



FEEDING

TOMORROW'S CITIES 2.0

.....and making them green



Colofon

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GREENTECH FARMING FOR MEGACITIES

Towards a new production paradigm in greenhouse horticulture

Re-thinking the dominant model

These are exciting times. We are reaching a tipping point in greenhouse horticulture. Notwithstanding the fact that advanced greenhouses are still the dominant way of producing vegetables, fresh produce, plants and flowers, the world in horticulture, and particularly greentech, is changing due to changing demand from megacities.

The rise of novel indoor farming concepts in cities

Feeding megacities will require novel indoor farming concepts and challenge the dominant paradigm in horticulture to think in at least hybrid forms of production systems. Away from production in endless hectares of horizontal greenhouses far from the urban customers, towards a variety of forms of indoor and vertical farming. Feeding the world means more and more securing access to fresh food in megacities where 5 billion people will live in 2030. Most of these megacities will be in Asia, where a growing middle class is up and coming. They have spending power. Access to and availability of fresh

and safe food becomes more important than a low price alone.

Yes, there is still a huge demand for building horizontal greenhouses at large distance from cities where land is still cheap. But lots of experiments on novel farming are going on worldwide: vertical farms, container farming and fully controlled climate rooms in buildings. These formula's may offer more sustainable solutions closer to customers in cities, with less waste, less transport and pollution, and absolute freshness. With these new concepts the distance from farm to fork will be minimal.

Public demand

It is expected that public demand, particularly from governmental authorities and city councils of megacities will increase to safeguard the basic needs of a healthy and productive population. They will look for innovative solutions that are quick to install. Long-distance greenhouse production may suffer a loss of 25-35% or more of the harvested production

due to transportation and inadequate infrastructure. But this practice is too costly and unsustainable to fit in the Sustainable Development Goals (SDG's) as proclaimed by the UN in 2015. Moreover, it is not necessary anymore with new growth concepts at hand.

Citizens want a healthy style of living

Particularly in the cities a new kind of consciousness is rising to live a healthy life. Sports and exercise is what people do to keep in shape. However, a healthy life starts with a healthy diet: enough nutrition, fresh food full of natural anti-oxidants and vitamins, fresh greens, salads, fruits are the first things that come to mind. In the Netherlands these ingredients abound at affordable prices all over. Comparing to other countries in the world, this it is an exception, because in many places fresh produce is expensive and hardly available for daily consumption; there is scarcity. Room for innovation, therefore, in the way production is getting organized.

Experimental and commercial initiatives all over the world

An international comparative survey*) shows that many experimental initiatives are already being undertaken to fill the gap. In the more advanced stage vertical and indoor farming logically blend with the concept of Smart Cities, being worked on in China, Singapore, and selected cities in India. Although it may look simple from the outside, to create a successful climate controlled indoor or vertical farm requires a lot of combined high tech: climate systems, LED-lighting systems, water systems and growth protocols, all of them based on data and digitalization.

Greentech business in horticulture

What will the integrated concept of advanced urban farming look like? It is a data-driven, at distance monitored growth system where recipes for fresh produce secure stable production through the year.

An integrated concept including advanced knowledge, combined information, construction, installation and relevant data. A different cup of tea from growing tomatoes.

Clusters and networks have to blend into a larger ecosystems where collaboration is key. After all having many specializing companies is great, but creating collaboration between them is even better. Dutch entrepreneurs enjoy the competitive advantage of their world class position in horticulture and supply service to the green house sector.

Cooperation enables them to propose tailor made growth recipes for fresh produce for specific locations/megacities in the world. Allow for a globalized approach where world class technology and deep inside plant knowledge is combined with local tastes and preferences.

Maybe a bridge too far for some. But it is creating trade with a higher value and leads to a higher quality of fresh produce, more productive and energized populations, as well as an impulse to local employment, local trade and more sustainable logistics in mega-cities around the world. A real contribution towards the World Goals (SDG's).

Inter-generational knowhow is key in the transformation process and it will be applied with artificial intelligence and dynamic innovations in installation technologies, robotics and drones.

Not so much the production of fresh produce, flowers and plants will be the head of the game, as will the knowledge of the systems to produce in stable, high tech climate controlled environments.



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