

# VERTICAL FARMING

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## ABSTRACT

India is a very huge country with very high population and our country is developing day by day. Indian Agriculture also needs a change with developing India. Uses of land, water and wastage also gets minimized in vertical farming. In vertical farming, crops are secured from pests and diseases, the crops are grown in a controlled environment. With these type of facilities, vertical farming is very good option for farming in the future.

## INTRODUCTION

Vertical Farming is a special concept of growing food in line with indoor farming, urban agriculture and controlled agriculture environment. It is the growing of plants in vertically stacked layers. It is used where the arable land is less. Such places are mountain side towns, deserts and cities grow a different type of fruits and vegetables.

In vertical farming soil, hydroponic or aeroponic growing methods can be used. Most of the common commercial vertical farms are produced inside buildings, some of them are in the green houses and shading of crops produces the unique crops.

## METHODS USED IN VERTICAL FARMING

In India there are three methods used in vertical farming namely Hydroponics, Aeroponics and Aquaponics. These are described as follows:

### 1. Hydroponics

In this method, foods are growing through water nutrients without soil. Food is secure from soil related problems such as pests, insects and diseases.

### 2. Aeroponics

In this method, less amount of water is used and foods are grown through moist and nutrients. As we know, in vertical farming plants are tie up with support so on their roots water nutrients are sprayed.

### 3. Aquaponics

This is the method of combining plants and fishes in the same ecosystem and the fish is grown inside the indoor ponds by providing them with nutrient rich waste.

## BENEFITS OF VERTICAL FARMING

- The main benefit of using vertical farming is every piece of land or an area is properly utilized in crop production.
- In vertical farming, the food production can be done throughout the year.
- No cost of transportation is required in vertical farming
- When comparing with traditional farming, 70-90 % minimum water used.
- The use of soil in vertical farming is 90% or none. So, there is no issue of pests and any type of disease.
- Organic food production is done in vertical farming because it is free from pesticides and air pollution.

## DRAWBACKS OF VERTICAL FARMING

- The cost of establishment is very high.
- Artificial light is used in vertical farming which is expensive as compared to traditional farming where natural light is used.
- Trained staff is needed in the management.
- Proper dispose of water is required.
- In vertical farming, LED light produces lots of heat which is a big problem in maintaining the problem during summers.

## CROPS SUITABLE

### 1. Some Small Size Vertical Crops

- Lettuce
- Broccoli
- Amaranthus

### 2. Some Medium Size Vertical Crops

- Cabbage
- Cauliflower
- Tomato
- Brinjal

### 3. Some Big Size Vertical Crops

- Maize
- Sorghum

## ECONOMICS OF VERTICAL FARMING IN INDIA

It plays an important role in selection of crops because if the crop is biological workable and not suitable for economics, then we need to leave this idea of producing that particular crop. The reason is:

- Less demand of that crop in the market.
- Improper technique.
- High cost of production.

So, these factors have to be considered before doing vertical farming.

## CROPS SUITABLE

Vertical Farming is a good solution to the critical issues in the Indian Farming like an absence of providing or oversupply of farm produce, excessive use of pesticides and fertilizers, weak soils and unemployment are the major concerns. So, vertical farming is the solution for reducing arable land.

