

‘Holland is becoming the Silicon Valley of Vertical Farm Systems’

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The worldwide trend of urbanization will have an enormous impact on food supply for billions of people, according to the expectation of Annemieke Roobeek, chair for strategy & transformation management at Nyenrode Business University and CEO of MeetingMoreMinds. More and more so-called ‘vertical farms’ for fresh horticultural products will rise up in the Mega Cities.

Vertical farms are characterized by the production of food in completely controlled, climatized, and stacked growing environments with very high outputs per square meter. Special light-recipes and advanced LED-lights can optimize growth processes. Philips is one of the largest players in this area. Pesticides are unnecessary in these closed systems and the food safety can be guaranteed. The use of water can be minimized. Food can be produced all year long under constant conditions.

Furthermore, the ecological footprint is smaller due to shorter supply and distribution chains. Besides that, there is also less food waste because products find their way to restaurants, supermarkets and consumers directly in the Mega Cities.

Vertical farms in Mega Cities

Roobeek expects the growth of vertical farms will mostly be seen in the greater metropolises in Asia and the United States, Canada, and areas in the Middle-East, like the Emirates. “You need an environment with an extensive market and direct distribution channels, like in large cities.”

The challenge lies in creating integrated system solutions for these vertical farms. Roobeek is convinced this could be a big opportunity for Holland to become market leader. “We have all the knowledge to put growth systems for vertical horticulture on the market: greenhouse constructors, climate and light experts, state of the art knowledge of cultivation and the awareness that it has to be sustainable and energy-efficient. In all these domains the Dutch greentech-companies are known worldwide for their expertise.”

“I see huge opportunities to get the Dutch greentech and horticulture to the next level through cooperation”

Roobeek is known for her knowledge of networking and the creation of ecosystems with divergent parties to speed up innovation. “I see huge opportunities to get the Dutch greentech and horticulture to the next level through cooperation. By looking for cooperation in the development and exploitation of vertical farms, you create a new business model in which the delivery of integral systems is of central importance. It yields more profit than competing each other out of the market. New companies and digital platforms will rise.”

According to Roobeek we will see a hybrid-development of advanced greenhouse horticulture at the edge of cities, and high-tech vertical farms and indoor farming in the middle of cities.

The competition isn’t resting either

Through a tailored course on Feeding Megacities the forefront of the Dutch Greentech has explored the opportunities of cooperation around vertical farms. Roobeek: “The challenge is great and that’s why you have to do it together. The competition isn’t resting either so rapidly is required. Amazon and Microsoft, Silicon Valley start-ups, but also IBM, Fujitsu and GE are seeing the opportunities and

are investing out of deep pockets. Bundled expertise in practice will have to be the Dutch answer to stay in the lead. If we can succeed in that, we can become the Silicon Valley for vertical farm systems and with that the gamechanger of the market.

Expertise is scattered

In the meantime, Roobeek's vision is widely shared across the sector, as is evident from several reactions. "Holland does have all the expertise to get vertical farms off the ground," according to Joep van den Bosch, CIO of Ridder Group. "The problem is that expertise is still scattered. That is why we haven't been able to offer turnkey-concepts of vertical farming on a large scale."

How do you make this expertise come together? "We have Westland as an example here in Holland. From production, to suppliers, to trading, everything is together in one cluster. Around every vertical farm there should be a cluster like that. In fact, every Megacity should have their own Westland."

Arno Eussen, founder and owner of Freshprojects: "The unique quality of the Dutch horticulture sector is that all the knowledge is united in a relatively small area: from breeding to cultivation. Those parties have to start cooperating quickly, because in the United States there are currently millions of dollars being invested in vertical farms. We have to start making progress in the next three years or we'll be playing catch-up."

Service centres

Eussen expects that we'll be able to control those vertical farms from large service centres in Holland: "The technical potential is there. One condition is that all the possible data has to be collected: from climatic conditions to harvest registration to the lifespan of LED-lights. With the help of artificial intelligence you can make well substantiated decisions based on all that data."

Harm Maters, chairman of the Avag, the branch organization of the Dutch greenhouse and installations sector, likes to emphasize the sustainability benefits of vertical farming: "With this concept we can already realize 10 of the 17 SDG's, like less energy and water use, less use of pesticides and a higher level of production."

Momentum

If there ever was a momentum to join forces in Holland to make vertical farming happen, it is now. Maters: "Cities worldwide are experiencing large growth. Partly by the economic growth, the need for fresh food is also rising. We are currently on the job of shaping consortia to jump into that. In a consortium like that not only the sector is represented, but also architects, consultancy firms, urban planners, knowledge institutions and financial institutions. We are now in the phase that we can start offering the first cases that make a play on the theme of Feeding Megacities."