

Protected Cultivation

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Introduction:

A controlled microclimate affects a plant's growth and development in a cropping approach known as protected cultivation. Industrial farming has made extensive use of numerous protected cultivation systems as agriculture has progressed. Among these agricultural protection methods, greenhouses, plastic houses, antique houses, net-houses, and shade houses are helpful. A greenhouse can be an inflatable structure or a framed building lined with a clear or semi-transparent material that provides at least some controlled conditions for crops to grow to maturity.

The agricultural industry and allied industries are the main engines of the Indian economy. A significant worry that has arisen since the Green Revolution is the proliferation of novel biotic and abiotic stressors. Protected farming methods alleviate these demands by providing a completely regulated environment. Considering

The process of altering the natural environment to promote the best possible plant growth is known as protected culture. Aerial and root environments can be altered to boost agricultural yields, lengthen the growth season, and allow for protected cultivation may also refer to an extensive system of controlled environmental agriculture, where all elements of the natural environment are altered for optimal plant growth and financial return at times of the year when field crops are not typically grown.

Growing in Difficult Agricultural Zones

In India, there are over 75 million hectares of land with unfavourable environmental characteristics such as desert, extreme cold, cultivable wasteland, fallow land, and barren and uncultivable land. The generation of money for the local habitat may be significantly enhanced if a tiny piece of this area was planted under greenhouse horticulture.

Greenhouse Complexes around Metropolitan and Other Big Cities

According to a reasonable assessment, practically every major city has a year-round demand for fresh fruits, vegetables, and ornamental plants. High-value and off-season crops

are also needed in these large cities. Growing vegetables in greenhouses could be a good way to meet the city's requirements.

Export of Agricultural Produce

India's agriculture is being looked at more and more as a way to close the country's trade deficit, and the country's produce, particularly its flowers, has a healthy market outside. Export-oriented crop promotion and greenhouse farming appear to be potential sources of foreign income. To minimize the expense of transportation, such facilities ought to be built close to the lifting point.

Greenhouse for Plant Propagation

These days, growing seedlings and cuttings that need a controlled environment to flourish is thought to be a good use for greenhouse technology. The capacity and quality of the plant material could be increased by converting the current nurseries that do not have a greenhouse into a greenhouse. The greenhouse facility can be used to propagate even different types of plant material. The amount of time needed to prepare seedlings would be significantly reduced in temperate climate zones if plants were propagated in greenhouses.

Greenhouse Technology as Base for Other Biotechnology

Controlling the ambient conditions in which plants develop is necessary for hydroponics or nutrient film techniques. In a similar vein, materials produced by biotechnology and tissue culture techniques must also be propagated in controlled environments. Greenhouse technology is the most appropriate solution for conducting these kinds of investigations.

Cultivation of Rare and Medicinal Plants

Numerous orchids and herbs found in India have been recognized for extensive cultivation. The ideal kind of environmental conditions for the intensive cultivation of these plants might be provided by the greenhouse.

Importance of Protected Cultivation:

It is no longer possible to ignore the growing urgency of the global issue of climate change. Anthropogenic factors, such as the unsustainable use of fossil fuels, the destruction of forests for industrial development, and the growing urbanization and overpopulation, are the key underlying causes.

- Creation of transplants with improved genetics and no known diseases



- The crop is protected from frost, wind, rain, storms, and cold. Because of controlled circumstances, plant growth is higher and harvests develop faster.
- Long-term improvements in manufacturing quality and output.
- Optimized water use results in a 40–50% reduction in usage.
- Effective use of the inputs.
- Year-round production of fruit, vegetables, and flowers
- Disease and pest occurrence is decreased or eliminated; crops will reach their full maturity during the year.
- Can be used for solar drying of farm produce.
- The best technology for industrial production of high-value commodities like flowers, medicinal plants, etc.
- The labor pool's involvement will be minimized
- crop cultivation in adverse weather conditions
- To meet consumer demand, some crops are grown continuously.
- Fully-grown, premium-quality, even organic crops for export markets
- Income from small land holdings was greatly inflated.
- Successful nurseries prepared as and when needed from seeds or vegetative propagation
- Increases output per unit of area
- Little weed infestation and effective water use
- Generates self-employment opportunities for educated youth
- Vegetable seed production
- Hybrid seed production
- The greenhouse's microclimate and bug-proof features breed plants, resulting in the development of modern types and the manufacturing of seeds.

Limitations of protected cultivation:

- High initial infrastructure costs (capital cost).
- Lack of skilled labor and local replacement of that labor.
- Lack of technical understanding of crop protection structures.
- Every single operation is incredibly time-consuming and demanding.
- Needs close monitoring and supervision.



- Some pests and pathogens that are found in soil are challenging to control.
- A significant challenge is a maintenance and repair.
- Requires confident marketing because a significant commitment of time, effort, and money is anticipated.

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