

FARMING

With the ever-rising food prices, there can always be a solution. You could start raising your own fish and growing vegetables just behind your own house

Ntende goes fishing in his backyard

BY VICKIE WANDAWA

What do you do when the cost of your favourite healthy meal soars, and you have to fork out more and more money? You grow it, eat it and sell the surplus to your neighbours.

Thirty-four-year-old John Ntende, an engineer working with Electricity Regulatory Authority, did just that. The father of one who lives in Gayaza, a city suburb, was inspired to start a fish farm right in his paved backyard.

"My inspiration was the cost of the fish. I used to have fish on a weekly basis but the prices kept increasing. And the hygiene in those fish markets is terrible. So I went online and researched on how to grow fish on a small scale without using a pond or cages," the soft-spoken engineer says.

The words 'fish farming' may conjure up images of gigantic fish cages or ponds, but that is not so in this type of fish farming, technically referred to as aquaponics. It can sit on an area as small as 10X10ft (the size of an average bedroom).

Aquaponics

The engineer describes aquaponics as the combination of aquaculture (raising fish) and hydroponics (the soil-less growing of plants) that raises fish and plants together in one integrated system.

He raises the fish in two 1,000 liter water tanks. Each tank is stocked with 70 fish, though 100 is the maximum. Between the tanks are three grow-beds. A grow-bed is any container filled with a growing media. Ntende uses the bases of three 1,000 liter water tanks as grow-beds. They are filled with a layer of rocks instead of soil, where he has sowed vegetable seeds. Growing

there are vegetables such as cucumber, tomatoes, beetroot and spinach.

"The fish and the plants are in a symbiotic relationship. After I have fed the fish in the water tank, the water gets dirty because the fish release waste in form of ammonia. Through a pipe, that dirty water is directed to the grow-beds. The rocks have nitrifying bacteria, which breaks down the ammonia into nitrates which are good for the plants' growth," he explains.

With the ammonia gone, the water is clean and is then directed through a pipe to a water tank below the grow-beds. Inside that water tank is a small water-proof water pump, which pumps the water back to the fish tanks, and the cycle continues.

He has also improvised covers on the fish tanks. They are made from a bit of wood and iron sheets.

"These prevent the birds from eating the fish and also block the sunlight from getting into the tanks as it would cause algae to grow. That takes away the oxygen from the fish," Ntende explains.

Maturity period

The fish are expected to mature between six and eight months. Currently they are three months. Although Ntende has two fish tanks, he says one can use less or more tanks. The system can also be integrated with soil-based agriculture.

"You can have a small soil-based garden somewhere and use the water from the fish tanks to water the plants," he says. He expects the fish to weigh at least 500gm on maturing.

Ntende's fish will mature around the same time. But he advises that in cases where one has more than one fish tank, the ages of the fish should not be uniform across the tanks.

That way, the fish mature at



Ntende's backyard fish and vegetables



Some of the fish fingerlings in Ntende's tanks

different times. "For example if the farmer is selling the surplus, they will be able to avail fish to their clients over a long period of time," he explains.

Purely organic

There are no chemical sprays used, it is purely organic. For starters, due to the absence of soil, soil-based diseases and pests are not likely to attack this system. But in the event that they do, organic sprays are advised.

"You are not supposed to use any kind of chemical because the fish will die. However, you can use organic-based chemicals, which you can even make yourself by crushing, for example garlic, lemon and ginger sprays," he says.

He further explains that if chemical sprays are applied,

the bacteria that turn the ammonia into nitrates for the plants to consume will die. Hence, the water will not be cleaned and when it flows back to the fish, they will die from toxicity.

"The whole system is totally natural. So you can sell the fish and the vegetables fresh from the garden without any chemicals which cause cancer," he notes.

Feeding

"Because this is a small project, I make my own feeds," he says.

He makes a paste from crushing silver fish, maize bran and greens. The greens are to provide minerals and vitamins. After this, he puts the paste in a nozzle bottle and squeezes out in fine lines on a flat surface to sun dry.

"When they harden, I break

THE COSTS

Ntende says the system cost him less than sh2.5m.

"In six months the fish will be mature and selling each at about sh3,000 means you will recoup the initial sh2.5m invested," he says.

All the materials Ntende used are available locally in hardware shops, save for the water pump he ordered online from China. It cost between sh300,000 and sh500,000.

"Electricity for running the pump 24 hours a week approximately costs me sh30,000 a month," he says.

In case of a power outage, he runs water from the tap and it slowly drips by gravity into the fish tanks.

However, he says he plans to install solar

them into bits by hand, and they are ready for feeding the fish," he says.

The fish are fed a handful thrice a day but the portions increase as they grow older.

"I sprinkle the feeds onto the water and watch as they eat. If the feeds are consumed within 10 minutes, then I know I have given the right quantity. And if after 10 to 15 minutes there are leftovers floating, then I know I need to reduce on the portions. If all the feeds are consumed before 10 minutes elapse, then I am under-feeding the fish and

system in the future, because it is more reliable compared to paid the power.

He continues that the water costs are low because the water is simply recycled. However, weekly, he tops it up with 20 liters to make up for the evaporation. The system is connected to a tap through a hose pipe.

To increase the amount of oxygen in the water, he places a small air pump slightly underneath the water surface of the fish tank, which he says goes for about sh100,000.

He bought the 170 fish from a farm in Matugga, and they cost about sh350 each. The rocks in the grow bed can be accessed at places with building materials. Each small truck of rocks is about sh150,000.

need to increase the portions," he explains.

You can do this! Putting up the system is al most a Do-it-Yourself, though one may need to hire some skilled labour along the way. For example, a plumber to install the plumbing system, and an electrician to do the wiring.

"This is something that can be done by everyone. I was not trained in biology, agriculture or anything. It is just research on the internet," he says.

DID YOU KNOW?

John Ntende, an engineer, says he learnt from research that many Americans are practicing aquaponics because there is a movement towards organic farming.

"Commercial farmers are using an assortment of chemical sprays, which many consumers are uncomfortable with, hence turning to

aquaponics, a purely organic process," he explains.

"It's not unusual to find aquaponics on apartment rooftops and backyards," he says.

He adds that it is also common in countries which do not have water like Saudi Arabia, Egypt and Qatar. In Africa though, not so many have embraced it.