

## Vertical Farming

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### What You Should Know About Vertical Farming

#### Is It the Future of Agriculture?

By the year 2050, the global population is slated to grow to 9.7 billion people, and feeding it will be a cosmic challenge. Due to industrial development and urbanization, we are losing the track of arable lands every day. In 2015, scientists reported that the Earth has been deprived of one third of its arable lands over the previous 40 years (According to a report by The Guardian)

We don't know how much more we are going to lose in the next 40 years. Escalating food demand due to growing population along with ever decreasing arable lands poses one of the greatest challenges facing us. Many are of the opinion that vertical farming can be the answer to this challenge. Is vertical farming the future of agriculture? Let's find out!

#### What Is Vertical Farming?

Vertical farming is the execution of producing food on vertically inclined surfaces. Instead of farming vegetables and other foods on a single level, such as in a field or a greenhouse, this method produces foods in vertically stacked layers commonly integrated into other structures like a skyscraper, shipping container or repurposed warehouse.



Exercise of Controlled Environment Agriculture (CEA) technology, this modern idea uses indoor farming techniques. The artificial control of temperature, light, humidity, and gases makes producing foods and medicine indoor possible. In many ways, vertical farming is similar to greenhouses where metal reflectors and artificial lighting augment natural

sunlight. The principal intention of vertical farming is maximizing crops output in a finite space.

### **How Vertical Farming Works**

There are four imperative areas in understanding how vertical farming works: 1. Physical layout, 2. Lighting, 3. Growing medium, and 4. Sustainability features.

Firstly, the key goal of vertical farming is producing more foods per square meter. To accomplish this goal, crops are cultivated in stacked layers in a tower like structure. Secondly, a perfect combination of natural and artificial lights is used to maintain the perfect light level in the room. Technologies such as rotating beds are used to improve lighting efficiency.



Thirdly, instead of soil, aeroponics (process of growing plants in an air), aquaponics (a system of growing plants in the water) or hydroponic growing mediums are used. Peat moss or coconut husks and similar non-soil mediums are very common in vertical farming. Finally, the vertical farming method uses various sustainability features to counterbalance the energy cost of farming. In fact, vertical farming uses 95% less water.

### **Advantages and Disadvantages of Vertical Farming**

Vertical farming has a lot of promise and sounds like the farm of the future. However, there are a few stumbling blocks to consider before rushing full-speed ahead into vertical farming.

#### **Advantages**

1. It offers a plan to handle future food demands
2. It allows crops to grow year-round
3. It uses significantly less water
4. doesn't affect the crops
5. More organic crops can be grown
6. There is less exposure to chemicals and disease

**Disadvantages**

1. It could be very costly to build and economic feasibility studies haven't yet been completed
2. Pollination would be very difficult and costly as there are no natural means involved.
3. It would involve higher labour costs
4. It hinges too much on technology and one day of power loss would be devastating result.

**Advantages of Vertical Farming:**

Having greater output from a small cultivation area is not the only advantage of vertical farming. Below given are some of the major benefits of vertical farming:

**1) Readyng The Coming Times:**

By 2050, around 68% of the world population is anticipated to live in urban areas, and the growing population will lead to an increased demand for food. The methodical use of vertical farming may perhaps play a noteworthy role in getting ready for such a confrontation.

**2) Increased And Year-Round Crop Production:**

Vertical farming allows us to produce more crops from the same square footage of growing area. In fact, 1 acre of an indoor area offers equivalent production to at least 4-6 acres of outdoor capacity. According to an independent estimate, a 30 storey building with a basal area of 5 acres can potentially produce an equivalent of 2,400 acres of accustomed horizontal farming. Additionally, year-round crop production is possible in a controlled indoor environment which is completely controlled by vertical farming technologies.

**3) Use Of Water To A Lesser Degree in Cultivation:**

Vertical farming allows us to fabricate crops with 70% to 95% less water than required for normal cultivation.

**4) Unmoved By Inauspicious Weather Conditions:**

Crops in a field can be adversely affected by natural calamities such as heavy rains, cyclones, flooding or severe droughts—events which are becoming increasingly common as a result of global warming. Indoor vertical farms are less likely to feel the brunt of the unpropitious weather, providing greater certainty of harvest output throughout the year.

**5) Increased Production of Organic Crops:**



As crops are produced in a tractable indoor environment without the usage of chemical pesticides, vertical farming allows us to grow pesticide-free and organic crops.

#### 6) Human and Environmentally Congenial:

Indoor vertical farming can significantly mitigate the occupational hazards associated with traditional farming. Farmers are not disclosed to hazards related to heavy farming equipment, diseases like malaria, poisonous chemicals and so on. As it does not disturb animals and trees inland areas, it is good for biodiversity as well.

#### Hindrance in Vertical Farming:

Vertical farming has both pros and cons. Sometimes the pros of vertical farming are highlighted and not the cons. Following are the major limitations of vertical farming:

- 1. No Established Economics:** The financial feasibility of this new farming method remains uncertain. The financial situation is changing; however, as the industry matures and technologies improve, It will spur up the practice of Vertical Farming.
- 2. Difficulties with Pollination:** Vertical farming takes place in a controlled environment without the presence of insects. As such, the pollination process needs to be done manually, which will be labouring intensive and costly.
- 3. Labour Costs:** As high as energy costs are in vertical farming, labour costs can be even higher due to their concentration in urban centers where wages are higher, as well as the need for more skilled labour. Automation in vertical farms, however, may lead to the need for fewer workers. Manual pollination may become one of the more labour-intensive functions in vertical farms.
- 4. Too Much Hinge on Technology:** The development of better technologies can always increase efficiency and lessen costs. But the entire vertical farming is extremely dependent on various technologies for lighting, maintaining temperature, and humidity. Losing power for just a single day can prove very costly for a vertical farm. Many believe the technologies in use today are not ready for mass adoption.