

A Strategy for 2003–2012

Faced with this challenge, WARDA's Strategic Goal for 2003–2012 will be:

“to significantly increase the quality, usefulness and availability of knowledge and technology within the rice sector to support and improve the well-being of the poor in Africa.”

This strategic goal is driven by four elements:

1. Pursuit of coherence and excellence in a number of core research areas.
2. Adaptation of the network-based model for research collaboration.
3. Enhancing the institutional capacities of national agricultural research and extension systems (NARES) through training and human-resource development.
4. Direct engagement with the ‘rice development sector.’

These elements are in line with the strategy of the CGIAR for Sub-Saharan Africa (CGIAR, 2000), which calls for coordination and a regional approach to research priority-setting. The exercise undertaken by the West and Central African Council for Agricultural Research and Development (WECARD/CORAF) on priority-setting (WECARD/CORAF, 1999) clearly showed the importance of rice across WCA. WARDA's Strategy builds on that of WECARD/CORAF and

is aligned with the overall focus of the CGIAR on reducing poverty, hunger and malnutrition in developing countries. In pursuing this strategy, WARDA is cognizant of the main elements of the agenda of NEPAD (2003), which identifies agriculture as one of its central pillars. WARDA is also fully engaged in the development and eventual implementation of the CGIAR Sub-Saharan Africa Challenge Program (FARA, 2003a) that is being led by the Forum for Agricultural Research in Africa (FARA, 2003b). The main elements of the integrated research agenda of this Challenge Program are reflected in the core research areas described in the following section of this Plan.

Core Research Areas

During the implementation of the previous strategic plan, advances were made in understanding the dynamics of rice production systems and developing technologies that have improved the productivity of small-scale rice farmers. However, many challenges remain, in particular the development of stress-tolerant cultivars and agronomic practices that help to stabilize yields and improve productivity, and the better integration of networks to optimize the use of scarce resources. The mechanics of the priority-setting process are explained in Appendix 2. The Strategy for 2003–2012 is based on a significant and consolidated research effort in two major areas: (1) development of components for integrated rice production systems, and (2) rice policy and development.

Integrated Production Systems

Rice is grown over a wide range of environments in WCA. As shown in Figure 3, at least some elements of this diversity can be represented by

the delineation of three main rice-growing ecologies (upland, lowland and irrigated systems). However, inter-linkages exist between ecologies (e.g. water and nutrient flow from upland to lowland). These externalities influence the

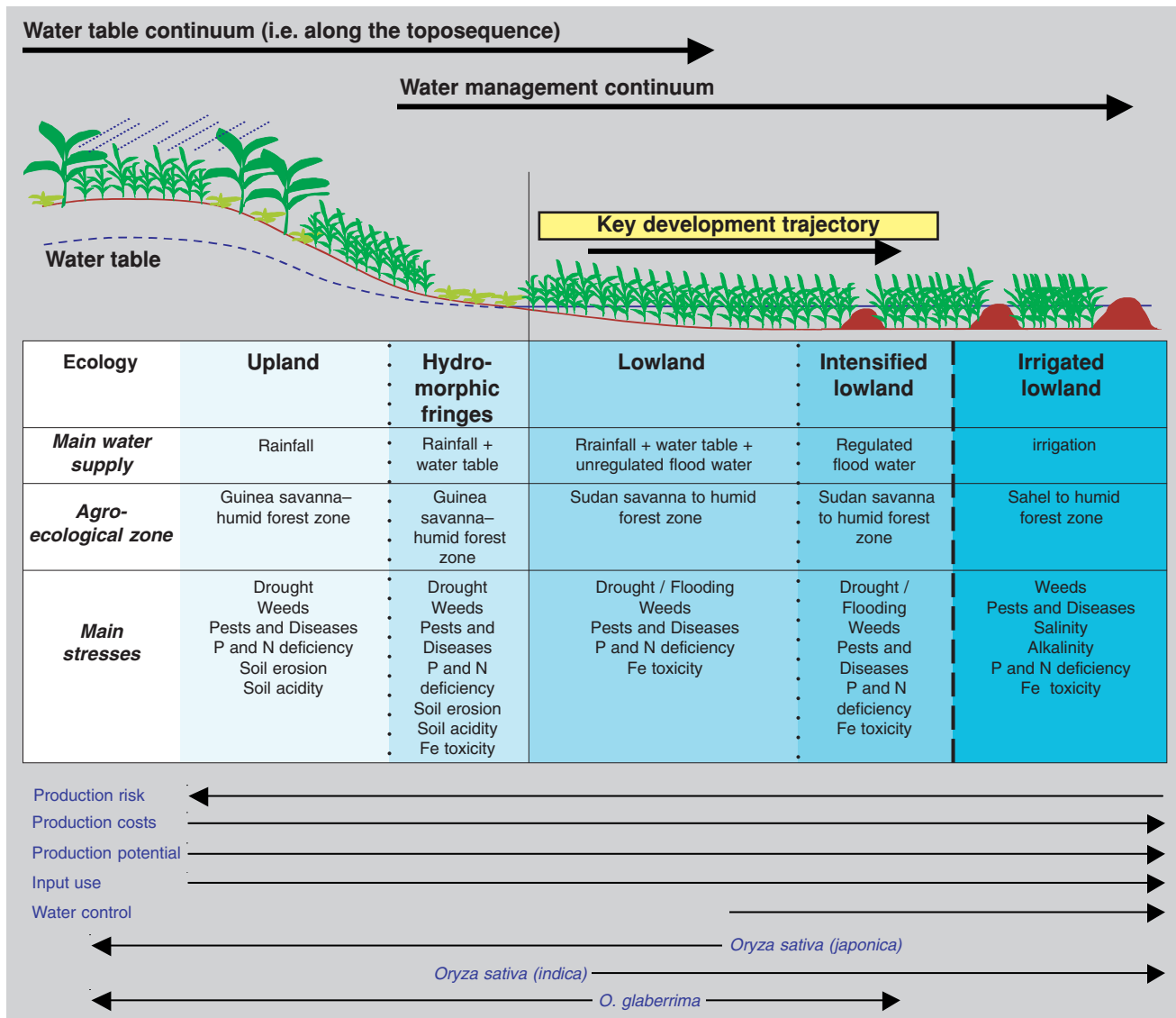


Figure 3. Rice-growing systems and scenarios in current WARDA Member States

ecological sustainability of farmland. Furthermore, inter-linkages can blur the borderline between rice ecologies, like the hydromorphic fringe between the uplands and lowlands. Another fuzzy transition exists between rainfed and irrigated lowlands, where a water-management continuum exists ranging from the strictly rainfed to the fully irrigated lowlands, which may evolve depending on investments in water control measures. Within each ecology, rice is produced as part of a myriad of production systems. This heterogeneity and the high level of articulation of rice production with other farm and off-farm activities, and thus within the larger ‘farming system,’ highlights the need for technical components that can be readily used by producers themselves to build more integrated production systems. The search for more integrated

production systems is above all a search for greater resource use efficiency through the creation of positive interactions within rice production systems, and between rice and other farm and non-farm activities. Seen in this way, the focus on integrated production systems encompasses most of the concerns that have come to be associated with the field of natural-resources management.

A number of key constraints to increased productivity and profitability have been identified within the major rice-growing ecologies (Table 1). An effective approach is to develop stress-tolerant material in combination with appropriate crop and resource management strategies. Some significant progress has already been made along these lines with the development of new genetic material, including the NERICAs³ (Appendix 3). WARDA

Table 1. Major biophysical constraints to increased rice productivity and profitability.

Ecology	Constraints
Rainfed upland	Drought; nitrogen (N) & phosphorus (P) deficiency; blast; soil acidity; erosion; stemborers; weeds; birds*; rodents*
Rainfed lowland	Iron toxicity; N deficiency; lack of water control; rice yellow mottle virus (RYMV); African rice gall midge (AfRGM); stemborers; nematodes; weeds; birds*; rodents*
Irrigated lowland	N deficiency, iron toxicity; salinity; alkalinity; RYMV; nematodes; AfRGM; weeds

* WARDA does not have a comparative advantage for working on vertebrate pests (birds and rodents), and so these are not considered further in this Strategy.

³ The term NERICA, New Rice for Africa, is used to refer to genetic material derived from crosses of *Oryza sativa* x *O. glaberrima*.

has already made significant strides in developing and promoting such an integrated approach to crop management for irrigated rice production in the Sahel (Appendix 4).

Overall, work in Integrated Production Systems will seek new knowledge and technology that will help farmers to maximize the benefits gained from improving their production systems. Key research challenges and questions in this core area will be:

Research Challenge 1.1: How best should existing genetic resources be used to develop rice varieties that best fit or better optimize farmers' existing production systems and are acceptable to both producers and consumers?

Research Challenge 1.2: How can resource use efficiency be further increased for more productive, profitable and socio-economically viable rice production systems?

Breeding activities to develop new genetic material will be supported by continued investment in capacity and facilities for the conservation and

management of genetic resources (Appendix 5), as well as the continued use of a range of biotechnology tools, including tissue-culture, gene-mapping and marker-assisted selection (Appendix 6).

Because the rainfed uplands, rainfed lowlands and irrigated systems account for the bulk of the area and total production in WCA, and in light of the emphasis on poverty impacts, priority will be given to work in these three ecologies. Allocation of resources among production systems takes into consideration the relative rice growing area and production (Table 2). The proposed emphases among Research Challenges across rice-growing ecologies is given in Appendix 7.

Rice Policy and Development

The high levels of biophysical and socio-economic diversity referred to above pose a serious challenge to traditional models for the generation and extension of technical and institutional innovations. Specifically, this diversity greatly decreases the

Table 2. Allocation of WARDA resources, 2003–2012.

Ecology	Area (%)*	Production (%)*	WARDA R&D effort (%) 2003–2012
All (cross-ecology)	–	–	20
Rainfed uplands	48	29	30
Rainfed lowlands	30	36	30
Irrigated	11	26	20

* Figures for WARDA Member States.

utility of approaches based on the promotion of tightly defined, multi-component ‘technical packages.’ There is now an emerging consensus that in the face of such diversity, more interactive or adult-learning models of change are required. Over the last few years, WARDA has made significant progress in this area through the use of participatory research and development processes (Appendix 8). These approaches, when combined with the outputs of research on components for integrated crop management (ICM), appear to offer powerful tools with which to support change. However, important questions remain as to cost effectiveness and appropriate methods for scaling up.

Agricultural research has long been characterized by a relatively narrow ‘production bias.’ Full account has not been taken of the wider range of factors that affects producers’ decisions, and the levels of productivity and profitability that they are therefore able to achieve. This production bias goes a long way to explaining the lack of uptake of many apparently improved agricultural technologies. Often neglected factors include the policy and market environment, the institutional context and post-production processes. Given the relative importance of imports in satisfying demand for rice and the importance of quality considerations in consumer decisions, these factors are of particular importance to the rice sector. Results from recent studies in Nigeria and Côte d’Ivoire illustrate some of the complex ways in which price considerations and quality factors interact in influencing consumers’ decisions (Appendix 9).

Finally, there is an urgent need to develop a much more detailed understanding of the likely

scenarios for rice development in the region, and their poverty, economic and environmental implications. Such an analysis would help in prioritizing alternative research and development investments. Allied directly to this is the need to assess systematically the impacts of technical and institutional change within the rice sector, with particular emphasis on productivity, profitability and poverty at the individual, community and national levels (Appendix 10). Work in this last area provides the link to WARDA’s mission of contributing to the alleviation of poverty.

Key research challenges in this core area will be:

Research Challenge 2.1: What factors affect the price of rice and market dynamics, and how do these in turn affect the competitiveness of local rice production?

Research Challenge 2.2: What impacts do technical, policy and institutional change in the rice sector have on the livelihoods and well-being of the poor?

Progress in the two core research areas outlined above—Integrated Production Systems, and Rice Policy and Development—will be dependent to a significant extent on increased levels of resource mobilization (Appendix 7), improved access to international scientific literature (Appendix 11), and provision of a full range of IT and communication facilities and services (Appendix 12).

In order to start to redress the long-term bias of rice research in the region toward technical or production problems, and in acknowledgement of

Gender issues

Most poor rice farmers are women. However, the proportion of women engaged in the research sector is extremely low (about 4%). WARDA will pay particular attention to gender issues in its activities, systematically including women in capacity-building programs and promoting rice science in colleges and universities to encourage young women to pursue scientific careers in rice research.

the critical role played by rice quality⁴ and the economics of post-harvest processing in determining the value and competitiveness of locally produced rice, WARDA's research effort over the period 2003–2012 will be distributed 65% to Integrated Production Systems and 35% to Rice Policy and Development.

Regional and Continental Research Collaboration and Capacity Building

The fact that WARDA was established as a regional, inter-governmental association meant that partnership, collaboration and capacity building were center stage from the beginning. The basic proposition was and remains that, faced with a set of common problems and with constrained human and financial resources, significant benefits can be derived from effective regional collaboration.

These benefits take several forms. In terms of the researchers themselves, the collaborative model can help break the intellectual and professional isolation that often comes with being the only rice breeder, agronomist or rice pathologist at a

particular research station or in a national program.⁵ Being a member of a functional research network is an important factor in motivating researchers to analyze, write up and present their work to their peers. For the NARS, regional collaboration provides access to ideas, funding opportunities, research outputs (including germplasm) and lessons that might otherwise remain out of reach.

In 2000, WARDA's regional Task Forces were merged with WECARD/CORAF's Rice Network to form ROCARIZ (*Réseau ouest et centre africain du riz*), which is now well established as the primary mechanism for regional collaboration in rice research and development (Appendix 13). To date, however, information sharing has been weak, and there has been inadequate collaboration and coordination of activities among WARDA's networks—Inland Valley Consortium (IVC, Appendix 14), Participatory Rice Improvement and Gender/user Analysis (PRIGA-PVS, Appendix 8), the African Rice Initiative (ARI, Appendix 15) and the International Network for Genetic Evaluation of Rice in Africa (INGER-Africa, Appendix 5)—, despite the fact that they work with the same or similar partners, and have more or less the same geographical coverage. ROCARIZ has evolved over the years from a WARDA owned and managed network to a NARS owned and WARDA facilitated network. This model for regional

⁴ The quality of marketed rice grain is a product of variety, production, post-harvest processing and handling.

⁵ The potential problem of professional isolation is illustrated by the fact that for 1998, it was estimated that over all disciplines, 106 scientists in West and Central African national agricultural research programs devoted some time to rice research. Yet this totalled only 36 person-years (Dalton and Guei, 2003).

collaboration needs to be both consolidated and significantly extended. One aspect of consolidation will be to seek greater articulation of all WARDA collaborative network-type activities. This is particularly important in terms of the efficient use of limited financial and human resources devoted to rice research and development in the region. In addition, for the purposes of efficiency and increased synergy, where appropriate WARDA rice-based initiatives or networks should operate within a single rice-sector platform at the national level.

Building on the experience of ROCARIZ, WARDA will seek to extend this kind of collaborative research model to other rice-producing areas of Africa. WARDA will proactively pursue working with the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA) and the Southern African Development Community’s Food, Agriculture and Natural Resources (SADC–FANR) unit in putting in place a rice network for the Eastern and Southern African regions.



Individual and institutional capacity building is integral to successful research collaboration and will continue to be a key and central function of WARDA (Appendix 16). WARDA will facilitate the unanimous call of the SROs, CGIAR and donors to rebuild and sustain the lost generation of trained agricultural human resources in Africa. This will take the form of special skills transfer, as well as medium- to long-term training of our NARS partners.

Engagement with the ‘Rice Development Sector’

WARDA’s research and networking activities are clearly not ends in themselves. Rather, their value lies ultimately in the contribution they make to the development of the rice production–consumption chain, and the opportunities that this development offers to the poor. As part of the 2003–2012 strategy, WARDA commits itself to reach out beyond its traditional partners to ensure that the knowledge and technology generated through research are both relevant and accessible to a broader range of actors interested in rice development in Africa.

In contrast to the rice production–consumption chain itself, the ‘rice development sector’ encompasses the individuals, organizations and institutions (and their associated mechanisms and actions), which formally and purposefully seek to change (‘promote the further development of’) the production–consumption chain. These actors are many and diverse, ranging from the international development banks and bilateral agencies, through government ministries and research institutions, to local NGOs. They have different motivations and

use a wide variety of approaches and mechanisms to achieve their objectives.

WARDA's traditional partners, the NARS, are clearly an important part of the rice development sector, as are national extension programs focused on rice. However, with political and economic liberalization and the emergence of a more dynamic 'civil society constituency,' NARES are now only two among the many actors with an interest in the development of the rice sector. Direct engagement with these other actors should significantly increase the impact of research outputs. For example, WARDA will seek to play the role of information clearing house to ensure that the experiences and



lessons learned within the rice development sector are collated, analyzed and widely disseminated.

The African Rice Initiative (ARI) provides another model for this kind of broader engagement (Appendix 15). Central to ARI is the establishment of 'national rice stakeholder platforms,' which will put rice producers, processors and retailers in direct contact with research and other actors within the rice development sector. If successful, these platforms will provide a direct link between those who produce, process and market rice, and those who purposefully try to affect how, where, by whom or at what level these activities take place. WARDA must be fully engaged in these discussions, and the fact that the ARI Coordinator is based at WARDA will greatly facilitate this engagement.

Similarly, and in response to the Association's broadly defined Constitutional Mandate—which calls upon it to promote the development of rice production and marketing in West Africa—, WARDA will explore the creation of a self-sustaining subsidiary (Appendix 17) through public-private dialog that would provide support to farmers and small businesses within farming communities.