


TAAT Technologies in Benin

This toolkit showcases some of the technologies scaled by the TAAT program in Benin, especially during its first phase and then in collaboration with a Sasakawa project. It features innovative solutions for rice cultivation, aquaculture, and other commodities. The toolkit highlights equipment, improved crop varieties and best practices, offering a comprehensive…

7 TECHNOLOGIES | CREATED ON JUN 14, 2024 BY TAAT PROFILING TEAM | LAST UPDATED JUL 30, 2025



TECHNOLOGIES IN THIS TOOLKIT

- **ORYLUX varieties**: Aromatic Rice for Africa
- **NERICA**: High yield rice varieties for Africa
- **PICS**: Hermetic Bags for Safe Storage of grain
- **GEM system**: Parboiling equipment for rice
- **Urea deep placement**: Nitrogen management for Efficient Rice…
- **Rice Threshing and Polishing Machines**: Axial flow thresher an…
- **Biochar**: Biomass Charcoal for Soil improvement

https://taat.africa/ifo

ORYLUX varieties: Aromatic Rice for Africa

Local African aromatic rice

This technology is all about growing special types of delicious-smelling rice in Africa. These rice varieties are designed to grow well in African conditions. They taste really good and are in high demand. Right now, not enough of this rice is grown in Africa, so a lot of it has to be imported.

Africa Rice Center
Sali Atanga Ndindeng

This technology is TAAT1 validated.

7·7 Scaling readiness: idea maturity 7/9; level of use 7/9

Gender assessment 4

Climate impact 2

Problem

- Low production of aromatic rice in Sub-Saharan Africa (SSA)
- High dependence on imports from Asia
- Limited access of farmers to seeds suited to prevalent growing conditions
- Lack of aromatic rice varieties adapted to SSA's conditions
- Need to improve yields, quality, and resistance of rice crops
- Insufficient connections between stakeholders for commercialization

Solution

- Development of aromatic rice varieties tailored to SSA's agroecosystems
- Crossbreeding with elite lines to maintain high yields and beneficial traits
- Utilization of genetic mapping and molecular tools for faster breeding
- Dissemination of ORYLUX seeds in local markets to increase availability
- Establishment of connections between farmers, processors, and consumers for value maximization

Key points to design your project

1. Identify suitable ORYLUX varieties.
2. Raise awareness about its benefits.
3. Ensure access to seeds and support.
4. Estimate seed quantity and costs.
5. Provide training and communication support.
6. Collaborate with institutes and companies for implementation.

Cost: $$$ **1,3 USD**

A Seed cost per kg

10—12 Kg per Ha	**51 USD per Ha**	**105 USD per Ha**	**200 USD per Ha**	**IP**
Planting densities	Labour costs for planting	Fertilizer inputs	Harvesting and winnowing of grain	Unknown

Technology from

ProPAS

Commodities

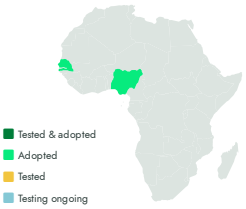
Rice

Sustainable Development Goals

Categories

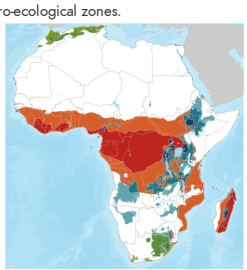
Production, Improved varieties, Quality improvement

Tested/adopted in



Where it can be used

This technology can be used in the colored agro-ecological zones.



Target groups

Farmers, Seed companies, Sellers

NERICA: High yield rice varieties for Africa

NERICA: Higher Yields, Resilience, and Profitability for African Farmers.

NERICA varieties are tailored for African conditions, offering high yields (2 to 6 tons per hectare), resistance to weeds and drought, and adaptability to poor soils. They show moderate resistance to diseases and pests, reducing the need for chemical interventions and promoting sustainable agriculture in Africa.

This technology is TAAT1 validated.

8·8 Scaling readiness: idea maturity 8/9; level of use 8/9

Gender assessment 4

Climate impact 4

Problem

- Traditional rice varieties often yield less, impacting food security and farmers' income.
- Conventional varieties are more susceptible to pests and diseases, leading to yield losses.
- Many varieties struggle in nutrient-poor soils and under erratic rainfall.
- Insufficient local production leads to heavy reliance on imported rice, affecting economic stability.

Solution

- NERICA varieties yield more, ensuring food security and higher income.
- They resist pests and diseases, reducing chemical use.
- Thrives in poor soils and limited water, suitable for diverse environments.
- Boosts local production, enhancing economic stability.
- Accessible to small-scale growers, improving practices and income.

Key points to design your project

To integrate NERICA technology into your project, consider the following steps:

- Develop NERICA varieties tailored to local growing conditions.
- Conduct awareness campaigns to highlight the benefits of planting improved rice varieties.
- Ensure equitable access and financial support for local suppliers and farmers.
- Estimate seed quantity needed, including technology costs and delivery expenses.
- Engage a team of trainers for installation support and develop communication materials.
- Consider optimizing NERICA with other agricultural practices like nitrogen management and weed control.
- Collaborate with agricultural institutes and seed companies for implementation.

Cost: $$$ **0.8—1.2 USD**
Per kg of seeds

ROI: $$$ **25—39 %**

1.7—0.7 ton per ha
with and without fertilizer

IP
Open source / open access

AfricaRice

Africa Rice Center
Sali Atanga Ndindeng

Technology from

ProPAS

Commodities

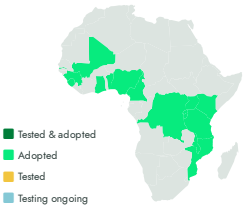
Rice

Sustainable Development Goals

Categories

Production, Improved varieties, Yield improvement, Drought tolerance

Tested/adopted in



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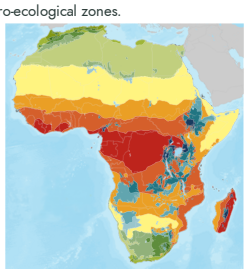


Target groups

Farmers, Seed companies

PICS: Hermetic Bags for Safe Storage of grain

Low cost storage technologies for grain

Hermetic bags are like super-sealed containers that stop air and moisture from reaching the grains inside. This way, farmers can store their grains for up to two years without them getting bad. This is good for farmers because it means they always have enough food and can sell their grains for better prices.

PICS

Purdue Improved Crop Storage

PICS GLOBAL

Laurie Kitch

This technology is TAAT1 validated.

9·9 Scaling readiness: idea maturity 9/9; level of use 9/9

Inclusion assessment 4

Climate impact 5

Problem

- **Post-harvest losses**: Farmers in Sub-Saharan Africa lose over 25% of beans due to inadequate storage methods.
- **Pest infestations**: Weevils, moths, and mites damage stored beans, forcing farmers to sell at low prices immediately after harvest to minimize losses.
- **Fungal contamination**: Traditional storage can lead to fungal growth, such as aflatoxin, contaminating beans and reducing their quality.
- **Food security issues**: Ineffective storage hinders farmers' ability to keep enough beans for consumption between harvests, threatening food security and livelihoods.

Solution

- **Airtight sealing**: The multi-layer design blocks air and moisture, preventing pest infestations without chemicals.
- **Moisture control**: Hermetic bags maintain stable moisture levels, inhibiting fungal growth like aflatoxin.
- **Long-term preservation**: They preserve beans for up to two years, maintaining quality and cooking time.
- **High durability**: Made from strong, reusable materials, hermetic bags ensure reliable grain storage.

Key points to design your project

To integrate PICS bags into your project:

- **Cost Analysis**: Bags cost $1 to $1.5 each (50kg or 100kg capacity). Estimate the number needed.
- **Supply Chain**: Identify suppliers, including delivery costs and any import duties.
- **Training**: Budget for training sessions and ongoing support.
- **Communication**: Create promotional materials (flyers, videos, etc.).
- **Grain Preparation**: Ensure grains are properly dried before storage, using moisture measurement devices if necessary.

These steps will help enhance food security and reduce post-harvest losses.

Cost: $$$ **2—3 USD**
Bag cost for users

ROI: $$$ **90 %**
Reduction of loss

50 or 100 Kg
Bag capacity

2 year
Life span

IP
Trademark

Technology from

ProPAS

Commodities

Common bean, Rice, Wheat, Maize, Sorghum/Millet, Soybean

Sustainable Development Goals

Categories

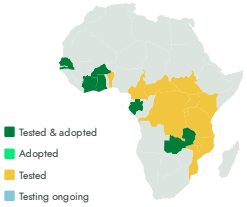
Prevention & storage, Equipment, Post-harvest handling

Best used with

Mechanized Threshing Operations

See all 1 technologies online

Tested/adopted in



Where it can be used

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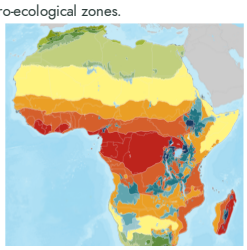


GEM system: Parboiling equipment for rice

Reduce milling losses, enhance nutritional and organoleptic quality

The technology improves rice parboiling with a new design, replacing traditional methods prone to emissions. Tailored for small to medium-scale processors, it enhances efficiency and product quality, reducing steaming time and improving grain quality significantly.

Africa Rice Center
Sali Atanga Ndindeng

This technology is TAAT1 validated.

9·9 Scaling readiness: idea maturity 9/9; level of use 9/9

Gender assessment 4

Climate impact 4

Problem

Traditional, Old-Fashioned Parboiling Methods are:

- Inefficiency and high labor requirements
- Excessive losses during dehulling
- Degradation of nutritional value
- Inferior sensory qualities

Solution

- Reduces steaming time to 20-25 minutes, minimizing emissions exposure.
- Improves grain translucency, reduces chalkiness, and boosts nutritional value.
- Provides low glycemic index, increased fiber, and higher vitamin B availability.
- Allows longer storage as rice flour, aiding food security.
- Made from simple, locally available materials.

Key points to design your project

To integrate it into your project, follow these steps:

- Raise awareness among processors and consumers about GEM parboiling systems.
- Assist in selecting the right system size and configuration.
- Ensure a steady supply of high-quality rice.
- Develop marketing strategies for rice flour and derived products.

Cost: $$$ **5000 USD**
Equipment

ROI: $$$ **70 %**
Internal rate of return for a GEM parboiling system

0.64 USD
firewood per 100kg of rice

IP
Open source / open access

Technology from

ProPAS

Commodities

Rice

Sustainable Development Goals

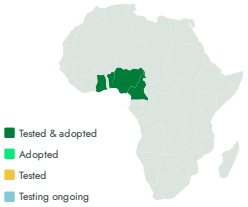
Categories

Transformation, Equipment, Agrifood processing

Best used with

- Advanced rice varieties for Africa ›
- High yield rice varieties for Africa ›
- RiceAdvice digital support ›

Tested/adopted in



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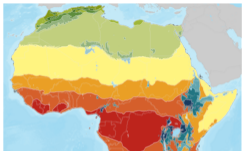


Urea deep placement: Nitrogen management for Efficient Rice Fertilization

Boost rice yields and save on fertilizer costs through efficient nitrogen management

Deep Urea Placement involves drilling urea granules into rice fields, optimizing nutrient uptake, soil fertility, and productivity. Placed 7 to 14 centimeters deep, it ensures consistent nitrogen supply, particularly suitable for lowland rice farming with clay soils.

Africa Rice Center
Sali Atanga Ndindeng

This technology is TAAT1 validated.

8·8 Scaling readiness: idea maturity 8/9; level of use 8/9

Gender assessment 4

Climate impact 7

Problem

- Inefficient Nitrogen Utilization.
- Environmental Pollution due to traditional urea application.
- Low Grain Productivity due to high nitrogen losses from current urea practices.
- High production costs without proportional yield increases.
- Limited irrigation in optimizing traditional urea application under varying rainfall.
- Climate disturbances causing by greenhouse gas emissions from conventional urea application.

Solution

- Large granules release nitrogen slowly, optimizing absorption by rice crops, reducing waste, preserving the environment and preventing contamination.
- Direct nitrogen delivery enhances soil fertility, promoting healthier rice crops and higher yields.
- Subsoil placement contributes to increased drought resilience in farming systems.
- Single-season application reduces labor and overall production costs.
- Suited for diverse agroecologies, benefiting both subsistence and commercial rice farmers.

Key points to design your project

1. Evaluate the required product quantity and cost, considering USD 0.4-0.8 per kilogram and a recommended rate of 0.25 tons per hectare.
2. Consider the technology's supply location, factoring in delivery costs and potential import duties.
3. Trainers can provide support during installation; budget for training and post-training assistance.
4. Develop communication materials for technology promotion.
5. Enhance the improved maize variety with companion planting, foliar micronutrient addition, engineered irrigation, motorized weeders, and RiceAdvice digital support.
6. Collaborate with agricultural institutes and agro-dealers for nationwide implementation.

Cost: $$$ **0.4—0.8 USD** per Kg

ROI: $$$ **30 %** increase in yield

0.25 ton Recommended rate per Ha

100—200 USD Equivalence cost for the recommendated rate per Ha

10 USD plunger-type applicator

IP Open source / open access

Technology from

ProPAS

Commodities

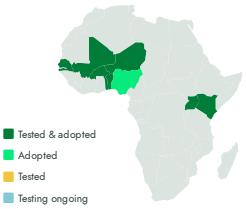
Rice

Sustainable Development Goals

Categories

Production, Practices, Fertilizer management

Tested/adopted in



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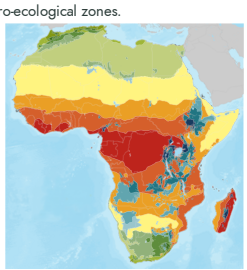


Target groups

Farmers

Rice Threshing and Polishing Machines: Axial flow thresher and improved quality polishing

Efficient rice threshing and polishing for premium quality grains, boosting income and market access in african communities.

Axial flow threshers utilize a rotating drum to separate rice grain from the surrounding husk, while abrasive polishers remove outer bran layers. Key parts are made of stainless steel for durability and hygiene. These equipment can be powered by diesel/petrol generators or solar installations for easy use in rural areas.

Africa Rice Center
Sali Atanga Ndindeng

This technology is TAAT1 validated.

8·8 Scaling readiness: idea maturity 8/9; level of use 8/9

Gender assessment 4

Climate impact 7

Problem

- High grain losses due to manual threshing methods.
- Inefficiencies in the traditional polishing process, particularly manual rubbing.
- Time-consuming and labour-intensive artisanal practices.
- Difficulty in processing large volumes of rice in communities.

Solution

- The motorized axial flow threshers reduces grain breakage and loss compared to traditional manual methods.
- The mechanized equipment drastically reduces the time and labour required for threshing and polishing.
- The mobile units are designed to be highly mobile and can be easily transported to even remote rural areas.

Key points to design your project

The adoption of Axial flow thresher and improved quality polishing offers a solution to enhance agricultural efficiency and reduce labor-intensive tasks. Key steps to integrate this technology include:

- Inform rice farmers, cooperatives and millers about the benefits of motorized threshers and polishers for increasing value addition and market access, and reducing post-harvest costs and losses.
- Identify suitable setup and size of mobile rice processing equipment
- Establish reliable supply of rice by drawing up contracts and delivery schedules for farmers.
- Provide loans to community-based and commercial processors for acquiring mobile units.

Cost: $$$ **4500 USD**
Local thresher

20 %
Losses reduced

15000—20000 USD
Advanced polishers and whiteners

3000 USD
Small bench-top polishers

IP
Patent granted

Technology from

ProPAS

Commodities

Rice

Sustainable Development Goals

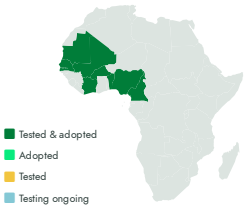
2 ZERO HUNGER

8 DECENT WORK AND ECONOMIC GROWTH

Categories

Harvest, Equipment, Post-harvest handling

Tested/adopted in



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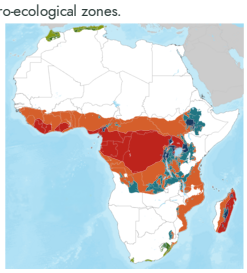


Target groups

Farmers

Biochar: Biomass Charcoal for Soil improvement

Biochar, a powerfully circular way to fight climate change

Biochar technology is a form of charcoal. It is made through a process called pyrolysis which involves burning of biomass in an oven with little or no oxygen. What you get out of it is solid material which then is added into soil.

Sasakawa Africa Association
Moshood Sulaiman

This technology is validated.

8·7

Scaling readiness: idea maturity 8/9; level of use 7/9

Inclusion assessment 3

Climate impact 7

Problem

- **Over 40% of Africa's soils are degraded**, leading to low productivity and high vulnerability to climate shocks.
- **Farmers burn crop residues for quick field clearing**, but this practice emits greenhouse gases and destroys soil health.
- **Low fertiliser efficiency and high input costs** result in poor returns and widespread food insecurity.
- **Agricultural practices are not aligned with climate goals**, limiting national progress on sustainability and mitigation targets.

Solution

- Boosts staple crop yields by 15–35% while restoring degraded soils.
- Reduces dependence on costly fertilisers and enhances food security.
- Helps meet climate goals by sequestering carbon and reducing emissions.
- Strengthens resilience to droughts and supports sustainable land use.

Key points to design your project

The biochar technology can significantly enhance the livelihoods of smallholder farmers, especially women, by boosting farm productivity, and supporting climate resilience.

To integrate this technology:

- Integrate biochar into national regenerative farming and climate-resilience strategies.
- Use carbon-credit schemes to attract private investment and incentivize adoption.
- Support farmer training hubs to promote production and connect with carbon markets.
- Facilitate access to pyrolysis equipment—available locally in Nigeria—for national rollout.

305 USD
For 500 Kg capacity

5—10 Tones
Recommended Biochar quantity for 1 hectare

IP
Open source / open access

Commodities

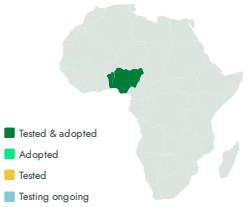
All Crops

Sustainable Development Goals

Categories

Production, Pre-production, Inputs, Fertilizer

Tested/adopted in



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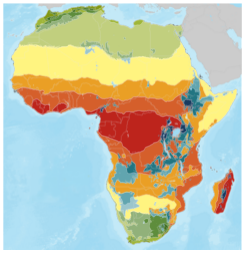

Target groups

Farmers

TAAT Technologies in Benin

https://taat.africa/ifo

ABOUT US

TAAT

TAAT, Technologies for African Agricultural Transformation, is an African Development Bank initiative to boost agricultural productivity by rapidly rolling out proven technologies to more than 40 million smallholder farmers.

TAAT aims to double crop, livestock, and fish productivity by 2025 by engaging both public and private sectors to expand access to productivity-increasing technologies across the continent.TAAT advises African government who receive funding from international financial institutions such as the African Development Bank to help them integrate the best agricultural technologies in their development projects. TAAT also offers technical assistance for the integration of these technologies, when needed.

TAAT Technologies

TAAT definition of agricultural technologies is very broad: they include improved varieties, inputs, equipment, agricultural infrastructure, practices and agricultural policies. In short, any solution to an agricultural constraint. TAAT technologies have been developed by a wide variety of organizations: the CGIAR, other international research institutions, national research organizations, or the private sector.

TAAT Clearinghouse

Within TAAT, the Clearinghouse has the remit to select, profile and validate agricultural technologies, and showcase them in online catalogs to support the advisory role that the Clearinghouse offers to governments and the private sector. The Clearinghouse strives to be an 'honest broker' of technologies through its selection, profiling, validation and advice.

TAAT e-catalogs

The e-catalogs are designed to be used by decision-makers within governments, private sector companies or development organizations. They facilitate the search for appropriate solutions that are adapted to local conditions and requirements, and provide all necessary information, presented in jargon-free and easy to analyze technology profiles. Once a decision-maker has selected a technology of interest, the e-catalogs facilitate their direct contact with those who can help them implement the technology, whether they are a research group or a private company.

TAAT Technology Toolkits

Technology toolkits are hand-picked selections of technologies from the TAAT e-catalogs. We offer some curated toolkits for specific cases, and registered users can create their own toolkits, showcasing their selection of technologies. Toolkits can be used online and shared as links, as mini e-catalogs, they can also be downloaded, saved, shared or printed as collections of technology pitches in PDF format (pitches are one-page summaries of technology profiles, available for all technologies on the e-catalogs).

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