

# AfricaRice

## Centrally curated breeding data secures institutional memory & team collaboration

### Context

AfricaRice has its headquarters in Côte d'Ivoire, with regional centres in Nigeria, Senegal and Tanzania and further country offices in Benin, Liberia and Madagascar. It works throughout Africa to alleviate poverty and improve food security through science and partnerships focused on sustainably increasing the productivity and profitability of rice farming. It is also an intergovernmental association of African member countries, with a Council of Ministers made up of African ministers of agriculture or scientific research who oversee its activities. This unique governance is a major asset, as this direct contact with ministers helps AfricaRice understand priorities and influence policy at the level of individual countries.

In 2005, AfricaRice had to relocate its headquarters from Côte d'Ivoire to Benin because of civil unrest. It recently moved back to Côte d'Ivoire amid changes to top management, with a new director general appointed in 2015, Harold Roy-Macauley, followed by a new Deputy Director General – Director of Research for Development (DDG-DR4D), Étienne Duveiller.

### Challenges

The main breeding challenge for AfricaRice is improving the genetic gain of the rice cultivars that it delivers to African regions. It also looks for ways to better support its national partners in different countries in modernising their own breeding programmes.

Like many organisations, AfricaRice is faced with an increasing avalanche of data. The turmoil and uprooting of the last decade has also brought to the fore the importance of securing institutional memory and effective collaboration through mechanisms that will facilitate data conservation, access and sharing.

“There is a need for AfricaRice to have its breeding programmes making full use of a centralised breeding informatics system. The IBP has helped us find a solution to ensure the quality and quantity of our data.

— Dr Paul Kiepe, Head of Research Planning and Coordination, AfricaRice”

### Solution

The IBP fills a gap for AfricaRice by providing the tools and services it needs to bring modern technology to breeders, including software that helps it centralise data and manage day-to-day activities, and consulting on molecular approaches. In the first phase of the relationship, adopting the IBP's Breeding Management System (BMS) enabled AfricaRice to update its own technologies and practices, and to train its partners in the Africa-wide Rice Breeding Task Force in using it as well. To date, the centre has successfully implemented the BMS in its breeding programmes in Senegal, Nigeria and Madagascar. It numbers twenty-five (25) individual users, of which seven (7) are champions – power users able to support others, and keen in promoting the tool – and two (2) represent the centre as an official IBP Hub for the region (see section below – *A growing partnership*).

The second phase of this project brought a shift from the desktop to the server version of the BMS, boosting collaboration. Once the new server edition became available, integrating a stronger analytical pipeline and permissions scheme, AfricaRice and the IBP worked together to gather the data that had been stored in individual desktops by each breeder, standardise and input this information into the cloud, and train AfricaRice's breeders in using the new format. All the centre's programmes now share a single centrally curated system on institutional infrastructure.

The new version not only represents a major improvement in terms of functionality and usability for users but, more importantly, is also bringing about a revolution in terms of sharing data within and between institutions, and of ensuring that data are retained and used beyond individual projects or careers. AfricaRice is now in an even better position to engage its partners in adopting the same solution at an institutional level.

“A stable cloud-based version of the BMS is a major advance, and the provision of up-to-date technologies and services by IBP is very important to me in my future work,” says Ibnou Dieng, Biometrician at AfricaRice and IBP Regional Representative. “As a Hub leader I look forward to continuing to help disseminate the BMS and to support rice breeders in Africa. As a BMS user myself, I am also keen to provide feedback and to be involved in setting new directions for development as our partnership continues to grow.”

### A growing partnership

AfricaRice and the IBP share a common vision, emphasising collaboration, community and the empowerment of breeders. The IBP supplies technological tools and knowledge, while AfricaRice reaches breeders in national programmes thanks to its wide network of partnerships. The IBP offers broad experience while AfricaRice has deep rice expertise. By combining their strengths, both magnify their impact in modernising rice breeding.

As an IBP Regional Hub since 2014, AfricaRice has received support from the IBP in accelerating its adoption of the BMS and strengthening the capacity of staff as BMS specialists. In turn, it has encouraged the use of the BMS by its partners. In total, Hub staff have provided training and technical support to over 100 breeders, research assistants, technicians and students from three (3) AfricaRice breeding programmes and nine (9) national research programmes.

### Looking forward

The IBP remains committed to improving and refining its tools and services, and to meeting AfricaRice's needs. “We are really talking about achieving together our common goals of modernising breeding, through facilitating the use of molecular markers, improving data management, providing infrastructure and capacity development, and so on,” says Jean-Marcel Ribaut, Director of the IBP. “We are on the same page, and there is every prospect for greater integration of our activities as the relationship continues to mature. We are very fortunate and happy in our close partnership with AfricaRice.”

The goal looking forward will be to fully support breeders, as the IBP and AfricaRice strive together to insure that national programmes continue implementing modern breeding strategies.



I am Kofi Bimpong, Molecular Biologist and Breeder at Africa Rice, and I work on rice breeding for higher yield and other important traits.

I use the BMS to plan my crosses, manage my field data, and analyse the data from my experiments, and have also explored the use of molecular markers.

I have become convinced that efficient data management systems and molecular approaches can accelerate our achievement of breeding goals. In the future, I would like to assist in modernising the breeding programme at AfricaRice with more advanced technologies, including precision, high-throughput measuring equipment for field phenotyping; genotyping techniques; and a well-deployed data management system. The IBP helps a lot by maintaining its open-arms collaboration with us, and providing support in molecular breeding and data management.