

FUTURE PROSPECTS IN HORTICULTURE

INTRODUCTION :

West Bengal is the only blessed State of Indian sub-continent which embraces almost all types of physical, climatic and soil conditions to provide a variety of crops. Other than agricultural crops, wide range of flora can thrive commercially. There are regions where horticultural crops can grown better and economic. From the snowy mountains in the north to the esturine Sundarbans in the south and from the dry lateritic uplands in the west to the shallow flatlands of the riverine in the east, scope and possibilities of horticulture are immense.

8.1. REGIONAL STUDY :

The State is divided into the following divisions for a detailed analytical study for scope and career in horticulture.

8.1.1. Northern Hilly Region

Mountainous or hilly region of West Bengal comprising three sub-divisions namely, Sadar, Kalimpong and Kurseong of Darjiling district are highly suitable for sub-tropical and temperate fruits. Cool humid climate with low temperature (Max.  $-24.2^{\circ}\text{C}$  in May and Min.  $1.9^{\circ}\text{C}$  in January), high rainfall (between 2,200 mm and 4,000 mm) mostly cloudy and foggy sky (with often snowfall in winter), soil with high acidity and shallow depth, provide limited scope for the

cultivation of field crops. Sizes of land holdings are small in the hills due to terraces and hence prove uneconomic. Intensive cultivation is suitable for this part of the district. Temperate fruit culture can be increased in areas with an altitude of 1,000 to 3,000 metres above mean sea level. Low chilling variety of apple, peach, plum, pear and strawberry are grown successfully. Mandarin orange, one of the best in quality, has an extensive market in the country. Cultivation of sweet orange (Washington Naval variety) should be taken care, which suits in the region. The region with its cool temperature is the natural green house for vegetables like cauliflower, cabbage, tomato, pea, bean, beet, carrot and squash. Seeds of the winter vegetables which are brought in the State from Kashmir and Kullu valley can easily done in the seed farm here. Kalimpong and the adjoining areas are most suitable for the establishment of seed farms. The areas of Darjiling and Kalimpong are the natural home of hundreds of species of orchids and ornamental plants. The only orchid research sub-station at "Lava" should be given much support. Flowering plants like Gladiolus, Gerbera, Rose, Cacti, Anthurium, Agapanthus (African lily), Amaryllis, Begonia, Bellis (Daisy), Colocia (Cockscomb or "Morogful") chrysanthemum, Digitalis (foxgloves), Geranium, helianthus (Sun flower), Hemanthus (Football Lily), Licum, Bimula (primrose), Tagetes (Marygold), Viola (Pansy) and many other flowers may be grown in Darjiling hill areas which will produce seeds, bulbs, corns etc. These plants have rich world market which may exploited by their systematic cultivation. It can be noted that Ind-Dutch Flower Art Limited has already started cultivation of Anthurium in Raigarh district of Maharashtra. Deccan Florance Limited has grown up with Rs. 8 million as capital. West Bengal can also invite capital from business houses for such projects.

### 8.1.2. Terai Zone

The sub-Himalayan or Terai zone is very rich and potential for pineapple cultivation. Except paddy and jute, no field crops are grown profitably due to light textured soil with low humus content and soil acidity. Regulation of fruiting by use of growth regulators like NAA, Calcium Carbide, Establishment of factories for processing of fresh fruits, transport and marketing facilities can improve the pineapple production in the Terai (Jalpaiguri and Kochbihar districts).

### 8.1.3. Alluvial Regions of Central and Lower Bengal

This vast plain covering of 16 lakh hectare in Uttar and Dakshin Dinajpur, Malda, Murshidabad, Nadia, Uttar and Dakshin 24 Parganas, Haora, Hugli and Bardhaman districts are the important horticultural regions of West Bengal. Although in each region, horticulture is very much secondary culture giving prime importance to food and cash crops. The scope for horticulture is immense due to great demand of the mega city of Calcutta. Sizeable demands also exist inside and outside of the State for the products. Growing of vegetables around the cities and towns along with the places of well communication by rail or road is highly profitable. Utilization of town waste and town sewage is boosting the vegetable cultivation in the vast areas of "Dhapa" on both sides of the Eastern Metropolitan By-pass in Calcutta. The region is rich in the production of Mango (Malda, Murshidabad, Nadia) followed by banana (Hugli) Papaya (Bardhaman, Medinipur) Guava (24 Parganas, Bankura, Birbhum) Litchi (Murshidabad, Nadia and 24 Parganas). Introduction of varieties of vegetables both summer and winter types are important measures for development in this area. Consumption of flowers has been rapidly increasing in Calcutta and other Urban centres. Apart from the flowers for daily worship

purposes like Jaba (*Hibiscus rose sinesis*) Tagar (*Tabernaemontana Coronaria*), Aparajita (*Clitoria ternata*), lotus etc. seasonal flowers like Gladioli, Zinia, Chrysanthemum are of great demand for decoration purposes. A number of flower boutiques have come up recently for class buyers which have turned up the business lucrative.

#### 8.1.4. Lateritic Zone

The lateritic tract covering the vast area in Bankura, Puruliya, Birbhum, Medinipur and Bardhaman lay along the western boundary of the State. The characteristic features are low rainfall (1100-1300 mm) and shorter rainy season, extremes of temperatures (45°C in April and 9°-10°C in December), undulating uplands subjected to erosion, poor fertility and acidic soils associated with very low organic matter and mineral salts. Where marginal lands are unsuitable for growing cereals and other fields crops profitably, horticulture is possible with developed agro-technique methods and irrigation facilities. Citrus fruits, particularly sweet orange and the loose skin Nagpur variety are grown profitably. Horticultural Research sub-station at Taldangra should be well equipped for this purpose. In the higher uplands fruits like Guava, Kul, Custard apple, Ber Pomegranate and Cashenuts have good prospects. The region is particularly suitable, due to early on set of cool temperature, for growing early winter vegetables like cauliflower, cabbage, tomato, pea, bean etc. The climate is very convenient for growing roses. Many florists of Calcutta who have their own gardens in Bihar extend their interest in this zone very much commercially.

#### 8.1.5. Southern Coastal Zone

The region along the sea coast of Medinipur and 24-Parganas covers the area. Due to high rainfall (1,500 mm-2,000 mm annually) floods are frequent in this zone.

Although the region is highly suitable for growing coconut and Cashewnut, but crops like Sugarbeet, Chilli, Watermelon and Sapota have good prospects.

Horticulture is a wide field and includes a great variety and diversity of crops which are classified as (1) crops grown for their food value with vitamin and mineral content like apple, sweet potato, (2) for their beverage property, like, tea and coffee, (3) which beautify the environment like, various hedges, grasses and ornamental trees and an wide range of flowers and flowering plant, and (4) miscellaneous group including crops grown for perfume and spices. Each crop has their own cultural techniques and hence to the teacher, Research workers or landscape gardeners horticulture is an applied science and a profession; to the manufacturers or sellers of horticulture supplies (like nursery plants, bulbs, corns, saplings, seeds etc.) is a business; and to for the personal front, it is a most fascinating hobby.

## 8.2. CAREER OPPORTUNITIES IN HORTICULTURE

Career opportunities in horticulture are classified as :-

(1) The production of horticultural crops, which include, sowing or managing an orchard, vegetable farm, commercial flower gardens or green houses. This requires a good practical knowledge about the effect of environmental conditions on crops ;; cultural practices, like irrigation, fertilization, spraying and pruning and essential element supply on plant growth and development.

(2) The career is prospective in the marketing sector of horticulture. The buying and selling of garden products for wholesale distributors, hotels, hospitals, the armed services and chain stores and super markets; selling of fresh and

processed fruits and vegetables, cut-flowers, potted plants or nursery stocks on a whole sale or retail basis ; selling of fertilizers, horticultural equipments growth regulators pesticides etc. But in this field also a good knowledge required in physiology of maturity or degree of ripeness. The management of produce require training in packaging, displaying of products and an anticipation of the needs of the consumer.

(3) There are ample scope in processing industries like, canning freezing, dehydrating or pickling plants and serving as a food technologists in the processing of fruits and vegetables, doing research work in the pre-packaging and merchandising of flowers, fruits and vegetables.

(4) Landscape designing and related fields also provide good scope as it is very much a part of horticulture. Serving as superintendents of parks, estates, corporate communities, recreational areas; consultants for golf courses, playing fields. A landscape designer should have ability of freehand drawing, training in colour and design and on working knowledge of landscape properties, physiology and morphology of trees, shrubs and other plants.

(5) To provide employees of all the above sectors educational and training programmes also create a high level job opportunities for such teachers and research workers who can solve the problems in both public and private institutions.

On the basis of the suggestions of the leading Agro-Botanists, Horticulturists of the Bidhan Chandra Krishi Viswa Vidyalaya, Mohanpur, Nadia, following recommendations are proposed for the development of horticulture in West Bengal with amply scope for job opportunities in every field of

### 8.3. PROPOSED SUGGESTIONS

- (1) A survey of the State for locating horticulturally, potential areas in respect of different horticultural crops.
- (2) Establishment of demonstration farms for horticultural crops and progeny orchard-cum-nursery in sub-divisional level from where planting materials may be made available to the growers.
- (3) Identification of high yielding fruit trees and collection, preservation and multiplication of these important clones.
- (4) To take up seed production programme of horticultural crops specially in vegetables flower and spices in this state.
- (5) Establishment of nutritional garden in the schools, clubs etc. of rural areas.
- (6) Utilisation of existing knowledge and information for the optimum production.
- (7) Rejuvenation of existing and old low yielding orchards specially in case of Mango and orange.
- (8) Setting up of processing units at the centres of production so that spoilage is reduced.
- (9) Co-ordination between growers and processing units to be developed.

- (10) Packaging materials should be easily available to the processing units.
- (11) Establishment of demonstration centres at Block- level for home scale preservation of fruits and vegetables.
- (12) Promotion of export of processed fruits and vegetables; vegetable and flower seeds of flowering plants and bulbs; important fruits of the States like Mango and Orange.
- (13) Training course of horticulture for the staff of the Directorate of Agriculture.
- (14) Training centres for the growers on improved production technology.
- (15) Publication of bulletins, pamphlets etc. on regional languages on various informations, quarries and their solves for growing of horticultural crops in West Bengal.
- (16) Co-ordination between growers and marketing agencies.
- (17) Promotion of Co-operative Societies for marketing.
- (18) To improve cold storage facilities of horticultural crops specially at important centres of prduction.
- (19) Transport facilities for easy and quick transhipment of these highly perishable crops.
- (20) A separate Directorate of Horticulture who can take every individual decision independently for the State rather than waiting for a share of budget from Department of Agriculture.

Research and Teaching in Horticulture comprise:

(1) Collection, Preservation and evaluation of germplasm of important Horticultural crops.

(2) Priority should be given to extensive research work on important tropical fruits like, Mango, Banana, Papaya, Pineapple, Guava and temperate fruits like pear, peach and plum on account of standardization of root stock, resistant breeding, determination of optimum plant density and standardization of agro-techniques for controlling pre-mature fruit drops and post harvest physiology.

(3) Intensive research work on important vegetable crops like cucurbits (pointed gourd, ash gourd, ring gourd, plumpkin, water-melon), brinjal, tomato, bhendi (Lady's finger) Chilli, tuber crops like potato, onion, raddish, cauliflower, cabbage, peas and beans on account of (1) identifying high yielding and resistant variety, (2) possibility of growing off-season crops, (3) extending the market life of fresh vegetables, (4) extension of post harvest life of important flowers of West Bengal (5) standardization of agro-techniques of orchards. Rose, jasmine, tuberose, marigold, gladiolous, carnation etc. for cut flowers and sproduction including plant materials (6) Genetical improvement of commercial flowers etc.

#### 8.4. CAREER IN HORTICULTURE IN WEST BENGAL :

Importance of technology in agriculture was seriously felt in West Bengal after independence when influx of refugees took shelter in West Bengal from Bangladesh (East Bengal). Crisis and shortage of food stuff compelled our scientists for extensive research and project work in food technology. Jadavpur University first set up Departments of

Food Technology and Bio-chemical Engineering from where students are honoured with B. Tech., M. Tech. and Ph.D. Degrees. Then Bidhan Chandra Krishi Viswa Vidyalaya came forward establishing a faculty of Horticulture in Mohanpur, Nadia district. The State Department of Agriculture have also created unemployment provision for the entire project. At present posts approved for different schemes in different horticultural research sub-stations are approximately as follows :

- (1) Horticultural Research Station at Krishnanagar has a total capacity of approximately 52 posts in various cadre.
- (2) Banana Research Station, Chuchura, Hugli has employment provisions for 21.
- (3) Total staff strength of Malda Horticultural Research Station accounts 12 persons.
- (4) Pineapple Research Station at Mohitnagar, Jalpaiguri created 10 posts for the centre.
- (5) Vegetable Research Station at Kalimpong and a separate wing at Darjiling together have a total staff strength of 23 persons under different schemes.

Provisions for other sub-stations are found as : (a) Agricultural Development Officer for fruits for 24 Parganas - 1 ; Murshidabad 1, Barddhaman-1 and Puruliya-1 (Total - 4). Total staff strength in the Horticultural sector of Department of Agriculture in West Bengal is 131 including both scientific and technical staffs.

## 8.5. ROLE OF AGRO-HORTICULTURAL SOCIETY

In India the cultivation of seasonal flowers and various other ornamental plants have started in Bengal by the grace of British Rulers and Catholic Missionaries. They have brought the new progynies started in the west, with them and created interest in floriculture among the higher classes of the Society. Dr. William Carey, the noted Educationist and Philanthropist founded the Royal Agri-Horticultural Society in India in the year 1820 in the attractive suburb of Alipore near Calcutta. The Society was an immediate success. Civilians, owners and planters began to take interests in high yielding seeds of cereals, vegetables, fruits and flowers along with various useful informations through branches of this Society and similar other organisations throughout the country. The Society has devoted much time to the improvement of fruits which are found suitable for the topical and sub-topical climates, varieties of Apples, Pear, Plum, Peaches and citrus fruits were brought from Europe and America and are cultured in the Societies orchard along with Grapes from Florida, Pumelo from Java and litchi from China. They were subsequently distributed throughout the country by the branches of the society for cultivation. Vegetables, popular in England like Cauliflower, Cabbage and Peas are improved and some new types were also imported. In 1824, a consignment of vegetable seeds like spinach, artichok, asparagus, lettuce, celary etc. were brought from South Africa and are grown and propagated. The Agri-Horticultural Society, since been started, is culturing various flowers and ornamental plants for sale through its branches in Delhi, Bombay, Lucknow, Cuttack, madras, Bangalore and others. In commemoration of the bi-centenary of Dr.Carey's birthday, the Carey Institute was formed by the Society in 1961 under which training in Horticulture is given to 12 persons with residential accommodation in a year. After completion of one

year course certificate is given, approved by the University of Calcutta. (Journal of the Agri-Horticultural Society, Calcutta, (1970)

The Agri-Horticultural Society arrange annual show cum sale which are now getting tremendous response in participation. The first exhibition on foreign vegetables, fruits, flowers and farm implements was hold in the country in 1828, organised by the society. Valuable cash awards and prizes awarded today on various class, types and sections by the society as encouragement are :

#### Class-I Plants in Pots :

Type - Cacti and succulents.

Section - Croton, Fern, Palms, foliage plant, rare and uncommon plants, flowering plants, Bougainvillea, Orchids Begonia, Coleus and Geranium.

One first prize and one second prize is given to each variety by the society and industrialists.

#### Class II Annual Pots :

Type - Associated Varieties.

Section - Annuals, Gladioli, Dahlia (large flowering double flowering and other varieties), Antirrhinum (Dwarf and tall), Aster, Carnation, Clarkia, Dianthus, Larkspur, Marigold (African and French, Nasturtium, Panisy, Petunia (large and doubled) Phlox, Portulaca, Salvia (tall and dwarf), verbena.

### Class III Cut Flowers :

Type - Annual

Section - Sweet Pea, Antirrhinum, Carnation, Dalhia, Gerbera, Roses, Gladiols and others.

### Class IV Floral Decoration :

Type - Arrangements

Section - (1) Flower arrangement, Contemporary style, Western style, Japanese style (2) Table arrangements. Dining or Luncheon (3) Floral arrangements, miniature.

All these sections receive prize or cash award by the eminent personalities and industrialists along with the Agri Horticultural Society.

### CONCLUSION :

From the discussion, it can be concluded that there is an immense scope of horticulture in the State with varied agro-climatic zones, where attention and care are very much needed for expansion, development in every sector. In Northern Hilly region of West Bengal intensive cultivation is the substitute where temperate fruits, winter English vegetables are commercially and successfully grown as inter culture. The area is the natural home for orchids which is a very rich commodity for export. The remote station of Lava should get priority for this purpose. Flowers and flowering plants, bulbs, corns have rich world market and hence systematic cultivation can earn a good profit. Further down,

the sub-montane terai zone show potentiality in pineapple cultivation. The fresh fruit processing industry and their marketing should adopt more scientific technology in packing, advertising, easily available through different marketing agencies. The vast alluvial and comfortable climatic zones of West Bengal covering 16 lakh hectre are the most important horticultural zone. Garden culture has to find its own portion here with food crops and cash crops. Horticultural crops are very much in demand for not only local sectors but to feed the megacity of Calcutta. The riverine plain is fertile and hence intensive cultivation with inter culture and different crop-combination can be successful to grow fruits, vegetables and flowers as they are mostly seasonal in nature. Introduction of high yielding varieties of vegetables for both summer and winter have great scope. The dry western tract with scarcity of ground water and extremes of temperature is not suitable for cultivation without irrigation but with little irrigational facilities and early winter season a good amount of vegetables can be grown. The climate favours commercial culture for a great variety of cut flowers specially roses. The Southern coastal zone, being saline and occasional flood problems cultivation is very much sensitive. The sandy coasts find excellent room for water melon. The state being a prospective home for horticulture need scientific attention for good management from orchard to marketing with created institutions. The role of Bidhan Chandra Krishi Vishwa Vidyalaya in Mohanpur, Nadia district is immense in this sector. Departments of Food Technology and Bio-technology in Jadavpur University has taken up responsibility in their own way. Finally, the approach taken by the Govt. of West Bengal is highlighted in the chapter. Department of Horticulture is a part of the Directorate of Agriculture, Govt. of West Bengal and hence employment provision on this account for each horticultural research station and sub-stations under various schemes is stated. The role of Agri-Horticultural Society in encouraging the hobby of commercialization is also discussed in detail.