Transforming Sub-Saharan Africa’s Rice Production through Rice Research

Following the Africa Rice Congress hosted by the Africa Rice Center (WARDA) on July 31 - August 4, 2006 in Dar es Salaam Tanzania, WARDA contributed a story highlighting the importance of rice research to improve the livelihoods of poor people in Sub-Saharan Africa.

Although most of the world’s rice is produced and consumed in Asia, demand for it is soaring in Africa. Rice has become a major source of calories not only for the affluent, but also for the urban and rural poor in many parts of the continent. Its availability and price have become major determinants of the welfare of the poorest African consumers.

Rice production in sub-Saharan Africa (SSA), though rising from 8.6 million tonnes of paddy (unhulled) rice in 1980 to 12.6 million tonnes in 2005, has not kept pace with demand. As a result, the quantity imported yearly by the region increased from 2.5 million tonnes in 1980 to 7.2 million tonnes in 2005. SSA spends more than US$1.5 billion in foreign exchange every year for its rice imports.

In the short term, rice imports may serve to bridge the gap in rice supply. But their increasing market share (40–45 percent of the total rice supply) reveals the region’s high dependency on external supplies for one of its staple foods. More than 30 percent of the internationally traded rice goes to Africa.

There is growing concern about the foreign currency drain resulting from massive rice imports, the marginalization of the local rice sector, and the food security implications of dependency on fluctuating world market prices and supply chains for this staple food. The situation is particularly worrying because the international rice market is relatively small, accounting for only 4-6 percent of the total rice produced globally.

Can SSA Substantially Reduce its Rice Imports?

Rice production in SSA is dominated by subsistence, smallholder farmers who have limited access to markets, no equipment other than hand-held tools and limited use of inputs. The average rice yield in the sub-continent is the lowest in the world – 1.4 tonnes per hectare compared to Asia’s average of 4 tonnes (more than 6 tonnes in China).

However, rice is successfully and economically produced in a wide range of agroecologies in SSA. In Mali, for example, rice yields have increased steadily in the Office du Niger Project. In Madagascar, where per capita rice consumption is among the highest in the world, most of the rice consumed is homegrown. Nigeria, which has all the agro-ecological zones suitable for rice cultivation, has the potential to become a major rice granary.

In SSA, the lowland rice ecology consists of 20–50 million hectares. If only 2 million hectares of this area were used to grow rice, producing an average yield of 3 tonnes per hectare, West Africa could easily stop its costly rice imports. Technologies to achieve this potential are now reaching African farmers.

Impact of Rice Research in SSA

According to recent impact assessment studies, rice research by national and international organizations is making a big difference in Africa, where rice is mostly grown by women.

A study conducted in 2003 by T.J. Dalton and R.G. Guei in seven West African rice-producing countries showed that about 100 improved rice varieties were released from 1980 to 2000, generating sizable gains in rice productivity. A bout 40 percent of the total rice area in SSA is planted with improved varieties, which are concentrated particularly in the irrigated and mangrove rice areas.

Rice variety improvement contributed, on average, US$375 million per year to the region’s economy and possibly as much as $850 million. Overall, improved varieties have increased net revenues by $93 per hectare, with the highest gains in irrigated and rainfed lowland ecologies. The returns to investment in rice research now exceed 20 percent annually.

The study also revealed that, without variety improvement, the regional balance-of-payment deficit for rice imports would have been 40 percent higher. And it would have been necessary to bring an additional 698,000 hectares of land under rice cultivation to maintain current levels of consumption.

The International Network for the Genetic Evaluation of Rice (INGER)- Africa, based at the Africa Rice Center (WARDA), has contributed importantly to this success. INGER- Africa promotes genetic diversity for different ecosystems through the exchange, evaluation and utilization of improved breeding materials originating from worldwide sources.

The New Rice for Africa (NERICA), developed by WARDA and its partners, is a well-known breakthrough. It is considered one of the major recent advances in rice variety improvement.
There are many reports of NERICA’s positive impact on farmers’ livelihood across SSA, from Guinea to Uganda. According to socio-economic impact studies carried out in Benin by WARDA and its national partner, NERICA adoption contributed to the following impacts:

- Child school enrollment rose by 3 percent in farm families adopting NERICAs
- School retention rate increased by 3 percent
- School expenditure per child increased by about 5,000 CFA ($8)
- Frequency of child sickness declined by 2 percent
- Frequency of hospital attendance when sick rose by 5 percent
- Health expenditures per sick child increased by about 7,000 CFA ($12)

When these modest impacts are extrapolated across the region’s entire rice sector, then the value of the agricultural research that led to the development of NERICAs becomes very significant.

Impact studies also reveal that rice research contributes effectively to the realization of almost all the Millennium Development Goals, including halving poverty and hunger, promoting education, improving health, reducing child mortality, empowering women and ensuring environmental sustainability.

### Pre-requisites for a Rice Revolution in SSA

Improved agricultural technologies, however effective, will not by themselves bring about a rice revolution in SSA. The Africa Rice Congress held in Dar es Salaam, Tanzania, from July 31 to August 4, 2006, underlined that to transform the region’s rice sector, governments must institute policies that guarantee prices; create access to credit, inputs and markets; and put in place safety nets and subsidies to support vulnerable groups, particularly women farmers. Such policies will give farmers incentives to adopt improved technologies that can raise their incomes and lift them out of poverty.

### Rice in Africa – Fast Facts

- Rice is a staple food for SSA’s rapidly growing population, whose rice consumption increased annually by 4.4 percent from 1961 to 2003.
- Rice is the region’s fourth most important cereal in terms of production (after sorghum, maize and millet).
- Rice occupies 10 percent of the total land under cereals and contributes 15 percent of total cereal production in SSA.
- About 20 million farmers in SSA grow rice, and about 100 million people depend on it for their livelihoods.
- From 1985 to 2003, the region’s rice production increased at an annual rate of 4 percent, compared to only 2.4 and 2.5 percent for maize and sorghum, respectively.
- Rice is grown on 8.5 million hectares in SSA, equal to 5.5 percent of the global rice area. Almost all of the region’s 38 countries grow rice, but two, Nigeria and Madagascar, account for 60 percent of the rice land. Nine other countries grow rice on more than 100,000 hectares, including Guinea and Cote d’Ivoire.
- Africa is the only continent where the two species of cultivated rice – *Oryza glaberrima* (African rice) and *Oryza sativa* (Asian rice) – are grown.
- The most widely grown rice species, *Oryza sativa*, is originally from Asia and was introduced in Africa only about 450 years ago. It is high-yielding and responds well to inputs but is not well adapted to African conditions.
- The less well-known rice species, *Oryza glaberrima*, was domesticated in the Niger River Delta over 3,500 years ago. It is well adapted to African farming conditions but generally has lower yield potential.

### Images

- Woman planting NERICAs in Guinea
- Children in Guinea