




Rice Technologies Toolkit

This toolkit is a collection of technologies designed to optimize rice cultivation in Africa. These technologies have been carefully selected to address the challenges faced during rice production and transformation, ensuring a more resilient and profitable rice sector. By integrating these technologies into your projects or business plan, you can maximize your yiel…

17 TECHNOLOGIES | CREATED ON JUN 10, 2024 BY TAAT PROFILING TEAM | LAST UPDATED JUL 24, 2025








TECHNOLOGIES IN THIS TOOLKIT

- **RiceAdvice digital support**
- **Herbicides Calculator**
- **Rice Swarna 2**
- **Trace**: FairFood Traceability Solutions
- **Rice-fish culture**: Integrating rice and fish farming systems
- **AKILIMO**: Digital Decision Support Tool
- **RiceAdvice Lite**: Digital Advisory for Rice
- **Rice Threshing and Polishing Machines**: Axial flow thresher an…
- **ARICA**: Advanced rice varieties for Africa
- **Urea deep placement**: Nitrogen management for Efficient Rice…
- **Foliar micronutrient addition for healthier rice**
- **GEM system**: Parboiling equipment for rice
- **NERICA**: High yield rice varieties for Africa
- **ORYLUX varieties**: Aromatic Rice for Africa
- **Precision Rice Irrigation and Surface Leveling**
- **Cut and Bury**: Motorized weeders for rice production
- **PICS**: Hermetic Bags for Safe Storage of grain

https://taat.africa/ntx

RiceAdvice digital support

Your Digital Guide to Better Harvests

RiceAdvice helps rice farmers optimize their crops! This app takes 10 minutes to answer questions about your farm, then recommends the best fertilizer types, amounts, and timing. It even helps set yield goals and fight weeds efficiently.

Africa Rice Center
Kazuki Saito

This technology is TAAT1 validated.

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

Gender assessment 4

Climate impact 2

Problem

- **Inefficient Fertilizer Use:** Wrong amounts and types hurt yields and waste money.
- **Weeds Steal Profits:** Without effective control, weeds can significantly reduce harvest.
- **Guessing Game Yields:** Unclear targets and calendars lead to inefficient farming.
- **Climate Woes:** Adapting to droughts and floods is a constant struggle.
- **Offline Knowledge Gap:** Limited internet access cuts farmers off from vital resources.

Solution

- **Fertilizer Fix:** Get the right amount and type for bigger yields and less waste.
- **Weed Warrior:** Fight weeds with "RiceAdvice-WeedManager" for a cleaner harvest.
- **Yield & Calendar Coach:** Set smart goals and plan your season based on your farm's needs.
- **Climate Champion:** Adapt and thrive despite weather challenges.
- **Offline Access:** Use it even with limited internet (occasional connection needed).

Key points to design your project

RiceAdvice app offers free, field-specific advice for rice farmers.

To integrate in a project:

- Download it and train extension agents to help farmers access the app's features. This includes guidance on nutrients, weeds, yield targets, and climate risks.
- Monitor results and consider collaborating with agricultural groups to promote wider adoption.

While the app is free, consider costs for devices, data, and extension agent support.

Cost: $$$ **0 USD**
for download

ROI: $$$ **100—200 USD**
Income increased per hectare

0.6—1.8 ton per hectar
Average grain yield

IP
Open source / open access

Technology from

ProPAS

Commodities

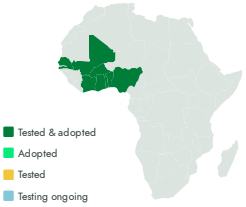
Rice

Sustainable Development Goals

Categories

Production, Prevention & storage, Market, Digital applications, Advisory and information service

Tested/adopted in



Where it can be used

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

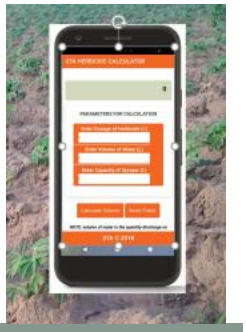
Target groups

Farmers

Herbicides Calculator

Reduce pesticide and herbicide losses with IITA's herbicide calculator

The IITA Herbicide Calculator is a digital tool that helps farmers figure out the right amount for backpack sprayers. This tool was developed using Java language, the Ionic framework, and Android Studio, ensuring its robustness and usability.



International Institute of Tropical Agriculture (IITA)
Godwin Atser

This technology is TAAT1 validated.

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

Gender assessment 4

Climate impact 6

Problem

- The widespread misuse of pesticides (including herbicides) due to poor calibration of spray tanks.
- Loss of inputs (pesticides or herbicides) during applications.
- Residue of chemical products in crops due to overdosing of pesticides or herbicides.

Solution

- The"IITA Herbicides Calculator" technology ensures the precise application of pesticides, mitigating issues related to over or under-dosing.
- Its promotes the effectiveness of herbicides, facilitating their optimal application.

Key points to design your project

To integrate this technology,

- Establish training programs and connect producers to financial support and markets.
- Estimate costs for the subscription to the IITA Herbicide calculator, android phones, data, training, and communication support.
- Collaborate with agricultural development institutes and seed multiplication companies.

30,000 USD

Cover training, android phones, data

IP

Open source / open access

Technology from

ProPAS

Commodities

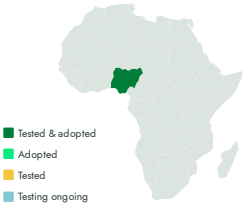
Maize, Rice, Sorghum/Millet, Cowpea, Soybean, Cassava, + 1 more

Sustainable Development Goals

Categories

Production, Digital applications, Pest control

Tested/adopted in



Where it can be used

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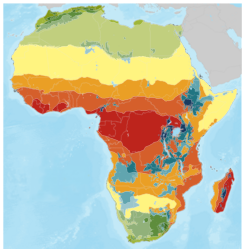


Target groups

Farmers

Rice Swarna 2

Unleashing Prosperity with Resilient Rice - Medium Cycle, Maximum Yield, Unmatched Quality

Rice Swarna 2 F1 is an advanced rice variety designed for high yields (up to 12 MT/ha), superior milling quality (over 70%), and strong resistance to diseases like BLB and blast. It offers double the yield of traditional OPVs, leading to increased profitability for farmers. This technology represents a significant shift towards sustainable, high-yield agriculture.

Advanta Seeds
Ibrahim Shindu

This technology is pre-validated.

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

Gender assessment 4

Climate impact 6

Problem

Low Yields: Poor farming and weather affect rice yields.

Insufficient Milling: Bad milling leads to money loss.

Reduced Tolerance to Bacterial Disease: Vulnerability to a bacterial disease causes yield losses.

Blast Disease Susceptibility: Lack of resistance to a fungal disease results in crop losses.

Solution

Low Yields: Rice Swarna 2 yields up to 10 MT/ha, enhancing food security.

Insufficient Milling: With a milling percentage over 70%, it improves market value.

Reduced Tolerance to Bacterial Disease: It's engineered to resist bacterial diseases.

Blast Disease Susceptibility: It also has strong resistance to fungal diseases.

Key points to design your project

Rice Swarna 2, a high-yielding and disease-resistant rice variety, tackles gender inequality (SDG 5) and climate change (SDG 13). Increased yields can empower women farmers by improving food security and livelihoods. Reduced disease might lead to less pesticide use, benefiting the environment.

Successful implementation requires a plan:

- Secure certified seeds and suitable land with proper drainage and irrigation.
- Train farmers on specific planting methods for Swarna 2.
- Plant Swarna 2 seeds according to recommended spacing.
- Implement proper weed control, fertilization, and irrigation throughout the season.
- Monitor crop health and assess yield to measure success and identify areas for improvement.

Remember: Access to necessary tools and equipment is crucial.

Cost: $$$ **115 USD**

Average cost of seeds for a farmer /ha

2000 USD
Average gross income /ha

475 USD
Total input costs /ha

Commodities

Rice

Sustainable Development Goals

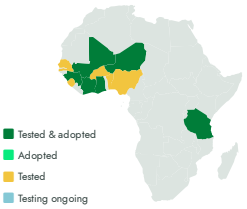
Categories

Production, Improved varieties, Yield improvement, Quality improvement

Best used with

- Nitrogen management for Efficient Rice Fertilization ›
- Foliar micronutrient addition for healthier rice ›
- Motorized weeders for rice production ›
- RiceAdvice digital support ›
- Axial flow thresher and improved quality polishing ›
- Parboiling equipment for rice ›

Tested/adopted in



Where it can be used

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

Trace: FairFood Traceability Solutions

Easy-to-use solution for food traceability

Trace technology is an advanced tracking solution for agricultural and food-related companies, offering transparency and sustainability. It enhances consumer trust by providing clear and verifiable data about a product's journey and ethical production practices.

This technology is pre-validated.

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

Gender assessment 3

Climate impact 6

Problem

- Agri-food companies struggle with risk mitigation in their operations.
- Transparent traceability of agri-food products is challenging to ensure.
- The food industry lacks sufficient tools for storing and managing essential data.

Solution

- Traceability solutions enable showcasing the precise origin of products.
- Transparent sharing of evidence supporting brand values with the public.
- FairFood's traceability solutions contribute to increased income for farmers.
- Foster transparency and trust, helping create fairer compensation mechanisms within the agri-food supply chain.

Key points to design your project

"FairFood Traceability Solutions" offers a digital platform to enhance transparency and trust in the agri-food supply chain. To integrate this technology into your project,

- Accessing the platform and installing the necessary software, considering associated costs.
- Configure the platform with relevant supply chain information and provide training and ongoing support to personnel.
- Utilize the platform to track product movement and share transparent information.

11,070 USD Initial investment	**110 USD** Social Return on Investment per farmer per YEAR
22.14 USD subscription/user/year	**3,320 USD** Operating Investment /YEAR
IP Open source / open access	

FAIRFOOD

Fairfood
Marten van Gils

Commodities

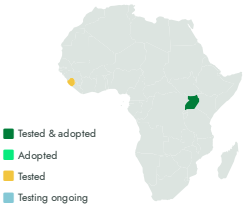
Common bean, Cassava, Cowpea, Leguminous, Maize, Sorghum/Millet, + 9 more

Sustainable Development Goals

Categories

Production, Prevention & storage, Transformation, Market, Pre-production, Digital applications, + -3 more

Tested/adopted in



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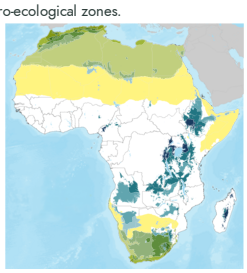


Target groups

Breeders, Farmers, Processors, Fish Farmers, Sellers

Rice-fish culture: Integrating rice and fish farming systems

Rice-Fish System Boosts Profits, Enhances Lowland Land Use for Food Security and Prosperity

Rice-fish co-culture integrates rice and fish farming, boosting food security and farmers' income while ensuring environmental safety by eliminating agrochemicals. It's an innovative approach for food security, economic stability, and environmental sustainability.

Africa Rice Center
Ephraim Sekyi-Annan

This technology is pre-validated.

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

Inclusion assessment 4

Climate impact 6 1

Problem

- **Food insecurity:** Limited access to nutritious food, resulting in nutritional deficiencies.
- **Market vulnerability:** Dependence on rice exposes farmers to market fluctuations, contributing to economic instability.
- **Environmental pollution:** Overuse of agrochemicals leads to soil and water pollution, harming biodiversity and ecosystem health.

Solution

- **Enhanced profitability:** Rice-fish co-culture improves economic viability with a higher benefit-to-cost ratio (2.2), addressing food insecurity.
- **Market resilience:** Rice-fish farmers demonstrate greater resilience to market shocks due to diversified income sources, ensuring economic stability.
- **Nutrition security:** Fish consumption directly tackles nutritional deficiencies, enhancing food security with a diverse and nutritious diet.

Key points to design your project

To integrate this technology into your project:

1. Develop a business model outlining startup costs and sales projections.
2. Identify suitable regions for implementation, focusing on areas with rice cultivation and suitable water bodies.
3. Provide personnel training on technology operation and maintenance.
4. Consider initial investment and operational costs for budgeting.
5. Offer training and post-training support, and explore collaboration with agricultural development institutions for implementation support.

Cost: $$$ **5,428 USD**
Initial Cost per Ha

ROI: $$$ **115 %**
Benefit

3,016 USD
Operating Cost

18,188 USD/ha
Benefit

IP
Open source / open access

Commodities

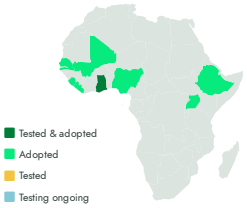
Rice, Fish

Sustainable Development Goals

Categories

Production, Practices, Water management, Production system

Tested/adopted in



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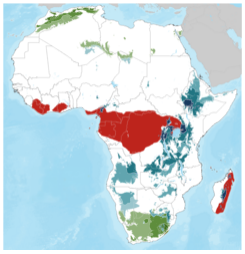


Target groups

Farmers, Fish Farmers

AKILIMO: Digital Decision Support Tool

We know cassava

AKILIMO is a digital application that provides personalized cassava farming advice using advanced algorithms. It offers guidance on planting, fertilizing, and harvesting based on user inputs, aiming to maximize yield and profit. It's accessible through various platforms, catering to all literacy levels.

This technology is pre-validated.

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

Gender assessment 5

Climate impact 7

Problem

- **Lack of Guidance**: Farmers lack personalized advice for optimal crop management and input usage.
- **Poor Strategies & Productivity**: Limited guidance leads to suboptimal farming strategies and lower productivity.
- **Inefficiency & Unsustainability**: Without proper advice, resource usage is inefficient and farming practices may be unsustainable.

Solution

- **Personalized Advice**: AKILIMO offers tailored, data-driven crop management recommendations.
- **Analytics & Optimization**: It uses advanced analytics for resource optimization, improving yields and reducing costs.
- **Sustainable Practices**: AKILIMO promotes environmentally friendly and responsible farming.

Key points to design your project

AKILIMO offers tailored advice for cassava farming, addressing key challenges like nutrient management, weed control, yield goals, climate risks, and resource access. It optimizes production, boosts profits, and minimizes waste.

Integrating AKILIMO:

- **Partnership:** Partner with EiA for advanced analytics and agronomic expertise, and with Extension Agents for effective farmer outreach and optimal use of AKILIMO.
- **Awareness & Training:** Host events and training to educate farmers and agents on AKILIMO's benefits and usage.
- **On-field Support:** Employ agents to assist farmers with AKILIMO navigation and advice application.
- **Accessible Interfaces:** Provide AKILIMO via printable guides, apps, IVR, and chatbots.
- **Demo Plots:** Showcase AKILIMO's effectiveness in demo plots to build trust.
- **Feedback Mechanism:** Establish feedback channels to enhance AKILIMO based on user input.
- **Expansion:** Scale AKILIMO to new regions and crops for broader impact.

Continuous efforts and farmer-centric focus are essential to making AKILIMO a valuable farming tool.

ROI: $$$ **2567 %**

EXCELLENCE IN AGRONOMY
Adapt Intensify Grow

Excellence in Agronomy
Barbra Sehlule Muzata

Technology from

CASH from EiA

Commodities

Cassava, Maize, Rice

Sustainable Development Goals

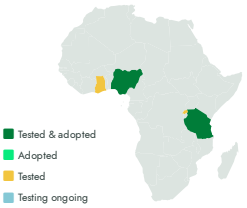
Categories

Production, Digital applications, Advisory and information service, Crop management

Best used with

- Six Steps to Cassava Weed Management ›

Tested/adopted in



Where it can be used

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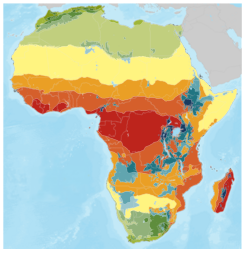


Target groups

RiceAdvice Lite: Digital Advisory for Rice

Empowering Rice Farmers with RiceAdvice Lite

Android or web-based decision support tool - RiceAdvice Lite provides field-specific recommendations on optimal sowing window and fertilizer management, and other good agricultural practices for irrigated and rainfed lowland rice.

This technology is pre-validated.

8·7

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

Gender assessment 3

Climate impact 1

Problem

- Fertilizer misuse
- Suboptimal rice management
- Impact on productivity and sustainability
- Risk to millions of people's food security

Solution

- Site-specific fertilizer recommendations
- Optimal planting times

Key points to design your project

"RiceAdvice Lite" is a digital tool offering personalized guidance for rice cultivation, addressing key challenges and optimizing farming practices. To integrate it into your project,

- Download the app,
- Identify business models,
- Invest in recommended technologies,
- Monitor progress, and promote adoption through partnerships.

IP

Unknown

EXCELLENCE IN AGRONOMY
Adapt Intensify Grow

Excellence in Agronomy
Ali Ibrahim

Technology from

CASH from EiA

Commodities

Rice

Sustainable Development Goals

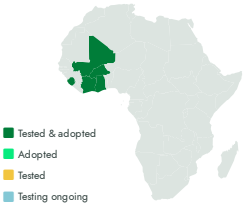
2 ZERO HUNGER

6 CLEAN WATER AND SANITATION

Categories

Production, Digital applications, Advisory and information service, Yield improvement

Tested/adopted in



Where it can be used

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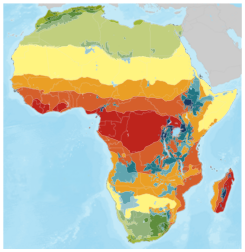


Target groups

Development institutions, Farmers, Governments

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

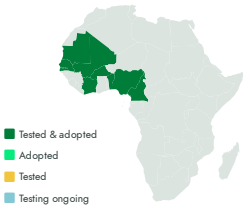
2 ZERO HUNGER

8 DECENT WORK AND ECONOMIC GROWTH

Categories

Harvest, Equipment, Post-harvest handling

Tested/adopted in



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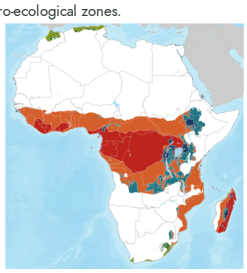


Target groups

Farmers

ARICA: Advanced rice varieties for Africa

Arica rice, the high yield, disease and stress tolerant rice

ARICA hybrid rice lines offer high yields and resistance to diseases and environmental stresses. Developed through advanced breeding methods, they must surpass benchmarks in yield and grain quality over three seasons. Field tests show ARICA 1, 2, and 3 outperform NERICA-L 19, boosting rice production and food security in Africa.

This technology is TAAT1 validated.

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

Gender assessment 4

Climate impact 7

Problem

- Traditional rice varieties in Africa yield inadequately.
- Common rice diseases and pests diminish yields and threaten food security.
- Environmental variability poses significant challenges, affecting crop growth and productivity.
- Traditional rice varieties struggle to adapt to diverse agroecosystems, resulting in suboptimal performance.

Solution

- ARICA varieties offer increased productivity and profitability.
- ARICA lines resist common rice diseases and pests, ensuring stable yields.
- ARICA hybrids withstand environmental stresses, ensuring consistent yields.
- ARICA varieties thrive in diverse agroecosystems, providing flexibility to farmers.
- Some ARICA lines possess traits like drought resistance and iron toxicity tolerance, addressing specific challenges.

Key points to design your project

- Steps to integrate ARICA technology:
  - Develop and certify tailored ARICA varieties.
  - Raise farmer awareness about benefits.
  - Facilitate financial support for seed purchases.
  - Provide training on cultivation and management.
- Accompanying solutions:
  - Deep urea placement for nitrogen management.
  - Foliar micronutrient addition for crop nutrition.
  - Engineered irrigation surfacing and water lifting.
  - Motorized weeders for effective weed control.
  - RiceAdvice digital support for comprehensive guidance.

Cost: $$$ **0,8 - 1,2 USD**
Initial cost of a Kg of seed

ROI: $$$ **40 %**
Increase in yield (income)

356 USD
Planting, maintenance, harvesting and winnowing

50 - 111 %
Potential yield

IP
Open source / open access

AfricaRice
Africa Rice Center
Sali Atanga Ndindeng

Technology from
ProPAS

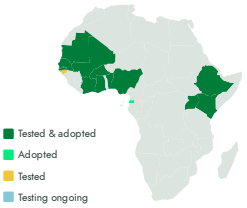
Commodities
Rice

Sustainable Development Goals

Categories
Production, Improved varieties, Yield improvement, Quality improvement

Best used with
- Nitrogen management for Efficient Rice Fertilization ›
- Foliar micronutrient addition for healthier rice ›
- Precision Rice Irrigation and Surface Leveling ›
- Motorized weeders for rice production ›
- RiceAdvice digital support ›

Tested/adopted in



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

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

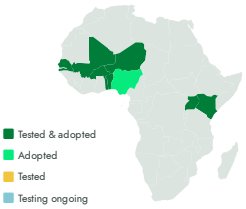
Rice

Sustainable Development Goals

Categories

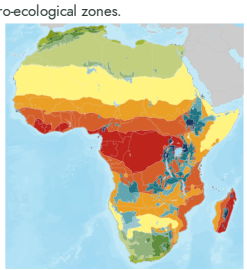
Production, Practices, Fertilizer management

Tested/adopted in



Where it can be used

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



Target groups

Farmers

Foliar micronutrient addition for healthier rice

Targeted nutrients for stronger crops and richer grain

Foliar micronutrient addition involves spraying liquid fertilizers onto rice leaves and stems. This ensures quick nutrient absorption, improving yields and grain quality with smaller quantities than soil application. Farmers apply the solution at key growth stages. This method boosts crop resilience and productivity, especially in nutrient-deficient soils.

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

- **Micronutrient Deficiencies and Low Yields:** Rice crops often lack essential micronutrients like zinc, copper, and boron, leading to low yields and poor grain nutrition.
- **Soil Nutrient Depletion:** Soils in Sub-Saharan Africa are increasingly depleted of vital nutrients, impacting crop health.
- **Inefficient Nutrient Uptake and Crop Vulnerability:** Traditional soil-based fertilizers result in inefficient nutrient absorption, making crops more susceptible to diseases and environmental stresses

Solution

- **Targeted Micronutrient Application and Efficient Uptake:** Spraying essential micronutrients like zinc, copper, and boron directly onto leaves addresses deficiencies, enhances nutrient availability, and maximizes absorption efficiency.
- **Increased Yields and Grain Quality:** Improved nutrient uptake results in higher rice yields and better nutritional quality.
- **Soil Health Improvement and Crop Resilience:** Supplementing with foliar micronutrients counteracts soil nutrient depletion and strengthens crops against diseases and environmental stress.

Key points to design your project

This technology on rice addresses low micronutrient content in Sub-Saharan Africa. It promotes sustainable agriculture, aligning with goals for food security and poverty reduction. To integrate this technology,

- Inform farmers, assess micronutrient deficiencies, formulate application plans, and provide resources.
- Estimate fertilizer and sprayer quantities, considering delivery costs.
- Training, communication support, and collaboration with agricultural institutes are crucial for successful implementation.

Cost: $$$ **41.1 USD**
Fertilizers

ROI: $$$ **7—30 %**
Yield increased

40 USD
Protective kits per person

30—45 USD
Knapsack sprayers with a tank of 20 liter

IP
Open source / open access

AfricaRice

Africa Rice Center
Sali Atanga Ndindeng

Technology from

ProPAS

Commodities

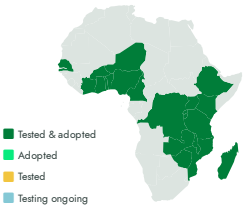
Rice

Sustainable Development Goals

Categories

Production, Inputs, Fertilizer

Tested/adopted in



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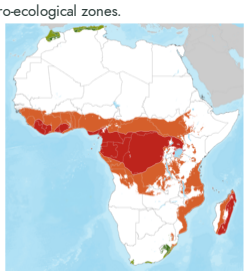


Target groups

Farmers

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

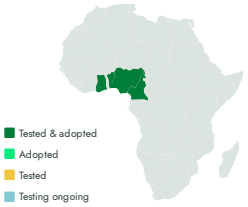
Categories

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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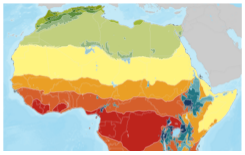


NERICA: High yield rice varieties for Africa

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

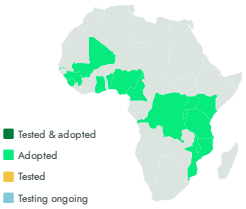
Rice

Sustainable Development Goals

Categories

Production, Improved varieties, Yield improvement, Drought tolerance

Tested/adopted in



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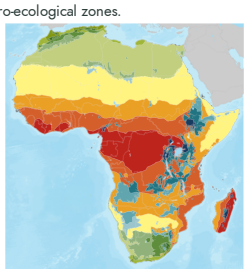


Target groups

Farmers, Seed companies

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

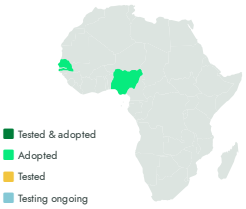
Rice

Sustainable Development Goals

Categories

Production, Improved varieties, Quality improvement

Tested/adopted in



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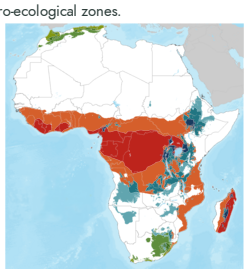


Target groups

Farmers, Seed companies, Sellers

Precision Rice Irrigation and Surface Leveling

Level Up Rice Yields with Precision Irrigation and Resource Conservation

These technologies involve creating flat surfaces in rice fields and using pumps to evenly distribute water. This helps farmers save water, energy, and nutrients, improving rice growth and increasing yields.

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

- The variation in ground level significantly impacts rice yield, with a notable decrease.
- Leveling the land requires substantial effort from farmers.
- The irrigation methods employed by farmers can be costly and, at times, stress the plants.

Solution

- Engineered irrigation surfaces ensures a uniform distribution of water across the crop, optimizing growing conditions.
- Laser-guided systems and mechanized tools reduce the manual effort required, making the process more accessible for farmers.
- Water lifting technologies provide efficient water delivery also contributes to healthier plant growth, alleviating stress on the crops.

Key points to design your project

Engineered irrigation surfaces and water lifting technologies address challenges in traditional rice improving productivity. To integrate them,

- Raise awareness, identify suitable methods, provide small loans, assess equipment needs,
- Consider delivery costs, engage trainers, develop communication materials,
- Collaborate with institutes, and associate with Motorized weeders for a comprehensive and sustainable approach.

Cost: $$$ **4 700—5 500 USD**

Add-on equipment

30—80 USD	1 000 USD	800 USD	IP
Hand-operated pumps	Solar-powered pump	High-pressure pumps	Unknown

Africa Rice Center
Sali Atanga Ndindeng

Technology from

ProPAS

Commodities

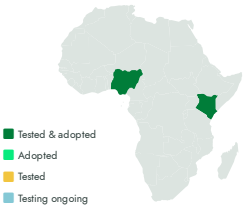
Rice

Sustainable Development Goals

Categories

Production, Practices, Water management

Tested/adopted in



Where it can be used

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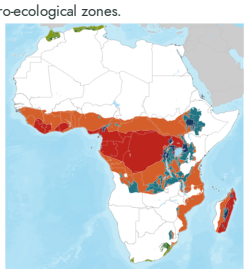


Target groups

Farmers

Cut and Bury: Motorized weeders for rice production

Effortless Weed Control for Bountiful Harvests

The Motorized Weeders for rice production (cut and bury) technology eliminate weeds in rice crops. The rotating blades of the weeders ensure effective weeding while minimizing damage to rice crops and soil. These machines can be used from the germination of rice plants until the canopy closes.

AfricaRice

Africa Rice Center
Kalimuthu Senthilkumar

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

- Labor-intensive manual clearing of paddy fields
- Inefficient weed control methods leading to reduced rice yields
- Limited access to affordable and effective mechanized weeders for smallholder rice farmers

Solution

- Introduction of motorized weeders for efficient clearing of paddy fields
- Adoption of mechanized weed control methods to increase rice yields
- Provision of affordable and effective mechanized weeders for smallholder rice farmers

Key points to design your project

The adoption of Motorized Weeders for rice production offers a solution to enhance agricultural efficiency and reduce labor-intensive tasks. Key steps to integrate this technology include:

- Informing farmers, importing or locally fabricating equipment.
- Organizing collective purchases or rentals, and facilitating access to small loans.
- Training and support for technology usage and maintenance are essential.

Cost: $$$ **550—750 USD**

Cut & bury with a 2-stroke petrol engine

ROI: $$$ **80 %**

Labour-saving for weeding.

IP

Open source / open access

Technology from

ProPAS

Commodities

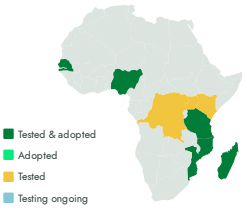
Rice

Sustainable Development Goals

Categories

Production, Equipment, Land preparation, Weed control

Tested/adopted in



Where it can be used

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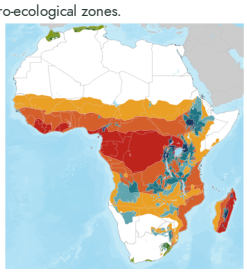


Target groups

Farmers

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

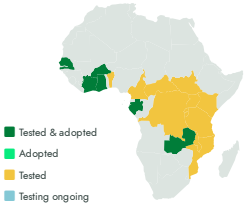
Prevention & storage, Equipment, Post-harvest handling

Best used with

Mechanized Threshing Operations

See all 1 technologies online

Tested/adopted in



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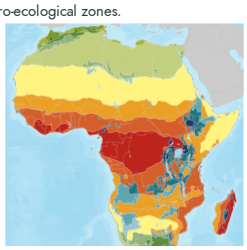

Rice Technologies Toolkit

https://taat.africa/ntx

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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