



Aeroponic Farming: Future of Indian Agriculture

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Abstract

India is one of the most popular countries in the world. It is 2nd most popular country with 130 crore population after china .NCP National Commission on Population predicts that India population will increase by 1.7 billion by 2050 to full fill the need of increasing population it became necessary to increase the food production While the arable land decrease due to several reasons like urbanization and overpopulation. Combined with the decreasing in arable land and climate change makes ensuring food security for the country even more challenging aeroponics farming is an intensive way to utilize unused space and increase food production

Keywords: Aeroponics, hydroponics, modern agriculture, vertical farming , Indian agriculture

Introduction

Aeroponics is a modern method of cultivation in which plants are grown in air or mist environment. In aeroponics plants are grown without the use of soil so aeroponics also called the soil less farming. Aeroponics derived from Greek word aer (air) and ponos (labour) . Aeroponics is a type of hydroponics here water mist nutrient sprayed to the roots of plants it is actually a sub of hydroponic. It is a hi tech method to grown plants in a very limited space while the production is higher per unit area . Aeroponics is considered as the best method to grow plants in soil free environment. And the plants grown under the aeroponics system are rarely affected to pathogens and superior in qualies these plants are healthier and more nutritious. But not all the plants can be grown in this type of system. These are some most preferred plants which are popularly and successfully grown in aeroponics system. Leafy vegetables: aeroponic system is much suitable for leafy vegetables because in with soil cultivation leaves became infected by soil borne pathogens and bacteria but in aeroponics system or soil less farming there is negligible chance of root or leaf infection. It is also beneficial for the crop which is susceptible for soil borne pathogens

Herebs are the labour intensive plant and growing these plant In an open environment became much more labour intensive while in aerophononic medium the duration of crop decreases and the aerophononic system is less labour intensive. Plants also generates higher yield in this medium

Fruits and vegetables: A lot of fruits and vegetables like broccoli, spinach , Cabbage, Carrots Peas pepper strawberry etc grown successfully in the medium.

Need of Aeroponics

The current world population is 7.2 billion and it is projected to increase 1 billion in next twelve years reaching 8.1 billion in 2025 and in 2050 it will reach 9.6 billion with the

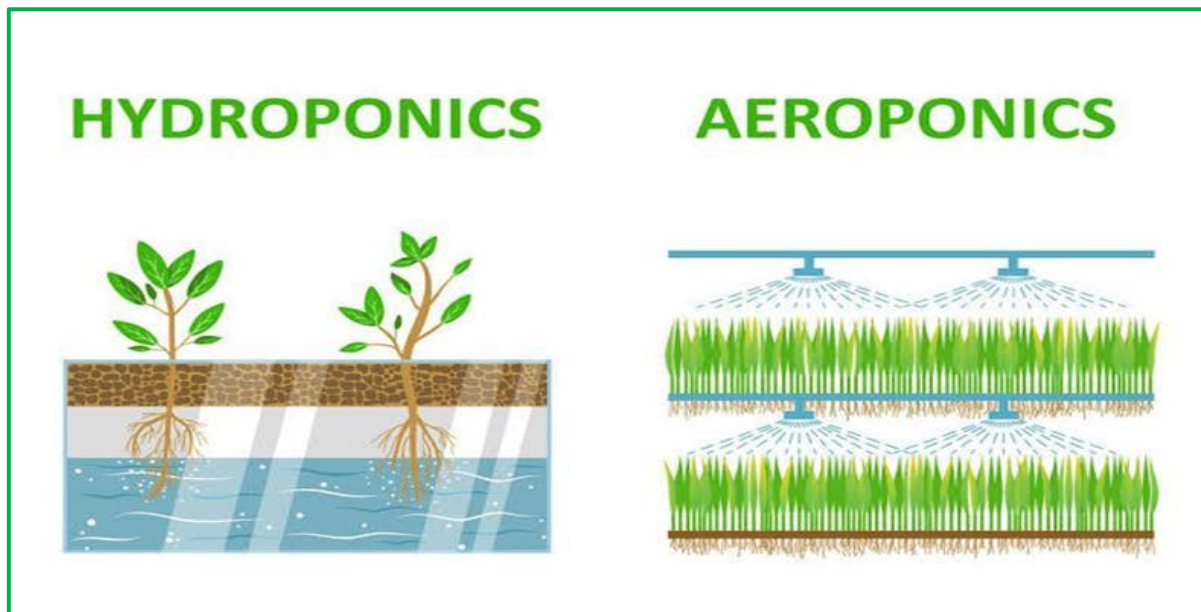
increasing population demand of more food also increases. But arable land area decreases due to the same reason which is over population. Urbanization is another important reason to adopting aeroponics farming. UN estimates that double of the people living now in cities will live in cities which is almost 80% of total population. Ensuring food security of cities will not only depend upon conventional farming. Area for cultivation in urban areas are rarely found and that is small not enough for farming mainly for traditional farming. Because it takes longer period for harvesting, production per unit area also very low to fulfill the need of urban population.

History of Aeroponics

Term aeroponics first used in 1920s for academic studies to show the root growth of plants but till 1990s it would not become a real contender but when NASA National Aeronautics space administration begins to look aeroponics as an option to grow plants in space means in soil less environment it also became an option for the areas where traditional farming aren't the proper option. The first aeroponically grown food was sold in a grocery chain by Richard Stoner.

Difference between Hydroponics and Aeroponics

Farmers have a misunderstanding about different vertical farming system sometimes they understand that the both term hydroponics and aeroponic are same because in both the medium plants are grown in a protected environment and growing medium is water but these are some basic differences between aeroponic and hydroponics.



Present Status of Aeroponic Farming in India

India is one of the strongest economy in the world it 5th in world economy. India is the country where 58% of total population of country depend on Agriculture while 70% of rural population still engage in farming for their livelihood. Contribution of agriculture in Indian economy hits 19.5 % in year 2020 -2021. So it's necessary to adopt new technology to increase food resources to continuously increasing population with urbanization.

India have a divers climatic condition which make it suitable to grow all type of plants, fruits and vegetables throughout the year. This is the reason why india is 2nd largest producer of vegetables in world but still our country faces food scarcity. The per capita vegetable availability is lower than ICMR recommendation which 275g and 300g respectively for male and female. In this condition when aeroponics farming take a place in

India then it might help people to get fresh and recommend dose of fruits and vegetables throughout the year with all this it will also help to increase the income of farmers.

Indian govt also providing subsidy for aeroponics farming Under the initiative "Development of Commercial Horticulture through Production and Post-Harvest Management," Amount of subsidy is 20% of total project cost limited to 25lakh in general while 30 lakh in North East region . The govt of madhya Pradesh also Gets licence for aeroponic system for virus free potato seed production.

Advantages of Aeroponics

- **98% less land:** Aeroponic uses 98% less land than conventional farming method because it use also Vertical space .
- **Safer for consumer:** in aeroponics

Conclusion

Vertical farming is definitely a solution to critical problems in Indian farming like lack of supply or oversupply of farm produce, overuse of pesticides, overuse of fertilizers, deteriorating soils and even the unemployment. But there are challenges like acceptance of vertical farming by Indian farming community. Indian farmers are facing various problems like lack of electricity supply throughout the day, assurance of minimum support prices, no control over market glut, water scarcity, etc.

The initial huge cost of infrastructure for a large-scale farm is a major hurdle for implementing vertical farming in India. Vertical farming in India has to face other challenges like public awareness, inclusiveness of farming community, technical know-how, cost incurred in managing and maintaining the vertical farm systems, and also its economic viability.

Water plays an important role in the world economy. Approximately 70 per cent of the fresh water used by human goes to agriculture. Out of that 45 per cent is wasted due to gaudy irrigation techniques. By using aeroponic systems, we can save 98 per cent of total water because of re-circulatory system. Fresh, clean, healthy, efficient and rapid food production can be obtained from aeroponic systems throughout the year. This soil-less culture can overcome all the constraints that are present in soil culture production.

Enhanced disease-free yield leads India to be at top growers and exporters in near future.

Aeroponic system has the potential to produce enhanced vegetative growth without use of any artificial hormones, pesticides or insecticide. Aeroponics is still a good way to learn how to master plant growth and learn about their needs, within a controlled environment.

For urban dwellers that live in apartments, sometimes aeroponics is the only practical way to garden. And on arid lands, aeroponics circumvents this problem, and provides the best means of growing plants effective.

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