

Success factors

With GEM technology, processors can get an additional US\$82 on every ton of rice parboiled compared to parboilers using the traditional system. GEM has a higher output rate of up to 25 tons of milled rice per month of high quality (lighter and uniform color, absence of heat-damaged grains and impurities, low levels of broken fractions). It reduces expenditure on firewood from 1.83 to 0.64 USD per 100 kg of paddy parboiled. It also reduces the steaming time from about 60—90 min to 20—25 min per 100 kg of paddy.

Cost-benefit analysis

The internal rate of return (IRR) of the GEM parboiling technology is 70% compared to 14% for the traditional technology.

Recommendations

The GEM parboiling technology is suitable for both rainfed and irrigated ecologies but it's profitability is higher in irrigated ecology due to reduced brown to black spots on paddy.

List value chains suited for the technology application

Rice value chain.



GEM Parboiling Technology



AfricaRice

AfricaRice is a CGIAR Research Center – part of a global research partnership for a food-secure future. It is also an intergovernmental association of African member countries.

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Technologies for African
Agricultural Transformation



AfricaRice

GEM rice parboiler



Traditional stove: high fuel consumption, smoke exposure, high grain loss and low product quality, low profit margin for women rice parboilers and traders



GEM: low fuel consumption, low smoke exposure, low grain loss and high product quality, high profit margin, less drudgery for women.



Milling machine

- In Nigeria and Benin, over **2,500 rice parboiler households** (14% men and 86% women) using the GEM through the innovation platforms
- Within a little over one year, rice parboiler households in the Lafia innovation platform (Nasarawa, Nigeria) **generated over US\$ 240,000** using GEM technologies.
- Local parboiled rice in the Lafia – Nasarawa market can now **compete with premium imported rice**

Brief description

In West Africa, parboiling of rice has traditionally been done using rudimentary methods and equipment, thus generating lower-quality and less marketable products. The GEM (Grain quality enhancer, Energy-efficient and durable Material) improved rice-parboiling technology produces quality rice, processes large quantities of rice relatively quickly, is energy efficient, and safer to operate than traditional methods — particularly for female and younger processors.

GEM combines the use of a uniform steam parboiler and an improved parboiling stove. When the quantity of paddy to be parboiled is more than 50 kg per session, other components (paddy soaking tank, labor-saving devices and improved drying surface) are required.

The GEM parboiling technology can be tailored to small- (20—300 kg), medium- (300—1000 kg) and large- (1000—3000 kg) scale processors. The cost of GEM

depends on the components and the scale of operation.

Developed by

Africa Rice Center (AfricaRice) and its partners

Location where the technology was proven

Benin, Côte d'Ivoire, Niger and Nigeria

Number of partners involved in technology

introduction/promotion Experienced women parboilers in Glazoué, Benin, were consulted in the development and testing process. Over 2,560 rice parboilers (14% men and 86% women) have been trained in best practices for the various components of GEM parboiling technology in Benin and Nigeria.

Results at the test sites

Processors who use the GEM parboiling technology indicate that they do not suffer from heat burns and other sicknesses related to smoke exposure. They also face less difficulty in lifting loads.

Preferences (%) and potential demand (%) for upgraded parboiled rice in 2016 and 2017

