Lessons from the rice crisis: Policies for food security in Africa
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Lessons from the rice crisis: Policies for food security in Africa

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A strong tradition of policy research

For over 25 years from the 1980s, Africa Rice Center (AfricaRice) and its member states were fighting against the policy prescriptions flowing from structural adjustment in promoting local rice production in West Africa. One of the tenets of structural adjustment policies that swept the sub-region was reduced investment in rice, presumably because it was not considered a traditional staple in Africa, and perhaps because imported rice was so cheap. However, this did not take into account a long history of rice in the sub-region, especially in the western coastal belt (The Gambia, Guinea-Bissau, Guinea, Sierra Leone, Liberia and western Côte d’Ivoire), where rice was historically the main food staple and made up 46–85% of people’s cereal intake in the 1960s!

AfricaRice was established in 1971 in the wake of the Green Revolution in Asia, with a view to importing Green Revolution technologies into West Africa. The fact that an Asian-style green revolution has failed to emerge in Africa is one of the major agricultural frustrations of the 40 years since AfricaRice’s establishment. At the turn of the millennium, AfricaRice began to take a holistic approach to rice policy, bringing together rice stakeholders from diverse government departments (not just ministries of agriculture) and from all ‘levels’ in what is now known as the value chain. One of the first activities was a two-year rice-sector project, funded by USAID, with the aim of formulating a sound and economically viable strategy for the Nigerian rice economy. Nigeria was chosen as a case study for good reason: it is the most populous country in West Africa, with rapidly growing (then and now) rice consumption; it is a microcosm of the sub-region covering a vast area and including all potential rice-growing ecologies; and it had a turbulent rice policy environment in the 1970s to 1990s. In 2003, AfricaRice drafted a strategy for rice sector revitalization in Nigeria.

Nigeria rice sector study

The project ‘The Nigerian rice economy in a competitive world: Constraints, opportunities and strategic choices’ developed a strategy to enhance the competitiveness of Nigerian rice through research and policy dialog. The project used stakeholder consultation and policy dialog to develop a shared vision of rice development issues and formulate the desired strategy. The project had two main objectives: (1) to increase the capacity of the Nigerian rice sector to compete with imported rice in terms of both quality and price; and (2) to enhance the market share of local rice in Nigeria. The final strategy document made a number of recommendations under the headings of:

- Agriculture and rice trade policy, including price protection for local rice
- Improving quality management along the value chain
- Increasing efficiency along the value chain
- Enhancing policy dialog among stakeholders and with government, including establishment of a national rice stakeholders’ forum.

Subsequently, Nigerian rice stakeholders established the Nigeria Rice Alliance and the federal government encouraged open debate of policy reform. Policies implemented included increasing import tariffs by 100% in 2003 and 150% in 2005, while maintaining government subsidies on fertilizers and other agro-inputs. In addition, US$ 400 million was released to boost agricultural production, including rice. Donors also took on board some of the recommendations in their projects.
Lessons from the rice crisis

In the period 2000–2006, AfricaRice also conducted a broad review of policy-related issues in West Africa, often applying a tool known as the Policy Analysis Matrix; maintained the West Africa Rice Statistics Databank, from which its flagship *Rice Trends* publication was developed every few years; looked at rice market efficiency; and studied the competitiveness of the rice sector in Benin, Côte d’Ivoire, Guinea, Nigeria and Senegal. Much of this research and its associated data would provide valuable, if not essential, insights in what was to come.

**Partnership mode of research**

“When it comes to policy work, AfricaRice has only a small team”, says Aliou Diagne, program leader for Policy, Innovation Systems and Impact Assessment. “We always work with national partners, as it is the only viable route to cover the whole continent”.

**Capacity-building**

Building the capacity of organizations and individuals so that they can carry out their work effectively and efficiently is an integral part of the majority of AfricaRice projects. For many years, the agricultural sector has been under-resourced in sub-Saharan Africa to the point that many national agricultural research systems (NARS) were aging and shrinking, because of the lack of qualified young scientists moving into position as the ‘old guard’ moved on. Consequently, many of the activities reported in this booklet involve a significant amount of training — including the design of questionnaires and surveys; manipulating the Emergency Rice Initiative Spreadsheet to guide production-enhancement strategies; constructing and operating farm and processing machinery; and ‘simply’ handling rice better to ensure grain quality.

Visiting scholar Chantal Ingabire of the Rwanda Agriculture Research Institute (ISAR) (shown on the left with AfricaRice impact-assessment unit’s Florent Kinkingninhou and Perpetue Kouamé) spent three months at AfricaRice headquarters learning to use data-analysis software and then analysing the results from a survey of constraints to rice production in Rwanda.
To help address the shrinking human-resource base of the NARS, AfricaRice has a long history of collaboration with universities both within and outside its mandate region. One has only to review the annexes of the Center’s annual reports to see the lists of postgraduate trainees and courses it has run.

Since the temporary relocation of the Center’s headquarters to Cotonou, Benin, the policy program has developed strong informal linkages with the Faculty of Agronomic Sciences of the University of Abomey-Calavi, also based in Cotonou. Prof. Gauthier Biaou explains that students

AfricaRice model for capacity-building

AfricaRice’s philosophy for capacity-building is intimately linked to its approach to research and development within the region, which is that AfricaRice will empower its NARS (and other) partners to carry out much of the research and all of the development work. Consequently, the model for capacity-building is a combination of the following:

- AfricaRice does not implement — that is the NARS’ role
- AfricaRice provides backstopping and training
- The Center runs an annual training workshop for one to two weeks on policy analysis and impact assessment
- AfricaRice develops software tools to automate the processing and analysis of survey data collected by the NARS
- The Center’s Visiting Scientist scheme involves NARS scientists being invited to AfricaRice, which provides tools and training for their work; the scientists analyze their own data and write their own country reports (the time spent at AfricaRice is typically six weeks), while AfricaRice focuses on cross-country comparative analyses and synthesis reports
- AfricaRice facilitates linkages between universities and NARS to give students ‘real world’ research experience.
who want to study rice within the faculty are linked with either AfricaRice or the Institut national de recherches agricoles du Bénin (INRAB). Students involved in this linkage are pursuing either a bachelor’s degree or a postgraduate Diplôme d’études approfondé (DEA, equivalent to a master’s). For AfricaRice, Aliou Diagne determines the thesis program and is also involved in developing the research protocol with Biaou and the student. Diagne and a lecturer from the faculty supervise the thesis work. “We start between one and three new thesis programs each year with AfricaRice”, Biaou says. Many students gaining their DEA then have the opportunity to take up a six-month placement at AfricaRice for ongoing training, prior to moving on to a PhD program. “Many of our students choose to pursue their PhDs in the USA”, says Biaou.

AfricaRice has similar links with the University of Ibadan, Nigeria, the University of Gaston Berger, Saint-Louis, Senegal, and the University of Lomé, Togo.
New challenges: 2006–2007

New DG: New focus

In 2006, agricultural economist Papa Abdoulaye Seck became director general of AfricaRice. He brought with him a wealth of experience in policy advocacy, among others, having been director general of the Institut sénégalais de recherches agricoles (ISRA) and technical advisor to the prime minister of Senegal as well as chair of the Forum for Agricultural Research in Africa (FARA) and governing board member of the West and Central African Council for Agricultural Research and Development (CORAF/WECARD).

Seck was already concerned about the state of the African rice sector, and immediately began a review of the Center’s past and ongoing policy work. It was also evident to an experienced agricultural economist like Seck that major changes were afoot in the main Asian exporting countries and that rice prices on the international market were likely to increase significantly. He worked closely with the Center’s policy program to distill and package the key messages coming from its research and the signals from the international markets. This ‘packaging’ took the form of short evidence-based synthesis papers, policy briefs and simple messages easily digestible by high-level policy-makers and the general population (see Box: Key messages distilled, page 6).

AfricaRice’s unique and privileged position

AfricaRice is unique among the members of the Consortium of International Agricultural Research Centers (CGIAR) in that it is also an intergovernmental Association of African states.
Lessons from the rice crisis

Key messages distilled

- **Rice has become critical for food security and political stability** throughout Africa, but especially in West Africa. For many decades, rice has had the fastest growing consumption rate among all staple crops, fueled in large part by huge growth in demand in urban centers. However, between 40 and 80% of rice consumed on the continent was imported. Despite being a major crop globally, only 7% of world production is traded internationally. Market signals were that the writing was on the wall for big changes in the major exporting countries in Asia. Consequently, African reliance on the international market is a very risky strategy — should anything happen to the global market supply, there would likely be major political implications because of the numbers of (especially urban) people who rely on rice for their daily food.

- **Research has shown that the potential for rice production on the continent exceeds consumption levels and that domestic rice can be competitive.** Even though aggregate yields are lower for Africa than for Asia, closer examination of yield by ecology and season suggests that rice yields in Africa are at least as high as those in Asia. Moreover, Africa has huge untapped natural resources in the form of land and water — resources that are now scarce in other parts of the world, such as Europe, Asia and North America. Although local rice has for a long time suffered the stigma of poor quality, its taste is preferred by many consumers over imported varieties; when quality concerns are met, many consumers are prepared to pay a premium for local varieties.

- **Rice technologies — varieties and crop management techniques — are available in Africa.** Although it is not the only player in the sector, AfricaRice has spent 40 years developing new, adapted varieties for African rice-growing ecologies; and refining crop management regimes for the various rice-growing ecologies.

Ecology for ecology, rice yields in Africa are not significantly different from those in Asia, as illustrated by a selection of national irrigated-rice yields.
As such, the highest oversight body of the Center is the Council of Ministers of Agriculture of all its member states. This arrangement gives AfricaRice unparalleled access to the highest levels of decision-making in African governments.

**Advocacy tour and high-profile meetings**

Seck wasted no time in alerting those who the Center serves about the strong probability of a looming price crisis in rice.

As soon as he took office, he began a series of visits to member states to warn them about the coming storm. The visits took him to the ministers of agriculture and in some cases to the offices of prime ministers and presidents.

In June 2007, Seck instigated a two-day workshop of the Africa Policy Research and Advocacy Group (APRAG) — a regional rice policy research and advocacy platform established by rice policy experts, including AfricaRice, in 2005. A subsequent press release, ‘Economists draw urgent attention to Africa’s looming rice crisis’, was picked up by regional and international media.

The Council of Ministers meetings and Director General Papa Seck’s advocacy tour drew attention from local and international media.
The Center’s statutory biennial Council of Ministers meeting in Abuja, Nigeria in September 2007 provided the platform for Seck to deliver his message to the whole AfricaRice membership in a presentation entitled ‘Rice crisis in Africa: Myth or reality?’ In this presentation, he not only forewarned the ministers of the looming crisis, but encouraged them to turn pending crisis into opportunity (see Box: Turning crisis into opportunity, page 9).

Renewed commitment to rice research and development

The Association status of AfricaRice means that the Center is owned by its member states. As such, member states have a statutory obligation to support the Center’s work through an annual financial contribution or subvention. This obligation was disregarded or considered of low priority by many member states for many years. However, as a result of the DG’s visits and advocacy efforts, member states’ annual contributions recorded a 10-fold increase in 2007–08 compared to the average contribution during 2001–2006. Several member states took measures to settle their outstanding contributions and promised to honor their annual contributions in the future. The fact that countries such as Niger and Chad, which are among the poorest in the world, have paid off the bulk (if not all) of their contribution arrears to AfricaRice is a clear demonstration of the greater commitment of its shareholders to rice research and development at the highest political level and the value they attach to the Center’s research outputs and policy advice.
The storm hits: The food price crisis

Forewarned is forearmed

Immediate reaction to the warning was mixed. Despite Senegal’s huge volume of rice imports and the enormous potential of its river valleys for rice production, the AfricaRice warnings were “not taken seriously”, according to Taïb Diouf, adviser to the Minister of Agriculture and former director general of ISRA. However, the country was quick to react, launching its Grande Offensive Agricole pour la Nourriture et l’Abondance (GOANA) on 18 April 2008 as a direct response to the crisis, which hit the country at the end of 2007.

At the other end of the spectrum, Benin “since 2006 felt the looming crisis [and] put in place rice-production programs”, according to Cyriaque Akakpo, deputy director and head of rice program at INRAB. Links were made with the AfricaRice-based African Rice Initiative (ARI) and an accord signed with Gesellschaft für Technische Zusammenarbeit (GTZ) with a view to increasing milled rice production to 600 000 tonnes in 2015.

Meanwhile, Nigeria had already acted upon AfricaRice research undertaken in the early 2000s. In 2003, the federal government launched a Presidential Initiative on Increased Rice Production, Processing and Export, which re-introduced direct support to rice farmers in the form of subsidies on agro-inputs (seed, fertilizer, agrochemicals, farm equipment and processing equipment); rehabilitated and improved irrigation infrastructure; adopted NERICA 1 for upland production; raised awareness of local rice potential among farmers and processors; and imposed an import levy to discourage rice importation and provide funds for rice research. The Initiative aimed at self-sufficiency in production by 2005. Although this was not achieved, much progress was made under the banner of this Initiative before the crisis hit in 2007/08.

Turning crisis into opportunity

At the Council of Ministers meeting in Abuja, September 2007, AfricaRice director general Papa Seck encouraged member states to turn the looming rice crisis into an opportunity to make the continent self-sufficient in rice production. Specific recommendations were to:

• Establish seed legislation and encourage the involvement of the private sector in seed supply and trade
• Reduce the import tax on small-scale farm and processing machinery that can increase rice farmers’ labor efficiency and improve grain quality
• Work together to reduce fertilizer prices — fertilizers in Africa are two to six times more expensive than in Asia and Europe
• Improve capacity at research, extension, processing and marketing levels
• Promote large-scale use of upland and lowland NERICA rice varieties
• Significantly increase the share of high-yielding irrigated and lowland rice farming.
AfricaRice reaction

As the predicted crisis took hold in late 2007 and 2008, AfricaRice’s immediate response was to develop an Emergency Rice Initiative (ERI), which Seck and deputy director general Marco Wopereis took to the Food and Agriculture Organization of the United Nations (FAO) in March 2008. FAO approved the ERI under its Task Force on Soaring Food Prices, and financially supported AfricaRice to rapidly organize a planning workshop to assist AfricaRice member countries to prepare concrete proposals to increase local rice production in 2008 and 2009.

The ERI program formulation workshop was held at the AfricaRice headquarters in Cotonou, 9–12 June 2008, with the technical support of FAO, the International Center for Soil Fertility and Agricultural Development (IFDC) and Catholic Relief Services (CRS). Participants included the African Development Bank, Banque Ouest Africaine de Développement (BOAD, West African Development Bank), the US Department of Agriculture (USDA), and the International Fund for Agricultural Development (IFAD).

Two main projects arose from this workshop. The two-year ‘Emergency Initiative to Boost Rice Production in Ghana, Mali, Nigeria and Senegal’, funded by USAID, helped some 56 420 farmers across the four countries through access to subsidized seed of improved varieties, fertilizer and improved crop-management methods. The project partners were CRS, IFDC and the national research and extension organizations. Seeds were provided through voucher and seed-fair systems, and training was provided to farmers through videos in local languages in all areas where the project intervened. Across the four countries, farmers produced 51 279 t more rice in 2010 compared to 2008; moreover, their production costs were reduced over the two years of the project.
Policies for food security in Africa

The second main project — ‘Improving access to rice seed and building a rice data system for sub-Saharan Africa’ (also known as the ‘Emergency Rice Project’) — was funded by the Japanese government, as a short, one-year project. The seed component was designed to provide access to quality rice seed for at least 2500 vulnerable farmers in each of the 20 selected countries in western, eastern and southern Africa. The project produced a total of 106.9 t of Foundation Seed from 29 varieties across the 20 countries and 668.4 t of Certified Seed, an average of more than 30 t per country. Project staff (AfricaRice scientists and NARS coordinators) directly trained 562 personnel (including 190 women) in quality-seed production, mainly technicians and extension workers from NARS, NGOs and private seed companies. At the institutional level, the seed component worked with 73 organizations — 20 NARS, 11 seed companies, 19 input-dealers and 23 NGOs — reaching a total of 58 226 vulnerable farmers with quality rice seed for improved production. Meanwhile, the data-system component involved the NARS and national agricultural statistical services (NASS) of 21 country members of the Coalition for African Rice Development (CARD) to collect large detailed rice statistics and information from nationally representative samples.

**Rice statistics — data quality**

Agricultural data can be difficult information to collect. However, the availability of accurate and detailed information on agricultural production, processing and consumption is extremely valuable when planning agricultural campaigns, especially at the national level, to increase the overall availability of food on the market. In December 2007, AfricaRice launched an initiative to improve the timely availability, reliability and relevance of rice statistics and information needed for quality rice research, evidence-based policy formulation, and monitoring and evaluation of rice-related investments in sub-Saharan Africa. Statistics is a specialized area and most countries have dedicated national statistics services. The 21 member countries of CARD that were identified to benefit from this initiative are no exception, and AfricaRice was instrumental in bringing together staff from the NARS and NASS to collaborate on this activity, in some cases for the first time.

**Rice statistics in Nigeria: Unparalleled collaboration**

Nigeria cultivates a large array of food and cash crops among which rice has emerged as the fastest growing sector and staple food, especially for the urban dwellers. Rice is cultivated in virtually all of Nigeria’s agro-ecological zones, from the mangrove and swampy ecologies of the River Niger delta in the coastal areas to the dry zones of the Sahel in the north. The land mass used for rice cultivation increased from 150,000 hectares in the 1960s to about 1.8 million hectares currently.

AfricaRice was able to draw together the four key stakeholders with an interest in agricultural statistics in Nigeria — National Cereals Research Institute (NCRI), National Bureau of Statistics (NBS), Nigeria Institute for Social and Economic Research (NISER), and Department of Agricultural Economics, University of Ibadan. These four organizations formed the Rice Statistics & Information Network in 2008 and constituted the Technical Working Group for the statistics project. The Nigerian allocation of US$ 93 000 of the Japanese funds would not have been enough to cover all of the country’s 36 states. However, NBS was so keen on its first single-crop survey, that it provided $50 000 to enable the survey to be conducted throughout the country. The results of the survey were published in a booklet in 2010.
Lessons from the rice crisis

With funding from the Japanese government as part of the ERI (see AfricaRice reaction above), AfricaRice was able to facilitate capacity-building workshops to guide NARS and NASS personnel in the design and implementation of surveys to collect detailed and reliable crop-specific data. After a review of methods used across the 21 countries, participants were encouraged to adopt new sample frames and sampling methodologies, with a view to regional harmonization to ease the process of regional data aggregation and comparative analyses.

As a direct result of these efforts, detailed data sets are now available for 20 participating countries, and the combined database is held at AfricaRice. These data provide not only the most detailed view of the countries’ rice sectors at one point in time, but will also provide a solid basis for analyzing future trends as the countries continue to increase domestic rice production in pursuit of self-sufficiency.

**ERI Spreadsheet**

The Emergency Rice Initiative Spreadsheet (ERIS) v1.0 software was developed by AfricaRice in advance of the ERI formulation workshop to help member countries analyze their rice production and input needs. ERIS is designed to help calculate potential yield gains, and associated needs for fertilizer and seed. It helps anticipate production gains in major rice-growing regions within the country and consequently the expected reduction in rice importation at national level. For its first use in the ERI workshop, country-specific Spreadsheets were preloaded (by AfricaRice) with the necessary primary and secondary rice production and price data from several sources, including AfricaRice surveys, FAOSTAT and USDA. Subsequent use of ERIS by country teams involves them inputting their own data.

**ERIS aiding national rice development policy in Benin**

Cyriaque Akakpo is head of the rice research program and deputy director of the Institut national de recherches agricoles du Bénin (INRAB). As such, he is closely involved in Benin’s rice development work. Like AfricaRice, INRAB sensed a looming crisis back in 2006. In that year, the Ministry of Agriculture signed an accord with GTZ to provide the country with assistance to boost national production to 600 000 tonnes of milled rice by 2015 — equivalent to 900 000 t of paddy. INRAB also arranged rice production activities as part of the African Rice Initiative (ARI). A fundamental problem at that time, however, was determining what steps needed to be taken to reach the goal.

In 2008, Akakpo took part in the workshop that launched ERI, and was trained in the ERIS decision-support tool. Now he had something to hand which would detail the progression required to achieve the country’s rice development goal.

The supply of 900 000 t of paddy rice by 2015 was entered into ERIS, but the prediction of resources required to reach the goal — funds, seeds and fertilizers — was unrealistic. Consequently, INRAB settled for the lower target of 300 000 t of milled rice (450 000 t paddy). ERIS determined the requirements to increase paddy production by 100 000 t per year: 60 t of Foundation Seed to provide 2200 t of Certified Seed for the farmers. These figures form the basis of Benin’s national rice development strategy.
National rice development strategies

CARD was created to help Africa double its rice production by 2018. CARD is committed to assisting 23 sub-Saharan African countries to develop National Rice Development Strategies (NRDS). It requested that AfricaRice provide a general framework for the NRDS and technical assistance to the country task forces that develop the strategies. AfricaRice subsequently developed a draft outline and format for the documents and processes required in establishing NRDS and participated actively in reviewing the drafts from the first group of 12 countries at a technical meeting in February 2009. “Some of the countries were developing their NRDS before the advent of CARD”, says Ibrahima Bamba, AfricaRice policy economist, “but these were subsequently adapted to the CARD framework”.

With its potential for agricultural development, Nigeria took the bold step of targeting a near quadrupling of national rice production from 3.4 million tonnes in 2007 to 12.85 million tonnes in 2018. According to M.A.A. Adewuyi, director of agro-processing, National Food Reserve Agency (NFRA), the former Presidential Initiative on rice (see Forewarned is forearmed above, page 9) was replaced by the NRDS, “with a change in focus from small-scale intervention to medium- and large-scale intervention to improve quality”. The Nigerian ‘draft zero’ NRDS was developed by NFRA via a workshop that involved a wide spectrum of development partners, including AfricaRice, bilateral and multilateral donors, and international agricultural development stakeholders. According to Karima M. Babangida, NFRA deputy director of agro-processing and marketing, the Nigerian NRDS was proclaimed “best draft” at the technical review meeting in February 2009, because of its adoption of a value-chain approach. Although launched in early 2010, the Strategy has yet to become legally binding on the federal government. It was, however, thoroughly reviewed at a stakeholder workshop in December 2010. The final draft will be presented to the President by the Federal Minister of Agriculture for government approval. At which point, “NFRA will ask for a donor workshop to gain backing for the Strategy”, according to Babangida.
What of the future?

“The flurry of policy activity since the onset of the first rice-price crisis in 2007/08 has had a positive impact on rice production in sub-Saharan Africa”, says Wopereis. The domestic production responses to supportive government policies were remarkable in several countries in Africa, particularly in West Africa where paddy production increased consecutively by 26.9% in 2008, 5.3% in 2009 and 9.7% in 2010 (see Box: Countries with spectacular rice production increase in 2008). “But the work has also highlighted ongoing bottlenecks and constraints to domestic rice production and consumption on the continent”, continues Wopereis.

It is evident from various studies that there are still serious constraints to rice expansion and intensification across the continent. These include lack of access to agro-inputs, and lack of adequate equipment for labor-intensive tasks such as land preparation, weeding and bird-scaring. Harvesting and postharvest processing present their own problems, especially in relation to quality control and timing. Marketing is also a bottleneck, as local rice has yet to break the stranglehold of imported rice on urban markets in particular, despite the fact that many Africans actually prefer local varieties. One constraint that impacts the whole rice value chain from farmer to retailer is access to credit — many ‘innovations’ are inaccessible to those without capital (see Box: Appropriate financial products for the local rice value chain, page 20).

Rice leading a green revolution in Africa

Despite these hindrances, AfricaRice firmly believes that Africa has the potential not only to become self-sufficient in rice, but also to become a net exporter onto the world market. Africa has the land, the water and the ecologies and climates to grow millions of tonnes of rice. Research has provided technologies in the form of new varieties and crop management options to make intensive and extensive rice production and processing truly profitable on a wide scale if the mechanization challenge is solved. Moreover, with its fast-growing population, Africa has the human resources to supply the workforce to drive a green revolution in rice across the continent.
Rice-based systems

There is of course more to African agriculture than just rice. Across the continent, it is probably the floodplains and inland valleys that provide the most fertile and productive land for any form of agriculture. Intensification means maximizing these land resources — in particular, working the agricultural calendar to fit two crop seasons into a year. In some places, such as the Senegal River valley, that second crop can be rice, because of the abundance of water for irrigation; however, in many other places it is far more useful to the farmer to grow a different crop in the second season. Consequently, for many years AfricaRice has adopted a mandate that covers ‘rice-based systems’ rather than just rice — this is particularly evident in the AfricaRice-convened Inland Valley Consortium. This focus on the wider farming system is all the more important as AfricaRice and its member states push for continental rice self-sufficiency.

Value chain development

And it is not just the wider farming system. Rice concerns thousands, if not millions, of people who are not rice farmers. On the pre-production side there are the producers and manufacturers of inputs (seeds, fertilizers, pesticides) and machinery and the traders who sell them. On the post-production side, there are processors, traders, wholesalers, retailers and consumers.

Matty Demont is an agricultural economist based at the AfricaRice Sahel Station. “The Senegalese eat mostly imported rice instead of the locally produced rice — why?” he asks. “The answer must be related to rice value chains in Senegal, and it will give us clues how to orient rice strategy to the end-user — making the chains buyer-driven”. The vast majority of Senegalese people in Senegal eat imported rice. This preference is influenced, at least in major part, by the fact the that locally produced rice (especially in the Senegal River valley [SRV] in the north) has historically been of mediocre quality, comprising mixed varieties, heterogeneous grain quality and with unacceptably high levels of impurities. But what if it was tailored to market preferences in terms of quality and presentation, would the people pay for it? By using an experimental auction system, and locally produced branded rice (Rival — a trademarked brand of domestic rice, marketed by the NGO Platforme d’appui aux initiatives du nord, PINORD), Demont and his team found that women consumers were willing to pay a premium for Rival more than double what they would and do pay for imported rice on the market (38% cf. 16%).
That said, some 20% of the participants preferred the conventional SRV rice. “The policy implication here is that we should never seek to push all SRV rice down the route of quality”, says Demont. “There is a market segment of consumers who are not willing to pay for quality. Value chain development should ensure that conventional SRV rice remains available for those consumers if improving its quality will result in significantly higher prices”.

The key lessons from the value-chain work conducted at the Sahel Station are that the availability of quality local (SRV) rice needs to be promoted among the population, production of quality rice requires investment, and policy needs to be sequenced — starting with increasing the quality of locally produced rice to the level of imported rice, which adds value to the product; scaling up rice production; and running promotional programs to market the surplus and replace imported rice in urban end-markets. A branding exercise in Saint-Louis in 2006 failed to impact the market because of lack of promotion.

**Mechanization**

Mechanization is now essential for rice production and processing. If farmers want to intensify their cropping, they need to speed up the operations that are labor-intensive when conducted manually. For example, when NERICA production was doubled in The Gambia between 2007 and 2010, farmers found it difficult to harvest and thresh the extra rice, which resulted in reduced quality because of the delays. In Senegal, high rice prices in 2009 prompted many farmers to grow a second crop, but they then discovered that the harvesting of that crop overlapped into the period when they should have been preparing the land for the main-season crop.

A recent *ex-ante* impact assessment conducted by the AfricaRice policy team gave a conservative estimate of 0.9 million tonnes of milled rice saved by halving on-farm post-harvest losses through the use of appropriate technologies. This would save almost 17% of current rice imports, with a value of US$ 410 million in 2011 prices! This in turn could raise about 2.8 million people in rice-farming households out of poverty.

In July 2011, a number of rice stakeholders from sub-Saharan Africa met to develop a roadmap for sustainable mechanization of the rice sector. The meeting emphasized the value of small-scale, locally adapted machinery specifically targeting labor-intensive activities, such as land preparation, weeding, harvesting and processing. Many of the recommendations of this meeting...
Policies for food security in Africa are reflected elsewhere in this booklet; however, participants also recommended that governments consult research when importing machinery to ensure its efficacy and durability under African farming conditions, and that capacity be built to provide after-sales support for farm machinery (e.g. servicing and repair).

AfricaRice has a long history of adapting and promoting appropriate-scale machinery in West Africa. The best-known example being the ‘ASI’ thresher–cleaner, which is now used by the majority of farmers on the Senegal side of the Senegal River valley. The Center’s latest import-and-adapt machine is a mini combine-harvester from the Philippines. This machine seeks to address the issues of inadequate local rice supply, slow harvest and poor quality that hamper production and marketing. The adapted prototype harvester being tested not only harvests small farm plots more quickly (taking about a quarter of the time of manual harvesting), but also provides threshed grain of a high quality, making it more attractive to local traders.

A vision of the future

“We have come a long way in the past five to ten years”, says Diagne, “and we have learned a lot”. He has a vision of the future in which Africa will become a global powerhouse of rice production. In this vision, farmers will operate modernized family farms, most of which will be mechanized — in many cases farmers will grow a second crop (either rice or some other crop); farmers’ associations or millers will aggregate quality paddy; all rice will be milled by dedicated quality millers; credit will be available to all stakeholders in the rice value chain; contractual arrangements will be the norm, between farmers or farmers’ associations and processors, and between processors and wholesalers or importers; wholesalers will buy bulk quality rice for branding and onward sale to retailers; and the commercial rice product will carry a label indicating not only its origin, but also its quality.

Diagne explains: “work with farmers and small-scale processors has persuaded me that encouraging farmers to do their own processing is not helping in the drive to improve and maintain quality”. For this reason, he favors a system in which farmers focus on production, using appropriate machinery to maximize their output in terms of both quantity and quality. “Encouraging farmers to use a locally adapted small-scale combine-harvester is another method for increasing the quantity and quality of locally produced rice”, explains Diagne. “Rather than paddy quality being affected by waiting on the farm for threshing, harvesting and threshing
are done in a single operation, and the harvested grain is immediately ready for delivery to the processor” (see Box: The case for an affordable locally adapted combine harvester). Processing would then be carried out with medium- and large-scale machinery owned by producer associations or private entrepreneurs. These would contract farmers to grow specific varieties with quality seed and specified inputs and other management practices — some form of outgrowers’ scheme. In this way, the processors will collect and aggregate rice of a single variety of a similar quality, which will enable them to produce grain of uniform quality ready for the market (see Box: Promoting investment in improved processing technologies, page 20).

**The case for an affordable locally adapted combine-harvester**

Harvesting and threshing of paddy are serious bottlenecks for rice farmers. Large combine-harvesters are ill adapted to the rice fields of smallholders. Consequently, paddy may sit in the field for weeks or even months waiting to be harvested or threshed, during which time its quality deteriorates because of exposure to the elements. As a result, many rice farmers resort to manual harvesting and threshing operations, which are time-consuming and affect the quality of the paddy. Delayed removal of paddy from the farm impinges upon the second season, jeopardizing the option for a profitable second crop.

AfricaRice is introducing and adapting a small affordable combine-harvester in the Senegal River valley, to enable timely harvesting and threshing. This could provide the incentive for farmers to sell their paddy quickly and focus on producing a second crop (either rice or a horticultural crop such as tomato, potato or green bean).

The early removal of paddy from the farm would not only enable farmers to focus on their core farming business (i.e. crop production), but would also open up the prospect for greater aggregation of the marketable surplus of paddy. Fragmentation of available marketable volume of paddy — that is, the fact that producers act alone in processing and selling their surplus paddy — is a major disincentive to private-sector investment in the domestic rice value chain.
What about large-scale mechanized rice farming?

“Rice production is done mostly by small-scale farmers”, says Ali Touré, AfricaRice agricultural economist. “However, large-scale farming is now gaining importance with the involvement of private sector in areas where land is still available and in countries where some land acquisition arrangements exist and are flexible”. Given Africa’s vast potential for rice production, this is clearly going to a logical route in the eyes of many policy- and decision-makers. “The first requirement for large-scale mechanized rice farming could be the capital investment issue”, continues Touré. “Large-scale mechanized farming requires necessary investments along the value chain which small-scale farmers do not have”.

The 2008 food crisis was a wake-up call not just for Africa, other countries around the world with burgeoning populations and insufficient resources to feed them also responded to the ‘call’. Some African governments are leasing land at minimal price to big foreign investors and other investors have seen the potential to make money out of producing food. Major foreign investors include China, India and Saudi Arabia, but wealthy and savvy nationals are also ‘cashing in’ on what has become known as the ‘land grab’. In Ethiopia, for example, hundreds of thousands of hectares of land have been leased to huge commercial farm enterprises, which have claimed communities’ unused fallow land and displaced villages to make way for large-scale commercial, mechanized farming.

There are concerns that such farms may focus on production for export or of cash crops, where the land was formerly used for subsistence and local food crops. It is said that Africa has the resources, and that countries cannot feed their own populations on small-scale agriculture alone. There are ‘losers’ in this — people who don’t want to leave their land, people who have their land taken away from them, people who don’t want to give up their traditional way of life. It seems that they must pay the price for development, and this can lead to resentment and conflict. On the ‘positive’ side, these huge farms require labor, and enterprises are establishing new villages to accommodate workers and their families. If promises are kept, these villages will have the infrastructure to improve the wellbeing of their inhabitants — such as schools, running water and clinics. There are fears, however, that some new land owners would rather import ‘experienced’ labor than employ locals. Increased local unemployment could become a serious issue as other sectors are unlikely to be able to absorb the surplus labor force.

“AfricaRice advocates all-encompassing and broad-based consultations with agricultural and rural stakeholders in Africa”, says Diagne. “To minimize the political risk of land acquisition, countries ought to take a closer look at granting long-term lease (25 to 50 years) instead of full ownership of agricultural land to foreign private firms or governments”. Moreover, governments should encourage the new landholders not to isolate themselves from the local communities. Rather they should provide employment for local people, investing in capacity-building where necessary. Since they are likely to construct mills of much higher capacity that they can fill, they should also be encouraged to contract local farmers to produce paddy on their own farms to fill milling capacity. By buying the locals’ paddy for milling, the new landholders would then be helping to develop the local rice value chain.

A rice combine-harvester in use in Uganda. It can harvest 192 ha in a month
Lessons from the rice crisis

Marketing is another important aspect. With enough evidence that Africans actually prefer local rice varieties and are prepared to pay a premium for them if the quality is right, contractual arrangements for delivery of quality grain between processors and wholesalers and appropriate branding are logical steps to improve the value and consumption of local rice on the continent. Thus, the ‘final’ step in the value chain is that wholesalers will buy and brand (package and label) quality local rice for onward sale to retailers and hence consumers.

In terms of public (and private) investment, Diagne believes that countries should continue to rehabilitate and expand irrigation structures, so that more small-scale farmers have access to the

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Promoting investment in improved processing technologies

Rice processing is dominated by small rice hullers, the majority of which produce an end-product that fails to meet to the quality requirements of urban consumers. Moreover, most operators of rice hullers only provide milling services — they do not buy paddy and sell on milled rice. This practice contributes to the fragmentation of the market for milled local rice and discourages private-sector investment. The promotion of private-sector investment in efficient rice processing technologies, such as ‘mini rice mills’ with built-in capacity for de-stoning, polishing and sorting homogeneous high-quality rice, will go a long way toward stimulating the local rice value chain.

Government investment efforts in modern rice processing technologies should include mechanisms that provide incentives for processors to upgrade their technologies, such as duty-free imports on processing equipment, tax concessions or access to finance. As paddy production expands, there is an urgent need to process good-quality milled rice that matches the quality benchmark of imported rice. However, the objective is not to repeat past misguided policies of government-run large-scale industrial rice mills. Instead it is to promote modern processing technologies that are capable of producing high-quality rice, both medium-scale to deliver large quantities for urban centers and ‘mini rice mills’ for rural locations.

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Appropriate financial products for the local rice value chain

Access to agricultural finance remains a critical concern in Africa. The development of financial products tailored to the needs of all rice value-chain actors is paramount to stimulate further improvement in the supply and competitiveness of local rice. For instance, limited access to production credit to purchase productivity-enhancing inputs can counter otherwise profitable production decisions. Without access to adequate financial products, rice farmers often end up selling their paddy on credit to traders who may then delay payment to farmers because of their own lack of access to adequate finance.

Failures in credit provision and access services constitute a major bottleneck in the development of a well-integrated value chain for locally produced rice, which adversely affects the overall competitiveness of the chain. The fixed investments in improved processing technologies, warehouses and farm machinery require longer-term financing than the short-term financing needs of paddy-production credit.

The development of storage capacity (warehouses) will require appropriate financial products to guarantee rice stocks. In many countries, little locally produced rice is available in urban areas. As paddy production expands, it will be necessary to promote year-round availability and marketing of local rice. Therefore, more investments need to be targeted toward the development of effective warehouse systems. For instance, successful experiences with warehouse-receipt systems’ could be scaled up and out. Incentives should be given to rice millers to facilitate access to finance for investment and working capital necessary to procure and hold paddy and milled rice in storage.

Adequate financing mechanisms and facilities for the marketing of rice should be extended to wholesalers of local rice.
best possible water management, which has a direct impact on rice yield. But with the prospect of increased production, there is then a need for investment in the harvesting, processing and marketing described above, so that the whole value chain works together to ensure more and good-quality local rice reaches consumers’ tables. Financial products (e.g. credit) need to be adapted to the target borrower — there is no ‘one size fits all’ credit mechanism for everyone involved in the value chain (see Box: Appropriate financial products for the local rice value chain). Moreover, access to good storage facilities along the rice value chain (including warehouses) should be expanded to improve the storage and marketing of quality rice.

“With all this in place, Africa as a whole, and the various sub-regions, should be able to become self-sufficient in rice”, concludes Diagne.

**Research focus — learning lessons of what does and doesn’t work**

“Everything that we do here at AfricaRice is research, either it is research in developing new technologies or it is research for development”, says Wopereis. “Even when we do something that looks like development, there is still a research component there, because we are trying to determine what works best where in the form of ‘proof of concept’ trials at pilot sites. Take for example the mini combine-harvester that is being adapted in Senegal. The work to date has been adaptation and evaluation, including on-farm testing and collection of data to assess its financial profitability and potential economic and social impact. If this ‘proof of concept’ suggests that the machine will be useful, we aim to scale up its use by linking up with development projects in 2012”.

The link with development is made through the RiceTIME unit — ‘TIME’ standing for ‘training, information management and extension linkages’. “RiceTIME’s role is to provide the link between research and extension”, says unit head Inoussa Akintayo, “playing a facilitation role in scaling up and scaling out of all technologies, be they varieties, knowledge or models”. RiceTIME was intimately involved with both the USAID and Japan projects under the ERI, and other value-chain projects funded by Canadian International Development Agency (CIDA), Common Fund for Commodities (CFC) and Syngenta Foundation for Sustainable Agriculture.

**“Are we sheltered from another crisis?”**

Two years after sounding the alarm bell at the 2007 Council of Ministers, Seck delivered his latest concerns in a presentation entitled ‘Are we sheltered from another crisis?’ at the 2009 Council meeting in Lomé, Togo. Both urbanization and rice-consumption rates are continuing to increase, while Africa as a whole depends on imports for 40% of its rice. Meanwhile, the global rice consumption rate is also outstripping the rate of production increase. Global rice stocks are dwindling and Asian production is threatened by changes in weather patterns. All these signs indicate that Africa is living dangerously in its reliance on rice imports.
Against this backdrop, Africa continues to be endowed with copious resources in the form of land, water and sunlight. “Simply increasing the African rice area by 15% and adopting technologies such as the NERICA varieties and integrated crop management to close the yield gap could make the continent self-sufficient in rice, with 5 million tonnes surplus for export every year”, declared Seck, who then went on to recommend policy options to governments for achieving this goal:

- Support research and extension — “economic efficiency of investments cannot be guaranteed without strong research investment”
- Adopt technology to target productivity (yields), quality and double-cropping
- Ensure quality seed stocks
- Improve water control — irrigated rice yields may be quadruple those of rainfed rice
- Develop basic infrastructure for postharvest processing, marketing and rural incomes
- Provide targeted subsidies, especially to fertilizer — “Sustainable increase in yields [is] impossible without subsidies”.

Less than two years on from that speech, global food markets were once again in upheaval. The food price index measured by FAO reached a record level in January 2011, and the World Bank estimated that about 44 million people have been pushed into extreme poverty as the result of high food prices since June 2010. Wheat recorded the highest price increase, its international price nearly doubling between June and December 2010. Meanwhile, rice experienced a 17% price hike.
It appears that the soaring price of wheat was one of the triggers of socio-political unrest that swept across the Arab world in December 2010 and into 2011. Thus, the apparent resilience of much of sub-Saharan Africa to these latest food price rises may owe much to its traditional dependence on maize, growing dependence on rice, and rice production increases after the 2008 crisis. While international maize prices soared by 60%, most of sub-Saharan Africa was sheltered from these hikes through its self-reliance status in this staple. In addition, the production drives put in place in the wake of the 2007/08 crisis would have helped shield the populace from some of the much smaller price increase that affected rice. On a global scale, increased ‘reserve’ stocks helped shield rice from the fate of other cereals — the market price of the global benchmark Thai Grade B rice increased ‘just’ 22% to February 2011, about 50% lower than its peak levels in May 2008.

**Regional integration**

One of the issues highlighted by Seck in his 2009 address to the Council of Ministers was the dwindling of global rice stocks. The Economic Community of West African States (ECOWAS) is looking into the viability of creating a grain reserve stock for West Africa, under the premise that stable rice prices would benefit the public of the region.

Two other aspects of regional integration are also being looked at by ECOWAS. First, a regional rice development strategy, to build complementarity into the NRDS and promote regional integration. And second, looking at harmonization of rice importation policies and the viability of bulk purchase of rice from the international market. As the primary importer of rice taking 30% of the trade supply, the region could stand to benefit from the economy of scale in bulk purchasing if an appropriate institutional mechanism relying mostly on the private sector can be designed and implemented.

**Weathering this storm and the next**

Policy-makers need to continue to invest in domestic production capacities with renewed vigor. Investment programs to rehabilitate and expand areas under irrigation should continue, along with support provided to raise the productivity of smallholder rice producers through access to improved varieties, good-quality seed and fertilizer. However, we have learned that targeting investment efforts uniquely on production may create a glut at harvest time because of insufficient capacity in the processing and marketing nodes of the value chain. Therefore, it is vital to simultaneously invest in the harvesting, processing and marketing nodes of the local rice value chain by a combination of public support to farmers and privileging private-sector investment.

AfricaRice’s ongoing policy advocacy work in the face of an uncertain future focuses on the following main policy recommendations:

- Promoting access to the new appropriate technologies — such as the mini combine-harvester — at the farm level, to encourage farmers to focus on production
- Increasing storage capacity along the value chain, and encouraging processors to buy and trade rice rather than simply provide a processing service to farmers
• Linking actors within the local rice value chain and facilitating contractual arrangements, including demonstrating to farmers in particular that such arrangements can be beneficial to all parties
• Providing access to financial products adapted to the needs of each type of actor in the rice value chain
• Establishing local (regional) rice stocks that are well managed (not necessarily by the public sector), to protect the region from short-term price shocks on the global market.
Notes


4. In the past, AfricaRice has reported that paddy production in Burkina Faso increased from 68 916 t to 235 000 t from 2007 to 2008 — an increase of 241% (citing Comité Permanent Inter Etats de lutte contre la Sécheresse dans le Sahel [CILSS] data from 2009). However, FAOSTAT (http://faostat.fao.org) data indicate a production increase from...
68 916 t to 195 102 t between 2007 and 2008. Although data from FAOSTAT and CILSS come from the same sources (Office of Agricultural Statistics), they publish the figures at different times: FAOSTAT production figures lag two years behind CILSS. During that timeframe, crop production figures can be updated and revised by the data suppliers, which is apparently the case for Burkina Faso rice production in 2008.

5. The Inland Valley Consortium (IVC) is an eco-regional program for sub-Saharan Africa; a platform for regional cooperation to promote the sustainable development of inland valleys; and a partnership of diverse institutions to create critical mass and jointly plan and implement an integrated research program of common interest.

6. Land-grabbing is not an African phenomenon, but rather a global one. It is also concerning farmers and others in Asia and Latin America.

7. ‘Warehouse-receipt systems’ are “documents issued by warehouse operators as evidence that specified commodities, of stated quantity and quality, have been deposited at particular locations by named depositors” (Coulter J and Onumah GE. 2002. The role of warehouse receipt systems in enhanced commodity marketing and rural livelihoods in Africa. *Food Policy* 27: 319–337).
Without whom…

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About this booklet

The policy research and advocacy conducted by AfricaRice immediately before and during the 2008 rice crisis were influential in providing adequate information and options that helped member countries and development partners identify and promote policies and projects that have contributed to a significant increase in rice production and renewed interest in the rice sector in general in Africa.

This booklet looks at AfricaRice’s role in sounding the alarm bells for the then looming crisis, the countries’ responses, and the ongoing work to ensure that African countries are not held to ransom by factors beyond their control in the international rice markets again.

About Africa Rice Center (AfricaRice)

The Africa Rice Center (AfricaRice) is a leading pan-African research organization working to contribute to poverty alleviation and food security in Africa through research, development and partnership activities. It is one of the 15 members of the Consortium of International Agricultural Research Centers (CGIAR). It is also an autonomous intergovernmental research association of African member countries.


AfricaRice temporary headquarters is based in Cotonou, Benin. Research staff are also based in Senegal, Nigeria, Tanzania and Côte d’Ivoire.

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