

Chapter – 1

Introduction

1.1 Horticulture

Horticulture is the branch of agriculture that deals with the art, science, technology, and business of growing plants. It includes the cultivation of medicinal plants, fruits, vegetables, nuts, seeds, herbs, sprouts, mushrooms, algae, flowers, seaweeds and non-food crops such as grass and ornamental trees and plants. It also includes plant conservation, landscape restoration, landscape and garden design, construction, and maintenance, and arboriculture. Inside agriculture, horticulture contrasts with extensive field farming as well as animal husbandry.

Horticulturists apply their knowledge, skills, and technologies to grow intensively produced plants for human food and non-food uses and for personal or social needs. Their work involves plant propagation and cultivation with the aim of improving plant growth, yields, quality, nutritional value, and resistance to insects, diseases, and environmental stresses. They work as gardeners, growers, therapists, designers, and technical advisors in the food and non-food sectors of horticulture. Horticulture even refers to the growing of plants in a field or garden.

1.2 Modern India Horticulture

India is currently producing about 283 million tones of horticulture produce and horticulture production has surpassed the food production in the country. It has proven beyond doubt that productivity of horticulture crops is much higher compared to productivity of foodgrains. Productivity of horticulture crops has increased by about 34% between 2004- 05 and 2014- 15. The special thrust given to the sector, especially after introduction of the Horticulture Mission for North East & Himalayan States (HMNEH) and the National Horticulture Mission (NHM) in the XI plan, has borne positive results. Given the increasing pressure on land the focus of growth strategy has been on raising productivity by supporting high density plantations, protected cultivation, micro-irrigation, quality planting material, rejuvenation of senial orchards and thrust on Post Harvest Management and marketing of produce for better price realization.

1.5 Indian Floriculture Industry

Floriculture is becoming a booming industry in India today. In India, floriculture is emerging as an important commercial crop. A lot of importance has been given to this sector due to its potential to create more rural employment, ensuring higher rate of returns to rural people and its capacity to earn more foreign exchange. More specifically, floriculture products are being used as raw materials in the manufacture of essence, perfumes, medicines and confectioneries for direct consumption by the society. The production of flowers is an age-old occupation. Until last decade, the growing and selling of flowers was confined to a few families. They grew a variety of flowers on the same land and the products were sold close to the house, as they could not survive a long journey. The situation in the last two decades has, however, changed. Now, different farmers are growing different flowers both for domestic market and export purposes. The flowers were, until 1960s, confined to domestic markets. These flowers are now moving long distances due to the availability of airfreight and hi-tech cooling systems.

The economic reforms and liberalisation policies introduced from 1991 and modified the EXIM policies of 1992-2014 have given fillip to this sector. After liberalization, the Government of India identified this activity as a sunrise industry and accorded it 100 per cent export-oriented status. Later, many writers have termed this industry as "Rosy Business sector", a Global Concern, Blossoming Industry, Thrust Area, Money Spinning, Lucrative export-oriented sector, etc.

Growing demand and much higher return per unit of land than any other agricultural activity has prodded farmers to take to this sector. The growing demand for floriculture product has also increased on account of rapid urbanization, increase in individual purchasing power among the middle-income groups, increase in the number of IT Units, Hotels, Tourists, Temples, increase in GDP, Per capita Income, changes in life-styles, changes in social values of the people, greater awareness among the people to improve the deteriorating environment and economic welfare of the people allocated to this sector as against 17 crores in the Eighth Five Year Plan (GOI 1996). This speaks of the importance given to the sector. This positive attitude enabled the country to achieve a breakthrough in the floriculture industry in terms of

expansion in the area and the production in the last two decades. Agricultural and Processed Food Products Export Development Authority (APEDA), is responsible for export promotion and development of floriculture in India.

Floriculture products mainly consist of cut flowers, pot plants, cut foilage, seeds bulbs, tubers, rooted cuttings and dried flowers or leaves. The important floricultural crops in the international cut flower trade are Rose, Carnation, Chrysanthemum, Gerbera, Gladiolus, Gypsophila, Alstroemeria, Lilies, Iris, Tuberose, Orchids, Anthurium, Tulip, and Lilies. Floriculture crops like Gerberas, Carnation, etc. are grown in green houses. The open field crops are Chrysanthemum, Roses, Gaillardia, Lily, Marigold, Aster, Tuberose etc.

About 232.74 thousand hectares area was under Cultivation in floriculture in 2012-13. Production of flowers is estimated to be 1.729 million tonnes loose flowers and 76.73 million tonnes cut flowers in 2012-13. The country has exported 22,947.23 MT of floriculture products to the world for the worth of Rs. 460.75 crores in 2014-15. United States, United Kingdom, Germany, Netherland and United Arab Emirates were major importing countries of Indian floriculture during the same period.

1.6 State wise Area under Floriculture

The NHB 2010-11 statistics showed that the highest area under floriculture was found in the state of Tamilnadu with 32,000hectares, followed by Karnataka with 27,000 hectares, west Bengal with 23,000 hectares, Andhra Pradesh with 21,800 hectares, Maharashtra with 17,500 hectares, Gujarat with 12,500 hectares and Uttar Pradesh with 10,400 hectares. These states together accounted for 75.89 per cent of the total area in the country. A larger proportion of the area of the floriculture in many states was concentrated around the suburban area of the urban centre as there was growing demand in the urban market.

1.7 Employment in Floriculture Production

Floricultural crops are highly labour intensive and have the capacity to generate more direct and indirect employment both in rural areas as well as in urban areas. The various estimates showed that the employment generation of flower crop

cultivation was higher than the other horticulture crops, food crops and commercial crops.

1.8 Protected vegetables and flowers cultivation

Protected vegetables and flowers production can reduce the amount of water and chemicals used in production of high value vegetables and flowers compared to open field conditions. The main advantages of protected cultivation are:

1. Improved quality and consistency supply of high value vegetables and flowers.
2. Year round production of high value vegetables and flowers.
3. Adverse climate for production of vegetables and flowers can be overcome by different systems of protected production.
4. Multiple cropping on the same piece of land is possible under protected environment.
5. Off- season production of vegetables and flowers to get better return to growers.

1.9 Future thrust for protected agriculture

Protected agriculture is climate resilient agriculture. It is expanding in India very fast in many states, especially Maharashtra, Karnataka, Gujarat, Andhra Pradesh, Tamil Nadu, Rajasthan, Punjab and Haryana. Protected agriculture is the future agriculture for the Indian Farmers as it is suited for small and marginal land holdings with very less available water. The increasing incidents of disease, pests and unfavourable weather necessitate the use of protected agriculture in India to meet the growing demand of high value vegetables and flowers.

1.10 The Government Initiatives on Protected cultivation include:

- Water Management
 - Drip Irrigation System
 - Sprinkler Irrigation System
- Protected Cultivation
 - Greenhouse
 - Plastic Tunnel
 - Shade Net House
 - Walk in Tunnels

- Plant Protection Nets
- Surface Cover Cultivation
 - Plastic Mulching
 - Soil Solarisation
- Water Resource Management
 - Farm Pond & Reservoir lined with Plastic Films
- Vermi Bed- Organic Farming

1.11 Statement of Problem / Key issues

- ❖ The Indian horticulture and floriculture sector is facing severe constraints like low crop productivity, limited irrigation, under developed infrastructure support like cold storage, markets, roads, climatic conditions, transportations, heavy post harvest and handling losses, resulting in low productivity. Efforts are needed to overcome constraints and move towards horticulture and floriculture growth in India.
- ❖ The others constraints are size of landholdings, rapid urbanization, declining crop production, bio-diversity and ever increasing population demand for food specially vegetables has increased manifold and protective cultivation offers a new dimensions to produces more, in limited area.
- ❖ The other important constraints of horticultural crop production are lack of sunlight, extreme temperatures, moisture deficiencies or excesses, weed growth, deficiencies in soil nutrients, excessive wind velocity and atmospheric carbon dioxide. Most of these are climatic factors or directly related to them. Many of these constraints have been alleviated or lessened by protected cultivation or controlled environments.
- ❖ The demand for horticulture & floriculture products is increasing significantly at national and international level in the recent decades.

1.12 Objectives

1. To study the practices, methods, structures and technology to achieve optimal productivity in protected cultivation vis-à-vis crop grown in the open fields.
2. To study the schemes of Maharashtra and Karnataka for promotion of high values crops like vegetables, flowers and fruits for small and marginal farmers.

3. To investigate into pre and post harvest technology, processing marketing, cold storage and employment opportunities.
4. To study the standard of living of the farm communities, economic health and role supporting organizations.
5. To study the capacity building and research development programs including R&D at National, State and local level.
6. Suggest measures in improving the implementation strategy.

1.13 Research questions or hypothesis

Based on the review of the available literature on the subject, following research questions have been formulated:-

1. How the small and marginal farmers have been benefitted through various socio economic schemes operating within State of Karnataka and Maharashtra for Horticulture and Floriculture development?
2. What are the professional skills acquired by the small and marginal farmers of Pune and Bengaluru for pre and post harvest technology in horticulture and floriculture?
3. What is role of supporting organizations in transferring technology to small and marginal farmers?
4. How the farmers are being benefitted in economic returns in terms of protective cultivations, vis a vis open field cultivations?
5. How the capital investments, schemes from Central and State Government are helping the small and marginal farmers in socio economic up-liftment?
6. To what extent the import/export policy is helping the small and marginal farmers for boosting agriculture productivity, specially Horticulture and Floriculture?

1.14 Methodology

The study will focus on the small and marginal farmers in the state of Karnataka and Maharashtra with special reference to Pune and Bengaluru on the basis the secondary data available from Horticulture Department of Government of Karnataka, Government of Maharashtra and Government of India. The study will be descriptive and exploratory in nature.

The source of data will be secondary. An Analysis of secondary data obtained through articles, journals, base line data of the departments, statistical handbooks of various departments like Agriculture, Horticulture Board of India, Agriculture Census, Published reports of the government, selected thesis, selected dissertation, Mentoring and evaluation reports of joint inspection team of the departments etc.

1.15 Conduct of the study

The secondary collected data will be analyzed for on the basis of various tools to address the research questions.

Method	Description	Usage
Secondary data		
National level	Details of the agriculture census data, baseline data on Horticulture, Floriculture, Plantation Crops, Medical Crops, Spices, Etc.	To assess the physical and financial allocations and targets, planning and policy framework, difficulties faced in implementation etc
State level	Details of floriculture and horticulture industries projects including financial (allocations, sanctions, expenditure), physical (planning process, approved projects, various government directives etc) and monitoring (internal monitoring reports, government directives etc)	To assess the physical and financial allocations and targets, planning and policy framework, difficulties faced in implementation etc
District level and below	Evaluation of project proposal, District survey reports, social economic service, Completion reports, process, photographs, monitoring reports if any.	To assess the physical and financial targets of the projects, planning and implementation of the individual projects, inputs, process and outputs of these projects
Key informant	Qualitative in-depth success stories of Hi-tech floriculture, horticulture with those who have first-hand knowledge of the initiative operations, contexts and are recipients / beneficiaries of government schemes with high productivity	Assess the difficulties and gap areas in relevance and implementation and best practices on how the effectiveness of the floriculture and horticulture industries can be enhanced through technology, transfer and up-gradation
Photos/images	Good resolution photos to document the process and outputs.	Assess the extent of the documentation and evaluation of the process in which stakeholders involved are along with the outputs achieved

1.16 Scope

The scope of study is to review the current status of horticulture and floriculture in India, effectiveness of various organizations, policies, operational gaps in planning and execution and its impact on economic and social aspects. The study is also concerned about the role of various stake holders in boosting economy and also recommends remedial measures for optimization of horticulture and floriculture industry in urban, peri-urban, sub-urban and rural sector for economic growth.

1.17 Limitations

Constraint of time and inadequacy of interaction with various stake holders in detail imposes limitation for a holistic and detail case study.

1.18 Chapterisation of Scheme

- Chapter 1 : Introduction
- Chapter 2 : Socio-Economic Analysis and Prospects of Horticulture and Floriculture.
- Chapter 3 : Economic Analysis of Selected Species under Protected and Open Field Cultivation and Related Government Initiatives
- Chapter 4 : Issues, Constraints and the need for Hi-tech Interventions for Improving Productivity
- Chapter 5 : Significance of Post Harvest Technology
- Chapter 6 : Key findings, recommendations and suggestions.
- Chapter 7: Annexures I) References; II) Cost Norms of Horticulture Schemes; III) Coding of Fruits, Vegetables and Flowers; IV) List of Beneficiaries of NHM in Bangalore and Pune; V) Normative cost price per acre; VI) Format of Horticulture Department for various schemes.