



Gaza leads the way with rooftop aquaponics for family nutrition

Urban fish and vegetable units a success where water, soil in short supply

7 April 2014, Rome – A family-based fish and vegetable growing system tested in the crowded conditions of the Gaza Strip has proved such a success that some families want to turn food production into small businesses.

An FAO project funded by Belgium introduced the soil-less or aquaponic food production units on the rooftops of 15 mostly poor and female-headed households in Gaza three years ago. In the most successful cases, families were able to grow enough tomatoes, peppers and eggplants during three summer months to meet all their household needs, plus up to 20 kilos of fish during a nine-month growth cycle.

“Of the 15 beneficiaries who worked on this initial pilot, two or three of them are now looking to scale up operations to begin producing for profit,” said project consultant Christopher Somerville. “We have already provided training on how to manage larger operations and are proud to contribute to the local economy as well as to improved nutrition.”

“We are now looking for funding to upscale home food production in Gaza and start building a network of local support so that it becomes sustainable once project funding ends,” he said. “I firmly believe that lessons we have learned through this project are applicable in other cities with similar climate, water and soil constraints.”

Growing food without soil

Aquaponics is a sustainable food production system that integrates aquaculture (growing fish) and hydroponics (growing plants without soil) whereby both agricultural practices mutually benefit from each other’s presence in one production unit.

The system relies on the nitrification process whereby waste from the fish is converted by nitrifying bacteria, which are hosted naturally within the unit, into an organic nutrient solution for growing vegetables.

The vegetables then take up the nutrients from the water, which essentially purifies it as it re-circulates back into the fish tank. Under this production technique, two products (fish and vegetables) can be harvested from only one input.

Also, due to the recirculation and recycling of water, aquaponics only requires a fraction of the water needed for ground-grown plant production in the Middle East.

Considering that access to good agricultural land and water will continue to be chronic issues within Gaza, aquaponics can serve as an applicable food production option

mainly due to: 1) efficient water utilization, and 2) easy installation of each production unit (fish and plant) on any flat, urban platform using local low-tech materials.

Unfortunately, power cuts led to fish mortality particularly during the hot summer months when the capacity for water to hold dissolved oxygen reduces as the water temperature increases above 30°C. Solar power or battery-powered air pumps may be the answer to this problem.

Lessons learned

Seeing as the initial pilot phase in Gaza was part of an emergency project, the main expenditure was on inputs for beneficiaries. The project was unable to invest in capacity building and technical support within the local community.

Somerville listed some important lessons learned from the pilot.

- The environment and climate should be favourable for aquaponics for at least 9 months of the year.
- There needs to be affordable access to key inputs including fish feed, fish fingerlings, simple water test kits, seeds and either electric or solar powered water and air pumps.
- Medium sized units for income generation along with small-scale units for domestic production should be piloted together with farmers/entrepreneurs and with academic institutes to develop local knowledge on the most applicable and financially lucrative fish and vegetables to grow in that region.
- Local non-governmental and community based organizations and other stakeholders already working in the fields of (urban) sustainable agriculture should be involved and trained at the start of the project to provide technical support and to constructively engage with the wider public on new agriculture technologies.

Aquaponics starter kit

- one locally made fibreglass fish tank (1 cubic metre)
- grow beds filled with volcanic gravel
- electric air pump
- PVC pipes/fittings and water quality monitoring kits
- tilapia fingerlings, fish food and enough vegetable seedlings for one growing season;