

# NGO NEXUS: SHARING SUCCESS

Aquaponics: Empowering Communities through Employment and Nutrition

## Leveraging knowledge

The goal of this document is to encourage the sharing of effective strategies among NGOs and community-based organisations, aiming to strengthen a network of individuals driving positive change. Leveraging the expertise found in SIP's best practices, this information serves as a guidance for distribution and implementation of best practices.

### What is aquaponics?

Aquaponics is a farming method that combines aquaculture (the cultivation of aquatic organisms like fish) with hydroponics (the growing of plants in nutrient-rich water without soil). Fish waste contains ammonia, which is converted into nitrates by beneficial bacteria. Plants utilize these nitrates as nutrients, purifying the water for the fish. The water is then recirculated back into the fish tank, creating a closed-loop system.

## The Social Employment Fund

The Social Employment Fund (SEF), managed by the Industrial Development Corporation, has provided meaningful work for over 89,000 individuals in various community-benefitting areas in just over a year.

Strategic Implementing Partners (SIPs) are tasked with employing a minimum of 1,000 participants for 16 hours per week in projects serving the common good.

Currently, the SEF collaborates with 37 SIPs in areas like community health, education, greening, and arts, who, in turn, partner with over 1,000 community organisations.

Visit the [SEF microsite](#) for more information



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# Why aquaponics?

Aquaponics holds promise for enhancing food security and nutrition in marginalized communities by offering a sustainable and resource-efficient means of food production. In areas with limited access to arable land or clean water, aquaponics can provide a reliable source of both protein (from fish) and fresh vegetables.

## Social Impact

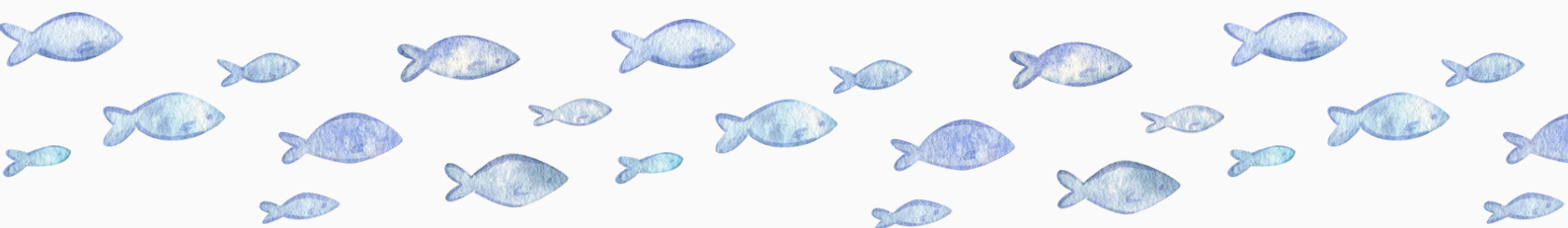
- Provides access to fresh, nutritious produce in food-insecure regions.
- Empowers communities to engage in local food production and entrepreneurship.

## Economic Viability

- Maximizes yield in limited space, making it suitable for urban farming.
- Diversifies income streams through both fish and plant sales.

## Environmental Sustainability

- Reduces water usage by up to 90% compared to traditional farming.
- Minimizes soil erosion and degradation.
- Eliminates the need for synthetic fertilizers and pesticides.

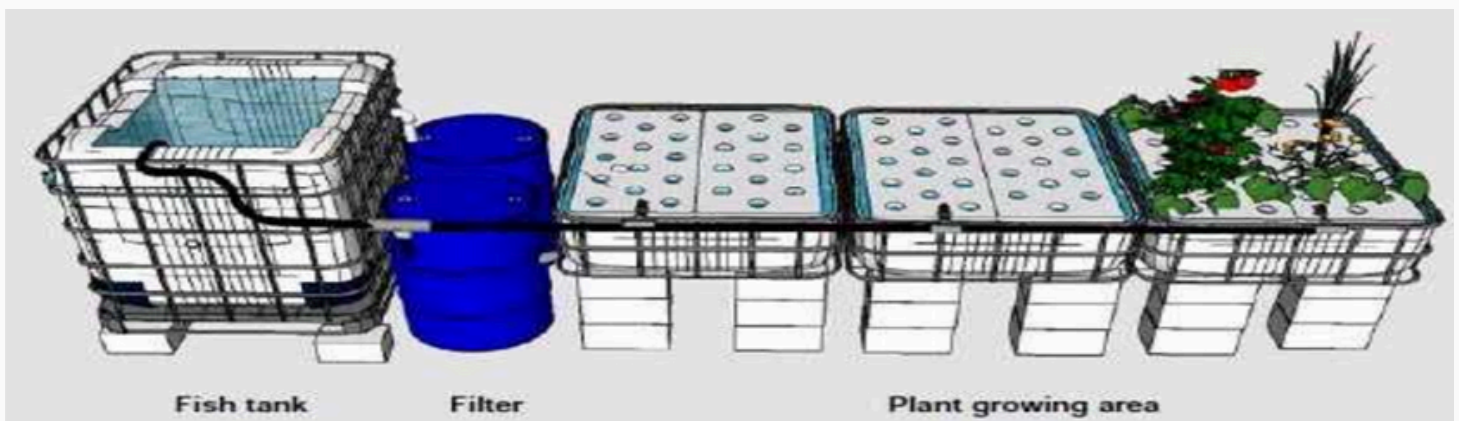


# Getting started: which aquaponic model to choose

You might be wondering where to begin, how to understand the different aquaponic models, and which one aligns best with what you are trying to do. Below, three different aquaponic models are outlined along with the advantages and disadvantages of each.

## 1. Deep water culture system

- The system is equipped with a filter separated from the grow beds that are filled with water and have floating artificial rafts (e.g. polyethylene sheets) on their top.
- The rafts have several holes in which the plants are cultivated with their roots hanging into the water.
- The water flows continuously into the system thanks to a large pump.
- The filtration components include a clarifier and degassing and biofiltering tanks.

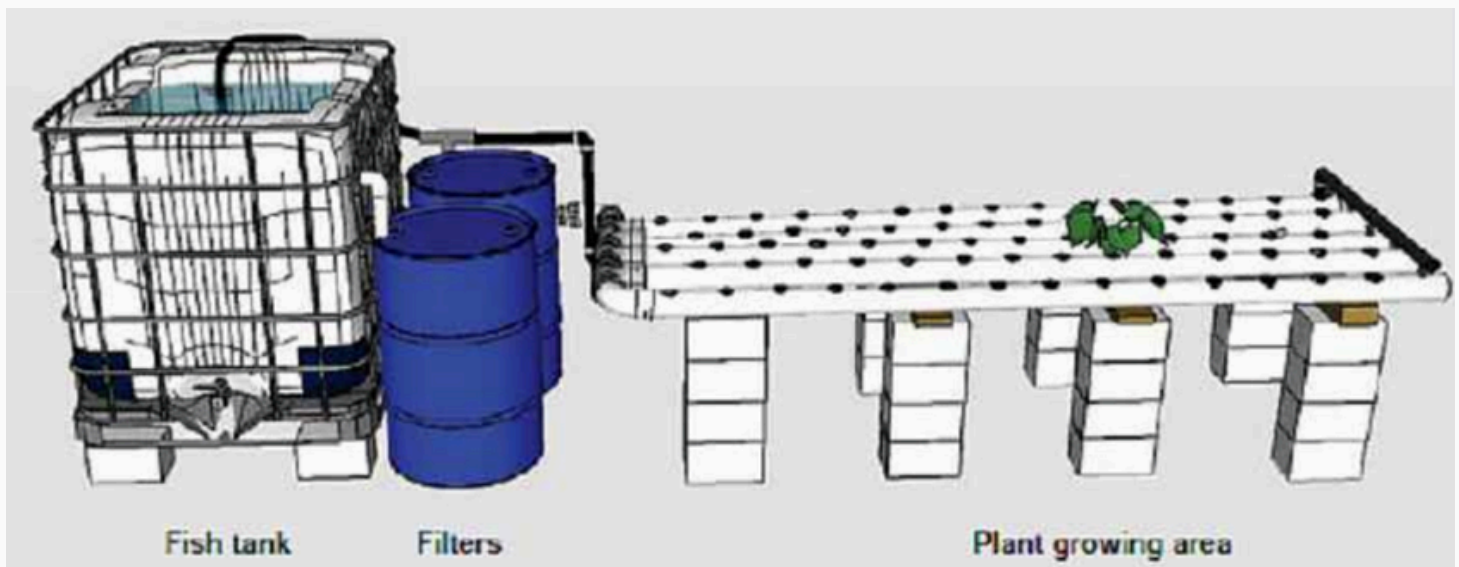


Advantages	Disadvantages
Highly productive.	Several components to manage.
High fish stocking capacity.	It requires high volume of air (it needs many air stones in the fish tank and into the beds).
Good for commercial production of plants.	Daily and periodic cleaning operations required.
Large volume of water provides a more stable aquatic chemical environment.	The heavy weight of the water forces to place the grow beds only on the floor.
Rafts and the plant roots provide additional area for bacteria growth.	Risk of anoxic spots into the hydroponic beds.

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## 2. Nutrient film technique

- The beds are made of tubes or plastic trays with several holes in which the plants are cultivated; a thin layer of water flows continuously on the bottom of the beds to keep moist the roots of the plants.
- The plant growing area can be positioned at the height that allows the operator to work standing.

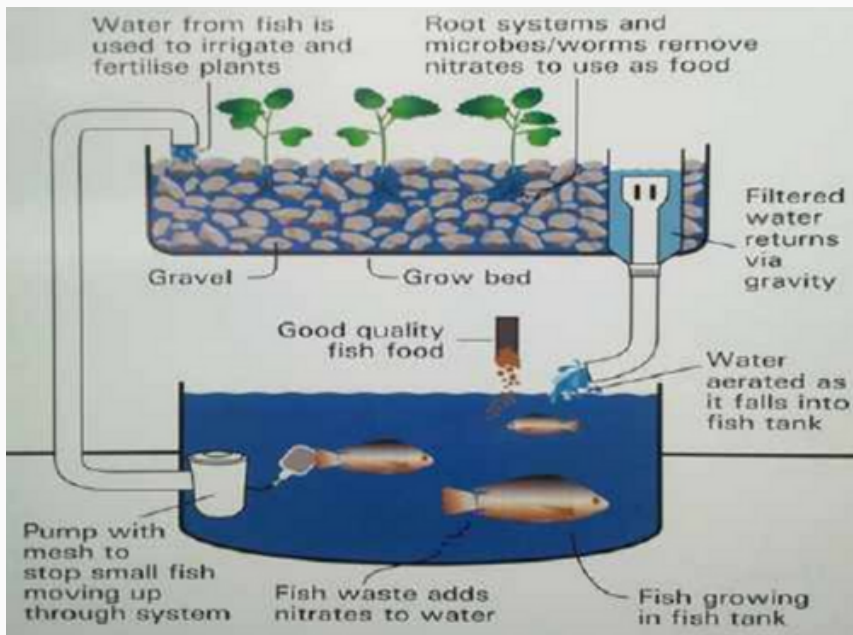


Advantages	Disadvantages
Ideal for leafy crops and herbs.	Filter components to manage frequently.
High ratio of plants to fish.	Low volume water doesn't allow buffer effect.
Appropriate for roofs thanks to the low weight.	Daily need of checking water parameters.
Crop is clean without any need of washing.	Risk of losing the crop if energy is off for some time or the temperature is changing in a short time.
Easy switch from Hydroponics to Aquaponics.	A failing pump can kill an entire crop within a few hours.
The plant roots provide additional area for bacteria growth.	Doesn't work well with plants that have large tap-root systems.
	Doesn't do well with plants that need a lot of support.

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## 3. Medium bed design

- All the water and sludge coming from the fish tank are pumped into the medium-filled grow beds where bacteria transform ammonia and mineralize the organic matter, providing nutrients to the plants.
- Commonly used media are expandable clay pebbles, limestone gravel and coconut fibre.



Advantages	Disadvantages
Easy management thanks to the included biofilter into the grow bed.	Substrate and pipes can be periodically clogged.
Solid fish waste are used.	Emptying the beds is required when media needs to be washed accurately.
Good for obtaining multiple crops.	Untreated accumulated solid waste is responsible for anoxic events in the bed.
Many plant species can be cultivated.	
Simplest and easiest to understand.	
Popular in the less developed countries.	
High oxygenation good for roots and bacteria.	

THIS DOCUMENT WAS CO-CREATED BY THE SOCIAL EMPLOYMENT NETWORK WITH INMED AND OTHER STRATEGIC IMPLEMENTATION PARTNERS. ITS PURPOSE IS TO FACILITATE INFORMATION SHARING AND THE DISSEMINATION OF BEST PRACTICES.

## INMED

INMED South Africa is registered non-profit humanitarian development organisation dedicated to breaking the complex cycles of hunger, poverty and unemployment through climate adaptive agriculture for more than a decade in South Africa. Among others, INMED uses aquaponics as means introduce small-scale farmers and households to agri-aquaculture through the ASE model which is designed to address:

- 2.5 million South Africans experience hunger every day
- 59,2% of South Africa's children live below the upper-bound poverty line
- 1 in 5 live in extreme poverty

Since 2006, INMED has strengthened food security in vulnerable communities in five of South Africa's nine provinces and has provided the necessary training and economic development for women, youth and people with disabilities to create sustainable incomes, achieve self-reliance and build resilient communities.

**For more information reach out to Unathi Sihlahla, Director of INMED South Africa and INMED Aquaponics® at [usihlahla@inmed.org.za](mailto:usihlahla@inmed.org.za)**



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