

Production and Marketing of Greenhouse Cultivation in India

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Abstract: *Indian Agriculture will continue to be a main strength in Indian Economy. As population increases the food demand also increases. The worry is that the existing system of agriculture will not be able to meet the food requirement near future as this system is facing challenges. Greenhouse systems improve growing conditions of vegetable, fruit and ornamental crops. Greenhouse coverage protects plants from adverse atmospheric agents and, together with suitable equipment, influences and ultimately modifies the crop microclimate, thus extend the market availability of the products, improving their quality and allowing higher yields. Greenhouse production has a higher return per unit area than crops grown in the open field, but it requires the use of large amounts of energy to operate the equipment on one hand and generates huge quantities of wastes to be disposed off on the other hand. Protected cultivation can be environmentally unfriendly, especially in areas with a large concentration of greenhouses. The objective of this paper is to know the challenges faced by the greenhouse cultivators in production and marketing of greenhouse produce. This study revealed that greenhouse cultivation is better option in the sense of utilization of inputs and improved crop production.*

Keywords: Greenhouse cultivation, crop production challenges, protected farming methods, agricultural sustainability, market constraints

1. Introduction

Greenhouse cultivation is the most intensive form of crop production. It is covered with glass or plastic film, transparent and translucent materials. The technology of using greenhouses to grow plants is of significant importance, especially in areas where the climatic conditions are always on the extreme side and regions of high rainfall. Under greenhouse conditions vegetable, ornamental and fruits crops are cultivated worldwide. In recent decades, greenhouse area has risen worldwide, due mainly to the increased use of plastic greenhouses for growing vegetable crops. Investment, labour and energy costs per unit area are much larger in the greenhouse industry than in any other agricultural sector. The main factors determining location and site selection of a greenhouse production area are: cost of production, quality of produced yield, and transportation cost to markets (Nelson, 1985; Castilla, 2007). Obviously, cost and quality of production depend on the local climate and the greenhouse growing conditions. The level of investment in technology (simple or sophisticated greenhouses and equipment), as well as management, depends primarily on the local climate. Nowadays, long distance transportation means that production areas may be located far from major consumption centres, enabling the development of greenhouse industries in many climatically favourable areas around the world. In addition to transportation, marketing, packing etc. also affects the overall cost of the products; they tend to be similar for different commodities coming from different geographical origins, but which compete in the same markets.

2. Data Base and Methodology

The data for the study gathered from a purposeful and well-structured field survey. The survey is conducted during the year 2024. The sample was based on stratified random sampling.

3. Objectives

- To understand the problems in production of greenhouse cultivation in India.
- To know about the problems in marketing of greenhouse cultivation in India.

4. Need of the Study

Production of crops in open field is one of the major traditional occupations of the people of Himachal Pradesh. But now a day's greenhouse cultivation in agricultural sector is going on.

When planning the installation of a greenhouse, two main questions must be answered (Jensen and Malter, 1995):

- Where will the production be marketed (domestic or export markets or both)?
- What type of commodities will be produced (edible or ornamentals)?

The need of the research has been felt to examine the challenges faced by the farmers in production and marketing of greenhouse cultivation in Kullu valley of Himachal Pradesh.

5. Scope of the Study

The research is confined to the Kullu district of Himachal Pradesh to ascertain the challenges faced by the greenhouse cultivators in production and marketing of greenhouse crops. The research is mainly a primary probe to analyze the research problem. The reference period for collecting primary data from the respondents of this district is 2024. In order to seek the primary information, 120 respondents were consulted.

6. Analysis and Discussion

Based upon the responses of 120 low and medium greenhouse holders, the challenges revealed by them with regard to production and marketing of greenhouse cultivation, the analysis has been drawn and discussed as below:

1) Challenges faced by greenhouse cultivators in production of Greenhouse Crops

Despite of good source of income in greenhouse cultivation, only few people of Kullu valley are indulged in this occupation. The greenhouse cultivators are facing many challenges mentioned below:

Site selection	65%
Design of the greenhouse	20%
Orientation and light	10%
Local climatic conditions, topography and soil quality	80%
Water supply	66%
Crop variety selection	83%
Transplanting and plant spacing	4%
Water management	17%
Type of commodities to be produced (edible or ornamentals)?	2.4%
Perishable nature of crops	26.4%
Requires HYV seeds	45.6%
Need temperature maintenance	90%
Drip system for irrigation	16.8%
Need spray frequently	27.6%
Need mask gloves and proper dress	1.2%
Need special fertilizer for greenhouse cultivation	4.8%
Maintenance of expensive greenhouse infrastructure	94%

As per the above points revealed by the respondents, there are a series of challenges in the process of greenhouse production. However, there is a disparity in the challenges depicting by the informants as only one respondent has stated that there is need for masks, gloves and proper dress while indulged in production in the greenhouse. On the contrary, 94% of the respondents have argued that the cost incurred on maintenance of greenhouse infrastructure is very high.

2) Challenges faced by greenhouse cultivators in marketing of Greenhouse Crops

Regarding marketing of the greenhouse crops the respondents have given mixed responses about the challenges they face. The major categories of the challenges explained by the respondents are as under:

No comparison of price of greenhouse and other types of cultivation	80%
Challenges regarding selection of domestic and foreign markets	54%
High transportation cost	72%
Crop and variety selection	48%
Type of crops to be produced as per market demand	57%
Lack of facilities of connectivity to markets	62%

The challenges with regard to marketing of the greenhouse crops range between 48% to 80%. The respondents have given quite serious points of challenges which need to be addressed to boost up greenhouse cultivation in the state.

7. Conclusions and Suggestions

On the basis of survey, it is concluded that appropriate site selection and design of greenhouses is essential factor for profitable and sustainable greenhouse production.

It also includes the type and level of greenhouse technology i.e. structure and internal equipment for climate control and subsequent crop production conditions, which in turn influence product cost and quality. One of the major challenges is marketing of GH produce due to non-accessibility of markets, especially in Himachal Pradesh where the adverse topographical conditions can be a limiting factor for profitable greenhouse cultivation. It is also found that lack of proper training and knowledge also influences the GH cultivation in Kullu valley. It is also concluded that an economic compromise between the investment costs of the greenhouses equipment and their agricultural performance is necessary to produce proper quality commodities at a competitive level.

8. Suggestions

On the basis of conclusion some suggestions are drawn below for the betterment of greenhouse cultivation in Kullu valley.

- Government should organize awareness camps at Panchayat and village levels frequently, so that farmers come to know about the benefits of greenhouse cultivation.
- Availability of cold storage needs to be ensured, so that farmers' losses are minimized.
- Proper irrigation facilities should be provided to farmers.
- Keep all surfaces free of plant debris and weeds.
- Reduce excess moisture and condensation in the greenhouse by improving ventilation and implementing horizontal airflow fans.
- Avoid excessive fertilization, runoff and puddling on floors, benches and greenhouse surfaces.
- Application of integrated pest management strategies.
- Use of innovative closed-loop fertigation systems with water recycling result in a significant reduction of plant diseases.

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