# Vertical farms revolutionise food security with 90% less water in the UAE



In a nation where sand dunes dominate the landscape, a transformative agricultural revolution is unfolding behind glass walls. Nestled within climate-controlled environments, vertical farms are yielding fresh produce—such as pesticide-free tomatoes and vibrant lettuce—without the aid of soil or conventional agricultural practices. This innovative farming method is emblematic of a shift towards a more sustainable food system, tailored for the challenges presented by the UAE's harsh climate.

Once considered a niche concept, vertical farming is rapidly gaining ground in the Emirates. It has moved from esoteric innovation to an integral part of the urban landscape, establishing itself in shopping malls, rooftops, and hospitality venues. This shift is not just about feeding a growing population; it’s part of a broader movement aimed at cultivating cleaner and smarter food sources in an era marked by significant environmental challenges.

Water scarcity remains a central issue in the UAE, where the agricultural landscape is increasingly linked to technological innovation. Vertical farms are spearheading this change, boasting a staggering 90% reduction in water usage compared to traditional farming methods. According to Mehlam Murtaza, Executive Director of UNS Vertical Farms, their closed-loop hydroponic systems recycle every drop of water. He emphasises, “We deliver exactly what the plant needs, directly to the roots. No more, no less.” By utilising vertical racks to enhance yield per square metre, these farms bypass many limitations imposed by the region's oppressive heat and irregular rainfall patterns.

Moreover, the absence of pesticides is a cornerstone of these farms’ operational philosophy. Both UNS and Pure Harvest Smart Farms advocate for a chemical-free approach, employing methods such as integrated pest management. Sky Kurtz, CEO of Pure Harvest, articulated their commitment to non-chemical interventions, stating, “If something does get in, we don’t reach for chemicals; we bring in beneficial insects or other natural interventions.” This holistic approach not only protects the environment but also appeals to a growing segment of health-conscious consumers seeking clean, local produce.

Consumer behaviour in the UAE is shifting dramatically, particularly among younger generations who are increasingly anxious about the environmental impact of their food choices. Curiosity and consciousness now drive purchasing decisions, with millennials and Gen Z willing to pay a premium for sustainable options. Kurtz observes, “Consumers are now willing to pay a bit more for food that’s not only good for them but good for the planet.” As specific crops like tomatoes, leafy greens, and strawberries lead this demand for fresh, local options, it demonstrates that sustainability has become integral to everyday shopping habits rather than a luxury.

Central to the success of vertical farming is the application of cutting-edge technology. Both UNS and Pure Harvest utilise Internet of Things (IoT) systems that monitor and optimise various growing conditions, ensuring year-round production, even under the extreme summer heat. Kurtz describes this as “veridical farming”—emphasising transparency and data-driven practices that resonate with concerned consumers. This tech-driven approach not only heightens efficiency but also dramatically boosts output, allowing producers to generate 10-15 times more food per square metre than traditional farms.

The UAE government is fully aware of the potential of vertical farming, which aligns with its efforts to enhance food security and reduce reliance on imports. The National Food Security Strategy 2051 sets ambitious targets for self-sufficiency, and initiatives like Abu Dhabi's AgTech Park and AeroFarms AgX are paving the way for future advancements in sustainable agriculture. The ADQ's partnership with Italy's ZERO to establish vertical farms demonstrates a significant commitment to exploring agricultural solutions tailored for the UAE’s desert climate.

As vertical farming continues to expand, so do opportunities for scaling operations and diversifying crops to meet evolving consumer demands. These advancements not only seek to secure food independence for the UAE but also rekindle a connection to the origins of what we consume. Reflecting on this agricultural renaissance, Murtaza states, “It’s about reconnecting with what we eat, about feeding growing cities without depleting the planet.”

The future of food in the UAE is not out in the fields but rather ascending vertically—under LED lights and amidst innovative technology, ensuring that wholesome, sustainable produce remains in reach for everyone. In this new agricultural paradigm, every salad in the UAE may well represent a conscious choice, forged not just in fertile soil but rather in an ethos of responsibility towards both health and the environment.

### 📌 Reference Map:

* Paragraph 1 – [[1]](https://www.khaleejtimes.com/business-technology-review/vertical-farming-in-the-uae-fresh-clean-and-grown-by-code), [[4]](https://www.reuters.com/markets/deals/vertical-farming-startup-plenty-expand-via-680-mln-jv-with-uaes-mawarid-2024-07-18/)
* Paragraph 2 – [[1]](https://www.khaleejtimes.com/business-technology-review/vertical-farming-in-the-uae-fresh-clean-and-grown-by-code), [[2]](https://time.com/6199680/technology-farming-climate-stress-sky-kurtz/), [[5]](https://www.agbi.com/tech/2023/03/agtech-special-report-vertical-farms-uae/)
* Paragraph 3 – [[3]](https://www.adq.ae/newsroom/adqs-agtech-park-begins-its-sustainable-agriculture-journey-with-vertical-farming-project/), [[6]](https://gulfnews.com/business/corporate-news/uae-based-pure-food-technology-unveils-game-changing-innovation-in-vertical-farming-to-offer-food-security-to-uae-1.1702019395726)
* Paragraph 4 – [[5]](https://www.agbi.com/tech/2023/03/agtech-special-report-vertical-farms-uae/), [[7]](https://www.globenewswire.com/news-release/2023/02/15/2608423/0/en/AeroFarms-AgX-Grand-Opening-in-Abu-Dhabi-UAE-Debut-of-The-World-s-Largest-R-D-Indoor-Vertical-Farm.html)
* Paragraph 5 – [[1]](https://www.khaleejtimes.com/business-technology-review/vertical-farming-in-the-uae-fresh-clean-and-grown-by-code), [[2]](https://time.com/6199680/technology-farming-climate-stress-sky-kurtz/)
* Paragraph 6 – [[1]](https://www.khaleejtimes.com/business-technology-review/vertical-farming-in-the-uae-fresh-clean-and-grown-by-code), [[3]](https://www.adq.ae/newsroom/adqs-agtech-park-begins-its-sustainable-agriculture-journey-with-vertical-farming-project/)
* Paragraph 7 – [[1]](https://www.khaleejtimes.com/business-technology-review/vertical-farming-in-the-uae-fresh-clean-and-grown-by-code), [[2]](https://time.com/6199680/technology-farming-climate-stress-sky-kurtz/)

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## Bibliography

1. <https://www.khaleejtimes.com/business-technology-review/vertical-farming-in-the-uae-fresh-clean-and-grown-by-code> - Please view link - unable to able to access data
2. <https://time.com/6199680/technology-farming-climate-stress-sky-kurtz/> - Sky Kurtz, CEO of Pure Harvest Smart Farms, employs advanced technology to cultivate tomatoes in the desert near Abu Dhabi, where temperatures often exceed 113°F. Established in 2017, the company uses high-tech greenhouses and vertical farms to create a controlled environment, enabling year-round production. Their produce, including 30 varieties of tomatoes, 14 types of leafy greens, and various strawberries, is supplied to supermarkets and restaurants in Dubai and the region. This approach reduces reliance on costly imported produce and aligns with Dubai's goal of increased self-sufficiency. Kurtz aims to demonstrate the viability of this technology in arid climates, offering a model for other regions facing similar challenges. ([time.com](https://time.com/6199680/technology-farming-climate-stress-sky-kurtz/?utm_source=openai))
3. <https://www.adq.ae/newsroom/adqs-agtech-park-begins-its-sustainable-agriculture-journey-with-vertical-farming-project/> - ADQ, an Abu Dhabi-based investment and holding company, has launched the operational phase of its AgTech Park with a vertical farming project in partnership with Italy's ZERO. Located in KEZAD, the facility aims to enhance indoor farming and explore desert-climate agriculture in the UAE. The project focuses on producing fresh produce, nutraceuticals, and biopharmaceuticals, contributing to the UAE's National Food Security Strategy 2051. The pilot phase is expected to conclude in summer 2023, with plans for a 40,000 sqm commercial phase in Al Ain. ([adq.ae](https://www.adq.ae/newsroom/adqs-agtech-park-begins-its-sustainable-agriculture-journey-with-vertical-farming-project/?utm_source=openai))
4. <https://www.reuters.com/markets/deals/vertical-farming-startup-plenty-expand-via-680-mln-jv-with-uaes-mawarid-2024-07-18/> - U.S. vertical farming startup Plenty has formed a $680 million joint venture with Mawarid, a subsidiary of Alpha Dhabi Holding, to develop indoor farms in the Middle East. The venture plans to build five farms over the next five years, starting with an indoor farm in Abu Dhabi expected to be operational by 2026. The farm aims to produce over 4.5 million pounds of strawberries annually for local consumption and export within Gulf Cooperation Council countries. This partnership highlights the growing investment in sustainable agriculture in the UAE. ([reuters.com](https://www.reuters.com/markets/deals/vertical-farming-startup-plenty-expand-via-680-mln-jv-with-uaes-mawarid-2024-07-18/?utm_source=openai))
5. <https://www.agbi.com/tech/2023/03/agtech-special-report-vertical-farms-uae/> - Bustanica, a 300,000 sq ft hydroponic farm established by Dubai’s Emirates Flight Catering and U.S. company Crop One, is located near Al Maktoum International Airport. The $40 million facility provides greens for Emirates and other airlines, preparing an average of 200,000 meals daily. The farm's closed-loop system circulates water through plants to maximise efficiency, saving 250 million litres of water annually compared to traditional outdoor farming. Pure Harvest Smart Farms has secured $180 million in funding and partners with UAE supermarket chain Spinneys. ([agbi.com](https://www.agbi.com/tech/2023/03/agtech-special-report-vertical-farms-uae/?utm_source=openai))
6. <https://gulfnews.com/business/corporate-news/uae-based-pure-food-technology-unveils-game-changing-innovation-in-vertical-farming-to-offer-food-security-to-uae-1.1702019395726> - Pure Food Technology, a UAE-based sustainable agriculture and food technology startup, has developed an innovative hydroponic, robotic, solar-powered prototype that requires 95% less water than traditional farming and delivers 100 times higher plant-based crop yield. The company has secured 11 patents and aims to scale up the vertical farm technology to reduce the UAE’s $7.7 billion vegetable food import bill and achieve self-sufficiency in nutrient-rich plant-based food production. The system integrates artificial intelligence, solar energy, robotics, and 3D printing technology. ([gulfnews.com](https://gulfnews.com/business/corporate-news/uae-based-pure-food-technology-unveils-game-changing-innovation-in-vertical-farming-to-offer-food-security-to-uae-1.1702019395726?utm_source=openai))
7. <https://www.globenewswire.com/news-release/2023/02/15/2608423/0/en/AeroFarms-AgX-Grand-Opening-in-Abu-Dhabi-UAE-Debut-of-The-World-s-Largest-R-D-Indoor-Vertical-Farm.html> - AeroFarms has unveiled AeroFarms AgX, its newest indoor vertical farm focused on research and development, located in Abu Dhabi, UAE. At 65,000 square feet, it is the largest indoor vertical farm of its kind globally. Supported by the Abu Dhabi Investment Office, AeroFarms AgX aims to advance sustainable controlled environment agriculture and indoor vertical farming to address global agriculture supply chain challenges. The facility will collaborate with Silal to commercialise new crops like tomatoes and peppers. ([globenewswire.com](https://www.globenewswire.com/news-release/2023/02/15/2608423/0/en/AeroFarms-AgX-Grand-Opening-in-Abu-Dhabi-UAE-Debut-of-The-World-s-Largest-R-D-Indoor-Vertical-Farm.html?utm_source=openai))