Vertical farming will play a role in future food production, expert says

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That sounds revolutionary. What other benefits would this crop production method offer?

Vertical farming allows multiple harvests of a crop per year and can make a substantial contribution to global food security. If we optimize the growing conditions for a crop in a closed system, cut off from the outside world, we can reduce water requirements by up to 90 percent and eliminate the need for chemical crop protection.

Yields can be increased by many times through optimal crop care and growth conditions. This includes intensive use of technologies, for example through fully automated management of crops as well as lighting and irrigation systems. This will help to minimize operational expenses.

Where do you see the obstacles and challenges?

Vertical farming has so far proven highly energy-intensive. This has made it unprofitable currently for crops such as grains, although it would be quite conceivable to increase the global mean annual per-hectare wheat yield by a factor of 6000.

I see also a major potential for the production of pharmaceutical and protein crops. Quality, nutrient content and flavors can be precisely controlled in vertical farming. New crop varieties specifically bred for this type of farming offer promising improvements in terms of quality. However, one point must be clear: the production of crops in vertical farms has to be cost-effective.

Where do you see the biggest need for research?

There are still many areas where a lot of research is needed. For example, what factors limit crop growth in vertical farming? Another issue is the conservation and efficient use of energy. If we can answer these questions, we can for example reduce...
the energy use in such indoor facilities towards making them profitable.

**So far, vertical farming has been used to grow vegetables. Will this indoor method replace production on conventional crop land one day?**

The success of vertical farming will depend on whether the products can capture a market share. Acceptance on part of consumers will also play an important role. People may take some convincing. That will be possible only through transparency and respect. We also need farmers who are willing to try vertical farming. Farmers have the know-how to grow crops and have extensive knowledge of cropping systems. We should therefore involve them in the development of vertical farming technologies.

I see a big opportunity for vertical farming for the production of healthy and sustainable food. However, I think it will never entirely replace conventional farming in fields. But vertical farming can and will play an essential role in food production in the future.


Provided by Technical University Munich