

## Vertical Farming: A New Approach towards Sustainable Agriculture

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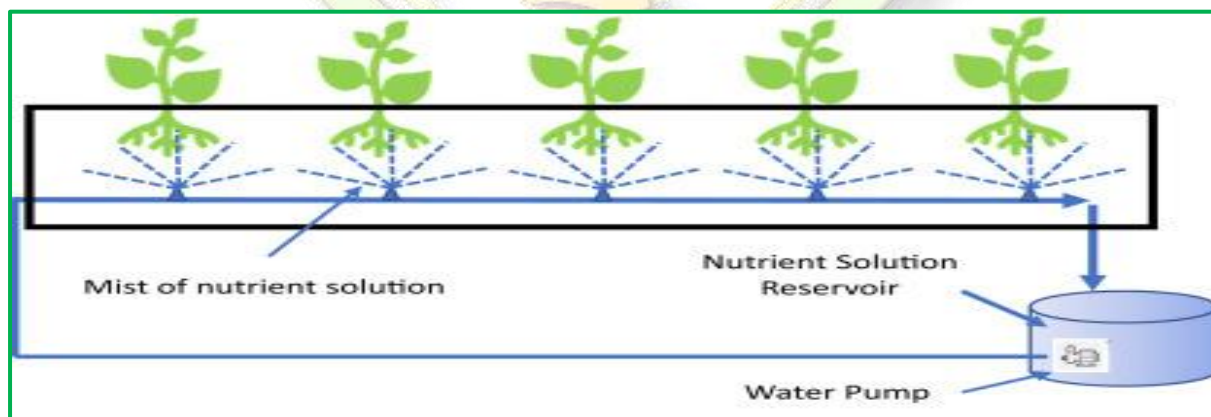
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The growth and production of plants and crops on surfaces that are inclined vertically and piled vertically is known as vertical farming. Plant cultivation indoors is known as vertical farming, sometimes known as indoor farming. Instead of sunlight and rain, vertical farms employ LED lighting and highly controlled growth and feeding systems. Because the plants are piled vertically in tiers, many of the farms resemble warehouses with towering shelving units. Physically, the plants are piled vertically in a tower-like arrangement. This reduces the amount of area required for plant cultivation. Then, a combination of artificial and natural illumination is employed to maintain the perfect environment for the plants' efficient development. The plant's growth medium makes up the third factor. Growing media such as aeroponic, hydroponic, or aquaponic systems are employed instead of soil.

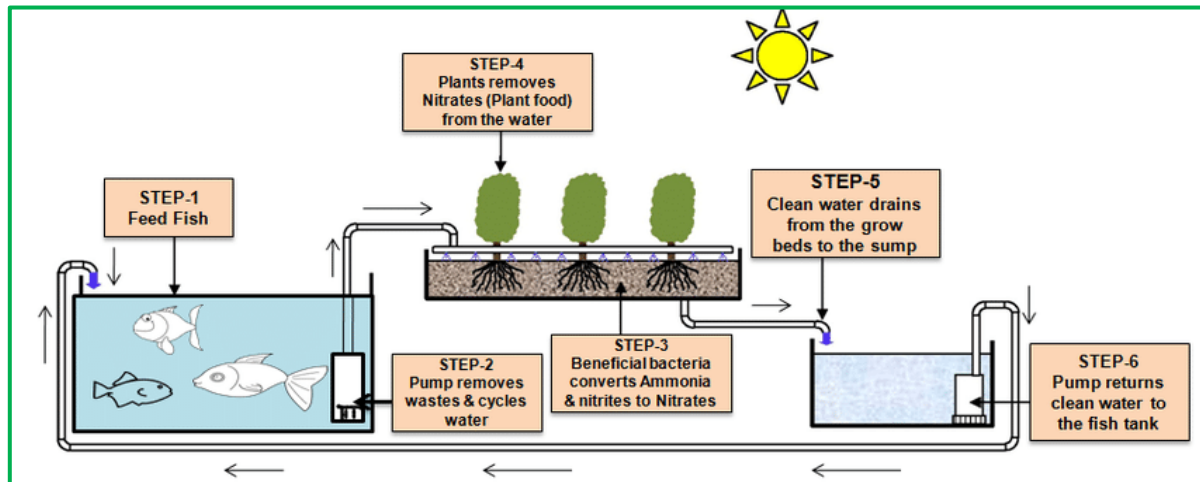
### Types of Vertical Farming

- Hydroponics:** It is a method for employing mineral nutrition solutions to grow food in water without needing dirt. The key advantages of this strategy are that it reduces concerns with soil-related agriculture, such as soil-borne diseases, pests, and insects.
- Aeroponics:** Aeroponics was developed as a result of a NASA (National Aeronautical and Space Administration, USA) project in the 1990s to find a practical way to grow plants in space. In aeroponics, crop containers are not necessary because there are no growing medium. Aeroponics employs nutritious solutions or mist in place of water. Due to the plants' attachment to a support and nutrient treatment of the roots, it requires very little space, very little water, and no soil.



- Aquaponics:** The terms aquaculture, which refers to fish farming, and hydroponics, which describes the method of growing plants without soil, were merged in order to create symbiotic relationships between the plants and the fish. The symbiosis is accomplished by

feeding "fertigate," which is nutrient-rich waste from fish tanks, to hydroponic production beds. The hydroponic beds then act as bio-filters to rid the water of gases, acids, and impurities like phosphates, ammonia, and nitrates.



### Advantages of Vertical Farming

1. Vertical farming has a promising future in agriculture since it has several advantages. It takes a little amount of land, 80% less water, is pesticide-free, can be recycled and stored, and, in the case of high-tech farms, is not very weather sensitive.
2. With the aid of a vertical farm, urban farming is now a possibility. As opposed to the refrigerated produce that is typically sold at supermarkets, when the farms are close by, the produce is also rapidly delivered and always fresh.
3. Reduced transportation lowers the price of fossil fuels and the emissions that follow from that, which also lowers transportation spoilage.

### References

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2. Niu, G. and Masabni, J. (2018). Plant production in controlled environments. *Horticulturae*, 4(4), 28.