

Importance of Horticulture in India and Its Impact in Agriculture

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Introduction:

India is the first largest country in population in Asian Continent. Agriculture is the main occupation since ancient times in Indian Economy. Agriculture related sectors play crucial role. Horticulture is an important sub sector in Agriculture, which is rapidly growing and gaining significance in our economy and agriculture as well. Horticulture influences consumption habit and attitude of consumers. Horticulture is most lucrative among all other farming sectors in India. India with its diverse soil and climate comprising several agro-ecological regions, provides an opportunity to grow a variety of horticultural crops. These crops form a significant part of total agriculture produce in the country comprised of fruits, vegetables, flowers, ornamentals, medicinal and aromatics crops, plantation crops, spices and condiments in a backyard garden to raising crops in large-scale operations. Horticulture involves the study of plants, their growth and development and how they interact with the environment. Horticulture is a unique field of study, as it combines elements of botany, agronomy, soil science and other aspects of plant biology. The main aim of this article regarding horticulture is to enhance the production of high-quality, nutrition and aesthetic pleasing plants, fruits and vegetables and play a unique role in India's economy by improving the income of rural people. Cultivation of these crops in an intensive labour which generated employment opportunities for the rural population.

The scope of Horticulture in India:

In India area under horticultural crops touched 25.66 million hectares. With regard to fruits, India is second largest producer of fruits after China. A large variety of fruit crops are grown in India. Of these, mango, banana, citrus, papaya, guava, pineapple, sapota, jackfruit, litchi, grape, apple, pear, peach, plum, walnut etc. are the important one. India accounts for 10 per cent of the total world production of fruits. The leading fruit growing states are

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Maharashtra, Karnataka, Andhra Pradesh, Bihar and Uttar Pradesh. In regards to vegetables belonging to solanaceous, cucurbitaceous, leguminous, cruciferous, root crops and leafy vegetables are grown in Indian tropical, sub-tropical and temperate regions. Most of the important vegetable grown in India are onion, tomato, potato, brinjal, peas, beans, okra, chilli, cabbage, cauliflower, bottle gourd, cucumber, watermelon, carrot, radish etc. In India, West Bengal, Orissa, Uttar Pradesh, Bihar, Maharashtra, Karnataka are the important states for horticultural crop production. Flowers are indispensable part of the Indian festivals. It is important/integral part of socio-cultural and religious life of Indian people. India is known for growing traditional flowers such as jasmine, marigold, chrysanthemum, tuberose, crossandra, aster, etc. Commercial cultivation of cut flowers like rose, orchids, gladiolus, carnation, anthurium, gerbera, is also being done. The important flower growing states Tamil Nadu, Karnataka, Andhra Pradesh, Maharashtra, West Bengal, Sikkim, Jammu and Kashmir, Meghalaya, etc. The importance of plantation crops is immense in terms of earning foreign exchange. The major plantation crops include coconut, arecanut, oil palm, cashew, tea, coffee, rubber, cocoa, betel vine, vanilla etc. The leading states are Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Maharashtra, Goa, Assam etc. Since from the ancient times, the world has been fascinated about Indian spices. It is used for flavouring, seasoning and imparting aroma in foods. India is also known as the home of spices producing a wide variety of spices like black pepper, cardamom, ginger, turmeric, chilli, coriander, etc. Major spices producing states are Kerala, Andhra Pradesh, Gujarat, Rajasthan, Maharashtra, Karnataka, Orissa, Tamil Nadu etc. In regards to medicinal plants, they have proved to be life savers since from the inception of Ayurveda. India has a diverse collection of medicinal and aromatic plant species distributed throughout the country. It has more than 9,500 species with medicinal properties. Important medicinal plants are Isabgol, Senna, Opium poppy, Periwinkle, Coleus, Ashwagandha, etc. and aromatic plants are Japanese mint, Lemon grass, Citronella, Davana, Patchouli etc. Horticulture practices also include landscaping which is the design and construction of gardens, parks and other outdoor spaces. Landscaping includes such activities as planting and pruning trees, shrubs and other vegetation. Landscaping can also involve the installation of irrigation systems, lighting and other amenities.

The importance of horticulture in India:

1. **Horticulture crops contributes to the national income :** It contribute to increase national income. It also increases foreign exchange earning achieved through the export of produce.
2. **High production per unit area:** A horticulture crops give very high production per unit area as compared to cereals and pulses crops. In horticulture crops inter-crops are also taken during initial years of cultivation.
3. **Fruit and vegetables are “protective foods”:** In vegetable crops, some of the vegetables are annual crops. Some vegetables give yield within month of planting/sowing, while crops like coconut give income throughout the year.
4. **Best utilization of undulating and barren land:** The horticulture fruit crops such as Cashewnut, Aonla, Ber, Mango, Tamarind, Jamun, Karonda can be grown on undulating, barren/ wastelands where agronomic crops cannot be grown on such on such land.
5. Utilization of dry land areas for fruit crops like ber, custard Apple, drumstick, aonla, jamun, etc., can be utilized under low water availability.
6. **Industrial use:** The Horticulture crops are used in various industries such as coconut in coir and toys industries, aonla, turmeric, alovera, clove in Medicinal industries turmeric, alovera in cosmetics industries, flower like jasmine, rose in perfumery industry and kokum juice, ginger, turmeric, mango pulp, aonla candy in preservation industries.
7. **Saving money:** Horticulture crops are cultivated in kitchen garden. Thus, one can get a fresh supply of vegetables and save a considerable amount of money, besides being a source of creation and recreation.
8. **Sustainable horticulture:** Horticulture is crucial sustainable agriculture offering solutions to environmental, economic and nutritional challenges. By prioritising horticultural practices, countries can conserve natural resources, reducing waste, stimulate economic growth and enhance food security.
9. Horticultural crops, especially the fruit crop reduce environment pollution and reduce soil erosion and help in increasing precipitation.
10. **Fodder to cattle:** During famine, leaves of some of some of the crops such as Tamarind, Aonla, Ber, etc. are used as fodder.

11. Horticultural crops and Human Nutrition: Fruits and vegetables are the cheapest source of natural nutritive foods. They provide palatability, taste, improve appetite and provide fiber thereby the constipation can be overcome. They improve the general immunity of human body against disease, deficiencies, etc. They are the important source of vitamins and minerals for used of several bio- chemical reactions occur in body.

12. Government support for horticulture: The government of India has implemented various policies and programs to promote the growth and development of the horticulture sector, including the National Horticulture Mission and the Horticulture Development Programs.

Common Problems horticulture sector in India:

The horticulture sector in India is suffering a lot due to some natural, manmade, technical and economic reasons. Following are the some selected reasons behind the crippling growth and proven to obstruct the growth of horticulture sector in India.

1. Inadequate availability of disease-free, high-quality planting material
2. Slow dissemination and adaptability of improve high yielding cultivars/ hybrids.
3. Lack of post-harvest management technology and infrastructure
4. Weak database and poor market intelligence.
5. Instability of prices, with no support price mechanism.
6. Inadequate technical manpower / human resource in farming system.
7. Poor credit supply, high rate of interest coupled with inadequate crop insurance scheme.
8. Poor linkage between Research and Development sectors, industries and farming communities.
9. Late implementation of government policies and schemes.
10. Absence of horticultural crop suitability map of India based on agro climatic conditions depicting most suitable areas for optimum productivity of a particular crop.

Crops Specific Problems:

1. **Fruit crops:** i) Long gestation period. ii) Predominance of senile orchards (e.g. apple and mango) iii) Lack of technology to manage problems like spongy tissue, alternate bearing and malformation in mango, wilt in guava, decline in citrus, etc. iv) Location specific technologies are not available.

2. **Vegetables crops:** i) High cost of production due to labour intensive technologies. ii) Exorbitant charges of hybrid seeds. iii) Risk intensive production system. iv) Lack of low cost environmental controlled green houses for high quality production. v) Supply and demand profile frequently changing with season, year and kind of vegetable.
3. **Potato:** i) Lack of varieties for diverse processing problems. ii) Low seed multiplication rate (5-10 times) from breeders' seed to certified seed. iii) Rapid deterioration of varieties due to viral complexes. iv) Lack of awareness of TPS technology. v) Lack of required cold storage space and non availability of low cost short term storage structure.
4. **Mushroom:** i) Available technology not cost effective. ii) Lack of design of low cost mushrooms houses. iii) Inadequate availability of quality spawns of different strains.
5. **Tuber crops:** i) Slow multiplication rate. ii) Poor management practices for pests like sweet potato weevil and disease like cassava mosaic.
6. **Floriculture:** i) Lack of indigenous production techniques. ii) F1 hybrids not fully exploited. iii) Narrow product range. iv) High rate of tariff imposed by importing countries.
7. **Medicinal and Aromatics Plants:** i) Trade of medicinal and aromatics plants is very secretive due to absence of any regulatory mechanism. ii) Very less number of plants under cultivation.
8. **Spices:** i) Lack of variability for host resistance to biotic and abiotic stresses. ii) Severe crop losses caused due to disease and pests. iii) Vagaries of monsoon affect crop growth, productivity and sustainability.
9. **Coconut:** i) Large area of old and senile plantation and most of these plantation under rainfed condition. ii) Rainfed cropping nature. iii) Prevalence of disease and pest like root-wilt, ganoderma wilt, tatipaka diseases and eriophyide and red palm weevil severe threats to industry. iv) Farm level processing is inadequate.
10. **Arecanut:** i) Incidence of diseases like yellow leaf diseases. ii) Lack of irrigation facilities.
11. **Oilpalm:** i) Poor water management in the palm orchards.
12. **Cocoa:** i) Large areas of old and senile plantations. ii) Lack of high yielding clones. iii) Black pod rot in cocoa continues to be problems in production front. iv) Farm level processing is inadequate.

- 13. Cashew:** i) Increasing level of senility of the existing plantation. ii) Poor management of pests like tea mosquito bug and stem borer. iii) Farm level processing is inadequate.
- 14. Tea:** i) Old age of tea bushes. ii) Slower pace of replantation- the rate of replanting is less than 0.4% as against the desired level of 2.0%. iii) Poor drainage and lack of irrigation when needed greatly reduces the yield. iv) Stagnation in productivity level compounded by high land labour ratio. v) Higher rate of taxation in the income from tea. vi) Stiff competition from the soft drinks.
- 15. Coffee:** i) Presence of large number of tiny growers with less than two hectare. ii) Existence of old moribund plant material due to reluctance of replant with new varieties.

Improvement programms :

The following thrusts and strategies are proposed to achieve the goals and diminish extent of the above problems regarding horticulture sector.

1. Improving production.
2. Improving productivity.
3. Reducing cost of production.
4. Improving quality of products for exports.
5. Value addition.
6. Marketing and Export.
7. Price stabilization.
8. Strengthening of organizational support.
9. Human Resource Development and
10. Addressing relevant policy issues.

Current Scenario:

Horticulture, over the past few years, has made remarkable progress in terms of expansion in area under different crops, increase in productivity, crop diversification, technological interventions for production and post harvest and forward linkage through value addition and marketing. A significant increase in area has been achieved in vegetables and flowers. Unprecedented growth has been achieved in off- season vegetable production and floriculture, making these sectors evolves as upcoming. Opportunities. Concept of greenhouse has become extremely popular. There has been a tremendous success in large scale of tomato



in open field as well as under protected condition. Critical areas like pest and disease management have been given principal focus with intensification of efforts on containing decline problems especially in orange and large cardamom. Massive rejuvenation programmed in orange and re-plantation in large cardamom has brought back some ray of hope in the direction of revival of these crops. A number of nurseries have been established for producing healthy and quality planting materials of orange and large cardamom. The tissue culture laboratories, in private sector, have been able to supplement the requirement of quality planting materials. Infrastructure development to augment marketing and post harvest management are being accorded top priority. Technology Mission for Integrated Development of Horticulture, sponsored by the Government of India has played the most vital role in integrating all ongoing initiatives. The main success factors for successful programmed implementation are use of high quality planting materials, adoption of clusters and constant monitoring. After the Green Revolution in mid-sixties, it became clear that horticulture, for which the Indian topography and agro climate are well suited, is the best option. India has emerged as the largest producer of mango, banana and cashew and second largest producer of fruits & vegetables in the world. The most significant development that happened in the last decade is that horticulture has moved from rural confines to commercial production and this changing scenario has encouraged private sector investment in production system management. The last decade has seen technological infusion like micro-irrigation, precision farming, greenhouse cultivation, and improved post harvest management impacting the development, but during the process various issues have emerged. India has a wide variety of climate and soils on which a large number of horticulture crops such as fruits, Vegetables, potato, tropical tuber crops, mushrooms, ornamentals, medicinal and aromatic plants, plantation crops, spices, cashew, cocoa and betel vine are grown. After the Green Revolution in the sixties, it however, became clear that horticulture, for which the Indian topography and agro-climate are well suited, was an ideal method of achieving sustainability of small holdings. However, the need for diversification was acknowledged by Government of India only in mid-eighties to make agriculture more profitable, through efficient land use; create skilful employment for rural masses and women and optimize the utilization of natural resources (soil, water and environment). Past efforts have been rewarding in terms of increased production and productivity of horticulture crops. India has emerged as the largest producer of coconut,

arecanut, cashew, tea and the second largest producer of fruits and vegetables in the world. The changing scenario encourages private investment. As a result horticulture has moved from rural confines to commercial ventures attracting youth since it has proved to be intellectually satisfying and economically rewarding. At national level horticulture sector has emerged as a potential player in the Indian economy contributing 30% to GDP in agriculture from more than 13.08% area under horticultural crops as well as a means of diversification in overall development of agriculture. Horticulture invariably improves the economic status of our farmers. The earlier seasonal availability of fruits and vegetables has now extended to all the year round, increasing the per capital consumption of fruits and vegetables. It has also played a significant role in women empowerment, providing employment opportunities through mushroom cultivation, floriculture, processing, nursery raising, vegetable seed production etc. The national goal of achieving 4% growth in agriculture can be achieved through the major contribution in growth from horticulture. Constraints in horticulture production: In spite of the fact that India is blessed with a wide range of soil and emetic conditions for growing large number of horticultural crops, a reasonable budgetary allocation, a sound network of R & D system, a large number of high yeilding varieties / hybrids and proven technologies, there are still several constraints which adversely affect development of a sound horticulture industry. Major common constraints are given below in respect of various sectors of horticulture.

1. Lack of planning in Production.
2. Non-availability of seeds of improved varieties.
3. High cost of basic production elements
4. Inadequate plant protection.
5. Measures and non- availability of resistant varieties.
6. Weak marketing facilities
7. Transportation limits
8. Post harvest losses
9. A biotic stress.

Schemes under Government Initiatives

The government has launched a number of programmes for increasing production of agricultural commodities. Many new initiatives have been taken to widen the food basket keeping in view the demand and nutritional requirements of the population.

Micro irrigation Scheme:

Micro Irrigation Scheme is implemented with the objective of better utilization of available water. During 2011-12, an amount of Rs. 124.43 Crores subsidy has been given to the beneficiaries for the installation of Drip Irrigation in area of 43,783 hectares. At present, 75% subsidy is given to encourage installation of drip irrigation in horticulture crop in all the districts of the state.

Rashtriya Krishi Vikas Yojana:

Under Centrally sponsored Rastriya Krishi Vikas Yojana, programmes are being implemented to reorient agriculture development strategies for rejuvenation of agriculture and to meet the need/ demands of farmers. Following programmes are being taken up under scheme.

India and World Horticulture production

During 2010-11, its contribution in the world production of fruits and vegetables was 12% and 14% respectively. Total production of fruits during last year was 599 million tonnes while that of vegetable was 10-12 million tonnes. India is the largest producer, consumer and exporter of spices. India is also the largest producer of mango, banana, papaya, coconut, arecanut and cashew nut in the world. India's significant horticulture production is despite its comparatively lower productivity. Both in case of fruits and vegetables productivity of India (11.7 and 17.3 tonnes per hectare respectively) is about half of the productivity of USA (22.2 and 31.4 tonnes per hectare). During 2010-11, its productivity was closer to world average for both fruits (10.9) & vegetables (18.8 tonnes per hectare). Compared to the leading producer of fruits and vegetables India lags behind in productivity in case of vegetables, whereas it leads in case of fruits. Infact productivity of India is amongst the highest in case of some fruits like grapes, banana, papaya etc.

Trends in Horticulture Production and Present Status :

During the last decade, area involved in production of horticultural crops has increased by 32% from 16592 (in 2001-02) to 21825 (in 2009-10) thousand hectares whereas the production increased by 65% from 145785 to 240532 thousand tonnes. Increase in production is more than twice of increase in area. This is indicative of improved productivity, which still has considerable scope of improvement.

Organic Farming



There is a need to promote organic farming in production of different horticultural commodities with the objective of promoting exports and improve returns. There is, therefore, an urgent need to develop technology for organic farming and create awareness on the benefits it provides. This calls for standardization of technologies for producing vermicompost, biofertilizer, mycorrhizae and bio pesticides for different crops. There is also need to develop guidelines for this purpose and designate agency/agencies for accreditation of such produce meeting international requirement.

Post Harvest Research

Since, fruits and vegetables are highly perishable, efficient Post Harvest Management has become an absolute necessity. It is also important for effective exploitation of the export potential of fruits and vegetables. Joint effort of R&D institution, farmers, government agencies and traders has resulted in India emerging as a major producer of fruits and vegetables in the world. But the magnitude of loss in food grains is to the tune of 10% whereas for fruits and vegetables losses are estimated at 35-40% due to improper Post Harvest Management (PHM) (XI Planning Commission). So, there is need to have a strong post harvest infrastructure for post harvest management of these perishables. Post harvest technology (PHT) is interdisciplinary “Science and Technique” applied to agricultural produce after harvest for its protection, conservation, processing, packaging, distribution, marketing and utilization to meet the food and nutritional requirements of the people in relation to their needs. Use of appropriate PHT reduces the post harvest and storage losses; adds value to the product, generates employment in the village and re- establishes agro- industries in rural sector. During 2011-12 (Up to October, 2011), an area of 1.43 lakh ha has been covered under area expansion of new gardens besides setting up of 29 nurseries. Under the component of rejuvenation of old and senile orchards, an area of 0.46 lakh ha, 0.56 lakh ha. Under promotion of IPM, 4950 ha. Under adoption of organic farming has been covered. 11 IPM infrastructure unit have been set up and 1.94 vermicompost units established. 1513 community water harvesting structures have been created. 7848 colonies with hives have been distributed. Under the component of integrated Post Harvest Management, 1017 units have been established which include 503 pack houses, 59 cold storage units, 380 low cost onion storage, 8 refrigerated vans, 17 ripening chambers and 46 Primary/Mobile Processing units. Under Market/ April Mandis and 1 functional infrastructure for collection, sorting, grading, etc. have been set up.

Conclusion:

Horticulture, which offers employment and advancement opportunities at all educational levels, finds itself in a time of transformation. Horticulturists apply their knowledge, skills, and technologies used 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. Today, Increasing production in horticulture through area expansion is gradually making way for concern like enhanced productivity, eco-friendly production, safe and nutritionally rich produce, volume for processing, value - addition and value chain management, international competitiveness, intellectual property issues, sustaining production under changing climate etc...Despite several challenges and constraints, there are also successes in various sectors of horticulture.

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