

Africa needs its own version of the vertical farm to feed growing cities

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The [Netherlands](#) is building its first large-scale commercial vertical indoor farm. It's expected to serve Europe's largest supermarket chains with high quality, pesticide-free fresh cut lettuce.



Bright Agrotech via [Wikimedia Commons](#)

Vertical farms [use](#) high tech lighting and climate controlled buildings to grow crops like leafy greens or herbs indoors while using less water and soil. Because it's a closed growing system, with controlled evaporation from plants, this farms use [95% less water](#) than traditional farms. At the same time, most vertical farms don't need soil because they use aeroponics or hydroponic systems – these dispense nutrients needed for plants to grow via mist or water. This technique is ideal for meeting the challenges of urbanisation and the rising demand by consumers for high-quality, pesticide-free food.

They're not unusual. In recent years, there's been a gradual increase in the number of vertical farming enterprises, especially in North America and Asia. In the US, [Chicago](#) is home to several vertical farms, while New Jersey is home to AeroFarms, the [world's largest vertical farm](#). Other [countries](#) such as [Japan](#), Singapore, Italy and Brazil have also seen more vertical farms. As the trend continues, vertical farming is expected to be valued at [US\\$5.80 billion](#) by 2022.

Africa faces similar trends that demand it considers vertical farms. Firstly, it's [urbanising](#) at a fast rate. By 2025 more than 70% of its population is expected to live in the cities. Secondly, many of these urban consumers are demanding and willing [to spend much more](#) to buy high quality, pesticide-free food.

Yet, despite sharing trends that have fuelled the vertical farming movement, Africa is yet to see a boom in the industry.

A few unique versions are sprouting up on the continent. These show that the African versions of vertical farms may not necessarily follow the same model of other countries. It's important to establish what the barriers to entry are, and what African entrepreneurs need to do to ensure more vertical farms emerge.

Barriers to vertical farming

Initial financial investments are huge. For example, a complete modern (6,410sqm) vertical farm capable of growing roughly 1 million kilos of produce a year can cost up to [\\$80 to \\$100 million](#).

There also needs to be upfront investment in research. Many of the successful vertical farms in the developed world, including the one launching in the [Netherlands](#), invest in research before they go live. This ranges from studying the most appropriate system that should be used to the best lighting system and seed varieties, as well investigating the many other ingredients that determine the success or failure of the farm.

Access to reliable and consistent energy is another barrier. Many African cities frequently experience power cuts and this could prove to be a big challenge for innovators wanting to venture in vertical farming business.

Faced with these challenges, entrepreneurs thinking of venturing into vertical farming in Africa need to put in more thought, creativity, and innovation in their design and building methods.

They need to be less expensive to install and maintain. They also have to take into consideration the available local materials. For example, instead of depending on LED lighting system, African versions can utilise solar energy and use locally available materials such as wood. This means that entrepreneurs should begin small and use [low-tech innovations](#) to see what works.

As innovators locally figure out what works best for them, there will be further variations in the vertical farms between African countries.

African versions

In Uganda, for instance, faced with a lack of financial resources to build a modern vertical farm and limited access to land and water, urban farmers are venturing into [vertically stacked wooden crates units](#). These [simple units](#) consist of a central [vermicomposting](#) chamber. Water bottles are used to irrigate the crops continuously. These stacked simple vertical gardens consume less water and allow urban farmers to grow vegetables such as kale to supply urban markets. At the moment, 15 such farms have been installed in Kampala and they hope to grow the number in the coming years.

In Kenya, [sack gardens](#) represent a local and practical form of a vertical farm. Sack gardens, made from sisal fibres are cheap to design and build. One sack costs about US\$0.12. Most importantly, they use local materials and fewer resources yet give yields that help farmers achieve the same outcomes as vertical farms in the developed world. As a result, many have turned into sack gardening. In Kibera, for example, [over](#) 22,000 households have farmed on sacks.

Also in Kenya, [Ukulima Tech](#) builds modern vertical farms for clients in Nairobi. At the moment it's created four prototypes of vertical farms; tower garden, hanging gardens, A-Frame gardens and multifarious gardens. Each of these prototypes uses a variation of the vertical garden theme, keeping water use to a minimum while growing vegetables in a closed and insect free environment.

The continent has unique opportunities for vertical farms. Future innovators and entrepreneurs should be thinking of how to

specialise growing vegetables to meet a rise in demand of [Africa's super vegetables](#) by urban consumers. Because of their popularity, startups are assured of ready markets from the urban dwellers. In Nairobi, for example, these vegetables are already becoming [popular](#).

Feeding Africa's rapidly growing urban population will continue to be a daunting challenge, but vertical farming – and its variations – is one of the most innovative approaches that can be tapped into as part of an effort to grow fresh, healthy, nutritious and pesticide-free food for consumers.

Now is the time for African entrepreneurs and innovators to invest in designing and building them.

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