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TO STUDY ABOUT HYDROPONICS TECHNOLOGY AND ITS IMPLEMENTATION IN HOTELS OF NAGPUR

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ABSTRACT

Hydroponics farms have become a new trend in the Agricultural sector, especially with the growing needs of food and also because of the limited resources. The purpose of the research project was to gain knowledge about the modern Farming Method. The findings of the research suggest that in about 5-10 years of time the hydroponic business is eyed to increase about 200%-300%compared to the present situation. The food products produced by Hydroponics method are both nutritious and organic. The limited use of resources in hydroponic farming makes this method the tool for future sustainability. The complete analysis of the research has been made by using 2 basic research tools .One is an online survey, conducted to collect the information regarding people views about Hydroponics. The other tool was an interview with a local Hydroponic Grower

INTRODUCTION

Soil is usually the most available growing medium for plants. It provides anchorage, nutrients, air, water, etc. for successful plant growth .However, soils do pose serious limitations for plant growth too, at times. Presence of disease causing organisms and nematodes, unsuitable soil reaction, unfavorable soil compaction, poor drainage, degradation due to erosion etc. are some of them. In addition, conventional crop growingin soil (Open Field Agriculture) is somewhat difficult as it involves large space, lot of labour and large volume of water. Moreover, some places like metropolitan areas, soil is not available for crop growing at all, or in some areas, we find scarcity of fertile cultivablearable lands due to their unfavorable geographical or topographical conditions. Of late, another serious problem experienced since is the difficulty to hire labour for conventional open field agriculture. Under such circumstances, soil-less culture can be introduced successfully.

While there has been a near continuous increase in fertility of soil until now, currently, this soil fertility

increase has stagnated. This is due to a saturation effect, wherefurther application of fertilizers only produces a marginal and diminishing return in productivity. Moreover, certain cultivable areas see poor soil fertility due to continuous cultivation which does not allow the soil to build-up its fertility over time due to growth of natural microbes. Further causes in decrease of productivity include natural phenomenasuch as repeated drought conditions and unpredictable nature of climate and weather as well as human caused pollution of rivers and other sources of water due to poor water management and wastage of a large quantity of water causing groundwater level decline Conventionally, soil has been the only and thus most ubiquitous medium for growing plants while providing the dual role of anchorage as well as supplying nutrients and waterto the plants allowing for successful plant growth.

This dependency on soil, however, causes inherent problems such as the constant presence of disease causing organisms and nematodes. Moreover the soil may be unsuitable or unfavorable to the plant in cultivation India More correctable and preventableproblems such as soil compaction and poor drainage may also occur and degradation due to erosion causes an avoidable decrease in fertility. Evidently, soils poseserious limitations for plant growth in general causing farmers to face difficulty due to the tradeoff between large space requirement or reduction in plant growth and thus productivity. Currently, it is difficult to hire manpower for open field agriculture. These problems are mitigated to a large extent due to the introduction of hydroponics and aeroponics, both of which are soilless cultures

Soilless cultivation represents a valid opportunity for the agricultural production sector, especially in areas characterized by severe soil degradation and limited water availability. Furthermore, this agronomic practice embodies a favorable response toward an environment-friendly agriculture and a promising tool in the vision of a general challenge in terms of food security. This review aims therefore at unraveling limitations and opportunities of hydroponic solutions used in soilless cropping systems focusing on the plant mineral nutrition process.

Hydroponics is a system of agriculture that utilizes nutrient-solvent rather than soilfor plant nourishment and growth. It can also be defined as a method in wherein plants aregrown in a liquid nutrient solution with or without the use of artificial media require pesticides, require less water and space than the traditional agricultural systems. Plants grown in soil and plants grown in a Hydroponics system do not need to develop extensiveroot structures to search for nutrients due to this it is easy to test and adjust pH levels(the crucial element to sustain plant life.

Plants need minimal energy to acquire nutrients from the roots. Where as in Hydroponics method, plants are raised in an inert and perfectly pH balanced growing medium where the energy saved by the roots is spent on

flower and fruit production. In Hydroponics method, the root system of the plant is supported with an inert medium suchas partite, Rockwool, clay pellets, peat moss, or vermiculite. The nutrient solution provided to the plant is also provided or accessed with proper oxygen facility which is veryessential for the plant growth Hydroponic flowers, herbs, and vegetables are planted in inert growing media andsupplied with nutrient-rich solutions, oxygen, and water. This system fosters rapid growth,stronger yields, and superior quality. When a plant is grown in soil, its roots are perpetuallysearching for the necessary nutrition to support the plant. If a plant's root system is exposeddirectly to water and nutrition, the plant does not have to exert any energy in sustaining itself. The energy the roots would have expended acquiring food and water can be redirected into the plant's maturation. As a result, leaf growth flourishes as does the blooming of fruits and flowers.

Hanging Gardens of Babylon

Definition of Hydroponics

The word Hydroponics is taken from the Latin language where Hydro means "water" and Ponics means "labor" .It's a method of cultivation or growing of plants without soil. water goes to work providing nutrients, hydration, and oxygen to plant life. Using minimal space, 90% less water than traditional agriculture, and ingenious design, hydroponic gardens grow beautiful fruits and flowers in half the time.

The roots are suspended in a purified water system that is enriched with nutrients.Instead of using soil, the root system is supported using an inert medium such as perlite, Rockwool, clay pellets, peat moss, or vermiculite.

Though the technology sounds cutting-edge, the history of hydroponics dates backto the famed Hanging Gardens of Babylon, one of the Seven Wonders of the Ancient World. The Euphrates River was diverted into

channels that cascaded down the lavish garden walls. In the 13th century, Marco Polo wrote of witnessing floating gardens in China. However, hydroponics is far from merely an innovation of the ancient ages. In the 1990s, NASA grew aeroponic bean seedlings in zero gravity aboard a space station, opening up the possibility of sustainable agriculture in space. Hydroponics continues to bea timeless and dynamic method of water conservation and crop production. The earliest published work on growing terrestrial plants without soil was the 1627Book Sylva Sylvarum or 'A Natural History' by Francis Bacon, printed a year after his death. As a result of his work, water culture became a popular research technique In 1699, John Woodward published his water culture experiments with Spearmint. He foundthat plants in less-pure water sources grew better than plants in distilled water.Dr. W. F. Gericke in 1936 from the University of California was the first person to carry out large- scale commercial experiments in which he grew tomatoes, lettuce and other vegetables. While working at the University of California

PURPOSE OF STUDY

Purpose of this project is to aware people about hydroponic technology and its advantages. This technology is best for indoor gardening, we can easily growing vegetable at home on water without soil with this technology water save 80% than traditional farming. If this technology will grow then everyone gets fresh vegetables at home and everyone can easily grow vegetables on their terrace or in garden.

Hydroponics also allows us to create farms in location where soil conditions are not too good to support farming or space is limited. The systems are closed and recycle that is not used by plants.

OBJECTIVES:

- To understand the working principle of hydroponic technology.
- To evaluate how hydroponic technology different from traditional farming.
- To identify the advantages of using hydroponic technique.
- To apply the hydroponic technique for growing vegetables on water solublenutrients.

REVIEW OF LITERTURE

The working principle of the Hydroponics Technology

The working principle of the hydroponics method can be easily determined by thescience through which

plants obtain food and grow. It has been proven scientifically that plants grow through a process called Photosynthesis, in which they use sunlight and a chemical pigment present in them called Chlorophyll to convert the glucose are further converted into fibers allowing the plants to grow. The pigment chlorophyll acts as a catalyst in the reaction as it enhances the occurrence of the reaction. If observed carefully,the use of soil is not determined in the growth of the plants because soil primary role of toprovide strength to the plant by strengthening by this it can be clearly understood that forthe growth of the plant soil is not important. The plant needs proper nutrition and water, soil is the best way to obtain nutrition, but if the plants could get those nutrients from othersource, they would still survive. This is the basic principle behind Hydroponics.

The plants that are grown by Hydroponics dip their roots directly into the nutrientbased water solvents rather than absorbing from the soil making the roots job easier. Thisis the reason for the shorter root system of these plants; this shorter root system enables the plant to divert their energy usage from absorbing nutrients from soil into growth of theleaves and the stem.

Plants needs

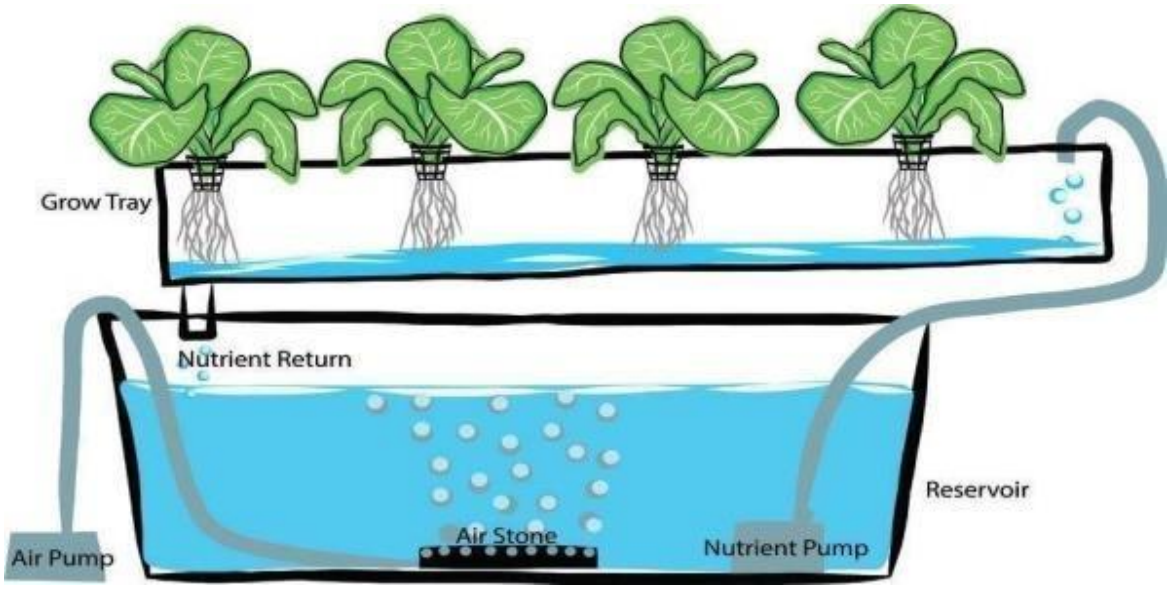
* Water
* Sunlight
* Air
* Root system
* Nutrients

How does hydroponics work?

Hydroponic systems work by allowing minute control over environmental conditions like temperature and pH balance and maximized exposure to nutrients and water. Hydroponics operates under a very simple principle: provide plants exactly what they need when they need it. Hydroponics administer nutrient solutions tailored to the needs of the particular plant being grown. They allow you to control exactly how much light the plants receive and for how long. pH levels can be monitored and adjusted. In a highly customized and controlled environment, plant growth accelerates.

By controlling the environment of the plant, many risk factors are reduced. Plantsgrown in gardens and fields are introduced to a host of variables that negatively impact their health and growth. Fungus in the soil can spread diseases to plants. Wildlife like rabbits can plunder ripening vegetables from your garden. Pests like locusts can descend on crops and obliterate them in an afternoon. Hydroponic systems end the unpredictability of growing plants outdoors and in the earth. Without the mechanical resistance of the soil,seedlings can mature

much faster. By eliminating pesticides, hydroponics produce much healthier and high-quality fruits and vegetables. Without obstacles, plants are free to growvigorously and rapidly.



RESEARCH METHODOLOGY

Selection of Area

- Study is limited to hotels of Nagpur city.

Selection of Sample

Questionnaire was used. Purposive random sampling technique was used forsample and sample was from all the direction of a particular area

Size of Sample

- 50 responses

Collection Of Data

a. Primary data:

The primary data consisted of information collected through questionnaire

cum personal interviews. The questionnaire consisted of basic information about topic

b. Secondary data:

The secondary data is consisting of individual information gathered by the research through text book, internet and magazines.

RESULT AND DISCUSSION

TABLE 1

1. Awareness About Organic Vegetables

Sr.No	Particular	No. of respondent	Percentage
1	Yes	52	91.2%
2	No	1	1.8%
3	Maybe	4	7%
	Total	57	100%

Discussion:-

From the above table it has been observed. 91.2% people said that they are wellaware about organic vegetable where as 1.8% people don't aware about organic vegetables. And 7% people are not sure about this.

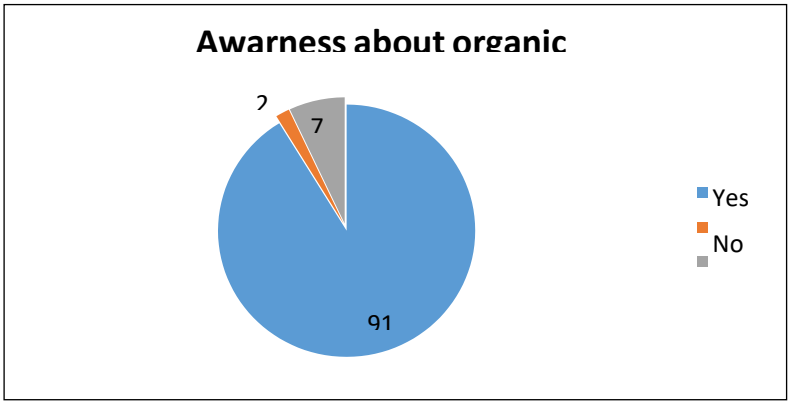


Fig No 1

TABLE 2

2. Awareness about Hydroponics Farming

Sr.No	Particular	No. of respondent	Percentage
1	Yes	36	62.1%
2	No	14	24.1%
3	May be	8	13.8%
	Total	58	100%

Discussion:-

From the above table it has been observed .62% people said yes they know about hydroponics farming .where as 24.1% people don't know what hydroponic farming is. And 13.8% people said that they may know about this.

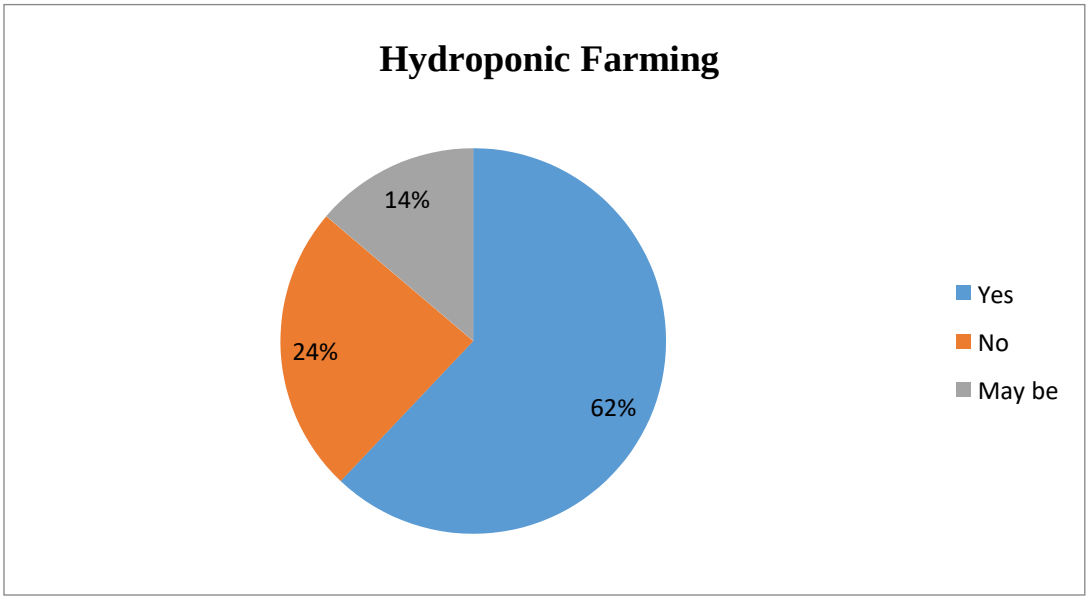


Fig No 2

TABLE 3

3. Use of Hydroponics Technology in Hotel.

Sr.No	Particular	No. of respondent	Percentage
1	Yes	38	65.5%
2	No	8	13.8%
3	May be	12	20.7%
	Total	58	100%

Discussion:-

From the above table it has been observed.65.5% people are said yes they would like to grow vegetables in their hotel and home. whereas 13.8% people not shown interested in growing vegetables in their premise and. 20.7% people said that they may think on growing vegetables in their premise.

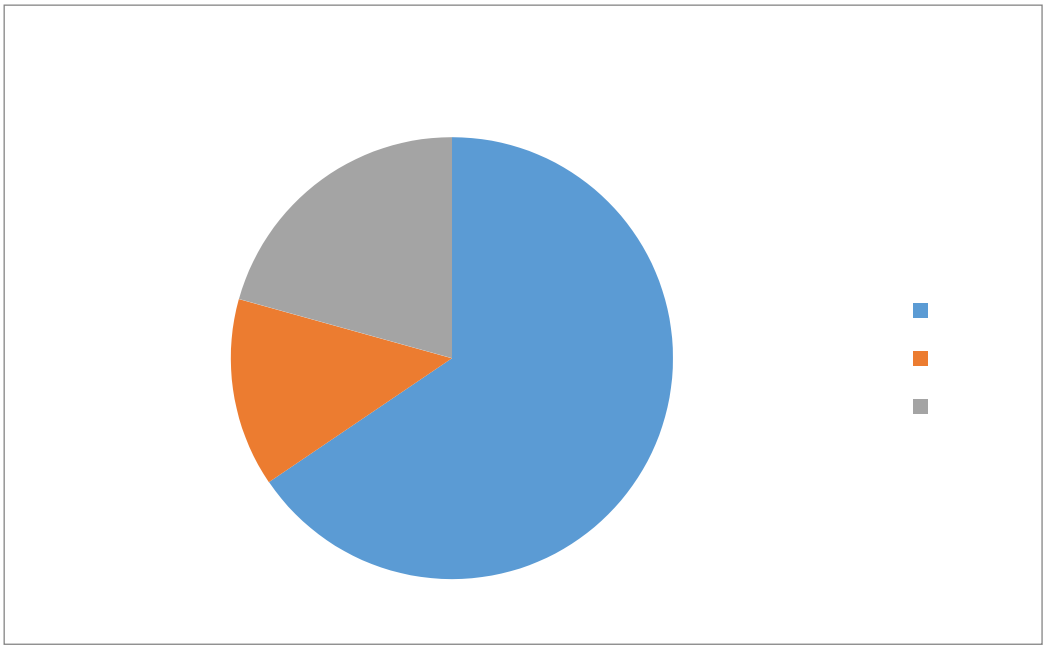


FIGURE 3

TABLE 4

4. Hydroponic Farming is better than Traditional Farming

Sr.No	Particular	No. of respondent	Percentage
1	Agree	33	58%
2	Disagree	20	35%
3	Neutral	3	5%
4	don't know	1	2%
	Total	57	100%

Discussion:

From the above table it has been observed .58 % people agree with hydroponicis better than traditional farming. Whereas 35% people disagree with hydroponics is betterthan traditional farming. 5% people are not sure about this.2% people says don't know about that.

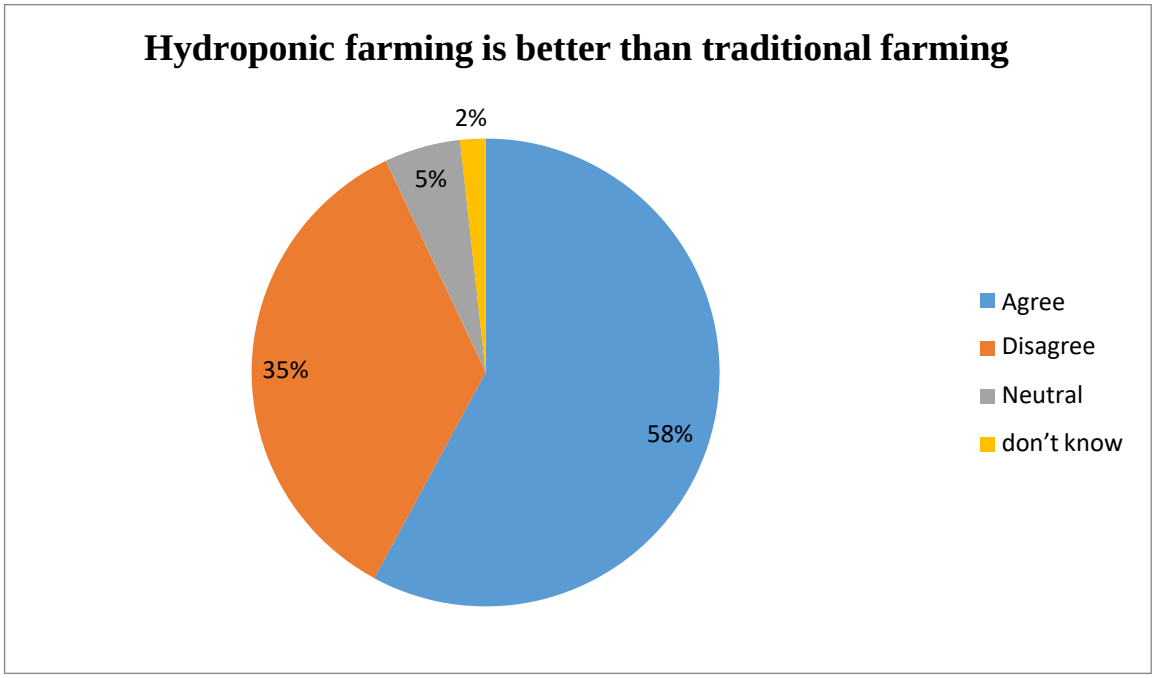


FIGURE 4

SUMMARY

Hydroponic is a technology for growing plants in nutrient solution (water andfertilizer) with or without use of artificial medium (eg sand and rockwool, vermiculite)

Hydroponics technology is helpful in limited water, low-yielding farmland, and soil pollution are the associated challenges in this world of growing population with growing food demands. Everyone is looking for efficient ways to increase food production and improve food security.

Hydroponics system in any hotel can help chefs grow their own choice of products-herbs and veggies, combined with the freshness and flavors, irrespective of seasons. It helps enhance the taste of the served food to a completely different level. Any restaurant serving their signature cuisine, using the ingredients produced using Hydroponics - a responsible sourcing, would increase the sense of satisfaction for the owner and customer.

CONCLUSION

The study mainly focuses on the working of Hydroponics and the need of it for Nagpur hotels and farm working process of the system. Hydroponics is truly the future of farmingand hotel industry also the Agricultural sector because of many factors. Limited use of resources, pesticide free growing, utmost utilization of space, faster production is few factors making the method a booming business. Most of the micro greens available aroundthe worlds' hotels and restaurants are produced by this method. The utmost important needfor hydroponics is its ability to produce all food crops round the year.

Progress has been rapid and results obtained in various countries have proved that this technology is thoroughly practice and has very definite advantage over conventional methods of crop production. The main advantage of soil-less cultivation is the much highercrop yields People living in crowded city streets ,without gardens , can grow fresh vegetables and barren and sterile areas can be made productive at relatively low cost.

SUGGESTIONS AND RECOMMENDATION

Suggestions:

- With the help of hydroponic technology one can grow fresh vegetables at home,in hotel, and farm.
- Hydroponic technology can also helpful growing vegetables at home in limitedspace.
- Hydroponic farming is new idea in Nagpur.
- With the help of this technology in any hotel can help chefs grow their own choice of products-herbs and veggies, combined with the freshness and flavors,irrespective of seasons. It helps enhance the taste of the served food to a completely different level.

RECOMMENDATION:

- Every hotel should have to implement this technology for growing freshvegetables for run their restaurant.
- Using this technology we can avoid chemical fertilizers and pesticides that harmto human body.
- Also this technology is cost effective and profitable.
- Those hotels don't have space they can use their terrace of hotel for implementhydroponic technique for growing vegetable.
- Hotels in city may have more space around their hotel they can utilize thistechnique in more effective way.
- Hotels can be using this in promotion to attract market segment.

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