



**Ministry of Agriculture,  
Land & Fisheries**  
**Fisheries Division**  
*Aquaculture Unit*

# Aquaponics



## What can be grown in an Aquaponics System?

### Vegetables & Fruits

Nearly any type of crops can be grown in aquaponics systems but leafy green vegetables and other short term vegetables crops are more profitable.

Common products are;

- Lettuce, chive, celery
- Sweet pepper, hot pepper, melongene, tomatoes
- Ornamental plants (flowers)
- Fruits



### Fish

Fish species to be used for food or ornamental purposes can be grown in aquaponics systems.

Common examples are:

- Tilapia, Cascadurua, Koi, Goldfish



**Fish Food**



**Ornamental**



**Tilapia**



**Cascadura**

## What does this mean?

### For a commercial producer or farmer:

- Space saving designs can maximize under utilized land space and does not require arable land.
- Increased production over traditional methods leads to increased profit.
- Ability to produce high quality protein (fish) and vegetables simultaneously.
- Can produce ornamental species of plants and fish.
- Organic/Naturally grown produce is a trending niche market, and organic food products fetch higher prices.



### For a subsistence home user:

- Ability to grow cost effective, healthy organic produce at home
- Encourages and promotes healthy lifestyles.
- Satisfaction in growing own produce.
- Self sustenance in food production.

**MINISTRY OF AGRICULTURE, LAND & FISHERIES**

**FISHERIES DIVISION**

**AQUACULTURE UNIT**

**AQUACULTURE DEMONSTRATION CENTRE**

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## What is Aquaponics

**Aquaponics** is the integration of two agricultural practices, **Aquaculture** and **Hydroponics** which yields a farming system that provides plant crops and fish. The methodology does not utilize artificial fertilizers.

**Aquaculture** – The cultivation of aquatic organisms under controlled or semi controlled conditions.

**Hydroponics** – Growing of plants in an inert media (soil less) using a nutrient rich chemical based solution.

The combination of these agricultural methods create a hybrid system that is efficient, natural and environmentally friendly.



Aquaponics



Hydroponics



## Advantages of Aquaponics

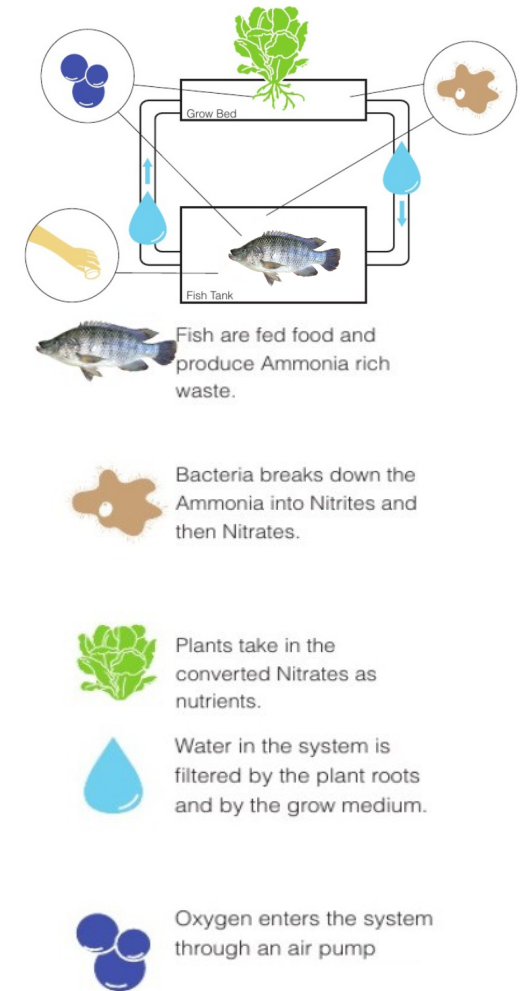
- Uses 80% less water for plant production than traditional farming methods.
- High stocking density of fish due to recirculating methodology. (0.7 lbs per gallon)
- Increased yield & faster growth rates of fish and plants due to continuous ideal conditions.
- Can obtain fish and plant production year round.
- Natural Pest control by intercropping with Allelopathic plants.
- Low maintenance (Therefore no need for; weed control and tillage)
- There is no need for artificial fertilizers and pesticides.
- Can be done virtually anywhere.
- The plant component is a functional bio filter and also generates income.



## Disadvantages of Aquaponics

- Can be relatively expensive to setup
- Setup requires technical knowledge of aquaponics systems.
- Methodology requires knowledge and experience of both fish culture and plant propagation.
- Requires continuous electrical energy input.
- The water parameters needs frequent monitoring.
- May not be conducive to production of some root crops.
- Small room for error (If one or more components fail this could lead to the loss of fish and / or plants)

## How Aquaponics Works



Internet

The principle of Aquaponics involves the plants utilizing the fish waste in the system as a nutrient source. In the process, the ammonia and nitrates are removed and the water is 'filtered' making it suitable for return and reuse by fish.