Climate Smart technologies

Climate-smart agriculture technologies for the sahel and horn of Africa

12 TECHNOLOGIES | CREATED ON APR 15, 2024 BY TAAT PROFILING TEAM | LAST UPDATED MAY 28, 2025

TECHNOLOGIES IN THIS TOOLKIT

- **PAC 501**: High yielding and drought tolerant white grain sorghum hybrid
- **Pond Liners to Save Water and Ease Maintenance**
- **IPM**: Integrated Management of Insects, Diseases and Weeds in...
- **Proactive Management of Striga Infestation**
- **Conservation agriculture**: Minimal Tillage and Surface Mulching of Soils
- **Urea deep placement**: Nitrogen management for Efficient Rice...
- **Seed Inoculation with Rhizobia**
- **Precision Fertilizer Micro-Dosing for Millet and Sorghum Yield**...
- **Motorized Planter and Fertilizer Applicator (Sénékéla)**: Mechaniz...
- **Contour Bunding Technique (CBT)**: Contour Bunds for Water...
- **DTMA & WEMA**: Drought Tolerant Maize Varieties and Water Efficient...
- **Heat and Drought Tolerant Wheat Varieties**

https://taat.africa/ier

PAC 501: High yielding and drought tolerant white grain sorghum hybrid

Unleash Prosperity with Our Drought-Tolerant White Grain Sorghum Hybrid

Advanta Seeds
Florent Clair

PAC 501 is a high-yielding, drought-tolerant sorghum hybrid that produces 4-4.5 tons per hectare, with early maturity and high nutritional value. It is widely adopted in Africa, improving productivity and resilience in areas with unpredictable rainfall.

This technology is pre-validated.

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

Gender assessment 4

Climate impact 4

Problem

- Sorghum crops face suboptimal yields, posing challenges for food security and farmers' income.
- Inefficient cultivation methods and less productive sorghum strains contribute to these low yields.
- Frequent periods of moisture stress negatively impact the growth and development of sorghum crops.
- Inadequate water availability during critical growth phases can result in significant yield losses.

Solution

This new varieties:

- Demonstrates robust performance under water scarcity conditions, mitigating crop growth impact.
- Highly responsive to key inputs, particularly fertilizer, optimizing resource use for improved yield and quality.
- Offers double the yield potential compared to Open Pollinated Varieties (OPVs), addressing low yields in traditional sorghum cultivation.

Key points to design your project

- The high yielding white grain sorghum hybrid technology boosts sorghum yields, aiding in poverty alleviation and combating food insecurity.
- Its drought tolerance enhances agricultural resilience to climate change.
- Improved cultivation practices contribute to land resource conservation and biodiversity.
- Steps for integration include conducting awareness campaigns, collaborating with public and private entities, providing capacity building for seed producers, and facilitating access to low-interest credit options.
- Collaboration with stakeholders such as seed companies, cooperatives, growers, and farmers is crucial for successful implementation.

Cost: $$$ **28 USD/ha**
Average cost of seeds for farmer

ROI: $$$ **288 %**
Gross income/inputs costs

800 USD/ha
average gross income

Commodities

Sorghum/Millet

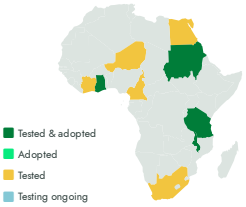
Sustainable Development Goals

2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
13 CLIMATE ACTION

Categories

Production, Improved varieties, Yield improvement, Quality improvement

Tested/adopted in



Where it can be used

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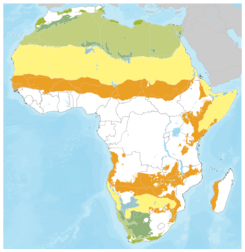


Target groups

Farmers, Seed companies

Pond Liners to Save Water and Ease Maintenance

Preserving Water, Pond Liners for Sustainable Fish Farming.

Pond liners, made of materials like PVC or polyethylene, act as synthetic geomembranes, preserving water, enhancing biosecurity, and simplifying pond maintenance. They are adaptable to various pond sizes and shapes, with plastic liners being robust but slightly harder to install in smaller ponds.

Excavated pond with liner

WorldFish
Bernadette Fregene

This technology is TAAT1 validated.

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

Cost: $$$ **500 USD**
a 15m x 10m x 1m pond.

ROI: $$$ **50 %**
reduction in water-related costs

2 - 3.5 USD/square meter
Sheet plastic

IP
Open source / open access

Problem

- Water seepage on porous soils like sands and silts causes significant water loss in ponds.
- Evaporation, especially in hot climates, further reduces water availability for fish farming.
- Algal blooms due to excessive nutrient levels can degrade water quality, affecting fish health and productivity.
- Inefficient nutrient cycling between water and sediment occurs without pond liners, necessitating intensive maintenance.
- Sandy soils and regions with limited access to freshwater are particularly vulnerable to water loss, worsening water scarcity for fish farmers.

Solution

- Prevents water loss and reduces evaporation by creating impermeable barriers.
- Enhances water quality by preventing algal blooms and promoting nutrient cycling.
- Facilitates pond construction in areas with porous soils or limited freshwater access.
- Offers flexibility in pond size and shape, accommodating different landscapes.
- Provides options for different liner materials, thicknesses, and installation techniques to suit diverse needs.

Key points to design your business plan

- Technology reduces water seepage and evaporation, conserving resources and cutting aquaculture costs.
- Promotes responsible water management, maintaining optimal water levels and preventing contamination.
- Aids in mitigating climate change impacts by conserving water and reducing emissions.
- Consider variable investment costs and delivery expenses for effective implementation.
- Context-specific methods should be identified for land leveling and water lifting.
- Key figures include plastic sheet costs, ranging from USD 2 to 3.50 per square meter.
- Plastic liner with sealing and installation costs around USD 500 for a 15 m x 10 m x 1 m pond.
- Rubber sheet lining can decrease water loss by up to 50%.
- Collaboration with aquaculture stakeholders is crucial for successful implementation.

Gender assessment 3

Climate impact 7

Technology from

ProPAS

Commodities

Fish

Sustainable Development Goals

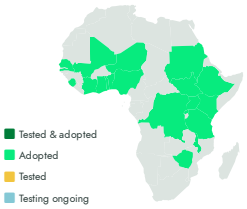
6 CLEAN WATER AND SANITATION

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Categories

Production, Equipment, Water management

Tested/adopted in



Where it can be used

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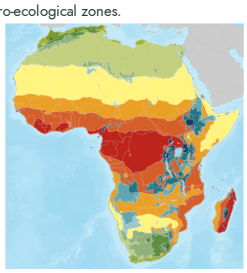


Target groups

Fish Farmers

IPM: Integrated Management of Insects, Diseases and Weeds in common bean

Smart Solutions for Safer Farming

IPM is a holistic approach to managing pests, diseases, and weeds in common bean cultivation, emphasizing environmental sustainability and food safety. It reduces reliance on chemical pesticides and promotes natural control mechanisms for crop productivity and food security.

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

- Common beans face threats from pests and diseases, affecting productivity.
- Chemical pesticides, though effective, pose health and environmental risks and can lead to pest resistance.
- Poor pest management can result in food insecurity and income loss for bean growers.
- Overreliance on pesticides disrupts natural ecological balance and control mechanisms.

Solution

- Holistic approach to crop protection
- Minimization of chemical pesticide usage
- Balanced ecosystems maintenance
- Understanding beneficial organisms' life cycles and interactions
- Utilization of strategies like natural predator release and cultural practices
- Effective against common bean pests, diseases, and weeds
- Adaptability to diverse soil and climate conditions

Key points to design your project

Integrated Pest Management (IPM) boosts crop productivity, ensures food security, and reduces pesticide-related health risks, promoting sustainability and biodiversity conservation. To integrate IPM into your project:

1. Identify pests and beneficial organisms, devising management strategies.
2. Understand short- and long-term benefits for pest control and costs.
3. Access control agents like predators and bio-pesticides, seeking guidance on their use.
4. Estimate needed quantities and provide proper training for application, factoring in training costs.
5. Develop communication materials and integrate IPM with other management practices.
6. Collaborate with agricultural institutes for successful implementation.

Cost: $$$ **5,000 USD**

Installation of rearing colonies of parasitoid wasps

6,000 USD	**0.5 - 1 USD**	**25 - 35 USD/Ha**	**IP**
Operation cost per year	Coating 1kg of seed	Pre-emergence herbicides	Open source / open access

Alliance

The Alliance of Bioversity International and the International Center for Tropical Agriculture (CIAT)

Justin Mabeya Machini

Technology from

ProPAS

Commodities

Common bean

Sustainable Development Goals

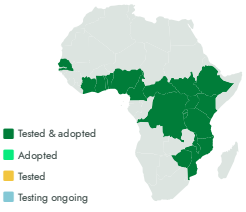
Categories

Production, Practices,
Pest control (excluding weeds),
Weed management

Best used with

- Mechanical and Chemical Weed Management ›
- Seed dressing of Seed with Fungicide and Insecticide ›

Tested/adopted in



Where it can be used

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

Proactive Management of Striga Infestation

Striga defended for farmers' empowerment

Sorghum severely infested by Striga

The technology for managing Striga infestation aims to tackle challenges like Striga weed and declining soil fertility. It involves simple farming methods like using less fertilizer, recycling organic matter, rotating crops, and planting Striga-tolerant varieties.

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
Dougbedji Fatondji

This technology is TAAT1 validated.

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

Gender assessment 4

Climate impact 6

Problem

- Striga attaches to the roots of maize, millet, sorghum, and rice, extracting nutrients and water delayed crop growth.
- Its causes a significant reduction in crop yield.
- The presence of Striga in fields can contribute to soil impoverishment.

Solution

- This technology proposes various agronomic practices such as fertilizer micro-dosing, organic matter recycling, crop rotation, intercropping, the use of Striga-tolerant varieties, seed dressing, pre-emergence herbicides, and hand weeding.
- It has led to an increase in sorghum and pearl millet yields by up to 60% within four years.

Key points to design your project

To integrate the technology:

- One needs to estimate fertilizer quantities,
- Consider delivery costs, provide training,
- Develop communication support, and
- Consider collaboration with agricultural institutes for optimal implementation.

ROI: $$$ **60 %**

Yield increase within four year

IP

Open source / open access

Technology from

ProPAS

Commodities

Sorghum/Millet

Sustainable Development Goals

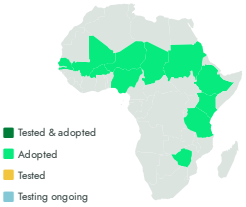
Categories

Production, Practices, Weed management

Best used with

- Precision Fertilizer Micro-Dosing for Millet and Sorghum Yield Enhancement ›

Tested/adopted in



Where it can be used

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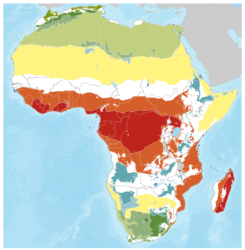


Conservation agriculture: Minimal Tillage and Surface Mulching of Soils

Conservation Agriculture for Sustainable Farming

Later ripening and better grain filling of wheat due to water conservation in no-till system (middle)

International Center for Agricultural Research in the Dry Areas (ICARDA)
Zewdie Bishaw

Conservation agriculture (CA) includes minimal soil disturbance, surface residue retention, and crop rotation, proven effective in dryland wheat farming. It improves soil quality, water use efficiency, and yield stability, while reducing costs and energy. Additionally, CA enhances soil biodiversity, mitigates emissions, and sequesters carbon, benefiting both farmers and the environment.

This technology is TAAT1 validated.

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

Gender assessment 4

Climate impact 7

Problem

- Excessive tillage and limited organic matter degrade soil quality.
- Droughts, intense rains, and overuse limit water availability.
- Dryland farming yields are low and vulnerable to water scarcity.
- Agriculture contributes to emissions and affects carbon storage.
- Traditional tillage leads to weed competition and yield reduction.

Solution

- Minimal soil disturbance, surface residue retention, and crop rotation.
- Enhanced soil quality, water efficiency, and yield stability.
- Mitigates drought and heat stress on crops.
- Saves water and reduces herbicide usage.
- Manages soil nutrients and pests effectively.
- Suitable for various soil types and water conditions.
- Increases resilience to environmental stresses.

Key points to design your project

The Minimal Tillage and Surface Mulching of Soils technology boosts crop productivity and ensures food security by maintaining consistent yields while conserving water and soil health. This method reduces agriculture's environmental impact, aiding in poverty alleviation and promoting sustainable livelihoods for farmers. To integrate this technology, it is essential to raise awareness of its benefits, ensure equipment accessibility, implement incentives for agroecosystem services, establish connections with food industries for market access, allocate resources for training and ongoing support, collaborate with agricultural institutions, and explore integration with complementary technologies.

Cost: $$$ **740 USD/ha**

Three-year average total production under CA

15 - 22 %	**18 - 21 %**	**20 %**	**923 USD/ha**	**IP**
Increase in yield	water use efficiency	increase in income	Increase in profit from wheat production	Open source / open access

Technology from

ProPAS

Commodities

Wheat

Sustainable Development Goals

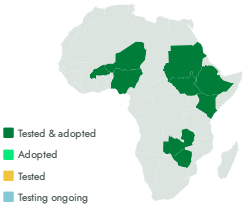
Categories

Production, Practices,
Pest control (excluding weeds),
Water management

Best used with

- Yellow Rust and Stem Rust Resistant wheat ›
- Hessian Fly Resistant Wheat Varieties ›

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

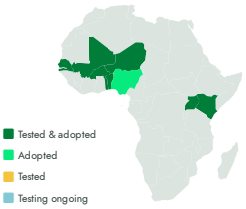
Rice

Sustainable Development Goals

Categories

Production, Practices, Fertilizer management

Tested/adopted in



Where it can be used

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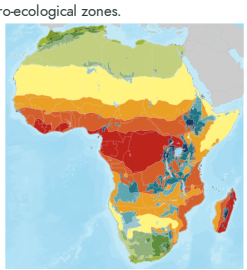


Target groups

Farmers

Seed Inoculation with Rhizobia

Boosting Crops, Nourishing Communities

The "two-step" procedure of seed inoculation that results in effective coverage with elite rhizobial (Source: the N2Africa Project)

Seed inoculation with elite rhizobium strains boosts legume yields by addressing nitrogen limitations through Biological Nitrogen Fixation (BNF). This cost-effective practice enhances crop production on small-scale farms in Africa, reducing reliance on expensive fertilizers, promoting environmental sustainability, and ensuring food, nutrition, and income security for farmers.

International Institute of Tropical Agriculture (IITA)
David Ojo

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

- **Nitrogen Deficiency**: Soils often lack sufficient nitrogen for plant growth.
- **Incompatible Rhizobia**: Newly introduced legume species may not be compatible with local rhizobia, leading to low yields.
- **Soil Health**: Maintaining soil fertility and health is a constant challenge.
- **Plant Diseases**: Farmers constantly battle against diseases that can devastate crops.
- **Sustainability**: Balancing economic viability with environmental sustainability is a major concern.

Solution

- **Biological Nitrogen Fixation**: Rhizobia address nitrogen deficiency.
- **Specific Strain Introduction**: Inoculation ensures the presence of the needed rhizobia.
- **Rhizobia Population Boost**: Inoculation guarantees optimal nodulation and nitrogen fixation.
- **Sustainable Farming**: Rhizobia promote sustainable agriculture.
- **Stress-Tolerant Strains Introduction**: Inoculation mitigates effects of stress on nitrogen-fixing symbiosis.

Key points to design your project

Rhizobia inoculant technology is a win-win for Africa:

It boosts food security (SDG 2), increases legume yields mean more food and income for farmers, especially women (SDG 5). Climate-smart agriculture (SDG 13), less reliance on chemical fertilizers reduces emissions.

To integrate this tech in your project, consider:

- Partnering with experts for training and quality control.
- Selecting suitable legumes and effective, adaptable rhizobia strains.
- Ensuring cost-effectiveness and proper distribution with storage and quality checks.
- Educating farmers and monitoring project success.

Cost: $$$ **15,000 USD**

Total cost of manufacturing one ton of dry inoculant

IP

Unknown

Technology from

ProPAS

Commodities

Soybean, Common bean

Sustainable Development Goals

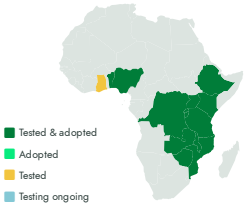
Categories

Production, Inputs, Inoculant

Best used with

- Climbing Bean with High Yield and N Fixation ›
- Biofortified Beans for Improved Nutrition ›
- Specialty Fertilizer Blends for Common Bean ›

Tested/adopted in



Where it can be used

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

Precision Fertilizer Micro-Dosing for Millet and Sorghum Yield Enhancement

Smarter Fertilizer, Stronger Crops: Maximize Growth with Minimal Input

The Fertilizer Micro-Dosing for Enhanced Yield and Efficiency Technology is a practice that involves applying small amounts of fertilizer in shallow holes at the base of each plant. This precise method is low-risk, affordable, and efficient.

This technology is TAAT1 validated.

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

Gender assessment 4

Climate impact 7

Problem

- Nutrient deficiencies in millet and sorghum
- Inefficient and risky fertilizer application methods
- Insufficient nutrient replenishment and gradual soil fertility decline
- Crop failure risk due to drought discouraging fertilizer investment

Solution

- Addressing nutrient deficiencies in millet and sorghum
- Providing a low-risk and precise fertilizer application method
- Fostering rapid crop growth

Key points to design your project

Micro-Dosing addresses nutrient deficiencies in millet and sorghum with precise, low-risk fertilizer application, promoting rapid growth, reducing environmental impact, and benefiting women. It aligns with climate-smart practices, enhances agricultural efficiency, and reduces poverty.

To integrate Micro-Dosing:

- Identify suitable fertilizers: Millet (50 kg/ha, 16,666 plants), Sorghum (100 kg/ha, 26,666 plants). Use NPK (15-15-15) or DAP fertilizers.
- Plan logistics: Include delivery costs, import clearance, and distribution to project sites.
- Raise farmer awareness through training and communication tools (flyers, videos, radio).
- Combine with stress-resistant crop varieties and Striga management for better results.
- Partner with agricultural institutes and fertilizer distributors for implementation.

This technology is applicable in Chad, Ethiopia, Kenya, Sudan, Tanzania, Burkina Faso, Mali, Niger, Nigeria, Senegal, and Zimbabwe.

Cost: $$$ **43 USD/ha**
Application without equipment

ROI: $$$ **15—108 %**
Increase in yield

IP
Open source / open access

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
Dougbedji Fatondji

Technology from

ProPAS

Commodities

Sorghum/Millet

Sustainable Development Goals

2 ZERO HUNGER · 12 RESPONSIBLE CONSUMPTION AND PRODUCTION · 13 CLIMATE ACTION

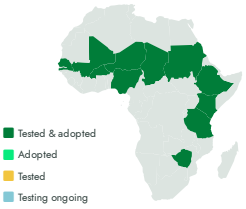
Categories

Production, Practices, Fertilizer management

Best used with

- Millet and Sorghum Varieties for Better Nutrition and Stress Resistance ›
- Dual-purpose Millet Varieties for Crop and Livestock Integration ›
- Proactive Management of Striga Infestation ›

Tested/adopted in



Where it can be used

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

Motorized Planter and Fertilizer Applicator (Sénékéla): Mechanized Tillers, Planters and Fertilizer Applicators

Make farming easier with planting and fertilizing machines

The motorized planter and fertilizer micro-dose applicator, known as "Sénékéla", provides precise and fast placement of seeds and mineral inputs on prepared soils or ridges. This technology is designed to reduce the workload for millet and sorghum producers.

This technology is TAAT1 validated.

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

Gender assessment 4

Climate impact 5

Problem

- Preparing the land, planting seeds and adding fertilizer by hand are too hard for farmers.
- It's take a lot of time to do and farmers spend much of money on animals or services to help

Solution

- Mechanizing farm activities to reduce the physical strain on farmers and lower the costs associated with maintaining animals or hiring services.
- It enables timely and efficient field operations, leading to increased crop productivity and higher profits.

Key points to design your project

The adoption of Mechanized Tillers, Planters, and Fertilizer Applicators offers a promising solution to enhance agricultural efficiency and reduce labor-intensive tasks. To integrate this technology, consider:

- Building public-private partnerships, demonstrating benefits to farmers,
- Providing training and technical support, linking to credit facilities,
- Evaluating equipment needs and costs and collaborating with agricultural institutes or fleet managers for implementation.

1000 USD

Unit of Sénékéla

IP

Open source / open access

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
Dougbedji Fatondj

Technology from

ProPAS

Commodities

Sorghum/Millet

Sustainable Development Goals

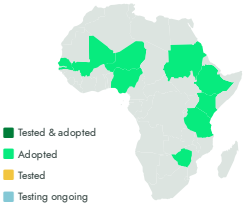
Categories

Production, Equipment, Land preparation

Best used with

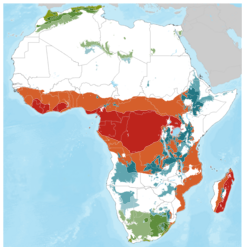
- Precision Fertilizer Micro-Dosing for Millet and Sorghum Yield Enhancement ›

Tested/adopted in



Where it can be used

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



Contour Bunding Technique (CBT): Contour Bunds for Water Harvesting

CBT: Nurturing Crops, Conserving Soil, and Cultivating Resilience

Semi-circular bunds reinforced with stones

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
Dougbedji Fatondji

The "Contour Bunding Technique (CBT)" is a farming strategy used in Africa's dry areas. It uses small walls built along field curves to collect water, reduce runoff, and prevent soil erosion. This enhances the soil's water retention, making it a practical solution for water scarcity in dryland farming.

This technology is TAAT1 validated.

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

Gender assessment 4

Climate impact 7

Problem

- **Water Scarcity**: Dryland farming often faces water shortages, making crop growth challenging.
- **Soil Erosion**: In dry areas, soil erosion and gully formation degrade soil health and productivity.

Solution

- **Water Management**: CBT uses walls to capture and store rainwater, increasing crop yields.
- **Soil Conservation**: CBT slows water movement, reduces soil erosion, and improves soil fertility.

Key points to design your project

The Contour Bunding Technique (CBT) promotes inclusivity and mitigates climate change impacts, contributing to several Sustainable Development Goals (SDGs). It's a valuable tool for sustainable agriculture and climate resilience projects.

To integrate CBT into a project:

1. **Raise Awareness**: Educate the community about CBT's benefits.
2. **Train Stakeholders**: Train agents and farmers on cost-effective bund construction techniques.
3. **Consult Farmers**: Discuss with farmers to understand water movement and determine optimal bund placement.
4. **Provide Resources**: Ensure access to necessary resources for building and reinforcing bunds.
5. **Monitor and Evaluate**: Track the effects of CBT on crop yields and soil health for continuous improvement.
6. **Engage Community**: Involve the community to ensure project sustainability and foster ownership.

Cost: $$$ **9 USD**

Drawing contour line per ha

40 %	20 %	IP
Runoff reduction	Sediment loss dicrease	Open source / open access

Technology from

ProPAS

Commodities

Sorghum/Millet

Sustainable Development Goals

2 ZERO HUNGER

13 CLIMATE ACTION

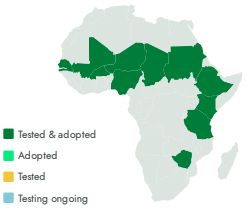
Categories

Production, Practices, Water management

Best used with

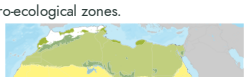
- Millet and Sorghum Varieties for Better Nutrition and Stress Resistance ›
- Precision Fertilizer Micro-Dosing for Millet and Sorghum Yield Enhancement ›
- Dual-purpose Millet Varieties for Crop and Livestock Integration ›

Tested/adopted in



Where it can be used

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



DTMA & WEMA: Drought Tolerant Maize Varieties and Water Efficient Maize Varieties

Enhance farm's resilience with DTMA and WEMA maize varieties, ensuring consistent yields even in unpredictable weather.

These seed technologies, developed conventionally and biotechnologically, enhance maize resilience to soil dryness and water scarcity, outperforming traditional varieties across various water stress levels in both dry and intermittently wet climates.

African Agricultural Technology Foundation (AATF)
Jonga Munyaradzi

This technology is TAAT1 validated.

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

Inclusion assessment 5

Climate impact 7

Problem

- **Dependence on Rainfall:** Over 90% of African maize farming is rainfed, leaving crops vulnerable to unpredictable weather patterns.
- **Yield Instability:** Conventional varieties are highly sensitive to water availability, leading to inconsistent yields.
- **Crop Failure Risk:** Insufficient rainfall can result in complete crop loss, jeopardizing livelihoods.

Solution

- **Enhanced Resilience:** DTMA and WEMA outperform conventional varieties under various water stress levels.
- **Increased Productivity:** Adoption of these varieties leads to substantial increases in maize grain production.
- **Improved Crop Resilience:** Crops become more robust, with heightened resistance to dry spells and low rainfall.

Key points to design your project

- Estimate seed quantity needed (0.8 to 1.2 USD per kg, 25 kg/ha).
- Factor in delivery costs, import duties (available in Kenya, Malawi, etc.).
- Arrange training and post-training support.
- Develop communication materials (flyers, videos, radio).
- Optimize with complementary techniques (e.g., IR maize, fertilizer blending).
- Collaborate with agricultural institutes and seed companies for implementation.

Cost: $$$ **0.8—1.2 USD/kg**	ROI: $$$ **240 USD**
Seed selling cost	Income per Ha
0.6 ton/Ha	**20—30 %**	**IP**
Yield increase	Larger grain harvest than common type	Unknown

Technology from

ProPAS

Commodities

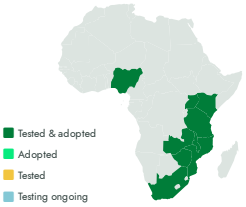
Maize

Sustainable Development Goals

Categories

Production, Improved varieties, Disease resistance, Yield improvement

Tested/adopted in



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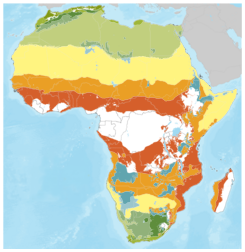
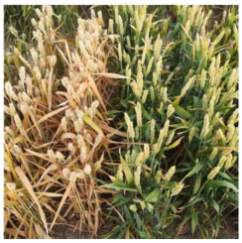


Target groups

Farmers

Heat and Drought Tolerant Wheat Varieties

Wheat cultivation in high temperature regions



These wheat varieties mature in 90 days, withstand temperatures 4°C above normal, maintain 75% yield under extreme conditions, resist diseases like yellow stem rust, and have high water use efficiency. They also good for bread flour with a protein content of 14-15%. Ideal for challenging environments like Sub-Saharan Africa.

ICARDA
Science for resilient livelihoods in dry areas

International Center for Agricultural Research in the Dry Areas (ICARDA)
Zewdie Bishaw

This technology is TAAT1 validated.

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

Gender assessment 4

Climate impact 7

Problem

- **Heat Stress**: Yield loss due to temperatures 4°C higher than normal.
- **Drought Conditions**: Poor performance with less than 200mm of moisture.
- **Low Productivity**: Traditional varieties yield much less than 6 tons/ha.
- **Limited Cultivation Zones**: Unsuitable for high temperatures and low rainfall areas

Solution

- **Heat Tolerance**: Withstand temperatures 4°C higher than normal.
- **Drought Resistance**: Perform well with less than 200mm of moisture.
- **Higher Yields**: Achieve up to 6 tons/ha.
- **Expanded Cultivation Areas**: Suitable for high-temperature and low-rainfall regions.

Key points to design your project

To integrate this technology

- Calculate seed quantity based on planting rate and cost,
- Consider sourcing logistics,
- Provide training and communication support, and
- Collaborate with agricultural institutes and seed multiplication companies for implementation.

Additionally, it's recommended to combine this technology with other wheat production methods for optimal results.

Cost: $$$

4 - 6 tons/ha	**100** kg/ha	IP
increase in yield	Planting rate	Unknown

Technology from

ProPAS

Commodities

Wheat

Sustainable Development Goals

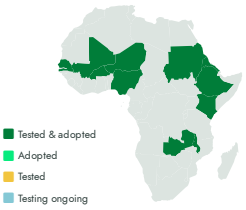
Categories

Production, Improved varieties, Drought tolerance, Heat tolerance

Best used with

- Wheat Cultivation in Dryland through Winter Irrigation ›
- Furrow Irrigated Raised Bed Wheat Production ›
- Yellow Rust and Stem Rust Resistant wheat ›

Tested/adopted in



Where it can be used

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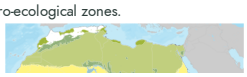

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Technologies for African Agricultural Transformation

Climate Smart technologies

https://taat.africa/ier

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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Technologies for African Agricultural Transformation

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