Aquaculture technologies Toolkit

This toolkit is a collection of technologies designed to optimize aquaculture production across Africa. These technologies have been selected to address the challenges encountered in aquaculture production, ensuring a more resilient and profitable aquaculture sector. By integrating these technologies into your projects or business plans, you can maximize yields while minimizin…

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

TECHNOLOGIES IN THIS TOOLKIT

- **Cage Systems for Fish farming**
- **Fast Growing and Hybrid African Catfish**
- **Hapa Nets for Fingerling**
- **Tank Systems for Fish farming**
- **Flow-Through and Recirculatory Water Systems for Fish Tanks**
- **In-Pond Raceway Systems for Fish Farming**
- **Affordable Fish Feed Production**: Formulation and Pelleting of Low-…
- **Aquaculture and vegetables Integration System**: Integrated…
- **Mechanized Processing and Value Addition for Fish Products**
- **Pond Liners to Save Water and Ease Maintenance**
- **Trace**: FairFood Traceability Solutions
- **Rice-fish culture**: Integrating rice and fish farming systems
- **GIFT "Genetically Improved Farmed Tilapia"**: All Male Tilapia…

https://taat.africa/afe

Cage Systems for Fish farming

Cage Culture: Dive Deep for a Sustainable Leap!

Cage Systems for Fish Culturing is a method where young fish are grown in submerged cages in large water bodies. The cages protect the fish, provide nourishment, and monitor their health. Once mature, the fish are harvested. This technique allows for natural, secure, and regulated fish farming, akin to a floating aquaculture facility.

Floating cage for tilapia farming inside Lake Victoria (Credit: Erick Ochieng Ogello)

WorldFish
Bernadette Fregene

This technology is TAAT1 validated.

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

Gender assessment 3

Climate impact 1

Problem

- **Space and Control:** Traditional fish farming requires large, expensive land and lacks control in open waters, leading to losses from predators and disease.
- **Water Quality:** In other forms, especially in small ponds, water quality can deteriorate quickly causing problems like low oxygen levels and harmful substance buildup.
- **Environmental Impact:** Some methods can negatively impact the environment, such as causing pollution from waste products.
- **Unpredictable Events:** In open waters, upwelling events can drastically change conditions in the cage, affecting fish health.

Solution

- **Space and Control**: Cage systems efficiently use water bodies, reducing the need for large land areas and providing a controlled environment for the fish.
- **Water Quality**: They help manage water quality issues common in other forms of aquaculture.
- **Environmental Impact**: Cage systems aim to minimize the environmental impact of aquaculture.
- **Upwelling Events**: High-tech solutions have emerged to predict and mitigate upwelling events.

Key points to design your project

Cage aquaculture systems are transforming fish farming in Africa. They offer a scalable, eco-friendly solution that boosts income and aligns with sustainability goals.

Successful implementation requires farmer training, key partnerships (including cage system manufacturers, feed suppliers, aquatic veterinarians, certification bodies, and local fishermen communities), water source assessment, understanding of market demand, and logistics planning.

Research institutions play a crucial role in providing the latest research on cage system technologies and best practices. Each partner brings unique resources and expertise, ensuring the project's success and sustainability.

150 USD

Fish cage of 8 cubic meter

IP

Open source / open access

Commodities

Fish

Sustainable Development Goals

1 NO POVERTY

2 ZERO HUNGER

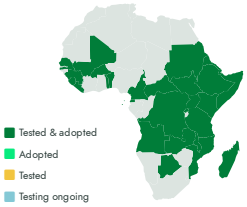
Categories

Production, Equipment, Aquaculture Systems

Best used with

- All Male Tilapia Fingerlings with Greater Yield and Uniformity ›
- Fast Growing and Hybrid African Catfish ›

Tested/adopted in



Where it can be used

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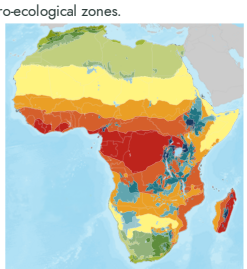


Target groups

Fish Farmers

Fast Growing and Hybrid African Catfish

Boosting Aquaculture with Resilient, Fast-Growing Catfish Hybrids

Fast Growing and Hybrid African Catfish" is developed to enhance freshwater farming in Sub-Saharan Africa. This technology involves the selective breeding and hybridization of two catfish species to create a superior hybrid offspring (Hetero-Clarias). The process of hybridization requires hormone-induced egg release in female catfish and the collection of seminal fluids from male catfish,...

WorldFish
Bernadette Fregene

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

- Limited availability of quality fingerlings
- Inadequate hatchery facilities
- High cost of fish feed
- Need for training for fish farm operators

Solution

- The Hetero-Clarias hybrid exhibits superior growth rate, higher survival, and greater hardiness compared to the parent species.
- Certified hatcheries provide a secure means to increase local supply of fast-growing and hybrid catfish.
- The produced hybrid catfish is sterile, allowing it to channel energy primarily into growth, resulting in better feed conversion and growth rates.

Key points to design your project

The fast-growing and hybrid African Catfish technology presents significant benefits for food security enhancement and climate resilience. To integrate this technology, consider activities such as:

- Pond construction, ensuring water quality, sourcing matured breeds or fingerlings, and providing balanced feed.
- Conduct awareness campaigns among farmers, ensure equitable access to fingerlings, estimate quantity and costs, engage trainers for support, and develop communication materials.

Cost: $$ **0.025—0.09 USD**
per gram of Catfish fingerlings

ROI: $$
per year

2500—3500 USD
Feed inputs for 8600—10000 Catfish fingerlings

IP
Open source / open access

Technology from

ProPAS

Commodities

Fish

Sustainable Development Goals

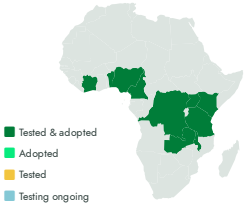
Categories

Production, Improved varieties, Yield improvement

Best used with

- Pond Liners to Save Water and Ease Maintenance ›
- Hapa Nets for Fingerling ›

Tested/adopted in



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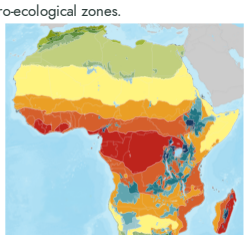


Hapa Nets for Fingerling

Hapa Nets for Mass Fingerling Hatchery Production

The "Hapa Nets for Mass Fingerling Hatchery Production" technology is cage-like enclosures in ponds to manage fish breeding and growth. Made of affordable materials, these nets enhance fingerling production by protecting fish from predators and controlling breeding conditions. They are adaptable to various aquaculture species and water bodies, improving overall production efficiency.

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

- Inadequate supply of high-grade fingerlings from improved fish breeds
- Poor and uneven growth rates, and high fingerling mortality in open ponds
- Predation by birds, reptiles, amphibians, and aquatic insects
- Difficulty in monitoring and managing brooders, hatchlings, and juveniles

Solution

- Safeguarding brooders, hatchlings, and juveniles from predators and other fish.
- Easing the management of brooder, fry, and fingerlings, enabling closer monitoring and adjustment of breeding, feeding, or aeration regimes.
- Increasing fertilization rates, promoting even growth of fish seed, and reducing mortality, leading to higher production of fry and fingerlings per unit area.

Key points to design your project

The technology facilitates affordable mass production of fingerlings, benefiting fish farmers by boosting income and ensuring food security through increased fish availability. It empowers women in aquaculture, fosters rural economic growth, and advocates sustainable practices to minimize environmental impact.

Key steps for incorporating the technology:

- Identify suitable pond locations and sizes.
- Procure appropriate net materials.
- Determine optimal stocking densities.
- Ensure access to high-quality, affordable feed.
- Promote the use of cultured fingerlings locally.

Allocate resources for training and support during implementation, collaborate with agricultural institutions, and consider integrating complementary technologies for optimization.

Cost: $$$ **1 USD**

Per square meter

150—900 fingerlings per square meter

Production in hapa

8—20 fish farmers

Number of fish farmers in a single hatchery

IP

Open source / open access

WorldFish

Bernadette Fregene

Technology from

ProPAS

Commodities

Fish

Sustainable Development Goals

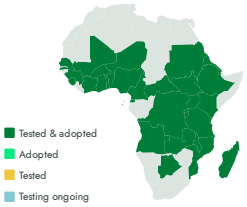
Categories

Production, Equipment, Aquaculture Systems

Best used with

- All Male Tilapia Fingerlings with Greater Yield and Uniformity ›
- Fast Growing and Hybrid African Catfish ›

Tested/adopted in



Where it can be used

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

Tank Systems for Fish farming

Aquaculture Innovation: Growing the Future, Nurturing the Waters

A concrete tank for raising catfish

A tank system for fish culturing is a land-based, intensive aquaculture enclosure. Made from materials like concrete or plastic, it requires a complete feed diet and can operate on various water and air supply systems. It's designed for high-density rearing of species like catfish and tilapia, with regular sorting needed. Success hinges on excellent water quality and year-round availability.

WorldFish
Bernadette Fregene

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

- **Resource and Environmental Challenges**: Limited land and water resources, difficulty in maintaining optimal water conditions, and significant environmental footprint of traditional methods.
- **Production and Efficiency Issues**: Limited capacity for high-density rearing, high death rates due to cannibalism, and inefficient feed use leading to slow growth.
- **Market Accessibility**: Increased costs and reduced freshness due to distance from markets.

Solution

- **Resource and Control Efficiency**: Less land and water usage with optimal environmental control.
- **Intensive Rearing and Survival**: High-density fish production with minimized cannibalism.
- **Market Proximity and Feed Optimization**: Close to markets with maximized food conversion.
- **Environmental, Biosecurity, and Energy Solutions**: Reduced footprint, disease risk, and energy use.

Key points to design your project

Tank systems in aquaculture offer a sustainable solution to traditional fish farming by providing a controlled environment for high-density stocking, using less land and water. They boost income and align with sustainability goals.

Implementing this technology involves:

- **Training** farmers on fish biology, feed and water management, and disease control.
- **Setting up infrastructure**, including tanks, water systems, aeration systems, and procuring quality inputs like fish seed and feed.
- **Implementing best practices** such as regular water monitoring, proper feeding, health checks, and establishing market linkages for produce sale.

Prerequisites include significant initial investment, continuous supply of quality water, access to training, understanding of local market demand, and logistics for produce transportation. These may vary based on local context and project objectives.

Cost: $$$ **120 USD**

Premade suspended tanks with a volume of 2000 liter

500 kg

harvest every 9months for a stocking rate of 50 fish per square meter

330 USD

Gross margin after deducting operating costs

Technology from

ProPAS

Commodities

Fish

Sustainable Development Goals

Categories

Production, Equipment, Aquaculture Systems

Best used with

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- Fast Growing and Hybrid African Catfish ›

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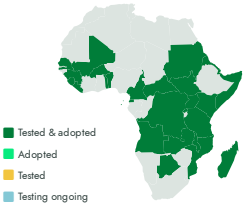

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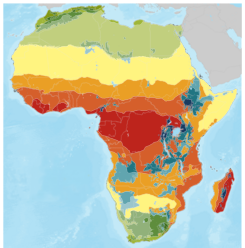


Flow-Through and Recirculatory Water Systems for Fish Tanks

Enhance fish farming efficiency with sustainable water systems, reducing resource wastage and ensuring robust fish growth.

Recirculatory Aquaculture Systems involve advanced setups for fish farming in tanks. They maintain essential conditions like oxygen levels and water temperature. Water is continuously filtered, ensuring a clean and healthy environment for the fish.

WorldFish
Bernadette Fregene

This technology is TAAT1 validated.

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

Gender assessment 4

Climate impact 4

Problem

- Challenges in maintaining water quality and oxygen levels for successful fish farming
- Need for effective waste management and control of pollutants in aquaculture systems
- Dependence on reliable water sources and electricity infrastructure for flow-through systems
- Cost and complexity of installing recirculatory systems compared to conventional methods

Solution

- Efficient use of limited land and water resources for higher density fish culture
- Maintenance of peak water quality conditions despite dense stocking rates
- Continuous water filtration and purification, leading to a healthier environment for fish
- Conversion of waste products into non-toxic substances for potential use in crop cultivation
- Flexibility in location choice based on water availability and electricity access

Key points to design your project

Steps to integrate RAS into a project:

- Assess water management needs based on farm settings and investment requirements.
- Acquire skills for installing and operating equipment under optimal conditions.
- Test water quality to determine pre- and post-treatment requirements.
- Estimate technology quantity and costs, including pumping, piping, and treatment expenses.
- Consider delivery costs, import clearance, and duties for project sites in relevant countries.
- Allocate resources for training and post-training support.
- Collaborate with agricultural development institutions to facilitate technology adoption.
- Explore integration with complementary technologies for enhanced efficiency.

Cost: $$$ **22000 USD**

Pumping and piping for recirculation system (130 m3)

44000 USD
Recirculation System (130 m3) treatment

1.5—5 USD
Settling of square meter pond construction

IP
Open source / open access

Technology from

ProPAS

Commodities

Fish

Sustainable Development Goals

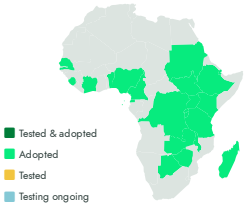
Categories

Production, Equipment, Aquaculture Systems

Best used with

- All Male Tilapia Fingerlings with Greater Yield and Uniformity ›
- Fast Growing and Hybrid African Catfish ›

Tested/adopted in



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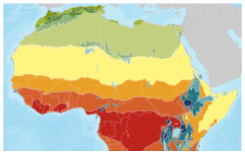


In-Pond Raceway Systems for Fish Farming

Revolutionize your fish farming with IPRS for maximum yields and sustainability.

The In-Pond Raceway System (IPRS) is an advanced aquaculture technology that maintains optimal water quality through continuous water flow and waste management, allowing for high-density fish farming.

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 pond farming limits fish productivity per area, reducing profits.
- Inadequate waste removal causes pollution and harms fish health.
- Traditional methods demand extensive land and labour, raising costs.
- Inadequate water circulation and oxygen levels lead to inefficient feed conversion.

Solution

- The In-Pond Raceway System (IPRS) enables stocking densities of up to 150 kg per cubic meter.
- IPRS recreates the fish's natural environment, promoting faster growth and keeping them free from diseases and stress.
- Production of higher-quality fish in less water and often exceeding traditional pond production by 200 to 300%.

Key points to design your project

The In-Pond Raceway System (IPRS) technology offers significant benefits for food security and climate resilience. To integrate it into your project, consider these steps:

- Choose a design and size of raceway that matches your objectives and resources.
- Ensure access to quality water and electricity supply for continuous flow.
- Train staff to minimize operating costs.

By following these steps, you can successfully integrate the IPRS technology into your project, thus enhancing food security and climate resilience.

Cost: $$$ **4 000 USD**
IPRS of 5 m long, 1.2 m wide, and 1.2 m deep

ROI: $$$ **30 %**
Profit margin increased

0.5882 kg of fish
for 1kg of feed

1.57 USD
8-month total variable costs per kg

0.31 USD
8-month total fixed costs per kg

IP
Patent granted

WorldFish
Bernadette Fregene

Technology from

ProPAS

Commodities

Fish

Sustainable Development Goals

2 ZERO HUNGER
8 DECENT WORK AND ECONOMIC GROWTH
13 CLIMATE ACTION

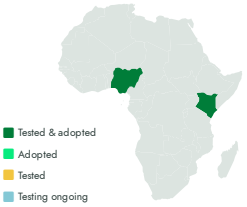
Categories

Production, Equipment, Production System

Best used with

- All Male Tilapia Fingerlings with Greater Yield and Uniformity ›
- Fast Growing and Hybrid African Catfish ›

Tested/adopted in



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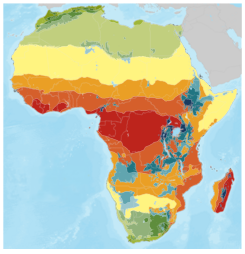


Affordable Fish Feed Production: Formulation and Pelleting of Low-Cost Feeds

Empowering Aquaculture with Affordable Feeds

The technology "Formulation and Pelleting of Low-Cost Feeds" aims to reduce the cost of fish feeds in Sub-Saharan Africa, where fish farms spend about 60-70% of their budget on imported feed. It promotes the use of local resources to produce quality, cost-effective and balanced fish feeds. This innovation could enhance the profitability and sustainability of fish farming businesses.

WorldFish
Bernadette Fregene

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

- Fish farming in Sub-Saharan Africa is costly due to expensive feeds.
- A large part of the cost is for imported feed ingredients.
- Simple, unprocessed grains used in feeds lead to poor nutrient transfer and pollution.
- High costs and inefficiencies limit the profitability of fish farming.

Solution

- The technology makes affordable fish feeds using local products.
- Pelleted feeds improve nutrient transfer and reduce pollution.
- Pellets are easier to store and transport, reducing costs.
- The technology allows feed customization for different fish species.

Key points to design your project

The "Formulation and Pelleting of Low-Cost Feeds" technology enables local production of affordable fish feeds in Sub-Saharan Africa, contributing to several SDGs. Implementation involves organizing raw ingredients, selecting a site, procuring equipment, packaging, marketing, and contracting. It requires understanding of fish species' nutrient requirements, local feed ingredients, and feed formulation. The technology can be combined with other aquaculture technologies and requires collaboration with key partners like research institutions, local farmers, and government agencies.

Cost: $$$ **1,200 USD**

Production of 1 ton

85,000 USD

Equipment of production

Technology from

ProPAS

Commodities

Fish

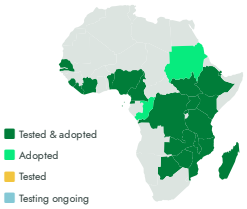
Sustainable Development Goals

2 ZERO HUNGER

Categories

Production, Inputs, Fertilizer

Tested/adopted in



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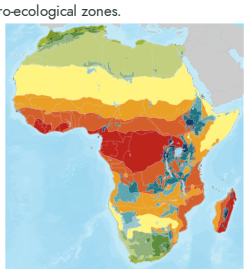


Target groups

Breeders

Aquaculture and vegetables Integration System: Integrated Aquaculture and Agriculture Systems

A floating aquaponic system

Aquaculture and Crops system for better yield

"Integrated Aquaculture and Agriculture Systems" is a method where fish and plants are co-cultivated. Fish waste serves as plant fertilizer, while plants purify the water for fish. This system optimizes resource use and enhances productivity in both aquaculture and agriculture.

WorldFish
Bernadette Fregene

This technology is TAAT1 validated.

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

Gender assessment 4

Climate impact 6

Problem

- Depleted soil: Reduced crop yields due to nutrient loss.
- Limited land: Difficulty expanding agriculture due to scarce arable land.
- Water competition: Farmers and fishers compete for water resources.
- High feed costs: Traditional fish farming methods are expensive.

Solution

- Waste to Wealth: Fish waste nourishes crops, reducing fertilizer costs.
- Double Duty: Fish and crops share land, maximizing output.
- Water Sharing: Same water sustains both fish and crops.
- Feed Savings: Crop leftovers become fish food, lowering costs.

Key points to design your project

Integrated Aquaculture and Agriculture Systems provide more income for farmers (women too, with fair access), cleaner water from less fertilizer. It supports UN goals on equality, sustainability, hunger.

To integrate in the project, consider:

1. Work with local farmers, fishers, and experts.
2. Pick a good spot with water and markets nearby.
3. Start small, choose fish & crops that work together.
4. Train farmers on fish & crops, system care.
5. Spread the word: flyers, radio, demos.

Costs can vary depending on project scale.

2,000 USD
annual maintenance cost for 0.5 ha

50-100 USD	2,466 USD	250,000 USD	IP
one square metter of hydroponic plastic beds	average net income per acre	for 0.5 ha of fully equipped aquaponic system	Open source / open access

Technology from

ProPAS

Commodities

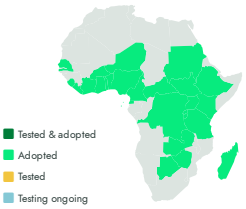
Vegetable crop, Fish

Sustainable Development Goals

Categories

Production, Practices, Yield improvement

Tested/adopted in



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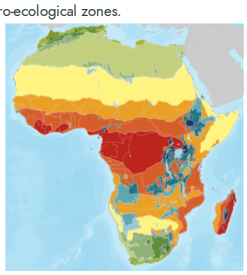


Target groups

Farmers

Mechanized Processing and Value Addition for Fish Products

From Catch to Cuisine: Enhancing Fish Quality and Sustainability

Smoking kiln suitable for processed fish products

This technology is a fish processing and preservation method involving the use of equipment such as solar tent dryers and smoking kilns. Solar dryers offer a low-cost alternative to refrigeration, and smoking kilns utilize smoke to kill microorganisms while drying the fish.

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

- Post-Harvest Losses, significant post-harvest losses occur due to bacterial activity and oxidation.
- High ambient temperatures in many regions accelerate the spoilage of fish,
- The availability of mechanized equipment and maintenance might pose challenges, particularly in resource-constrained areas.
- Traditional smoking kilns may consume significant energy and time.

Solution

- Fish processing and preservation technologies extend the shelf life of highly perishable fish, reducing post-harvest losses.
- These methods improve the palatability, taste, and nutritional value of fish products, enhancing their market acceptance.
- Solar tent dryers and smoking kilns are cost-effective and widely used, eliminating the need for refrigeration during transport and storage.

Key points to design your project

The Mechanized Processing and Value Addition for Fish Products technology enhances efficiency and sustainability in fish processing. To establish a fish processing operation, follow these steps:

- Develop a business plan and secure funding for equipment and premises.
- Train staff on safe and hygienic processing practices.
- Ensure a steady supply of fish for optimal facility operation.
- Access reliable utilities and fuel affordably.
- Market finished products to maintain cash flow.

1500 USD

Handheld electric fish scaler

1,000 USD	2,500 USD	2,000 USD	IP
Filleting equipment	Equipment for skinning and deboning 10 to 20 fish/minute	A greenhouse-style solar dryer 15 m × 8 m with capacity of 850 kg fish per batch	Patent granted

WorldFish

Bernadette Fregene

Technology from

ProPAS

Commodities

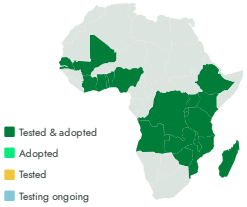
Fish

Sustainable Development Goals

Categories

Transformation, Practices, Agri-food processing

Tested/adopted in



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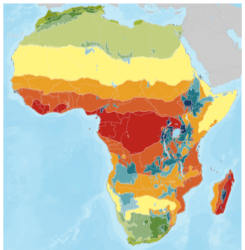


Target groups

Processors

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

Gender assessment 3

Climate impact 7

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 project

The pond liners technology conserves water resources, reduces evaporation, and promotes responsible water management in aquaculture, benefiting biodiversity and sustainable fisheries. To integrate this technology into a project:

1. Assess project requirements.
2. Select suitable liner material.
3. Obtain necessary equipment.
4. Provide comprehensive staff training.
5. Implement installation according to guidelines.
6. Ensure ongoing training and support.
7. Develop communication materials.
8. Collaborate with relevant stakeholders for effective implementation.

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

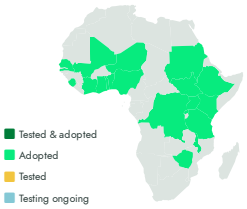
Technology from
ProPAS

Commodities
Fish

Sustainable Development Goals
6 CLEAN WATER AND SANITATION
12 RESPONSIBLE CONSUMPTION AND PRODUCTION

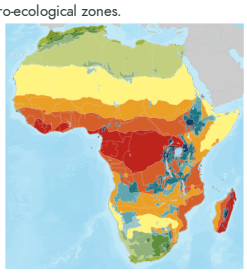
Categories
Production, Equipment, Water management

Tested/adopted in



Where it can be used

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



Target groups
Fish Farmers

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

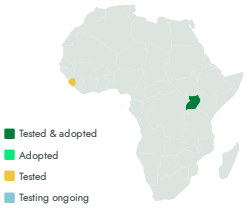
Common bean, Cassava, Cowpea, Leguminous, Maize, Sorghum/Millet, + 9 more

Sustainable Development Goals

Categories

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

Tested/adopted in



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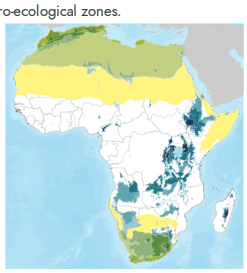


Target groups

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

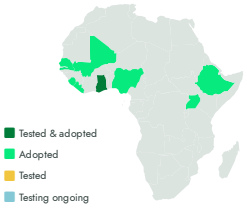
Rice, Fish

Sustainable Development Goals

Categories

Production, Practices, Water management, Production system

Tested/adopted in



Where it can be used

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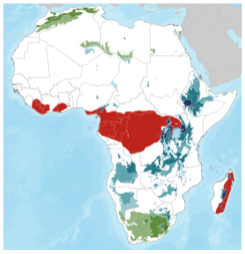


Target groups

Farmers, Fish Farmers

GIFT "Genetically Improved Farmed Tilapia": All Male Tilapia Fingerlings with Greater Yield and Uniformity

Greater yield and uniformity in tilapia farming

The technology involves predominantly growing male tilapia. This can be achieved through various methods such as manual selection, hormone treatment, or natural techniques. Specifically bred tilapia (GIFT) is recommended for commercial farming.

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

- Mixed-sex tilapia culturing often leads to lower yields and non-uniform harvests.
- Manual sex selection at the beginning of the production cycle is time-consuming.
- Hormonal alteration of fry involves the application of α-Methyltestosterone, which may pose concerns regarding its use in feed and its impact on fish health and the environment.

Solution

- Utilizing improved lines of tilapia breeds can enhance the effectiveness of manual selection, hormonal treatment, YY male technology, and GIFT.
- Crossbreeding strategies can produce 100% male offspring, improving mono-sex tilapia production efficiency.
- Careful management of brood stock selection in hatcheries, focusing on younger brooders free from wounds and parasites, ensures high-quality and abundant fish seed production.

Key points to design your project

The mono-sex male tilapia technology aligns with Sustainable Development Goals, promoting food security, gender equality, climate action, and marine life preservation. To integrate this technology, consider:

- Feasibility studies,
- Legal frameworks, and specialized training for farmers. Training costs and
- Communication support should be included.
- Accompanying solutions include Hapa Nets for Mass Fingerling Hatchery Production.

Cost: $$$ **100 USD**
Stocking rate of 1,000 fish per cubic meter of water

ROI: $$$ **30 %**
Harvest volume increased

0.1 USD
Cost of one month mono-sex fingerlings in Kenya

300 - 900 g
Weight of male fingerlings stocked in cages in 5 to 8 months of culture

IP
Patent granted

WorldFish
Bernadette Fregene

Technology from

ProPAS

Commodities

Fish

Sustainable Development Goals

2 ZERO HUNGER
8 DECENT WORK AND ECONOMIC GROWTH

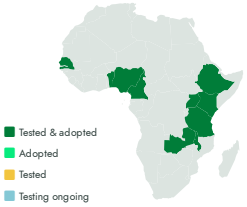
Categories

Production, Improved varieties, Yield improvement

Best used with

- Hapa Nets for Fingerling ›

Tested/adopted in



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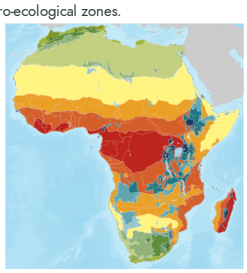

Target groups

Breeders

Aquaculture technologies Toolkit

https://taat.africa/afe

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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