

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.

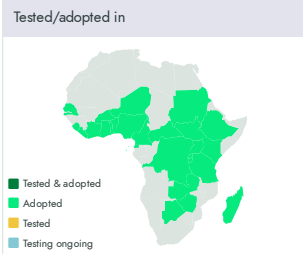
WorldFish Center
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Technology from
ProPAS

Commodities
Fish, Pepper, Onions, Tomato, Okra

Sustainable Development Goals

Categories
Production, Practices, Yield improvement



Target groups
Farmers

This technology is **TAAT1 validated**.

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

Inclusion 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.
 - **Food insecurity:** Difficulty accessing affordable protein.
 - **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.
 - **Protein on the Plate:** Fish farming provides affordable protein.
 - **Feed Savings:** Crop leftovers become fish food, lowering costs.

Key points to design your program

Integrated Aquaculture-Agriculture Systems (IAAS) establish a circular production model that recycles nutrient-rich fish water to fertilize high-value vegetable crops, improving resource-use efficiency, farm profitability, and food security. Suitable for urban and peri-urban agriculture, climate resilience, integrated farming systems, and agribusiness development programmes, the technology contributes to **SDGs 2 (Zero Hunger), 3 (Good Health and Well-being), 8 (Decent Work and Economic Growth), 11 (Sustainable Cities and Communities), and 13 (Climate Action)** while creating new business opportunities for women and youth.

To successfully integrate this technology, consider the following key actions :

- Identify suitable production areas with reliable water resources and good market access, including humid and sub-humid zones, dryland water-harvesting systems, floodplains, reservoirs, and gravity-fed production areas.
- Establish partnerships with WorldFish, research institutions, extension services, hatcheries, irrigation specialists, farmer organizations, and private-sector service providers to support integrated production systems.
- Support integrated production infrastructure, improved fish breeds, high-value vegetable production packages, and farmer training on water quality management, nutrient recycling, irrigation, and integrated farm business management through demonstration activities.
- Monitor water-use efficiency, fish and vegetable productivity, farm profitability, technology adoption, and programme outcomes.

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



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