



AfricaRice

## Increasing investment in Africa's rice sector

Africa Rice Center (AfricaRice) – Annual Report 2009

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## About Africa Rice Center (AfricaRice)

*The Africa Rice Center (AfricaRice) is a leading pan-African research organization with a mission to contribute to poverty alleviation and food security in Africa through research, development and partnership activities. AfricaRice is a member of the Consortium of Centers supported by the Consultative Group on International Agricultural Research (CGIAR). It is also an autonomous intergovernmental research association of African member countries.*

*The Center was created in 1971 by 11 African countries. Today its membership comprises 24 countries, covering West, Central, East and North African regions, namely Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Côte d'Ivoire, Democratic Republic of Congo, Egypt, Gabon, The Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Madagascar, Mali, Mauritania, Niger, Nigeria, Republic of Congo, Senegal, Sierra Leone, Togo and Uganda.*

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

*For more information, visit: [www.AfricaRice.org](http://www.AfricaRice.org)*

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# AfricaRice

## Message from the Board Chair and the Director General

The Year 2009 was a year of substantial growth for the Africa Rice Center. The membership of the Center increased to 23 African countries with the admission of the Republic of Gabon. With the continuing expansion of the activities of the Center into Central, East and North Africa, the Council of Ministers passed a resolution at their 27th Meeting held in Lomé, Togo, in September 2009, to change the acronym from WARDA to AfricaRice. Consequently, our new appellation in English is Africa Rice Center (AfricaRice) and Centre du Riz pour l'Afrique (Africa-Rice) in French.

Along with the name change, AfricaRice has witnessed a marked increase in the payment of member state contributions, which together with a large number of new projects has resulted effectively in a doubling of the Center's budget from 2007 and 2008 levels. Some of the new projects have come about because of our timely advocacy in reaction to the 2008 rice crisis and the resulting response of Japan and USA via the funding of an Emergency Rice Initiative. The Center also received support from FAO and UNDP to produce foundation and certified seed for Liberia, using our still functional facilities in Mbé in Côte d'Ivoire.

AfricaRice welcomed a large number of new staff members in our different locations. Working conditions in Cotonou have been significantly improved with the addition of 16 new offices and new ICT equipment. In Senegal, six new offices were built and two laboratories are currently under construction. Staff members in Nigeria were able to relocate to more spacious settings, with additional office space provided at the IITA headquarters in Ibadan. In Tanzania, staff numbers have increased from five to 25 and together with IRRI, they have relocated to new offices in Dar es Salaam. The East and Southern Africa Rice Program (ESARP) established by AfricaRice and IRRI in December 2008 have been significantly strengthened.

Among the most significant achievements of the Center in 2009 has been the 'Superior' rating received from the World Bank for the work accomplished in 2008 and reviewed under the CGIAR Performance Measurement System. The project on 'Rice Policy and Technology Impact on Food Security and Poverty Reduction' supported by the European Union which forms the core of our Policy and Impact Assessment Program was also very favorably reviewed. All these attest to the highest quality of scientific output by the Center.

Recognition for our work also came through awards received by staff. AfricaRice Director General, Dr Papa Abdoulaye Seck, was honored by the French Government with the award of 'Ordre de Mérite Agricole de France', reflecting international recognition for his work. The 2009 Japan International Award for Young Agricultural Researchers was won by AfricaRice Research Assistant, Amos Onasanya.

By the end of 2009, a Center Commissioned External Review of our Genetic Diversity and Improvement Program was organized with three-member panel coming from Mali, France and Brazil. We continued building strategic partnerships by signing Memoranda of Understanding with Cornell University for genotyping of African rice and with Louisiana State University to join forces to rebuild the rice sector in Liberia.

In 2009, the Center was fully engaged in the CGIAR reform process. We worked with our sister Consortium centers – IRRI and CIAT – in developing the first draft of a proposal, the Global Rice Science Partnership (GRiSP), aligning international rice research worldwide. The Council of Ministers endorsed the establishment of GRiSP in their meeting in Lomé, Togo, in September 2009.

AfricaRice scientists actively participated and facilitated major activities of the Coalition for African

Rice Development (CARD), an initiative spearheaded by JICA and AGRA, resulting in the formulation of national rice development strategies for the first group of 12 CARD member countries.

In this year's report, we profile the donor United States Agency for International Development (USAID). From the time of the inception of AfricaRice (then WARDA) in 1971, USAID has been supporting the Center. The support from USAID goes beyond monetary contributions. The Agency has also provided technical assistance and guidance through the posting of scientists, development specialists and research managers.



In 2009, most African governments consolidated the gains in rice productivity made in 2008, after the food crisis hit the continent. This has involved a host of measures ranging from subsidy for seed and fertilizers to restoring irrigation infrastructure and establishing milling and storage structures. Despite this, Africa's demand for rice continues to increase by an astounding 4.2% over the previous year. The gap between demand and supply filled by imports remained stable at almost 10 million tonnes of rice, costing US\$ 4 billion. The import bill for rice still remains a huge burden for many African countries.

AfricaRice is determined to continue through its well-tested strategic partnership mode to conduct research for development impact to contribute to reducing the gap between rice supply and demand. Linking research and development efforts and involving the private sector will be critical to boosting Africa's rice sector and to reduce the continent's reliance on imports.

***Getachew Engida***

***Papa A Seck***

*Chair of the Board of Trustees, Mr Getachew Engida (left), with Director General, Dr Papa A Seck.*

## African countries invest more in rice

During 2009, Africa consolidated the gains made while dealing with the food crisis of 2008. The food crisis had shaken many national governments and societies, and they strengthened policy measures initiated to overcome the emergency situation. Rice continued to grow as the food grain of choice for many Africans.

In 2009, AfricaRice continued its advocacy that it had started even before the food crisis. At the biennial meeting of the Council of Ministers (COM) of AfricaRice member states, held in Lomé, Togo, in September 2009, Director General Dr Papa A Seck, reiterated the message that Africa was not sheltered from another food crisis. AfricaRice had predicted the impending rice crisis before it happened and had urged the African countries to take action to increase domestic rice production.

During the year, Dr Seck also had the opportunity to meet the President of The Gambia, His Excellency Prof. Alhaji Dr Yahya Jammeh, and the Prime Minister of Chad, His Excellency Youssouf Saleh Abbas.

As a result of the policy support initiatives started by many countries after the 2008 food crisis, there has been an increase in rice production in Africa. According to FAO statistics, African countries produced 24.43 million tonnes of paddy in 2009, an increase of 3.44% over the 2008 production of 23.62 Mt.

In Ghana, production increased from 301,920 tonnes in 2008 to 391,440 t in 2009, an increase of 30%. In The Gambia it increased from 38,300 t (2008) to 79,000 t (2009), an increase of 106%. Mali recorded an increase from 1.62 Mt (2008) to 1.95 Mt (2009),



*At the Council of Ministers Meeting held in Lomé, Togo, AfricaRice reiterated the importance of increasing domestic rice production in Africa.*

an increase of 20%. Paddy production in Senegal increased from 408,219 t (2008) to 502,104 t (2009), an increase of 23%. In Uganda, production increased from 171,000 t (2008) to 181,000 t (2009), an increase of 6%.

## Policy support to overcome the crisis

Many African countries responded to the 2008 rice crisis by implementing policies that either reduced the cost of imported rice or supported domestic rice production.

Probably due to the ease of its implementation, the most widespread intervention was the temporary reduction or suspension of customs duties and taxes on imported rice. In Côte d'Ivoire, the 10% customs duty on imported rice was suspended and the value added tax on retail rice was reduced from 18% to 9%.

Some countries turned to price controls to contain the increase in consumer prices. In Benin, Burkina Faso, Cameroon, Mali, and Senegal, governments assumed control of staple food prices. Reference retail outlets were established in Burkina Faso, Mali and Senegal.

Although following the implementation of the structural adjustment programs in the 1990s, governments in sub-Saharan Africa (SSA) refrained from directly intervening in the production and marketing of rice, the surge in food prices prompted a rethinking of their rice policy. Several countries are now adopting self-sufficiency in rice as a main policy goal. A change in rice policy is indeed perceptible since 2008 as governments are allocating more to rice sector development in order to stimulate domestic production in the short to medium-term.

For instance, in 2008 and 2009, public investments in the Malian rice sector reached US\$ 84 million and US\$ 106 million respectively. As part of the “Initiative Riz”,

the Government of Mali promoted greater access to agricultural credits. Upland farmers in Mali obtained subsidy for seeds and fertilizers. The Government of Mali also pre-financed the procurement of farm machinery and establishment of rice mills, and launched a large land development program.

The policy measures introduced to stimulate domestic production often include the provision of subsidies on inputs such as seed and fertilizer, farm machinery and post-harvest equipment (e.g. Nigeria, Senegal, Togo); the establishment of minimum producer price (Nigeria); and the expansion of areas under irrigation by speeding up the rehabilitation of existing irrigation schemes.

Supportive government programs helped farmers shift to rice cultivation in Benin, resulting in increased area and production. The programs promoted the production of certified seed, available at subsidized rates to the farmers, and also the development of lowlands for rice cultivation.



*Governmental support in Benin is helping increase rice production.*

In Côte d'Ivoire, the government launched a national rice program, which is working on restoring irrigation infrastructure, and establishing milling and storage structures. Support is also provided to farmer cooperatives.

In Ghana, the government restored irrigation structures and subsidized fertilizers. The Senegalese Government continued its support to rice farmers under the Great Agriculture Endeavor for Food and Abundance (the GOANA Initiative) to increase agricultural output.

The Congolese Government reduced import taxes on rice to overcome the crisis. This was followed by multiplication of seeds of NERICA and local varieties and their distribution to farmers. The Government of Burkina Faso provided support services to reorganize the rice sector and increase cultivated areas through lowland development, expansion of irrigated rice perimeters and the introduction of upland rice in cotton-based systems.

## Enough land, enough water

Sub-Saharan Africa (SSA) has enormous potential for developing and increasing rice production. There is tremendous scope for developing rainfed lowland rice areas, augmenting the area under irrigation, and raising yield levels in farmers' fields through diffusion and adaptation of rice technology to local conditions. The total area of land potentially suitable for crops in Africa is estimated to be 874 million ha (Mha), but only 150 Mha is harvested yearly. According to the United Nations Environment Program (UNEP), Africa only uses about 4% of its water resources.

In SSA only 3% of crop land is irrigated (representing 5 Mha). The total irrigation potential in the principal river basins of SSA amounts to 35 Mha. Therefore, there are still abundant untapped opportunities to

expand rice production in SSA for a versatile crop such as rice that can be grown across a wide range of agro-climatic zones.

Rice in Africa is mainly grown under rainfed conditions, unlike Asia, where 55% of rice is grown under irrigation. From the about 8.4 Mha of land under rice cultivation in SSA in 2007, about 40% is located in the upland ecology (contributing 19% to total rice production), 37% in the rainfed lowland ecology (contributing 48% to total rice production) and 14% in the irrigated ecology (contributing 33% to total rice production). The remaining 9% is covered by deepwater and mangrove rice.

Upland rice farming is constrained by frequent drought, low soil fertility (due to deficiencies of nitrogen and phosphorus) and soil acidity. Weed competition constitutes the most important yield-reducing factor, followed by drought, blast, soil acidity and low soil fertility. Many of the poorest rice farmers depend on the upland ecology. Typical average rice yield under upland growth conditions is about 1 t/ha. With the use of robust varieties, and improved management practices to rebuild soil fertility and capture rainwater, there is potential to increase yields in the uplands by 2 to 4 t/ha.

Lowland rice cultivation offers great prospects for expansion, intensification and diversification. Estimates of available rainfed lowland areas range between 138 Mha and 238 Mha. The soils in lowland ecologies are generally less fragile and floodwater conditions promote the growth of nitrogen-fixing bacteria and blue-green algae that produce enough nitrogen to sustain 3 t/ha rice yield year after year. The main constraints to rice production are water control and weed management. The attainable yield is from 3 to 6 t/ha, while the actual yield is typically between 1 and 3 t/ha. Rainfed lowlands also have great potential to diversify rice systems, e.g. by growing vegetable crops after rice, or through combined rice-fish culture.



*Substantial yield increases have been achieved in the Office du Niger region of Mali due to optimal use of existing irrigation.*

Irrigation for rice comes in many different forms in SSA and ranges from small (20 ha) stream diversion based systems to large (>10,000 ha) gravity or pump-based systems. Though developing new large irrigated rice schemes may perhaps not be possible, there is much scope for using the potential of existing irrigation infrastructure.

For instance, the substantial yield increases achieved in the Sahel (Mali and Senegal), show that irrigated rice is a feasible option in the sub-region. Attainable rice yields with full water control are in the range of 7 to 9 t/ha, while actual paddy yields on farmers' fields are from 3 to 6 t/ha.

## **Good agronomic practices**

Yield gaps (differences between actual and attainable yields) in farmers' fields can be bridged and are often related to suboptimal timing of crop management interventions. A key issue here is the lack of 'energy' in rice farming in Africa. Introduction of small-scale machinery for land preparation, weeding, harvesting and post-harvest practices will be prerequisite for many farmers to enhance productivity.

Seed systems (both informal and formal systems) need to be strengthened across SSA. In many countries, there is no operational seed multiplication system that permits to disseminate improved technologies at scale to farmers. Targeted direct distribution of seed of improved varieties and market-based options such as seed fairs and seed vouchers will help improve the availability and access to seeds of improved varieties to the most vulnerable rice farmers.

To maximize the gain in productivity of rice farmers in favorable environments, farmers need to gain improved access to mineral fertilizers. Productivity in rice system can be further enhanced by improving the efficiency of fertilizer use. Although the yield responses and incentives for fertilizer application for irrigated rice production in SSA appear comparable to results found in Asia, the average fertilizer application rates in SSA was only 13 kg/ha in 2008 against a developing countries average of 94 kg/ha. This low average level of fertilizer application indicates a substantial scope for potential yield increase.



*Increased emphasis on mechanization is required to bridge the yield gap and reduce post-harvest losses.*

New technologies have limited impact if one focuses on only one aspect of the cropping calendar (e.g. fertilizer management or varietal choice). Much better results are obtained if a more holistic approach is used, where a new technological option is not just introduced but rather integrated into the prevailing production system, taking into account interactions with other production factors and management practices. In this way, the technology will be adapted to its new environment. This integrated rice management (IRM) approach has particular promise in systems with large gaps between actual farmers' yields and attainable yields under better management. IRM has the potential of substantially enhancing rice production by boosting the productivity of land, water and labor, and allowing significant gains in profit.

## Positive comparative advantage

Despite the potential, there was not sufficient support from national governments for the production of domestic rice in the past since it was believed to lack comparative advantage vis-à-vis imported rice, though evidence from empirical studies have repeatedly indicated that rice is competitively produced in SSA. For instance, on the basis of comparison between the main rice growing ecologies (irrigated, upland and rainfed lowland), rice yields in SSA are often comparable to those in other developing nations.

A survey conducted in irrigated rice farms in three Sahelian countries in 2005 showed that average paddy yield was 3.8 t/ha in Mali, 3.7 t/ha in Niger and 5.8 t/ha in Senegal. These yields are similar to those recorded in major rice exporting countries such as Thailand, India, and Vietnam, respectively at 4.2 t/ha, 5.2 t/ha and 4.2 t/ha. But, the aggregate yield of rice in Africa is low to due a much larger share of rainfed rice farming systems in SSA (77%) when compared to the rest of the world (45%).

A study conducted by AfricaRice and partners in five countries (Benin, Guinea, Mali, Nigeria and Senegal) shed further light on the competitiveness of domestic rice production vis-à-vis rice imports and on the improvement in the comparative advantage of rice production systems in SSA.

The study showed that domestic rice production systems are generally competitive for domestic market vis-à-vis imported rice and exhibit positive returns for farmers. It is cheaper to produce a unit of rice than to import it. Rice production in these countries efficiently utilizes scarce domestic resources and its expansion is socially beneficial.

## Improving grain quality

A host of interrelated production and marketing constraints hinder the expansion of local production. Though consumers in Mali and Guinea tend to prefer local rice, in many other countries domestic rice sells at a discounted price due to perceptions about its poor quality. Most of the factors that underlie this poor quality are related to post-harvest management operations, resulting in rice with stones and other impurities.

The quality and homogeneity of paddy delivered to rice millers is not always good. Poor practices by farmers in harvesting, threshing, drying and storing generally contribute to lowering the quality of locally-produced rice by mixing good paddy with damaged grains as well as foreign matter. Paddy grains are often dried on asphalted road where they mix with stones and other foreign matter. Locally-produced rice sold in most African markets generally contains broken and whole grains of different varieties, sizes, and color.

To enhance the market value and appeal of locally-produced rice, it will be necessary to improve the appearance, cleanliness and homogeneity of grains.

This will require that rice farmers adopt better harvest and post-harvest paddy handling practices. The improvement of rice processing technologies is also critical. In Nigeria a majority of rice millers attributed the difference in the quality between locally milled rice and imported milled rice to the type of processing technologies. Though the difference in the price of domestic and imported grain supported establishment of mills, the millers could not buy improved machines due to the unavailability of credit and sufficient throughput of locally-produced paddy.

This highlights the need for addressing the institutional and physical bottlenecks such as adequate access to credit, secure land ownership, transport services, farm machinery and agricultural inputs.



*Local rice is perceived to be of poorer quality and fetches lesser price in the market.*

## Long-term commitment

The food crisis of 2008 exposed the national governments in Africa to the dangers of relying on a thin international rice market. This was a challenge and also an opportunity to increase domestic production. In response, many of the governments initiated policy support measures to strengthen domestic production. This resulted in improved rice production across Africa in 2009, mainly based on the introduction of subsidies on inputs, such as machinery, seeds and mineral fertilizer.

In addition, a long-term commitment is needed to ensure that Africa can feed itself in terms of rice and perhaps even export to other continents in the not too distant future. It will require rebuilding Africa's research and extension capacity at the national level and attracting investments to establish enhanced production, storage, processing and distribution capacity based on 'win-win' formulas for all concerned.

## Breaking new ground in East and Southern Africa

Tanzanians have many names for rice in Kiswahili. When rice emerges as a grain it is called “Mbunga”, it becomes “Mchele” when milled and “Wali” when cooked. Tanzanians have had a long tradition of rice cultivation. In East and Southern Africa (ESA), Tanzania is the second rice producer after Madagascar, with a production of 900,000 tonnes for a total area under cultivation of 681,000 hectares (2008).

Despite the history, rice fields do not produce to their optimum in Tanzania. The management systems rely on low inputs and improved varieties are not much in use. Farmers are at times hesitant to pick up high-yielding varieties, for they think the new varieties do not give what they want. For instance, in Ifakara, Kilombero district in Morogoro region, a variety called Katrin that yielded 8 tonnes per hectare was introduced but never picked up. Instead, a variety called Supa yielding 1.45 t/ha was preferred. The new variety was not aromatic, said the farmers.

AfricaRice, the CGIAR Center mandated to increase rice production in Africa, working in collaboration with the International Rice Research Institute (IRRI) launched the East and Southern Africa Rice Program (ESARP) to help the national agricultural research systems (NARS) in Tanzania and other countries in the region to strengthen their research to increase rice production.

ESARP was launched in 2008 and both institutions moved in together in the same building in Dar es Salaam, Tanzania, in May 2009. Research activities are conducted under the program and are articulated around four main projects namely the Stress Tolerant Rice for Africa and South Asia (STRASA), the Green Super Rice, the Japan-funded breeding project and the Emergency Rice Initiative.

The program aims at improving rice production through improved varieties, crop management and

post-harvest practices; mechanization; exchanging germplasm; strengthening the capacity of the pool of scientists and public- and private-sector extension agents; improving the sharing of knowledge on rice; and building partnerships to strengthen marketing.

### Developing stress-tolerant varieties

Varietal development in ESA is focused in overcoming the dominant stresses in the region. In 2009, drought tolerance genotyping was conducted where 120 lines were screened for their ability to withstand drought. Of these, 31 tolerant lines were identified of which 26 would be planted in 2010.



*AfricaRice researcher Martin Ndomondo screens for cold-tolerant genotypes in the SUA screenhouse, Tanzania.*



*NERICA 4 rice farmers in Semotu parish, Nakaseke district in Uganda.*

Between February and May 2009, the cold tolerance screening trials were set in motion in Igurusi, Tanzania. This activity was followed by upland and lowland NERICA multilocational trials between March and May. Multiplication of cold tolerant materials obtained from IRRI, Korea and Japan were conducted at Dakawa in April and June 2009. Screening of the cold tolerant genotypes was carried out in the screen-house of Sokoine University of Agriculture (SUA) between August and December.

Drought is a major constraint to rice production in Uganda, and most farmers abandon upland rice production mainly due to this constraint. STRASA project activities in Uganda started in 2009. To identify and use germplasm with increased drought

tolerance, a diverse population of genotypes are being evaluated and selected for drought tolerance in the National Agricultural Research Organization (NARO) research station and on farmers' fields.

AfricaRice supplied 167 breeding lines to NARO (the Ugandan NARS). Of these 80 lines were planted in each of the three selected on-farm locations; Iganga (East), Masindi (West) and Lira (North), with stress vulnerability, and all the 167 (INGER) materials were planted at Namulonge. During the season, drought severely affected the performance of the materials in all the locations which provided a good opportunity for selection. Agronomic data was collected on a few of the on station evaluated materials that survived drought.

Participatory varietal selection (PVS) in Masindi and Iganga resulted in the selection of breeding lines. The selection was mainly based on drought tolerance and early maturity. Some varieties, however, produced some grain, prompting farmers to score for grain yield. Farmers indicated the reason of choice for each variety and scored the varieties according to the choice of selection. In the coming seasons, seed multiplication of the selected breeding lines, mother and baby trials and multi-location trials will be conducted.

NERICA 4, NERICA 1 and NERICA 10 are the popular varieties released in Uganda, and are presently grown by many farmers. With the funds provided through AfricaRice under the STRASA project, NARO was able to engage a number of organizations and seed companies in seed production. A total of 2,800 tons of seed (foundation and certified) were produced in 2009.

## Seeds to deal with the food crisis

Tanzania and Uganda, along with Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Sudan, and Zambia were among the countries in ESA that were



*Mr James Tinka, Chairman of the Kihagusi Abateraine Farmers' Association, at Pakanyi in Uganda, advises farmers to grow rice to earn good income.*

covered by the Emergency Rice Initiative implemented by AfricaRice with funding from the Japanese Government. Developed as an initiative to deal with the adverse impact of the food crisis of 2008, the seed component of the project was launched in April 2009.

The project aims at providing access to quality rice seed to vulnerable farmers. It is being implemented by AfricaRice through the national agricultural research systems (NARS) in each country. The NARS in turn involve the research and extension networks, the national seed service, seed producers and private seed companies.

The stakeholders involved are seed companies, NGOs (promoting rice through various interventions), input dealers, government officials and policy makers.

## Rice as a cash crop

Ugandan farmers have been finding good income from growing rice for seed, and they have started considering it as a cash crop. James Tinka, chairman of a farmers' organization located in Pakanyi, 140 km away from Lira, started growing rice along with maize, beans and groundnut. Tinka grows rice as a cash crop and is convinced that he earns more income while marketing it as seed.

"I invested 800,000 Ugandan Shillings to produce one acre of rice and the yield generated 2.5 million shillings worth of income," explains Tinka. "We marketed rice seed in 10 kg bags at 22,000 shillings each bag."

Most members of the Kihagusi Abateraine Farmers' Association that Tinka heads feel that rice has had a significant impact on their lives. "I will advise other farmers to grow rice because it generates good income and it is helpful for domestic consumption," declares Beatriz Dogo, 49 years old and a mother of seven. She says that a quarter acre of rice is more profitable than a full acre of any other crop she has grown so far.

Tinka also benefited from the STRASA training organized in Kampala on rice seed production and that was how he came to grow seed because it is more profitable. He also took part in the PVS trials held at Masindi where 36 farmers were involved and found that NERICA 4 was better than the popular variety Superica in terms of yield and taste.

The farmers at Pakanyi say that they changed their cultivation practices after attending the training courses organized under the STRASA project. Seeds are not broadcast any longer, but planted in line. The farmers have improved rice storage practices and also become aware of rice production costs, helping them to fix the price appropriately while marketing their produce.

To improve farmers' capacity in the region, a rice seed cost workshop was held with funding support from the International Fund for Agricultural Development and STRASA for NARS and university scientists, technicians and extension workers. The workshop benefitted participants from Rwanda, Burundi, Uganda, Kenya, Mozambique, Tanzania and Malawi.

## New horizons

The role of rice as a strategic food crop in Africa is becoming more significant with changing food habits that increase the demand for this grain. With the opening of a joint office between AfricaRice and IRRI, both the CGIAR centers will blend their strengths to improve rice production in this region.



*Ms Beatrice Waiswa drying and cleaning NERICA rice seeds in Bugabo sub county, Namutumba district of Uganda.*

## Research in brief

### Fast-tracking farmers' access to research innovation

In sub-Saharan Africa (SSA), the time-lag between the development and the official release of a variety can be as long as 14 years due to the lack of functioning varietal release systems in most countries. Stakeholders have long urged for a change in this inefficient system, which limits farmers' access to new varieties.

Involving farmers in testing improved varieties, known as participatory varietal selection (PVS) can help reduce this time lag. In 2009, based on recommendations by AfricaRice and demand from farmers, the Government of Senegal passed a decree recognizing PVS as part of the official pre-release process.

The impact of this decision in Senegal was immediately felt as 16 new rice varieties selected by farmers were released for large-scale cultivation. Fifteen of these varieties were developed by the Africa Rice Center (AfricaRice), including 11 for irrigated system and four for upland (dryland) system.

Senegal is one of the biggest rice consumers in SSA, with an annual consumption of about 800,000 tonnes of



*AfricaRice research on irrigated cropping systems in Senegal is increasing rice production.*

rice per year. However, local production satisfies only 20% of the national demand for rice; the remaining 80% is met through imported rice at a cost of about USD 240 million.

In the wake of the crisis caused by soaring food prices, particularly rice, which led to several riots in the country, the Government launched an ambitious plan to make Senegal self-sufficient in rice by 2015. The sustainable intensification of irrigated rice production in the Senegal River Valley, which accounts for almost 70% of national rice production, was selected as a major priority.

The irrigated systems have the highest yield potential because of better water control and reliability. Using technologies developed by AfricaRice and partners, irrigated systems in Senegal and Mali have produced tremendous yield increases over the last 20 years from approximately 2 tonnes per hectare to nearly 6 t/ha on an average in 2008. However potential yields in these systems can be as high as 8 to 12 t/ha.

AfricaRice has developed high yielding short-duration varieties under the name of “Sahel” that are suitable for double cropping in rice irrigation schemes. Three Sahel varieties are grown in more than 70% of the Senegal River Valley.

To enable farmers to get the best out of improved varieties and enhance the sustainability of irrigated rice farming in Senegal, AfricaRice has introduced integrated rice crop management (IRM) options that include options for improved fertilizer, weed and water management, efficient post-harvest technologies as well as decision-making tools. Studies have shown that even a partial adoption of these technologies by irrigated rice farmers has resulted in 60% increase in farm yields and 85% increase in profits.

A rice thresher, referred to as ASI, was developed with several partners, based on a prototype from IRRI to reduce post-harvest crop losses from manual

threshing to help irrigated rice farmers, particularly women. Since its commercial release in 1997, ASI has become the most widely used thresher in the Senegal River Valley with more than 80% adoption among those exposed to the technology.

## Birds and weeds

Hungry birds destroy ripening grain all over the world, yet few researchers study them. Farmers in Senegal told AfricaRice researchers that their two major rice pests were birds and weeds.

In a farmer survey by AfricaRice near Saint Louis, Senegal, farmers said that birds lowered yields, especially when the fields were weedy. The weeds mature before the rice does, and birds like to eat weed seeds, the farmers said. The birds only eat rice once the weeds are gone. Farmers said that “if we manage our weeds we have less bird attack”.

The farmers were right. AfricaRice researchers validated what the farmers said in experiments on-station with four treatments:

1. No control of either weeds or birds
2. Only bird control (plots were covered with nets)
3. Only weed control (hand weeded every ten days)
4. Full control of birds and weeds

They did the experiment with early and late maturing rice varieties. The weed-free fields discouraged birds. Weedy fields, on the other hand, attracted birds. The birds fed on weed seeds, found shelter in the weeds, and perched on the weeds to eat the rice. Weed-free, early maturing varieties suffered little from bird attacks. If the rice matures late, it is ripe when the weeds seeds are all gone, and the birds then turn to the rice grains.



*Omar Boyang slings a stone at birds eating his rice in The Gambia.*

Pest management scientists tend to ignore birds, and ornithologists tend not to think of birds as pests. Therefore, far too little research is done on birds as pests. This research, although in an early stage, suggests that farmers have several options to manage birds:

- Keep fields weed free
- Plant early maturing rice
- Experiment with different planting times

The AfricaRice team measured bird damage in the Senegal River Valley, based on their annual farmer surveys. They estimated average bird damage at 11.2% of the potential rice yield in 2003-2007, which translates into an average annual economic loss of 4 billion FCFA (about USD 9 million).

Some governments and farmers use large quantities of non-selective poisons to kill birds. This needlessly kills non birds that do not eat grain, besides damaging the environment and human health. Alternatives to these harmful pesticides are urgently needed. Research like this is a step in the right direction.

## Video CDs on parboiling trigger social change

For resource poor farmers even a small value addition that helps improve their income goes a long way. AfricaRice intervention in Benin is helping women from smallholder farm families to increase the market value of rice by improving the parboiling process. Parboiling makes rice easier to process, enhances its nutritional value and reduces the breakage rate at hulling.

There is a caveat though. Doing the parboiling process the right way can make significant difference in the quality of the grain after processing, while doing the wrong way can destroy it for the market.



*Women parboil rice in front of the video camera in Benin.*

In central Benin, where women from smallholder farm families parboil rice as an income generating activity, AfricaRice first worked to improve their parboiling process, and then spread the new technique to other villages through farmer-to-farmer videos.

The traditional method of parboiling in Benin involved soaking the paddy for at least 12 hours in a large aluminum pot, draining the water and pre-cooking the paddy with a small quantity of water in the same pot. This meant that while the paddy on the top may not be entirely steamed at the bottom it may be totally cooked, resulting in varying grain quality.

A change in equipment design was made to improve the process. The new equipment has two vessels kept one over the other. The soaked paddy is kept in the top vessel. Water is boiled in the bottom vessel and the steam passes into the other vessel through perforations at its bottom, precooking the paddy. Using the improved method ensures better milling quality for the grains.

The next question was how to spread the message of the improved parboiling technique? This resulted in a counter question on who is better suited to teach other farmers than their peers who have done it before. But then there was the limitation to the number of farmers that the first group could teach. AfricaRice overcame that limitation by video-graphing the improved process and spreading it through the distribution of video CDs to other farmers.

Promoting learning through video CDs is part of the innovative zooming-in zooming-out (ZIZO) approach developed by AfricaRice. ZIZO starts with a topic of regional relevance in which farmers are involved in learning and modifying technologies. Once this is done a draft video is made with some of the farmers. This draft is again tested in other communities for fine-tuning before it is scaled out.

In Benin, the impact of the video CDs is exceeding what was anticipated, i.e. of teaching other farmers on improved parboiling techniques. The video CDs are becoming triggers for social change.

When the AfricaRice team consisting of Dr Paul Van Mele, Ms Espérance Zossou and Mr Jonas Wanvoeke studied the impact of the video CDs in Collines department (district) in Benin, they found that the video programs boosted rural women's entrepreneurial mindset, and this resulted in the women's groups generating higher profit through rice parboiling. In the villages studied, there is more parboiled rice in the local markets and the quality has improved. This has attracted more consumers and a greater demand for parboiled rice, which in turn resulted in a higher price for parboiled rice.

Women have realized that parboiling adds significant value to rice. For instance, in Segbeya village, Ms Assogba Antoinette did not know how to parboil rice. She started parboiling after watching the videos, first for her household consumption and later for the

market. She motivated her neighbor, Ms Egbin Bayi, to start parboiling for home and market needs.

Even among women who had been parboiling rice before, the productivity of those who watched the video CD was more. While those who did not watch the videos parboiled 300 kg of rice per cropping season, the ones who had benefited from the video CD produced 500 kg of parboiled rice.

Most women watching the video CD were excited about the rice color, cleanliness and the low rate of breakages after husking. This led them to use the new method to improve rice quality so that it can be sold in the market. And seeing the low percentage of breakage they started marketing the processed rice.

It did not take long for the enterprising women to understand that economies of scale would help them in the market. To take larger quantities to the market they needed to group themselves. They discussed with the representatives of the non-governmental organizations (NGOs) working in their villages to help them band into groups. More women meant more hands and more parboiled rice to take to the market.

More members also meant more leverage with the institutions. Women's groups were able to access funds from microfinance institutions to buy paddy rice on credit. This they parboiled, packaged, labeled and sold, getting a higher price for their produce. The women prodded the NGOs working in their villages to support them in their negotiations with the microfinance institutions. The NGOs helped the women's groups to access credit from a Benin Government project, Micro Credit to the Poor. Further, the NGOs identified traders and sellers who were interested in parboiled rice and linked the women's groups to them.

The small change of improving parboiler design and spreading the message through video CDs is leading to a big impact.

## How much would you pay for good quality domestic rice?

Should consumers buy a particular rice variety merely because it is produced in the country? Should he or she spend hard-earned money to buy rice that the family does not like? And, what is the impact of research for increasing rice production in Africa if ultimately there is no uptake in the local markets?

The Policy and Impact Assessment team at AfricaRice has been working to find the answers to these questions in 2008–2009 through experimental auctions held at Saint Louis and Dakar in Senegal. Their aim was to assess what the market would pay for the rice produced in the Senegal River Valley vis-à-vis imported rice.

The Senegalese Government had launched the Grand Agricultural Offensive for Food Security and Abundance (GOANA) in April 2008. This initiative aims to make Senegal self-sufficient in rice and other agricultural produce by 2015 by irrigating and cultivating unused land in and around the Senegal



*Consumers taste cooked samples of SRV and Thai rice at an AfricaRice experimental auction.*

River Valley (SRV). While the Offensive worked to strengthen production of rice, there was need to check if the consumers would take up the increased rice production in the SRV.

Two experimental auctions were held in the end of 2008 and beginning of 2009. According to AfricaRice scientist Dr Matty Demont, the results were interesting. They revealed that the urban consumers were willing to pay a premium of 45 FCFA/kg (US\$ 0.09/kg) for good quality SRV rice. If the rice is labeled (as in the Rival® brand developed by Oxfam-funded market access support program for rice farmers in the SRV – PINORD), the consumers were willing to add an additional 17 FCFA/kg to this.

The auctions had two levels of assessment. First, the participants decided whether they are willing to upgrade from their present rice preference. Then, they decided how much they are willing to pay for the quality SRV rice.

Each of the two experiments in Saint Louis and Dakar lasted five days during which 10 auctions were conducted – one each in the morning and the afternoon. They were mainly targeted at women who are the decision makers at home on purchasing rice. The analyzed rice qualities were (i) conventional SRV rice (used as benchmark); (ii) non-labeled SRV rice of enhanced quality; (iii) labeled (Rival®) enhanced quality SRV rice; and (iv) labeled (Thai-25) imported rice.

The benchmark rice was a mix of varieties (Sahel 108 and 201) which is commonly available in the market. It was the most inferior in terms of quality and price among the test rice samples. The imported Thai rice had quality between the benchmark and the enhanced quality SRV rice. The non-labeled and labeled enhanced quality SRV rice were the same, except that the latter was carefully packaged, branded and marketed with the trademarked brand Rival®. Two bidding rounds were held, separated by a sensory test

where each participant was presented four dishes with cooked samples of four rice types and was asked to taste the rice types.

If the participants are willing to pay a premium for enhanced quality SRV rice, why are they not consuming the rice? The answer: 18 to 47% of the participants were not aware that such rice existed. The awareness among the participants from Saint Louis was higher than the one recorded in Dakar, considering that the former town is closer to the SRV.

Experimental auctions conducted by AfricaRice showed that consumers familiar with enhanced quality SRV rice were more likely to purchase it, while those unfamiliar with its characteristics were significantly more reluctant to buy it.

“Being familiar about the enhanced quality SRV rice is a significant decision-making factor for purchasing it, and this is where the government support can go a long way in strengthening the consumption of domestic rice,” says Demont.

In Senegal, 45% of the stakeholders in the rice supply chain report lack of visibility, due to the absence of a marketing strategy, as one of the reasons for the limited uptake of local rice by urban consumers. The majority of the participants at the auctions had heard of enhanced quality SRV rice through promotions on the GOANA program, but had not seen any specific advertising on the product.

AfricaRice has been recommending the use of generic advertising on enhanced quality SRV rice to be introduced through the GOANA program. Consumer acceptability will be higher when they realize that the product that they buy is widely recognized and also accepted by the people around them. The generic advertising will also support the efforts of small-time entrepreneurs, who bring the enhanced quality SRV rice to the market but do not have the resources to advertise it.

Branding and labeling, in turn, can support the advertising efforts by reaching to the consumers a product of reliable quality consistency.

Investing in post-harvest technologies to deliver quality tailored to the needs of the urban consumers is absolutely essential to get local rice accepted vis-à-vis imported rice. Studies in Senegal show that the most important determinants for rice are taste, swelling capacity, ease of cooking and the form of the grain.

Eliciting from a person how much of hard-earned money he or she would spend is one of the most effective ways to understand the value that a product has in the market. The AfricaRice experiments obtained an indication of the market potential of enhanced quality SRV rice. This will help the stakeholders in the value chain to work to reach the right quality of local rice at the right price to the market, and thereby increase the consumption of local rice.

## Donor profile - USAID

The year 1971 marked the beginning of a long and fruitful partnership between the United States Agency for International Development (USAID) and the newly formed West Africa Rice Development Association (WARDA), which was renamed as the Africa Rice Center (AfricaRice) in 2009.

The first meeting of the Center’s Governing Council held in Monrovia, Liberia, in September 1971 was attended by the 11 founder member countries and by a small group of donors that included USAID. In 1972, USAID began funding the Association. However its support went far beyond funding, as it also provided technical expertise and guidance through researchers, development specialists and research managers.

USAID’s comprehensive approach to food security across the whole value chain – from farm to table – matches that of AfricaRice. Both believe that the enormous challenge of improving food security and reducing widespread poverty can be addressed by harnessing scientific and technological innovations.

Year	Unrestricted Grants in US\$	Restricted Grants in US\$	Total in US\$
2000	250,000		250,000
2001	224,991	-	224,991
2002	225,000	-	225,000
2003	225,000	-	225,000
2004	225,000	-	225,000
2005	200,000	146,316	346,316
2006	200,000	612,461	812,461
2007	250,000	408,962	658,962
2008	250,000	70,071	320,071
2009	250,000	3,381,701	3,631,701
<b>Total</b>	<b>2,299,991</b>	<b>4,619,511</b>	<b>6,919,502</b>

*USAID unrestricted and restricted funding to AfricaRice, 2000–2009*

## Early support

USAID’s early support to AfricaRice focused on the training of rice specialists and field assistants and providing experts in entomology, rice processing and land and water management. It also provided two consultants in 1972 to help formulate specific projects as part of the Center’s medium-term plan.

A flashback into the mid-1970s shows that several USAID experts were actively involved in assisting AfricaRice, including John Osguthorpe, USAID Project Coordinator in the Executive Secretariat; Peter Danielle, Advisory Committee Member; Everardo Vogel, Entomologist; W K Bach, Land and Water Management Engineer; A Britton, Extension Officer; and O Mafolasire, Training Officer.

Similarly, during the late 1980s USAID supported the posting of Dr Robert Ayling to assist AfricaRice during the critical restructuring process when AfricaRice moved its headquarters from Liberia to Cote d’Ivoire. In addition to providing strategic technical assistance, Dr Ayling led AfricaRice’s communications and training activities during the transitional period.

Such a wide range of experts shows the extent of substantive collaboration between the two partners, which has remained strong over the years, contributing greatly to the Center’s scientific reputation.

## Multifaceted partnership

As the USAID-AfricaRice partnership spans four decades, it is difficult to cover all the activities. Only a few highlights are presented here, which reveal the multifaceted nature of this partnership: (1) the Task Force mechanism and the ROCARIZ rice network; (2) the AfricaLink project; (3) rice policy research; (4) marker-assisted selection; and (5) the emergency rice initiative.

## Task Force mechanism and ROCARIZ rice network

**Task Force mechanism:** In the 1990s, thanks largely to USAID support, and in keeping with the Center's unique structure as an international as well as an Africa-owned institution, AfricaRice instituted an innovative and effective mode of operation with national partners in sub-Saharan Africa – the Task Force mechanism.

The Task Force structure fostered a participatory approach to research planning at a regional level and a high level of national involvement in collaborative research. The national agricultural research systems (NARS) took the lead in all phases of the research cycle.

The major objectives of the Task Forces were to improve the regional coordination of rice R&D activities, enhance access to information, accelerate technology transfer, and build national capacities. Priority assessments conducted annually by these multi-country, issue-based Task Forces provided direct input to the formulation of the Center's medium-term plans.

**ROCARIZ:** The Task Force model was so successful that it was adopted by ROCARIZ, the rice research and development network for West and Central Africa. ROCARIZ was established jointly in 2000 by AfricaRice and the West and Central African Council for Agricultural Research and Development (WECARD/CORAF) with financial support from USAID and later from the European Commission.

ROCARIZ inherited and continued the Task Force mode of operation while adding a full-time coordinator hosted by AfricaRice, a formal steering committee and a stakeholders' consultation group. These inclusive start-up steps ensured strong buy-in from network partners.

ROCARIZ encouraged joint NARS-AfricaRice ownership of the regional research agenda and facilitated teamwork and knowledge sharing through a bottom-up approach to address the needs of the national partners.

ROCARIZ also provided substantial funding and technical support for the operations of Task Forces through competitive small grants. In the period 1996-2005, about USD 2.2 million was disbursed as small competitive grants to research teams.

This innovative approach has helped create synergies that led to remarkable results. For instance, ROCARIZ played a central role in the development of the lowland NERICA varieties by AfricaRice Scientist Dr Moussa Sié and his national partners from ROCARIZ.

Key to the success was ROCARIZ, which facilitated the shuttle-breeding approach to accelerate the selection process and achieve wide adaptability of the lowland NERICAs. For this achievement, Dr Sié received the 2006 Fukui International Koshihikari Rice Prize of Japan.

In a 2004 evaluation of all USAID-funded research networks in the region, ROCARIZ emerged as the best example of research partnership between an international center and NARS. It has not only strengthened the rice R&D capacity of the national scientists and extension staff, but also helped AfricaRice attain critical mass in areas where it could not have done it alone. Thanks to these successes, ROCARIZ received the CGIAR Outstanding Partnership Award in 2008.

The first phase of ROCARIZ is over. Since the membership of the Center has expanded beyond West and Central Africa, AfricaRice and NARS partners are brainstorming on the next phase of the network to ensure that it encompasses all the regions of the continent.

## The AfricaLink project

In the 1990s, with the revolution in communication technologies, e-mail and the Internet was emerging as the principal means of accessing and exchanging information. However in sub-Saharan Africa, the communication technologies were still poor and unreliable.

This made it difficult for the national scientists to communicate with each other and with the rest of the agricultural research and development community.

They also had difficulty in accessing agricultural databases, electronic publishing, geographical information systems (GIS), management information systems, and other information technologies.

For USAID, bridging the knowledge divide is a key component of its science and technology agenda.

Similarly, AfricaRice has an obligation towards its member countries to significantly improve the quality, usefulness and availability of knowledge and technology within the rice sector.

USAID and AfricaRice therefore decided to improve communication technologies in national programs through the AfricaLink project, which was launched in 1997 to bring the NARS and extension services into the information age.

One of the first of its kind, the AfricaLink project provided Internet and e-mail connection to some 91 national agricultural research and extension sites in West and Central Africa, giving access and on-site training to nearly 1000 national researchers.

It covered the costs of connection and communication for an initial phase, after which the national programs took responsibility. All participating NARS are still reaping the benefits 20 years later.

## Policy research

USAID has also been a major supporter of AfricaRice's policy research. A milestone in this joint activity was the project titled *The Nigerian rice economy in a competitive world: Constraints, opportunities and strategic choices*. This consisted of a series of studies carried out by AfricaRice in collaboration with the Nigerian Institute of Social and Economic Research (NISER) to get a clear picture of the rice sector dynamics, particularly the factors explaining consumers' shift to imported rice.

The project involved a wide range of stakeholders, from farmers to rice processors and traders, achieving a shared vision of issues and possible solutions.

Work focused on issues of rice quality, and on how this affected the consumer preferences for local and imported rice, as local rice prices were often discounted by 30% or more, mainly because of its lack of cleanliness. The recommendations emphasized quality and branding to increase competitiveness of local rice.

It also recommended a comprehensive approach to revitalize the rice sector by improving the efficiency of operators at the stages of production, processing, and marketing.

The comprehensive strategy was presented to the stakeholders and the Nigerian Government in 2003. It was integrated as a major component of the country's Presidential Initiative on rice production, processing and export in Nigeria, which raised awareness on the need for public support to stimulate rice production and reduce dependence on imports. Under this initiative, rice imports were subjected to high import duty and levy (over 100%) and subsidies were provided to facilitate access to seeds (50%) and fertilizers (25%).

Overall, this seminal project has contributed to the development of an effective rice development strategy

for Nigeria to revitalize the rice sector, in terms of both increasing local capacity to compete with imported rice (quality and price), and enhancing the market share of locally produced rice.

## Marker-assisted selection

On any continent, farmers suffer when their crop fails, but in Africa it can become a question of life and death. Therefore, the threat posed by the rice yellow mottle virus (RYMV), which is unique to Africa, has been taken very seriously by international and national researchers, ever since severe RYMV epidemics broke out in West Africa in the 1990s.

RYMV has the potential to destroy lowland and irrigated rice anywhere in Africa, contributing to food scarcity in areas where rice is an important staple. Unfortunately, all rice varieties traditionally grown in these ecologies are susceptible to RYMV.

AfricaRice scientists are working in close partnership with advanced research institutes, such as the Institut de recherche pour le développement (IRD) in France, to fast-track the process of developing RYMV-resistant varieties using molecular biology techniques. The Center is also working to put these molecular biology tools in the hands of national partners in Africa.

As part of this effort, a three-year project (2005-07) was launched with support from the USAID West Africa Regional Program (WARP) to train national staff of four African countries – Burkina Faso, Guinea, Mali and The Gambia – in the application of marker-assisted selection (MAS) techniques to transfer a RYMV resistance gene, *rymv1*, into popular rice varieties.

The project is hopeful that a strategy combining biotechnology with regional knowledge within an integrated pest management approach could significantly reduce the impact of this disease.



*NARS scientists undergo training on marker-assisted selection at the AfricaRice biotechnology laboratory.*

Thanks to this innovative project, the national partners of AfricaRice are benefiting in several ways. The resistance gene *rymv1* has been successfully transferred using MAS into various popular West African rice varieties that were previously susceptible to RYMV. Seed bearing the *rymv1* allele has been produced from the best lines and multiplied for distribution to project countries for evaluation and use in national breeding programs.

Perhaps most significantly, the project has substantially boosted the research capacity of participating countries. Scientists from the project countries underwent intensive hands-on training in the use of molecular techniques for plant breeding. Functional biotechnology laboratories have been established in each of the four countries and national scientific staff have been trained to use the laboratory equipment. In fact, this is the first time that national programs in the project countries have had access to laboratories equipped for these scientific applications.

To further increase the biotechnology capacity in Africa, a few students from Benin, Burkina Faso, Côte d'Ivoire, and Niger are doing their PhD studies on RYMV under the supervision of AfricaRice scientists.

The legacy of this project will be the availability of laboratories furnished with equipment necessary to apply molecular biology techniques to rice breeding, as well as trained national staff who can apply these techniques across many different crops.

The project has thus been very valuable in building national research capacity in biotechnology. This will help them identify and adapt the technology to their country's needs and constraints. The potential benefits of the project are expected to go far beyond the four project countries to reach all the African countries that grow rice and could eventually turn the tide in the battle against RYMV.

## Emergency Rice Initiative

In 2008, the food crisis caused by soaring prices of rice sparked violent riots in several West African countries, including Burkina Faso, Cameroon, Guinea, Côte d'Ivoire, Mauritania and Senegal, illustrating the continent's vulnerability to international rice market shocks.

USAID and AfricaRice committed to assist vulnerable households through a two-year emergency initiative to boost rice production in four West African countries – Ghana, Mali, Nigeria and Senegal. This initiative is supported by USAID through the US Government's Famine Prevention Fund facility.

The project seeks to improve farmers' access to: (i) high quality seed of improved rice varieties; (ii) mineral fertilizer; and (iii) best-bet rice knowledge. It aims to assist at least 10,000 farm families, especially vulnerable households, and raise rice production by at least 7,500 tonnes in each of the project countries through increased use of high-yielding rice varieties, improved farming methods and fertilizers.

The project is encouraging the involvement of the private sector in each country, particularly in the area of agro-input supply. It is also promoting community-based seed systems (CBSS).



*Ms Elizabeth Baguri and Ms Hassan Sori with Dr Kabirou Ndiaye, AfricaRice Project Manager for the USAID-funded project, in their rice farm in Daffiama village, Ghana.*

Project partners include the Catholic Relief Services (CRS), the International Center for Soil Fertility and Agricultural Development (IFDC), and NARS. The initiative was launched in each of the four project countries in January 2009. All the stakeholders including the project partners, public and private sector representatives and NGOs participated.

It is hoped that such concerted efforts to stimulate agricultural growth and reduce hunger can help prevent conflict and reduce vulnerability among resource-poor producers and consumers.

## Future outlook

These achievements reflect the strength of the partnership that has united AfricaRice and USAID for rice research and development in the region. Describing this partnership, AfricaRice Director General Dr Papa Abdoulaye Seck said, "I see this as a valuable tool for the development of the rice sector in the continent. It will help us make a real difference in Africa."

# Major events

## January

### **Emergency assistance with USAID support**

To assist vulnerable households in West Africa who were severely affected by soaring rice prices, AfricaRice with support from the United States Agency for International Development (USAID) through the USA Government's Famine Prevention Fund facility, is spearheading a two-year emergency project to boost rice production in four West African countries – Ghana, Mali, Nigeria and Senegal.

The USAID-funded Emergency Rice Initiative project was launched in each of the four project countries in January – 20 January (Senegal), 23 January (Mali), 27 January (Nigeria), 30 January (Ghana). All the stakeholders including the project partners, public and private sector representatives and NGOs participated.

The project seeks to improve farmers' access to high quality seed of improved rice varieties; mineral fertilizer; and best-bet rice knowledge. It aims to assist at least 10,000 farm families, especially vulnerable households, and raise rice production by at least 7,500 tonnes in each project country through increased use of high-yielding rice varieties, improved farming methods and fertilizers.

## February

### **Coalition for African Rice Development (CARD) meeting**

A technical meeting of the Coalition for African Rice Development (CARD) was hosted by AfricaRice from 2 to 5 February in Cotonou, Benin, to help the first group of CARD member countries build the framework for the national rice development strategies (NRDS). About 45 participants attended this meeting.

AfricaRice is an active steering committee member of CARD – a joint initiative of the Japan International

Cooperation Agency (JICA) and the Alliance for a Green Revolution in Africa (AGRA).

CARD seeks to double rice production over the coming 10 years. It serves as a facilitating and coordinating mechanism, building on existing policies and programs, and was officially launched in May 2008 at the Fourth Tokyo International Conference for Agricultural Development (TICAD-IV) in Yokohama, Japan.

### **Maintaining stewardship over NERICA® quality**

A delegation from the CGIAR Central Advisory Service on Intellectual Property (CAS-IP) led by its Project Manager, Dr Victoria Henson-Apollonio, met with staff members from AfricaRice on 13 February, in Cotonou, Benin, to discuss issues relating to the branding of NERICA® and highlight the relationship between product quality and trust building.

As the expanding range of NERICA varieties is being increasingly adopted by smallholder farmers, it is important to protect the quality associations that have been established by AfricaRice.

CAS-IP, which helps CGIAR-supported Centers manage their intellectual assets as public goods, explained that AfricaRice might consider maintaining the stewardship over NERICA quality, especially concerning the quality of NERICA seed production from breeder to foundation to the certified seed that reaches the farmers.

During the meeting, participants were informed that molecular markers that could be used to verify the identity of NERICA varieties released by AfricaRice are available and that some of the African countries had in-country capacity to perform such tests.

These molecular methods could be used to verify NERICA identities in addition to some phenotypic markers currently used in the field.

## **Green Super Rice for Africa and Asia**

An international meeting to plan a project on Green Super Rice for the Resource-Poor of Africa and Asia (GSR) was hosted by AfricaRice on 24 and 25 February, at its regional research station in Ibadan, Nigeria.

The project aims to reduce poverty and hunger and increase food and income security of resource-poor farmers in Africa and Asia through the development and dissemination of Green Super Rice varieties that give high and stable yield without requiring heavy inputs.

The project targets at least 5 million poor rice farmers, including 3.5 million women farmers in sub-Saharan Africa, South-East Asia and South Asia. The long-term (10 year) goal of the project is to increase rice production by about 10% in the rainfed and irrigated areas of those regions. In sub-Saharan Africa, the project covers Nigeria, Liberia, Rwanda, Uganda, Mali, Mozambique, Senegal, and Tanzania.

The African component of the project will be coordinated by AfricaRice and implemented in partnership with the International Rice Research Institute (IRRI) and national programs of project countries, non-governmental organizations, farmers' associations and the private sector. Representatives of all the project partners attended the planning meeting.

## **Stress-Tolerant Rice for Africa and South Asia**

Stakeholders of the project on Stress Tolerant Rice for Africa and South Asia (STRASA) met on 26 and 27 February, at the AfricaRice regional station in Ibadan, Nigeria, to review the progress made by the project and plan for 2009.

Funded by a grant from the Bill & Melinda Gates Foundation to IRRI, the STRASA project aims to accelerate the development and delivery of improved rice varieties that are tolerant to five major stresses – drought, submergence, salinity, iron toxicity and low temperature.

AfricaRice is IRRI's main partner in implementing the African component of this project. The project member countries in Africa comprise Benin, Burkina Faso, The Gambia, Ghana, Guinea, Mali, Nigeria and Senegal in West Africa as well as Ethiopia, Madagascar, Mozambique, Rwanda, Tanzania and Uganda in East and Southern Africa.

The project highlighted the following achievements at the meeting:

- Production of seeds of improved and stress-tolerant varieties ready for evaluation in the project countries through farmer participatory varietal selection;
- Training of national scientists, technicians and farmers in modern breeding approaches, improved seed production and impact assessment;
- Implementation of improved and standardized screening facilities at the research stations of Africa Rice Center for the different stresses; and
- Establishment of a network of national scientists and partners in the project countries.

In addition to representatives from 16 sub-Saharan African countries, the President of the West and Central Africa Women Rice Farmers' Association, Mrs Penda Gueye-Cisse, as well as private seed producers were invited to the meeting to give their feedback.

## **March**

### **Board highlights the Center's achievements**

At the Board of Trustees meeting held from 7 to 10 March, the following achievements of the Director General Dr Papa Abdoulaye Seck and the staff members of AfricaRice were applauded:

- Significant increase in contribution from member states;



*AfricaRice Board of Trustees visit an experimental field in the Cotonou station, Benin.*

- Increase in the number of member states from 17 in 2006 to 22 in 2008;
- Doubling of the Center’s budget compared to 2007;
- Clear and coherent research agenda; and
- Progress in implementing the External Program and Management Review (EPMR) recommendations.

The Board commended the Center’s active participation in the CGIAR change management process, while emphasizing its unique model as a pan-African intergovernmental institution.

#### **Dr Robert J Carsky Memorial Award instituted**

To honor the contribution and dedication of the late Dr Robert Carsky, who worked as Agronomist at the Africa Rice Center (AfricaRice) until his tragic death in 2004 in Bouaké, Côte d’Ivoire, an annual award in his memory was instituted by the Center.

Announcing the launching of this award, AfricaRice Director General, Dr Papa Abdoulaye Seck, said that it would recognize the staff members who have made

outstanding contributions in the areas of research and research support. “The Dr Robert Carsky Award will be conferred on the most outstanding internationally recruited staff (IRS) and the most outstanding general support staff (GSS).”

The award function was held at the end of the AfricaRice Board of Trustees meeting. Ms Rebecca Khelseau-Carsky was invited to hand over the award, which consists of a certificate and a token in the form of cash, to the selected staff members.

The two recipients of this award selected by a special jury were Dr Koichi Futakuchi from Japan for IRS and Ms Oyin Oladimeji from Nigeria for GSS.

Dr Futakuchi is the Ecophysiologicalist working from Cotonou, Benin. The jury highlighted that his scientific contributions and insights are very useful to rice breeders of the Africa Rice Center and the national programs. Commending Dr Futakuchi for his hard work, the jury stated that he has raised the visibility of the Center and greatly contributed to the continued support from Japan.



*Ms Oyin Oladimeji receives the Dr Robert J Carsky Memorial Award from Ms Rebecca Khelseau-Carsky.*

Ms Oladimeji, Research Assistant based at the AfricaRice Regional Station in Ibadan, Nigeria, was commended for her dynamism and dedication. The jury described her as an excellent facilitator in the interactions between rice scientists, extension staff, and farmers for activities relating to participatory varietal selection (PVS) and seed production. Under the supervision of various Africa Rice Center breeders, Ms Oladimeji has been actively involved in the development of rice varieties for upland and lowland ecologies. She is also proficient in processing rice into high-value products.

### **Realizing the agricultural potential of inland valleys**

The European Commission-funded project Realizing the agricultural potential of inland valley lowlands in sub-Saharan Africa while maintaining their environmental services (RAPS) was launched in Benin (through a workshop from 25 to 27 March) and in Mali (30 March to 1 April).

The project seeks to improve the livelihood of the rural poor by enhancing the productivity and competitiveness of inland valleys. This is through sustainable intensification and diversification of agricultural productivity, and product value chain development; while conserving land and water resources.

It is jointly implemented by AfricaRice, Wageningen UR, the International Center for Development Oriented Research (ICRA), Centre de coopération internationale en recherche agronomique pour le développement (CIRAD) and the national research and extension systems of Benin and Mali.

The use of the participatory learning and action research (PLAR) co-learning and co-innovation approaches and multi-stakeholder platforms will ensure the ownership of research results and rapid diffusion of knowledge beyond the key sites in each target country.

## **April**

### **Rebuilding rice capacity in post-conflict Liberia**

With support from the United Nations Development Programme (UNDP), AfricaRice, through its African Rice Initiative (ARI), is rebuilding the capacity of smallholder rice farmers in post-conflict Liberia within the framework of the Millennium Village Project in Kokoyah village, Liberia.

Through this collaborative project, ARI seeks to provide technical assistance and guidance across the rice value chain from seed production to harvest and post-harvest processing in close partnership with the national agricultural research and extension systems.

As part of this project, a training program was organized by ARI from 6 to 10 April, on quality seed production of NERICA and other improved varieties and modern farming practices. More than 20 agricultural technicians attended the course.

### **Regional harmonization of the Emergency Rice Initiative project**

Two regional coordination committee meetings were held as part of the USAID-funded Emergency Rice Initiative project to boost rice production in Ghana, Mali, Nigeria and Senegal to harmonize project management, evaluation and reporting mechanisms.

The first one was organized in Cotonou, Benin (from 8 to 10 April), for Ghana and Nigeria; and the second one in Saint Louis, Senegal (14 and 15 April) for Mali and Senegal.

### **Helping African agriculture adapt to climate change**

As part of a multi-partner project led by the University of Hohenheim on Developing rice and sorghum crop adaptation strategies for climate change in vulnerable environments in Africa (RISOCAS), a workshop was organized in Cotonou, Benin, from 16 to 17 April, to evaluate the results from the first year.

The main objective of this project is to deliver coping strategies for crop adaptation to changing climatic conditions, along with tools and methodologies enabling stakeholders to develop such strategies further, or to apply them to other crops or environments.

The project focuses on rainfed rice and sorghum and irrigated rice, which are among the most important staple small-grain cereals in sub-Saharan Africa. For each of the three target crops and ecosystems, sets of valuable physiological and morphological traits for breeding will be delivered to breeders, along with suitable selection tools.

The project is jointly carried out by the University of Hohenheim and AfricaRice in partnership with the Centre de coopération internationale en recherche agronomique pour le développement (CIRAD); Université Gaston Berger, Senegal; Centre national de la recherche appliquée au développement rural (FOFIFA), Madagascar; and the Institut d'économie rurale (IER), Mali.

Attached to the workshop, a training course on modeling was held from 20 to 24 April, to train RISOCAS project members and invited guests on existing models which will be used during later project phases.

### **Strengthening capacity on impact assessment**

Strengthening the capacity of national partners on impact assessment is an important component of the Policy and Impact Assessment Program activities at the Africa Rice Center.

A training course on impact assessment was jointly organized by AfricaRice, Institut sénégalais de recherches agricoles (ISRA) and the University Gaston Berger (UGB) in Saint Louis, Senegal, from 20 to 24 April.

The main objective of this training course was to introduce the participants to new methods and tools in impact assessment used for evaluating agricultural research projects. About 20 participants from 11 countries attended the workshop.

## **May**

### **New office launched for ESA**

AfricaRice and IRRI opened a new joint office at Dar es Salaam, Tanzania. This office signifies the importance of increasing rice production in East and Southern Africa (ESA). In 2007, only five staff members were employed by AfricaRice and IRRI in the ESA region, and the number grew to 25.



*AfricaRice-IRRI joint office in Dar es Salaam, Tanzania.*

## ARI Steering Committee meets

The 2009 Steering Committee/Experts Meeting of the African Rice Initiative (ARI) of the Africa Rice Center was held in Cotonou, Benin, from 4 to 6 May.

More than 35 participants attended, including four representatives from the African Development Bank (AfDB) as well as representatives from the United Nations Food and Agriculture Organization (FAO).

The Steering Committee reviewed the progress made in AfDB-funded project countries (Benin, the Gambia, Ghana, Guinea, Mali, Nigeria and Sierra Leone) and in the CFC-funded project countries (Cameroon, Chad and Central African Republic).

The Steering Committee meeting of 2009 was particularly noteworthy because of the participation of Mr Bakary Togola from Mali, President of the farmers' association APCAM, who has achieved remarkable success in rice farming.

## June

### Addressing Africa's critical needs in rice seed and data

As part of its overall support to AfricaRice's Emergency Rice Initiative in response to the world food crisis, Japan is providing significant support to carry out activities in two major areas:

- Enhanced access to quality seed of improved rice varieties in selected countries in sub-Saharan Africa in 20 out of the 21 Coalition for African Rice Development (CARD) candidate countries.
- Collection of reliable rice data in all the 21 CARD countries to support the development and implementation of national rice development strategies.

For the seed component of this project, the West Africa regional launching meeting, followed by a training

workshop, was organized in Cotonou, Benin, from 27 April to 1 May. The East Africa launching meeting and training workshop took place in Dar es Salaam, Tanzania, from 4 to 8 May.

For the rice statistics component of this project, the West Africa regional launching meeting, followed by a training workshop, was organized in Cotonou, Benin, from 11 to 15 May. The East Africa launching and training took place in Dar es Salaam, Tanzania, from 1 to 5 June.

### Partnership with BADEA

As part of a new partnership between AfricaRice and the Arab Bank for Economic Development in Africa (BADEA), a program was launched to make the rice sector in the region competitive by improving the capacity of operators at the research and extension levels. The program is complementing the Center's efforts to raise rice productivity in sub-Saharan Africa through the African Rice Initiative and the Emergency Rice Initiative launched in 2008 in response to the food crisis.

With support from BADEA, scientists from AfricaRice and partners imparted knowledge on integrated rice



*Training course on integrated rice management in partnership with BADEA.*

management through hands-on training to more than 50 participants including about 30 women from 16 countries across SSA.

AfricaRice has found that knowledge of integrated rice management is crucial to bridge yield gaps in farmers' fields through better crop management. By applying this knowledge combined with a participatory learning and action research (PLAR) approach developed by the Center, rice yields in farmers' fields can be increased by 0.5 to 2 t/ha without enhanced production costs.

### **CFC-funded Inland Valley Project workshop reviews achievements**

An end-of-project meeting was held at AfricaRice on 3 and 4 June, on the CFC-funded project on Sustainable productivity improvement for rice in inland valleys in West Africa (SPIRIVWA).

The objectives of the workshop, which marked the final stage of the project, were to get an overview of project achievements and to discuss technical and financial reporting. It was attended by nine project participants.

SPIRIVWA was implemented in three different agro-ecologies in West Africa (savanna – Burkina Faso; intermediate zone – Côte d'Ivoire; humid forest zone – Nigeria) with the respective national partners INERA, NCRI and CNRA. The project aims at improving inland valley rice productivity through the development of water management structures, participatory farmer training and farmer participatory experiments with improved weed management practices.

## **August**

### **Gabon joins as the 23<sup>rd</sup> member state**

Gabon joined AfricaRice as a member state. This extended the Center's reach outside the West African region.

Gabon also has one of the highest per capita rice consumption levels in the sub-region. The Government of Gabon aims to boost domestic rice production and reduce imports.

### **JICA and ARI enhance rice seed production capacity**

A training workshop to produce improved quality seeds was organized by the African Rice Initiative program of AfricaRice, in collaboration with the Japan International Cooperation Agency (JICA), at the Songhai Center, Porto Novo, Benin from 3 to 7 August.

More than 20 technicians, including four women, from five countries (The Gambia, Ghana, Liberia, Nigeria and Sierra Leone) participated in this training course, which had the following objectives:

- Enhance the capacity of rice technicians from the national agricultural research and extension systems of sub-Saharan Africa to produce good quality seeds;
- Enhance their capacity in varietal maintenance; and
- Offer opportunities to them to exchange their experiences and information.

The participants raised major issues relating to rice production in their countries, such as the shortage and the high cost of production inputs; poor funding of research and development; lack of infrastructure, equipment and qualified human resources; weeds, birds and rodents.

At the end of the workshop, participants prepared and presented action plans for their respective countries. These plans were discussed and suggestions for improvement made.

## September

### Chevalier honor for DG

AfricaRice Director General, Dr Papa A Seck was honored by the French Government with the Chevalier de l'Ordre du Mérite Agricole for his service for strengthening agricultural research. His other distinctions include the Chevalier de l'Ordre National du Lion conferred by the Government of Senegal in 2005 for his services to the country; the Certificate of recognition from Forum for Agricultural Research in Africa (FARA) in 2005; and the Medal of Honor from the West and Central African Council for Research and Development (CORAF/WECARD) in 2007.

### 27th Council of Ministers Meeting

The 27th Council of Ministers (COM) Meeting of AfricaRice was held in Lomé, Togo, on 2 and 3 September. The COM resolved to change the name of the Center from West Africa Rice Development Association to Africa Rice Center (AfricaRice), “considering the expansion of the geographical



*Board Chair, Mr Getachew Engida; Director General, Dr Papa Seck; and the Chair of COM and Minister of Agriculture, Livestock and Fisheries of Togo, Honorable Kossi Ewovor, welcome the Prime Minister of Togo, His Excellency Gilbert Houngbo, to the COM Meeting.*

mandate of Africa Rice Center towards Eastern Africa, Central Africa and Northern Africa.”

The Prime Minister of Togo, His Excellency Gilbert Fossoun Houngbo, inaugurated the COM Meeting.

Further, the COM endorsed the establishment of the Global Rice Science Partnership (GRiSP) between AfricaRice, IRRI and the International Center for Tropical Agriculture (CIAT).

The COM also congratulated Director General, Dr Papa Abdoulaye Seck, and the staff of AfricaRice for their efforts to increase the international visibility of the Center.

## October

### UNDP project indicates positive impacts of NERICA

In Benin, NERICA adoption resulted in a 6% increase in school attendance, 14% increase in the gender parity index, and an increase of CFA 11,400 (about \$20) in school expenditure per child. These were some of the findings from impact studies on NERICA adoption that were shared with research partners at the concluding workshop of the project on Research on inter-specific hybridization between African and Asian rice species (Phase III), held at AfricaRice, Cotonou, Benin, from 6 to 8 October.

This project, which is supported through the Japan-UNDP Partnership Fund, was addressing food security and poverty reduction in selected African countries, through improved rice production as well as improved livelihood of small-scale farmers. The project was based on the outcomes of the researches conducted in the previous two phases.

The project covered AfricaRice member countries as well as selected countries of Central and Eastern Africa. Partnership with international institutions and universities engaged in rice research as well as

coordination with parallel UNDP-funded projects was pursued.

Promising interspecific (NERICA) and *Oryza sativa* lines were identified through selection from segregating populations, evaluation of fixed lines for agronomic performance and specific stresses such as drought and pests. The project also focused on the development of new interspecific rice from the cross of *O. sativa* and *O. barthii*, which is an ancestor of *O. glaberrima* and a wild species of African origin. The new interspecific rice is expected to widen the genetic diversity in farmers' fields.

## November

### Research Days

The Research Days function for AfricaRice was organized from 2 to 5 November. In addition to AfricaRice scientists from all locations, it had participation from senior representatives from the Center's partner organizations. In 2009, the Center had used a new format for the Research Days which permitted a greater time for scientific discussions when compared to the earlier years.

The Research Days meetings included intensive discussions on ideas and challenges related to genetic diversity and improvement; water management; weed management; integrated pest management; training and extension linkages; seed systems; learning and innovation systems; impact assessment; policy; and value chains. The progress on scientific research activities was reviewed and action plan was drawn up for the coming year.

### AfricaRice researcher wins Japan International Award

Dr Amos Onasanya, AfricaRice researcher, won the 2009 Japan International Award for Young Agricultural Researchers, on 4 November at the



*AfricaRice researcher, Dr Amos Onasanya, with the Japan International Award for Young Agricultural Researchers.*

University of Tokyo, for his contribution to the molecular and pathotyping characterization of major rice diseases and insect pests in Africa. He was one of the three recipients of the award during 2009.

The Japan International Award for Young Agricultural Researchers is given by the Ministry of Agriculture, Forestry and Fisheries, Government of Japan, in recognition of the contribution of young agricultural researchers for developing technologies to improve food security and environment in developing countries.

### USAID emergency rice project takes stock of progress made in target countries

A regional workshop of the project Emergency Rice Initiative to boost rice production in Ghana, Mali,

Nigeria and Senegal was held in Cotonou, Benin, from 9 to 13 November with representatives from AfricaRice and partner institutions.

This project is led by AfricaRice in partnership with the International Soil Fertility and Agricultural Development Center (IFDC), Catholic Relief Services (CRS) and the national research and extension systems in target countries. The project is funded by the United States Agency for International Development (USAID).

The workshop discussions focused on: i) the conclusions from the monitoring tour; ii) implementation, monitoring and evaluation mechanisms at country and regional levels; and iii) the work plans for 2010. The workshop also included a side-event to train project participants in the reporting of success stories and lessons learnt relating to the project.

## December

### CCER for Research Program 1

The Research Program 1 – Genetic Diversity and Improvement – at AfricaRice underwent a comprehensive Center-Commissioned External Review (CCER). The Review Panel was chaired by

Dr Alain Ghesquiere, and had Dr Oumar Niangado and Dr Flavio Breseghello as members.

In addition to visiting the Center's facilities and having detailed discussions with AfricaRice scientists at headquarters and the research stations, the team also met with representatives from partner organizations.

### EU project reviewed

AfricaRice project Rice policy and technology impact on food security and poverty reduction, funded by the European Union, and implemented by Research Program 4, was reviewed and the favorable report was announced in December.

The review team commended AfricaRice for generating high level of interest for its work on identifying and quantifying factors of importance for ensuring competitiveness of African rice; communicating research results efficiently; timely production of effective policy briefs; developing policy options; enabling stakeholder participation; coordinating effectively with the national agricultural research systems; and generating effective international public goods.

Overall, the reviewers recommended that future support for the project be continued to build on the results achieved.

# Financial statements

## Statement of Financial Position for the year ended December 2009

### ASSETS

	2009 (US\$)	2008 (US\$)
<b>Current Assets</b>		
Cash and Cash Equivalent	11,275,590	4,435,284
Accounts Receivable:		
Donors	5,034,043	4,016,102
Employees	250,847	255,151
Others	796,258	930,598
Inventories	295,383	437,780
Prepaid Expenses	169,277	255,673
<b>Total Current Assets</b>	<b>17,821,399</b>	<b>10,330,588</b>
Property and Equipment	9,346,901	8,231,407
Less: Accumulated Depreciation	(8,544,079)	(7,518,141)
<b>Total Property and Equipment – Net</b>	<b>802,822</b>	<b>713,266</b>
<b>TOTAL ASSETS</b>	<b>18,624,221</b>	<b>11,043,854</b>

### LIABILITIES AND NET ASSETS

	2009 (US\$)	2008 (US\$)
<b>Current Liabilities</b>		
Accounts Payable:		
Donors	5,953,935	2,479,114
Employees	421,570	306,699
Others	762,963	486,514
Employees Investment Account	214,000	214,000
Provisions and Accruals	2,673,395	1,590,273
<b>Total Current Liabilities</b>	<b>10,025,863</b>	<b>5,076,600</b>
<b>TOTAL LIABILITIES</b>	<b>10,025,863</b>	<b>5,076,600</b>
<b>Net Assets</b>		
Unrestricted Net Assets:		
Undesignated	7,795,536	5,253,988
Designated	802,822	713,266
<b>TOTAL NET ASSETS</b>	<b>8,598,358</b>	<b>5,967,254</b>
<b>TOTAL LIABILITIES &amp; NET ASSETS</b>	<b>18,624,221</b>	<b>11,043,854</b>

## Statement of activities

### REVENUES, GAINS AND OTHER SUPPORT

	Unrestricted	Restricted		Total	
		Temporarily Restricted	Challenge Programs	2009	2008
	US \$	US \$	US \$	US \$	US \$
Grants	4,870,297	16,585,262	345,608	21,801,167	10,900,172
Member States – Operating Income	556,958			556,958	1,894,367
Member States – Capital Development Income					
Other Income	100,463			100,463	314,835
<b>Total Revenue, Gains and Other Support</b>	<b>5,527,718</b>	<b>16,585,262</b>	<b>345,608</b>	<b>22,458,587</b>	<b>13,109,374</b>

### EXPENSES AND LOSSES

Program Related Expenses	2,325,013	16,556,189	345,608	19,226,811	8,540,670
Management and General Expenses	3,485,825	29,072	-	3,514,897	4,234,534
<b>Sub-Total Expenses and Losses</b>	<b>5,810,838</b>	<b>16,585,262</b>	<b>345,608</b>	<b>22,741,708</b>	<b>12,775,204</b>
Indirect Cost Recovery	(2,914,225)			(2,914,225)	(1,560,854)
<b>Total Expenses and Losses</b>	<b>2,896,613</b>	<b>16,585,262</b>	<b>345,608</b>	<b>19,827,483</b>	<b>11,214,350</b>
<b>Change in Net Assets:</b>					
<b>Net Surplus</b>	<b>2,631,105</b>			<b>2,631,105</b>	<b>1,895,024</b>

## TOTAL EXPENSES – BY NATURAL CLASSIFICATION

	Unrestricted	Restricted		Total	
		Temporarily Restricted	Challenge Programs	2009	2008
	US \$	US \$	US \$	US \$	US \$
Personnel Costs	2,857,260	3,423,819	73,035	6,354,114	5,524,778
Supplies & Services	2,354,410	6,008,256	175,719	8,538,385	4,791,044
Collaborators and Partnerships Costs	2,408	5,681,317	36,821	5,720,546	1,160,345
Operational Travel	293,137	763,610	22,644	1,079,391	701,893
Depreciation	303,623	708,260	37,389	1,049,272	597,144
<b>Sub-Total Expenses and Losses</b>	<b>5,810,838</b>	<b>16,585,262</b>	<b>345,608</b>	<b>22,741,708</b>	<b>12,775,204</b>
Indirect Cost Recovery	(2,914,225)			(2,914,225)	(1,560,854)
<b>Total Expenses and Losses</b>	<b>2,896,613</b>	<b>16,585,262</b>	<b>345,608</b>	<b>19,827,483</b>	<b>11,214,350</b>

## GRANTS

	Grant Period	For the year ended December 31, 2009			
		Funds Received	Accounts Receivable	Total	
		US\$	US\$	2009	2008
		US\$	US\$	US\$	US\$
<b>UNRESTRICTED:</b>					
Belgium	Jan '09–Dec '09	559,888		559,888	497,194
Canada	Jan '09–Dec '09		627,801	627,801	702,657
France	Jan '09–Dec '09	88,758	181,332	270,090	239,051
Germany	Jan '09–Dec '09	213,315		213,315	230,329
Japan	Jan '09–Dec '09		597,782	597,782	603,478
Sweden	Jan '09–Dec '09	471,184		471,184	458,664
United Kingdom	Jan '09–Dec '09	852,941		852,941	820,875
USAID	Jan '09–Dec '09	187,500	62,500	250,000	250,000
World Bank	Jan '09–Dec '09	1,020,000		1,020,000	710,000
Côte d'Ivoire	Jan '09–Dec '09	7,296		7,296	8,971
<b>Total Unrestricted Grants</b>		<b>3,400,882</b>	<b>1,469,415</b>	<b>4,870,297</b>	<b>4,521,220</b>
<b>TEMPORARILY RESTRICTED:</b>					
AfDB I (NERICA Dissemination Project)	Jan '04–Dec '09	404,600		404,600	475,413
ACP - Afroweeds Project	Oct '09–Oct '12	7,741		7,741	
BADEA - IRM Training	Jan '09–Dec '09	319,368		319,368	
CAAS - Chinese Academy of Agricultural Sciences	Nov '08–Oct '11	1,168,719		1,168,719	
CANADA - Fund for Africa (CFA)	2003–2007				(1,385)
1/ New CANADA Fund for SWIHA	2006–2008				24,460
CANADA Linkage Fund-Mc Gill University	Apr '08–Mar '11	78,911		78,911	7,607
CFC- SPIRIVWA Project	Jan '00–Dec '09	84,247		84,247	247,107
CFC- NERICA Dissemination in Central Africa Project	Jan '08–Dec '11	341,592		341,592	472,863
Conserv. Food & Health Found.	Jul '06–Jun '09	25,691		25,691	19,342
DFID 16 - Striga Project-University of Sheffield	May '08–Dec '11	10,175		10,175	6,346
1/ European Union (Rice Policy & Technology Impact on Food Security)	Jan '07–Dec '09	510,069		510,069	518,519
European Union (RAP Project)	Jan '09–Dec '10	724,622		724,622	
FAO - Liberia Seed Production Project	Aug '08–Jun '09	156,239		156,239	19,957
Federal Republic of Nigeria Seed Multiplication Project	2006-2008				53,706

		Grant Period	For the year ended December 31, 2009			
			Funds Received	Accounts Receivable	Total	
					2009	2008
					US\$	US\$
	GTZ-RISOCAS-University of Hohenheim Project	Mar '08–Feb '11	163,044		163,044	137,373
	GTZ - Characterization of Bacterial Leaf Blight	May '08–Apr '10	32,045		32,045	49,822
	IBRD - Genebank Upgrade Project	2003–2008				6,145
1/	IBRD - World Bank Contribution to SWEP-IVC	Jan '06–Mar '08				28,054
	IBRD - Genebank Upgrade Project (GPG-Phase 2)	Jan '07–Dec '09	102,918		102,918	101,487
	IBRD - IITA / WARDA Corporate Services Alignment Project	Jan '07–Dec '08				487,015
	IBRD - AfricaRice Full Cost Recovery Project.	Jan '09–Dec '09	29,072		29,072	
	IFAD (PADS Project)	Mar '05–Mar '08				36,841
	IFAD - HIV/AIDS and Rural Poverty Project	Jan '07–Jun '09	19,956		19,956	77,375
	IFAD - NERICA Seeds Access - West and Central Africa Project	Dec '07–Sep '12	360,608		360,608	191,573
	IFAD ESA Project	Jan '09–Dec '09	45,000		45,000	
	IFAR - CGIAR Fellowship Programs	Jan '09–Dec '09	22,000		22,000	
	IRRI/WARDA Abiotic Stress Project	Jan '08–Dec '10	2,397,892		2,397,892	1,527,925
	Japan (Interspecific Hybridization Project)	Jan '00–Mar '09	403,951		403,951	387,240
1/	Japan (Increasing Quality Competitiveness of Local Rice Project)	Jan '03–Mar '09	115,732		115,732	107,920
1/	Japan (Developing Interspecific OG & OS Progenies)	Jan '03–Mar '09	97,233		97,233	131,670
1/	Japan (High Yield Varieties - Humid Zones)	Dec '05–Mar '09	88,054		88,054	91,916
1/	Japan (Physical and Genetic Investment - NERICA Project)	Jan '07–Mar '09	136,951		136,951	95,977
1/	Japan - Development of Sustainable Rice Farming Systems Project	Jan '08–Mar '09	66,125		66,125	51,945
	Japan - Emergency Rice Initiative	Apr '09–Mar '10	4,512,262		4,512,262	
	Japan - SMART IV	Oct '09–Sep '14	42,733		42,733	
	Japan - Capacity Building	Oct '09–Dec '09	7,070		7,070	
	Japan - Capacity Building	Oct '09–Dec '09	22,936		22,936	
1/	Japan (RYMV Project)	Jan '00–Mar '09	117,150		117,150	102,508
	JICA/WARDA - Collaboration Project	Apr '04–Open	209,901		209,901	233,095
	JIRCAS/WARDA - Drought Project	Apr '05–Open	30,588		30,588	43,090
	Netherlands (APO/JPO Project)	2004–2007				(1,235)
	Rockefeller (Drought Tolerance Project)	Mar '04–Dec '07				(663)

	Grant Period	For the year ended December 31, 2009			
		Funds Received	Accounts Receivable	Total	
		US\$	US\$	2009	2008
		US\$	US\$	US\$	US\$
UNDP/TCDC-IHP PHASE 2	Jan '07–Dec '09	181,185		181,185	149,912
UNDP New PVS Extension Project	Jun '06–Apr '08				64,124
UNDP Enhancing Capacity - NERICA	Jun '06–Dec '08				135,643
UNDP - Liberia Seed Production Project	Oct '08–Jun '11	77,891		77,891	985
UNDP KMV Project Liberia	Apr '09–Apr '11	89,290		89,290	
USAID Bridge Fund 2009	Jan '09–Dec '09	350,000		350,000	
USAID - RYMV Project	Oct '06–Dec '09	34,278		34,278	74,064
USAID: INSAH2 - RiceMaize Stratification Project	Sep '06–Dec '07				(3,993)
USAID: West Africa Rice Initiative Project	Oct '08–Sep '09	2,997,422		2,997,422	
<b>Sub-Total Restricted Grants</b>		<b>16,585,262</b>		<b>16,585,262</b>	<b>6,151,744</b>
<b>CHALLENGE PROGRAMS:</b>					
<b>Harvest Plus</b>					
CIAT - Agreement No. 5021	Nov '05–Dec '09				15,833
<b>Water and Food</b>					
WorldFish - Project M439	Apr '05–Mar '10	20,175		20,175	81
<b>Generation Challenge Program</b>					
CIMMYT - GCP Project SP1-G4008-05	Jan '08–Dec '08	6,995		6,995	8,982
CIMMYT - GCP Project SP3-G4007-08	Aug '07–Jul '09	149,205		149,205	134,471
CIAT - Agreement No. C-119-06	Jan '05–Dec '08				10,826
GCP-I-Bridges-WARDA/IRD	Aug '07–Dec '09	22,984		22,984	57,016
GCP-NAM population-WARDA/CIAT	Aug '08–Jul '09	79,512		79,512	
GCP Rice CI Workshop	Jun '09–Dec '09	34,442		34,442	
GCP Drought Avoidance Root	Nov '08–Dec '11	32,295		32,295	
<b>Sub-Total Challenge Program Grants</b>		<b>345,608</b>	<b>-</b>	<b>345,608</b>	<b>227,209</b>
<b>Total Grant Revenue</b>		<b>20,331,752</b>	<b>1,469,415</b>	<b>21,801,167</b>	<b>10,900,172</b>

1/ The use of these Grants has been restricted towards selected projects in CGIAR Approved Agenda for AfricaRice.

## Board of Trustees

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Boubié Vincent Bado	Regional Representative and Head of Sahel Regional Station
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Sitapha Diatta	Coordinator and Representative in Côte d'Ivoire
Aline Lisette-Vidal	Head of Training, Information and Library Services
S Gopikrishna Warriar*	Science Writer
Cyrille Adda	Program Assistant
Bila Belemgoabga <sup>□</sup>	Research Support Officer
Issaka Yougbare	Research Support Officer
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Fassouma Sanogo	Translator
Aboubacar Madougou*	Translator
Emmanuel Onasanya	Desktop Publishing Assistant

## Program 1: Genetic Diversity and Improvement

Moussa Sié	Program Leader, Lowland Rice Breeder
Marie-Noëlle Ndjiondjop	Molecular Biologist
Koichi Futakuchi	Crop Ecophysiologicalist
Ines Sanchez <sup>□</sup>	Head of Genetic Resources Unit
Mandé Semon	Upland Rice Breeder
Baboucar Manneh	Molecular Biologist & Coordinator BMGF Abiotic Stress Project
Kazuki Saito	Agro-Physiologist
Kayodé Sanni	PDF – INGER-Africa Coordinator
Kofi Bimpong*	PDF – Molecular Genetics – Salinity Tolerance (Senegal)
Karim Traoré	PDF – Irrigated Rice Breeding (Senegal)
Khady Nani Dramé	PDF – Molecular Genetics – Iron Toxicity
Negussie Shoatatec Zenna	PDF – Molecular Genetics – Cold Tolerance (Tanzania)

John Manful*	PDF – Grain Quality
Abdel Latif A El Namaky Raafat*	PDF – Hybrid Rice (Senegal)
Gbenga Akinwale	Research Assistant (Nigeria)
Bosede Popoola	Research Assistant (Nigeria)
Oyin Oladimeji	Research Assistant (Nigeria)
Daniel Tia Dro	Research Assistant
Fatimata Bachabi	Research Assistant
Mamadou Fofana	Research Assistant
Ayoni Ogunbayo	Research Assistant
Kolade Fisayo	Research Assistant
Souleymane Gaye	Research Assistant (Senegal)
Martin E Ndomondo	Research Assistant (Tanzania)
Seleman R Kaoneka	Research Assistant (Tanzania)

## Program 2: Sustainable Productivity Enhancement

Paul Kiepe	Program Leader and IVC Coordinator
Sylvester Oikeh <sup>□</sup>	Soil Fertility Agronomist
Yacouba Séré	Plant Pathologist
Francis Nwilene	Entomologist
Jonne Rodenburg	Weed Scientist
Eklou Attiogbevi-Somado	Cropping Systems Agronomist
Susumu Abe	SMART-IV Project Coordinator
Nhamo Nhamo*	PDF- Soil Fertility and Agronomy (Tanzania)
Tolulope Agunbiade <sup>□</sup>	Research Associate (Nigeria)
Koffi Akator	Research Assistant
Koné Brahim <sup>□</sup>	Research Assistant
Abibou Niang	Research Assistant
Alassane Aw	Research Assistant (Senegal)
Abdoulaye Sow	Research Assistant (Senegal)
Abou Togola	Research Assistant
Amadou Touré	Research Assistant
Amos Onasanya	Research Assistant

### **Program 3: Learning and Innovation Systems**

Paul Van Mele	Program Leader, Learning & Innovation Systems Specialist
Julien David Reece*	Agricultural Innovation System Scientist
Michael Misiko*	Social Scientist
Jonas Wanvoeke	Research Assistant
Abdoulaye Kaboré*	Research Assistant

### **Program 4: Policy and Impact Assessment**

Aliou Diagne	Program Leader and Impact Assessment Economist
Matty Demont	Agricultural Economist
Ibrahima Bamba	Policy Economist
Franklin Simtowe <sup>□</sup>	PDF – Impact Assessment
Godswill Makombe*	Agricultural Economist (Tanzania)
Ali A Touré	Research Assistant
Akahoua Simon N’cho	Research Assistant
Mandiaye Diagne	Research Assistant (Senegal)
Maimouna Ndour	Research Assistant (Senegal)

### **RiceTIME: Training, Information Management and Extension Linkages**

Inoussa Akintayo	Head of Rice Time Unit and Coordinator, Africa Rice Initiative
Rita Afiavi Agboh-Noameshie	CFC Project Coordinator
Amadou M Beye*	Japan Emergency Fund Project Coordinator
Mamadou Kabirou N’Diaye*	USAID Emergency Fund Project Coordinator
Boubakary Cissé	Program Assistant
Saidu Bah	Research Assistant
Kokou Ahouanton	Research Assistant
Malik Idriss Lompo*	Research Assistant (Côte d’Ivoire)
Mansour Diop*	Research Assistant (Senegal)

## Collaborating Scientists

Tadashi Takita*	Breeder (JICA)
Glenn Gregorio□	Breeder (IRRI)
Ryoichi Ikeda□	Breeder (JICA)
Yoshimi Sokei	Agronomist (JICA)
Hiroshi Tsunematsu□	Geneticist (JIRCAS)
Joel Huat*	Vegetable Agronomist (CIRAD)
Bertrand Muller*	Agro-climatologist (CIRAD)

\**Joined in 2009*

□*Left in 2009*



*AfricaRice team members and partners during Research Days 2009.*

## Postgraduate trainees

Name and Thesis Topic	Institution / University	Country of Origin	Gender	Sponsor	Degree
<b>Abiodun, Joseph</b> The effectiveness of insect screening technique for developing durable resistant rice cultivars to rice yellow mottle virus based on vector short-range migration	Federal University of Technology, Akure, Nigeria	Nigeria	M	Japan	PhD
<b>Adjegan, Komlavi II</b> <i>Evaluation de l'influence des changements climatiques sur la production rizicole locale au Togo dans les zones PVS</i>	Ecole Supérieure d'Agronomie, Lome, Togo	Togo	M	Japan	Agricultural Engineer
<b>Agbaka, Adeline</b> Setting a standard of milling degree in Benin	University of Abomey-Calavi, Benin	Benin	F	Japan	DEA
<b>Agnoun, Yves</b> <i>Sélection et amélioration variétale du riz de bas-fond: Evaluation des interspécifiques issus de croisement réciproques d'Oryza glaberrima / Oryza sativa</i>	University of Abomey-Calavi, Benin	Benin	M	Japan	MSc
<b>Awotide, Amoke</b> Assessing the impact of improved rice technology on income distribution and poverty among rice farmers in Nigeria: The case of NERICA	University of Ibadan, Nigeria	Nigeria	F	European Union	PhD
<b>Bancole, Bernice</b> <i>Dynamique des populations de ravageurs en riziculture de bas fonds</i>	Ecole Polytechnique, Abomey-Calavi, Benin	Benin	F	Japan	Masters
<b>Basso, Adamou</b> <i>Caractérisation des souches de Xanthomonas oryzae pv oryzae prélevés au Niger</i>	Agronomic and Veterinary Institute HASSAB II (IAV), Kingdom of Morocco	Niger	M	Germany	PhD

Name and Thesis Topic	Institution / University	Country of Origin	Gender	Sponsor	Degree
<b>Bemerrew, Mohammed</b> Learn about Xoo and Xoc/work on isolation and recognition of Xoo and Xoc on agar.	Leibniz Universität Hanover, Germany	Germany	M	DAAD	Masters
<b>Bleoussi, Roseline</b> <i>Etude comparative de la qualité du riz étuvé par différentes méthodes</i>	University of Abomey-Calavi, Benin	Benin	F	Japan	Maitrise
<b>Brett, Christopher Aho</b> Economic viability and impact of improved tropical agricultural practices	Université Gaston Berenger, Senegal	USA	M	Self	Agricultural Engineer
<b>Cissoko, Mamadou</b> The molecular genetic basis of resistance in rice to parasitic weed <i>Striga</i>	University of Sheffield, UK	Côte d'Ivoire	M	BBSRC-DFID	PhD
<b>Dago, Faustin</b> Effect of fertilizers on RYMV epidemic	University of Cocody, Abidjan, Côte d'Ivoire	Côte d'Ivoire	M	Japan	PhD
<b>Dandedjorohoun, Lidia</b> <i>Analyse économique d'une technologie améliorée de transfert d'énergie au cours de l'étuvage du riz</i>	University of Abomey-Calavi, Benin	Benin	F	European Union	Agricultural Engineer
<b>de Mey, Yann</b> Economics of bird control in irrigated rice in the Senegal River Valley	Katholieke Universiteit Leuven, Belgium	Belgium	M	European Union	MSc
<b>de Vries, Michel</b> Rice in Sahel and Savannah zones of West Africa: How to increase production efficiency at different spatial and temporal scales	Wageningen University, the Netherlands	The Netherlands	M	DGIS	PhD

Name and Thesis Topic	Institution / University	Country of Origin	Gender	Sponsor	Degree
<b>Dibba, Lamin</b> Impact of NERICA adoption of farmer livelihoods	Kwameh Nkrumah University of Science and Technology, Ghana	The Gambia	M	SCARDA	Masters
<b>Djedatin, Gustave</b> Identification and mapping of resistance genes to bacterial leaf blight in rice	University of Abomey-Calavi, Benin	Benin	M	USAID	PhD
<b>Dohounkpan, Berenger</b> <i>Etude de l'entomofaune du riz au Benin</i>	University of Abomey-Calavi, Benin	Benin	M	Self	Agricultural Engineer
<b>Dontsop, Paul Martin N</b> Impact assessment of NERICA varieties on rice farmers welfare in Nigeria	University of Ibadan, Nigeria	Cameroon	M	European Union	PhD
<b>Doogue, Stephen</b> Partial equilibrium analysis of the impact of alternative trade policies on domestic production and import demand for rice, with reference to one or more countries identified as of interest to AfricaRice	University of London, UK	United Kingdom	M	University of London	Masters
<b>Dossa, Carlos</b> <i>Evaluation agro-morphologique d'une population en ségrégation ITA 306 x TOS et étude des variations moléculaires des parents</i>	Institut Régional du Génie Industriel, des Biotechnologies et des Sciences Appliquées (IRGIB-Africa), Benin	Benin	M	Generation Challenge Program	Masters
<b>Dossa, Sylvestre</b> <i>Isolement de bactéries, méthodes d'inoculation et d'évaluation du BLB sur le riz</i>	University of Parakou, Benin	Benin	M	Self	Agricultural Engineer

Name and Thesis Topic	Institution / University	Country of Origin	Gender	Sponsor	Degree
<b>Dumais, Stephanie</b> Improving rice processing strategies for food security in West Africa	McGill University, Canada	Canada	F	McGill University	Masters
<b>El Hassimi Sow, Mounirou</b> <i>Criblage d'une collection du riz du Niger pour la résistance au virus de la panachure jaune (RYMV) et étude de la diversité génétique</i>	University of Kwazulu-Natal, South Africa	Niger	M	USAID	PhD
<b>Falilou, Abou Adam</b> <i>Caractéristiques physico-chimiques et culinaires et amélioration de la qualité du riz cultivé au Bénin</i>	University of Abomey-Calavi, Benin	Benin	M	UNDP	DEA
<b>Gadedjisso, Agossou T</b> <i>Evaluation de l'efficacité technique dans les zones de conduite du PVS au Togo pour la dissémination du NERICA</i>	Ecole Supérieure d'Agronomie, Lomé Togo	Togo	M	Japan	Agricultural Engineer
<b>Gheysens, Stephanie</b> Derive a better understanding of resistance mechanism to iron toxicity in lowland rice	Université Louvain-La-Neuve, Belgium	Belgium	F	Université Louvain-La-Neuve	Masters
<b>Glover, Stephen</b> Adoption of the NERICA varieties assessed for four new countries: Econometric analysis of agricultural data in West Africa using program evaluation methods	University of London, UK	United Kingdom	M	University of London	Masters
<b>Guindo, Brema</b> <i>Production végétale et protection des végétaux</i>	University of Abomey-Calavi, Benin	Mali	M	CORAF	Masters

Name and Thesis Topic	Institution / University	Country of Origin	Gender	Sponsor	Degree
<b>Hiel, Marie Pierre</b> Derive a better understanding of resistance mechanism to iron toxicity in lowland rice	Université Louvain-La-Neuve, Belgium	Belgium	F	Université Louvain-La-Neuve	Masters
<b>Houeto, Judith</b> <i>Gestion des insectes de stock</i>	University of Abomey-Calavi, Benin	Benin	F	Self	Agricultural Engineer
<b>Kaci, Emmanuelle</b> <i>Travailler sur les value chain/ préparer et organiser une expérimental auction à Nouakchott, Mauritanie</i>	Université de Provence, France	France	F	European Union	Masters
<b>Kam, Honore</b> Marker-assisted selection for improvement of rice varieties resistant to RYMV for West Africa	University of Kwazulu-Natal, South Africa	Burkina Faso	M	USAID	PhD
<b>Koumiga, Lota</b> <i>Les déterminants de l'offre du riz local dans une zone de conduite de PVS au Togo</i>	Ecole Supérieure d'Agronomie, Lomé Togo	Togo	M	Japan	Agricultural Engineer
<b>Krieger, Celia</b> <i>Le criblage de 14 variétés de riz pour leur compétitivité vis à vis des adventices en vue de la création de lignées intra et interspécifiques</i>	Université Louis Pasteur de Strasbourg, France	France	F	Self	Masters
<b>Krupnik, Timothy</b> Agroecological and socioeconomic evaluation of the performance of the System of Rice Intensification in the Senegal River Valley	University of California-Santa Cruz, USA	USA	M	Fullbright	PhD
<b>Mayer, Stephanie</b> Improving rice processing strategies for food security in West Africa	McGill University, Canada	Canada	F	McGill University	Masters

Name and Thesis Topic	Institution / University	Country of Origin	Gender	Sponsor	Degree
<b>Montcho, David</b> <i>Diversité et bases génétiques des traits liés à la vigueur végétative et à l'adaptation du riz africain aux différentes conditions hydrologiques</i>	University of Abomey-Calavi, Benin	Benin	M	Bill and Melinda Gates Foundation	PhD
<b>Moukoumbi, Yonnelle</b> <i>Diversité génétique et valorisation NERICA de bas-fond</i>	University of Abomey-Calavi, Benin	Gabon	F	UNESCO	PhD
<b>Mouzoun, Denis</b> <i>Analyse des déterminants de l'efficacité des exploitations rizicoles</i>	University of Abomey-Calavi, Benin	Benin	M	European Union	Masters
<b>Okry, Florent</b> Strengthening rice seed systems and agro-biodiversity conservation	Wageningen University, the Netherlands	Benin	M	NUFFIC	PhD
<b>Piedade, Maria Coruche</b> The impact of participatory varietal selection: A cross country assessment	University of London, UK	Portugal	F	University of London	Postgraduate diploma
<b>Rizotto, Amy</b> Extending the reach to strengthen value chains: Increasing consumer awareness of quality Senegal River Valley rice	Washington University, USA	USA	F	Fulbright	Masters
<b>Rutsaert, Pieter</b> Willingness to pay for quality rice in the Senegal River Valley	Katholieke Universiteit Leuven, Belgium	Belgium	M	European Union	MSc
<b>Sangare, Rodrigue J</b> <i>Initiation aux techniques de biologie moléculaire pour l'amélioration variétale du riz</i>	University of Abomey-Calavi, Benin	Mali	M	Generation Challenge Program	Masters

Name and Thesis Topic	Institution / University	Country of Origin	Gender	Sponsor	Degree
<b>Santos, Carline</b> <i>Évaluation de la susceptibilité des NERICA et de leurs parents à Sitophilus spp et Sitotroga cerealella</i>	University of Abomey-Calavi, Benin	Benin	F	FAO	Masters
<b>Sellar, Matthew</b> The potential impact of changes in rice import tariff on the domestic sector using a 3SLS methodology	University of London, UK	United Kingdom	M	University of London	Masters
<b>Souley, Issaka</b> RYMV isolates pathotyping, serotyping and epidemiology in Niger	University of Cocody, Abidjan, Côte d'Ivoire	Niger	M	Japan	PhD
<b>Takahashi, Ryo</b> Effects of Sawah development on socioeconomic indicators for rural households in Bida, Nigeria	Meiji Gakuin University, Japan	Japan	F	Japan	Masters
<b>Teeken, Bela</b> Biology and anthropology of African rice ( <i>Oryza glaberrima</i> )	Wageningen University, the Netherlands	The Netherlands	M	Wageningen University	PhD
<b>Yank, Audrey</b> Improving rice processing strategies for food security in West Africa	McGill University, Canada	Canada	F	McGill University	Masters
<b>Yao, Nasser</b> Marker-assisted selection for improvement of rice varieties resistant to RYMV for West Africa	University of Kwazulu-Natal, South Africa	Côte d'Ivoire	M	USAID	PhD

# AfricaRice training programs

## Trainings and workshops conducted by AfricaRice in 2009

Theme	Workshop/ training	Countries represented and the number of participants	Place and date	Total number of participants
Support workshop for the formulation of the National Rice Development Strategies (NRDS)	Workshop	Cameroon 2 Côte d'Ivoire 2 Ghana 4 Guinea 3 Japan 2 Kenya 3 Liberia 2 Mali 1 Mozambique 4 Nigeria 4 Senegal 1 Sierra Leone 2 Tanzania 4 The Gambia 1 Uganda 2	Cotonou, Benin. From 2 to 5 February	37
Launching workshops for the Green Super Rice (GSR) and Stress Tolerant Rice for Africa & South Asia (STRASA) projects	Joint workshop	Benin 2 Burkina Faso 2 China 23 Côte d'Ivoire 1 Ethiopia 1 Ghana 1 Guinea 1 Liberia 1 Madagascar 1 Mali 2 Mozambique 3 Niger 1 Nigeria 48 Philippines 4 Rwanda 2 Senegal 2 Tanzania 2 The Gambia 1 Uganda 2 USA 4	Ibadan, Nigeria. From 24 to 27 February	104
NERICA seed production	Training	Liberia 15	Botota, Liberia. From 6 to 10 April	15

Theme	Workshop/ training	Countries represented and the number of participants	Place and date	Total number of participants
Launching workshop for the Rice & Sorghum Crop Adaptation Strategies for Climate Change in Vulnerable Environments in Africa (RISOCAS) project	Workshop	Benin 1 Côte d'Ivoire 1 France 3 Germany 7 Ghana 1 Madagascar 1 Mali 3 Senegal 1 Switzerland 1	Cotonou, Benin. From 16 to 24 April	19
Training on economic impact assessment	Training	Burkina Faso 1 Cameroon 1 Central African Republic 1 Chad 1 Democratic Republic of Congo 1 Ghana 1 Guinea 1 Mali 2 Nigeria 3 Senegal 14	Saint Louis, Senegal. From 20 to 24 April	26
Launching workshop of the Emergency Seed Project	Workshop	Benin 3 Cameroon 3 Côte d'Ivoire 3 Liberia 2 Madagascar 3 Mali 2 Mauritania 3 Nigeria 2 Senegal 3 Sierra Leone 3 Togo 4	Cotonou, Benin. From 27 April to 1 May	31

Theme	Workshop/ training	Countries represented and the number of participants	Place and date	Total number of participants
Launching workshop for the Access to Rice Statistics Project	Workshop	Benin 3 Burkina Faso 2 Cameroon 2 Central African Republic 2 Côte d'Ivoire 2 Democratic Republic of Congo 2 Guinea 2 Madagascar 2 Mali 2 Rwanda 2 Senegal 2 Togo 4 Tunisia 1	Cotonou, Benin. From 11 to 15 May	28
Training on rice seed control	Training	Mali 6 Senegal 16	Saint Louis, Senegal. From 4 to 10 May	22
Training on integrated rice management in sub- Saharan Africa	Training	Benin 3 Cameroon 3 Central African Republic 3 Congo Brazzaville 3 Democratic Republic of Congo 3 Gabon 2 Mali 2 Niger 2 Senegal 3 Togo 2	Porto-Novo, Benin. From 18 to 29 May	26
Training on integrated rice management for rice production	Training	Ghana 5 Nigeria 4 Sierra Leone 5 Tanzania 3 The Gambia 5 Uganda 4	Porto-Novo, Benin. From 1 to 12 June	26

Theme	Workshop/ training	Countries represented and the number of participants	Place and date	Total number of participants
Impact assessment training workshop	Training	Democratic Republic of Congo 1 Ghana 1 Malawi 1 Nigeria 7 Rwanda 3 Uganda 1 Zimbabwe 3	Dar es Salaam, Tanzania. From 8 to 10 June	17
Strengthening the capacity for collecting pertinent and accurate data on technologies and rice economies of sub-Saharan Africa. Sub- regional workshop	Workshop	Benin 3 Burkina Faso 3 Cameroon 2 Central African Republic 2 Côte d'Ivoire 4 Democratic Republic of Congo 2 Ghana 2 Guinea 2 Kenya 2 Liberia 1 Madagascar 2 Mali 3 Mozambique 2 Niger 3 Nigeria 2 Rwanda 1 Senegal 2 Sierra Leone 2 Tanzania 2 The Gambia 2 Togo 3 Tunisia 1 Uganda 2	Abidjan, Côte d'Ivoire. From 27 to 31 July	50
Training on seed multiplication	Training	Ghana 5 Liberia 5 Nigeria 7 Sierra Leone 2 The Gambia 2	Porto Novo, Benin. From 3 to 7 August	21

Theme	Workshop/ training	Countries represented and the number of participants	Place and date	Total number of participants
Training on drought screening for rice genetic improvement	Training	Benin 4 Burkina Faso 2 Mali 2 Nigeria 3 Uganda 2	Cotonou, Benin. From 14 to 18 September	13
Final workshop of the Inter-Specific Hybridization Project (Phase 3)	Workshop	Benin 1 Democratic Republic of Congo 1 Ethiopia 1 Japan 2 Senegal 2 Tanzania 1 Uganda 2	Cotonou, Benin. From 6 to 8 October	10
Workshop on USAID-funded Emergency Rice Initiative	Workshop	Ghana 4 Liberia 1 Mali 4 Nigeria 7 Senegal 4 Togo 1	Cotonou, Benin. From 9 to 13 November	21
Training course on research capacity development for evaluation of NERICAs in Africa	Training	Benin 1 Gabon 2 Guinea 1 Madagascar 1 Mali 2 The Gambia 2	Cotonou, Benin. From 16 November to 11 December	9
Training on rice, rice seed production and entrepreneurship.	Training	Benin 3 Burkina Faso 3 Guinea 3 Mali 3 Senegal 9 The Gambia 3	Saint Louis, Senegal. From 7 to 12 December	24
Training course for Japan Overseas Cooperation Volunteers (JOCV)	Training	Benin 1 Burkina Faso 3 Djibouti 1 Gabon 4 Ghana 1 Niger 4	Cotonou, Benin. From 14 to 23 December	14

# Publications

## Papers published in peer-reviewed journals\*

Abadie C, Chilin-Charles Y, **Huat J**, Salmon F, Pignolet L, Carlier J, Lescot T, Côte F and Jenny C. 2009. New approaches to select cultivars of banana with durable resistance to *Mycosphaerella* leaf spot diseases. *Acta Horticulturae*, 828: 171–178.

**Abe SS**, Mueller C, Steffens M, Koelbl A, Knicker H, Koegel-Knabner I. 2009. Effects of land use change on chemical composition of soil organic matter in tropical lowland Bolivia. *Grassland Science*, 55: 104–109, ISSN: 1744-6961.

**Abe SS**, Oyediran GO, Masunaga T, Yamamoto S, Honna T, Wakatsuki T. 2009. Soil development and fertility characteristics of inland valleys in the rain forest zone of Nigeria: Mineralogical composition and particle-size distribution. *Pedosphere*, 19 (4): 505–514, ISSN: 1002-0160.

**Abe SS**, Yamamoto S, Wakatsuki T. 2009. Soil-particle selection by the mound-building termite *Macrotermes bellicosus* on a sandy loam soil catena in a Nigerian tropical savanna. *Journal of Tropical Ecology*, 25: 449–452, ISSN: 0266-4674.

**Abe SS**, Yamamoto S, Wakatsuki T. 2009. Physicochemical and morphological properties of termite (*Macrotermes bellicosus*) mounds and surrounding pedons on a toposequence of an inland valley in the southern Guinea savanna zone of Nigeria. *Soil Science & Plant Nutrition*, 55: 514–522, ISSN: 0038-0768.

Abiodun J, Olufolaji DB, **Séré Y**, **Nwilene FE**, **Onasanya A** and **Agunbiade TA**. 2009. Effect of migration distance on vector-mediated approach of screening rice varieties for resistance to rice yellow mottle virus. *Nigerian Journal of Plant Protection*, 23: 76–183.

Adandonon A, Vayssières JF, Sinzogan A and **Van Mele P**. 2009. Density of pheromone sources of the weaver ant *Oecophylla longinoda* affects oviposition behaviour and damage by mango fruit flies (Diptera: Tephritidae). *International Journal of Pest Management*, 55(4): 285–292, ISSN: 0967-0874.

**Adda C**, Atachi P, Korie S, Hell K and Tamo M. 2009. Effect of planting date on incidence and damage by *Sesamia calamistis* (Lepidoptera: Noctuidae) in maize in southern Benin. *International Journal of Tropical Insect Science*, 29(4): 208–218, ISSN: 1742-7584.

Afolabi SA, **Akator SK**, Abo EM, **Onasanya A** and **Séré Y**. 2009. Production of polyclonal antibodies to various strains of rice yellow mottle virus (RYMV) obtained across different agro-ecological zones in West Africa. *Scientific Research and Essays*, 4(4): 306–309, ISSN: 1992-2248.

Afouda L, Godjo A, **Séré Y**, Nouatin G and Akossou A. 2009. Transmission de *Pyricularia grisea* (Herbert Herbert) Barr par les semences aux plantules de riz au Bénin. *Annales des Sciences Agronomiques*, 2(12) spécial: 11–22, 2009, ISSN: 1659-5009.

\* The names of Africa Rice Center (AfricaRice) authors are shown in bold.

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## Acronyms and abbreviations

AfDB	African Development Bank
AfricaRice	Africa Rice Center
AGRA	Alliance for a Green Revolution in Africa
APCAM	Assemblée permanente des Chambres d'Agriculture du Mali
ARI	African Rice Initiative
BADEA	Arab Bank for Economic Development in Africa
BBSRC	Biotechnology and Biological Sciences Research Council, UK
BMGF	Bill and Melinda Gates Foundation
CAAS	Chinese Academy of Agricultural Sciences
CARD	Coalition for African Rice Development
CAS-IP	Central Advisory Service on Intellectual Property
CCER	Center-Commissioned External Review
CFC	Common Fund for Commodities
CGIAR	Consultative Group on International Agricultural Research
CIAT	International Center for Tropical Agriculture
CIRAD	Centre de coopération internationale en recherche agronomique pour le développement
COM	Council of Ministers
CORAF/WECARD	West and Central African Council for Research and Development
CRS	Catholic Relief Services
DAAD	Deutscher Akademischer Austausch Dienst (German Academic Exchange Service)
DFID	Department for International Development, Government of UK
DGIS	Directorate General for International Cooperation, Government of the Netherlands
EPMR	External Program and Management Review
ESA	East and Southern Africa
ESARP	East and Southern Africa Rice Program
FAO	Food and Agricultural Organization of the United Nations
FOFIFA	Centre national de la recherche appliquée au développement rural, Madagascar
GCP	Generation Challenge Program of the CGIAR
GOANA	La Grande offensive agricole pour la nourriture et l'abondance (an initiative of the Government of Senegal)
GRiSP	Global Rice Science Partnership
GRU	Genetic Resources Unit
GSR	Green Super Rice for the Resource Poor of Africa and Asia
GSS	general support staff
GTZ	Gesellschaft für Technische Zusammenarbeit GmbH, Germany
IBRD	International Bank for Reconstruction and Development
ICRA	International Centre for Development Oriented Research in Agriculture

ICT	information and communication technology
IER	Institut d'économie rurale, Mali
IFAD	International Fund for Agricultural Development
IFDC	International Soil Fertility and Agricultural Development Center
IGO	inter-governmental organization
INGER	International Network for Genetic Evaluation of Rice
IRD	Institut de recherche pour le développement, France
IRRI	International Rice Research Institute
IRS	internationally recruited staff
ISRA	Institut sénégalais de recherches agricoles, Senegal
ISSN	international standard serial number
JICA	Japan International Cooperation Agency
JIRCAS	Japan International Research Center for Agricultural Sciences
JOCV	Japan Overseas Cooperation Volunteers
MAS	marker-assisted selection
MDG	Millennium Development Goal
NARO	National Agricultural Research Organization, Uganda
NARS	national agricultural research systems
NERICA	New Rice for Africa
NGO	non-governmental organization
NRDS	national rice development strategies
NUFFIC	Netherlands Organization for International Cooperation in Higher Education and Research
PDF	Post-Doctoral Fellow
PINORD	Oxfam's market access support program for rice farmers in the Senegal River Valley
PLAR	participatory learning and action research
PVS	participatory varietal selection
RAP	Realizing the Agricultural Potential of Inland Valley Lowlands in sub-Saharan Africa while maintaining their Environmental Services
RIGA	Rice Information Gateway for Africa
RISOCAS	Developing rice and sorghum crop adaptation strategies for climate change in vulnerable environments in Africa
RMP	recommended management practices
RYMV	rice yellow mottle virus
SCARDA	Strengthening Capacity for Agricultural Research and Development in Africa
SMART-IV	Sawah, Market Access and Rice Technologies for Inland Valleys
SPIRIVWA	Sustainable Productivity Improvement for Rice in Inland Valleys in West Africa
SRV	Senegal River Valley

SSA	sub-Saharan Africa
STRASA	Stress Tolerant Rice for Africa and South Asia
SUA	Sokoine University of Agriculture, Tanzania
SWEP-IVC	Systemwide and Ecoregional Program – Inland Valley Consortium
TICAD	Tolyo International Conference for Agricultural Development
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	United States Agency for International Development
WARDA	West Africa Rice Development Association
WARP	West Asia Regional Program
ZIZO	zooming-in zooming-out

## About the Consultative Group on International Agricultural Research (CGIAR)

The Consultative Group on International Agricultural Research (CGIAR) is a global partnership that unites organizations engaged in research for sustainable development with the funders of this work. The funders include developing and industrialized country governments, foundations, and international and regional organizations. The work they support is carried out by 15 members of the Consortium of International Agricultural Research Centers, in close collaboration with hundreds of partner organizations, including national and regional research institutes, civil society organizations, academia, and the private sector.

### The Centers

AfricaRice	Africa Rice Center (Cotonou, Benin)
Bioversity International	Bioversity International (Rome, Italy)
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)
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics (Patancheru, India)
IFPRI	International Food Policy Research Institute (Washington, DC, USA)
IITA	International Institute of Tropical Agriculture (Ibadan, Nigeria)
ILRI	International Livestock Research Institute (Nairobi, Kenya)
IRRI	International Rice Research Institute (Los Baños, Philippines)
IWMI	International Water Management Institute (Colombo, Sri Lanka)
World Agroforestry	World Agroforestry Centre (Nairobi, Kenya)
WorldFish	WorldFish Center (Penang, Malaysia)



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