germplasm supplied as well as issues mainly tied to intellectual property rights (IPR). The requester also undertakes to share with WARDA the outcomes of research carried out with the material received. This information is archived and helps to develop a worldwide performance database of the material developed by WARDA. The relevant directives are on WARDA website.

Conclusion

The activities of the Genetic Resources Unit of the Africa Rice Center stretch beyond mere germplasm collection, multiplication, treatment, storage, distribution and evaluation to promote successful adoption of superior varieties distributed by INGER-Africa. Special emphasis is placed on characterization (agromorphological and molecular) and management of the WARDA Genebank in compliance with international standards. Since 2003 the GRU has undertaken collective action with other similar Centers to restore the international public good element of the CGIAR's genetic resources. This collaboration with CGIAR Centers and other Advanced Research Institutions (ARI) will continue in the future, to increase efficiency and effectiveness in the management and accessibility of the collections held in trust, particularly rice plants held in common by Centers.

Acronyms and Abbreviations

ADG	Assistant Director General
ADPL	Assistant Director, Program Leader
AfDB	African Development Bank
ARI	African Rice Initiative
CGIAR	Consultative Group on International Agricultural Research
COM	Council of Ministers
CORAF	<i>Conseil ouest et centre africain pour la recherche et le développement</i>
DG	Director General
ECARRN	East and Central Africa Rice Research Network
ExCo	Executive Committee of the CGIAR
EPMR	External Performance Management Review
GRU	Genetic Resources Unit
IITA	International Institute of Tropical Agriculture
INRAB	Institut national de la recherche agronomique du Bénin
IPG	international public good
IVC	Inland Valley Consortium
NARI	National Agricultural Research Institute
NARS	National Agricultural Research Systems
PMI	performance measurement of impact
R & D	research and development
ROCARIZ	Réseau ouest et centre africain du riz
SG 2000	Sasakawa Global 2000

About the Consultative Group on International Agricultural Research (CGIAR)

The Consultative Group on International Agricultural Research (CGIAR) is a strategic alliance of countries, international and regional organizations and private foundations supporting 15 international agricultural Centers that work with national agricultural research systems and civil society organizations including the private sector. The alliance mobilizes agricultural science to reduce poverty, foster human well-being, promote agricultural growth and protect the environment. The CGIAR generates global public goods that are available to all.

In a world where 75 percent of poor people depend on agriculture to survive, poverty cannot be reduced without investment in agriculture. Many of the countries with the strongest agricultural sectors have a record of sustained investment in agricultural science and technology. The evidence is clear; research for development generates agricultural growth and reduces poverty.

Agricultural research for development has a record of delivering results. The science that made possible the Green Revolution of the 1960s and 1970s was largely the work of CGIAR Centers and their national agricultural research partners. The scientists' work not only increased incomes for small farmers, it enabled the preservation of millions of hectares of forest and grasslands, conserving biodiversity and reducing carbon releases into the atmosphere. CGIAR's research agenda is dynamic, flexible and responsive to emerging development challenges. The research portfolio has evolved from the original focus on increasing productivity in individual critical food crops. Today's approach recognizes that biodiversity and environment research are also key components in the drive to enhance sustainable agricultural productivity. Our belief in the fundamentals remains as strong as ever: agricultural growth and increased farm productivity in developing countries creates wealth, reduces poverty and hunger and protects the environment.

CGIAR Centers

CIAT	<i>Centro Internacional de Agricultura Tropical</i> (Cali, Colombia)
CIFOR	Center for International Forestry Research (Bogor, Indonesia)
CIMMYT	<i>Centro Internacional de Mejoramiento de Maiz y Trigo</i> (Mexico, DF, Mexico)
CIP	<i>Centro Internacional de la Papa</i> (Lima, Peru)
ICARDA	International Center for Agricultural Research in the Dry Areas (Aleppo, Syria)
ICLARM	WorldFish Center (Penang, Malaysia)
ICRAF	World Agroforestry Centre (Nairobi, Kenya)
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics (Patancheru, India)
IFPRI	International Food Policy Research Institute (Washington, D.C., USA)
IITA	International Institute of Tropical Agriculture (Ibadan, Nigeria)
ILRI	International Livestock Research Institute (Nairobi, Kenya)
IPGRI	International Plant Genetic Resources Institute (Rome, Italy)
IRRI	International Rice Research Institute (Los Baños, Philippines)
IWMI	International Water Management Institute (Colombo, Sri Lanka)
WARDA	Africa Rice Center (Cotonou, Benin)



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