VERTICAL FARMING
FOR SUSTAINABLE URBAN DEVELOPMENT

By Ivan Lawrence White

Approximately 20% of undernourished people live in cities. In these urban areas, many people are going hungry due to monetary factors such as unemployment and high housing costs as well as given constraints on key resources like water and agricultural land. Given this problem, the challenge is represented by food security and safety and experts, companies, institutions, academia and International Organizations advocate and invest energy to explore further sustainable solutions.

An answer to this issue is urban agriculture through different technological solutions as the vertical farming technology experimented in Singapore by the Sky Greens Company.

Engineered by Jack Ng the founder of Sky Greens this vertical farming system, called *A-Go-Gro* technology, grows vegetables in shaped towers, each of six meters tall. These modular frames are quick to install and easy to maintain. Each tower consists of 22 to 26 tiers of growing troughs, which are rotated around the aluminium tower frame at a rate of 1mm per second to ensure uniform distribution of sunlight, good air flow and irrigation for all the plants.

The rotation system does not need an electrical generator. It is powered by a unique gravity aided water-pulley system that uses only one litre of water, which is collected in a rainwater fed overhead reservoir. This method also boasts a very low carbon footprint as the energy needed to power one A-frame is the equivalent of illuminating just one 60-watt light bulb. The water powering the frames is recycled and filtered before returning to the plants. All organic waste on the farm is composted and reused.

The result of vertical farming is that it removes the farms from traditional fields and places them in warehouses. This allows producers to place mini farms directly in the cities and away from the drought and disease that normally threatens reliable crop yields.

Agricultural towers and Vertical farming, in terms of urban agriculture practices, produce the following benefits:

- supply enough food in a sustainable fashion to comfortably feed local communities for the foreseeable

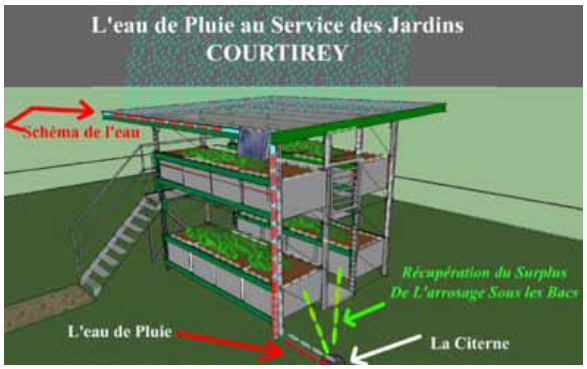
future;

- allow large portions of land to revert to the natural landscape restoring ecosystem functions and services;
- safely and efficiently use the organic portion of human and agricultural waste to produce energy through methane generation, and at the same time significantly reduce populations of vermin (e.g., rats, cockroaches);
- remediate black water creating a much needed new strategy for the conservation of drinking water;
- take advantage of abandoned and unused urban spaces;
- break the transmission cycle of agents of disease associated with a contaminated environment;
- allow year-round food production without loss of yields due to climate change or weather-related events;
- eliminate the need for large-scale use of pesticides and herbicides;

In July 2012, Sky Greens showcased the vertical urban farm at the World Cities Summit 2012, Liveable and Sustainable Cities - Integrated Urban Solutions, which showed that Sky Greens *A-Go-Gro Systems* offer a sustainable green food resilience solution to urban cities.

Though at their initial steps, it is evident the potential that lays in urban agriculture and its Vertical Farming and agricultural towers. These techniques can become a major tool in the fight against malnutrition and nutritional deficiencies and secure a hunger free sustainable development.

Another example of the success of this technique is the Agricultural Towers for multi-level cultivation implemented by Jean Claude Rey in France, promoted at international level and also by IDEASS Programme.



To know more

Sky Greens website

A Go Gro Vertical Farming

Abstract in verticalfarm.com

Vertical Farming in vertical-farming.net

Article in lowtechmagazine.com

Article in permaculturenews.org

Article in cnn.com

Article in eco-business.com

Article in core77.com

Agricultural Towers IDEASS Brochure