Chapter-1

IMPORTANT VEGETABLE CROPS-PRESENT STATUS AND FUTURE PROSPECTS

Objectives:

Students will be able to learn about

- The diversity and importance of vegetable crops.
- Current trends in area, production and productivity.
- Export potential and future prospects

Introduction:

Whenever we go to dining table for any kind of meal, we see different forms of vegetables starting from soup (tomato, sweet corn), or in cooked form as fried/baked vegetables, curry, *sambhar* or as salad, *raita*, pickles or as dessert like melons. Even when we opt for fast foods like burgar, pizzas, chowmin, momos *etc.,* we find many raw vegetables like capsicum, cabbage, tomato, cucumber or lettuce as one or the other ingredients. Have you ever wondered how many types of vegetables are being grown in our country or why these are important? What is the present status of vegetable cultivation? What are the future prospects of vegetable cultivation? Such questions must be arising in your mind. This chapter tries to solve all your doubts about present status and future prospects of vegetable cultivation.

What are Vegetables?

Vegetables are usually consumed as an auxiliary dish with starchy staple food to add flavour and taste variation to a meal. Vegetable crops represent a diverse group of plants and it is difficult to comprehend the term with a single acceptable definition. They vary in life span (annual, biennial, perennial), propagation (seeds, vegetative), growth habit (herbaceous, vine, shrub, tree), growing season (summer, winter) and uses of different parts and at different stages. Vegetable crops comprise of a large number of herbaceous plants, mostly annuals, of which different parts like leaf, stem, flower bud, flower, fruit and root *etc.* are eaten either cooked or raw as principal item during the meals. Vegetables are defined mainly on the basis of their uses. A simple definition of vegetable may be given as **'An edible, usually a succulent plant or a portion of it eaten with staples as main course or as supplementary food in cooked or raw form'.**

Sometimes, a plant may be as vegetable in one country but a fruit, weed, an ornamental or a medicinal plant in another country depending upon their use. For example, tomato is vegetable in Asian continent but regarded as fruit in Europe. The garland chrysanthemum is a vegetable to some Asian countries but to others, it is an ornamental. Muskmelon

and watermelon are mainly used as dessert but they are considered as vegetables, since many members of cucurbit family (Cucumber, bottle gourd, bitter gourd *etc.)* are vegetables and their cultural requirements are similar. Sometimes, a plant species may be used as vegetable only at certain growth stage while other species may be used at all growth stages. Bamboo is mainly used for wood but bamboo shoot is used as vegetable in many places. Many legumes are used as vegetables at various growth stages such as sprouted seeds, tender shoots, immature tender pods and mature seeds. Some fruits such as papaya, jackfruit and banana are used as vegetables in different parts of India when they are immature.

Importance in nutrition:

India has attained self sufficiency in food grain production and even now we are exporting a sizable quantity to other countries and earning foreign exchange. However, food and nutritional security for increasing population is still a matter of concern to all of us. The level of under-nutrition is unacceptably very high. The nutrient requirement for human being varies with sex, age, weight, height and physical activity. The balanced diet should contain adequate energy source (calories) and nutrients like protein, carbohydrates, fats, minerals, essential amino acids and vitamins. Vegetables consists of a large number of species, mainly used as an essential complement to the daily diet, providing vitamins, minerals, fibre, specific amino acids and other health promoting phytochemicals. Increasing consumption of vegetables is generally considered to offer health benefits in all dietary situations. Moreover, majority of Indian population prefer vegetarian diet and sufficient quantity of low cost protective foods like vegetables should be provided to improve nutritional status of people mainly in rural areas. Vegetable crops being rich sources of various health building substances, especially vitamins and minerals, offer unique advantage for food and nutritional security, tackle malnutrition and dietary deficiency diseases.

Vegetables provide variety to diet and make meals more appetising. Most of the vegetables contain high amount of water and their calorific values are not very high. However, calorie requirement can be supplemented by carbohydrate rich vegetables like potato, cassava, taro, sweet potato *etc.* Peas, beans, cowpea and leafy vegetables are rich sources of protein. Vegetables constitute the main source of minerals and vitamins, hence called protective foods. Calcium is necessary for development and proper functioning of bones and teeth, while iron is required to prevent anaemia. Raw vegetables are specially useful for providing vitamins because many vitamins such as Vitamin C and Vitamin B complex are not stable at cooking temperature.

Vegetables neutralises the excess of acid inside the body and provide alkaline reactions for normal metabolism. Cellulose, pectin and other constituents present in the fibres of vegetables help to clear the bowels, reduce constipation and promote digestion.

Table 1: Vegetables rich in vitamins and minerals-

Vitamin A	Carrot, beet leaf (palak), amaranth, curry leaves, coriander leaves, kale
Vitamin B	Pea, chilli, garlic, coriander leaves
Vitamin C	Capsicum, cabbage, bitter gourd, amaranth, beet leaf, musk melon, tomato
Calcium	Amaranth, beet leaf, fenugreek leaves, onion, broccoli, kale
Iron	Amaranth, beet leaf, fenugreek leaves
Iodine	Okra, onion, asparagus

A recently published WHO/FAO report recommends a minimum of 400g of fruit and vegetables per day (excluding potatoes and other starchy tubers) for the prevention of chronic diseases such as heart disease, cancer, diabetes and obesity, as well as for the prevention and alleviation of several micronutrient deficiencies, especially in less developed countries.

Economic importance:

Vegetables are quick growing and their yield potential is four to five times more than cereal crops from a unit area. Besides, their high yield potential per unit area and time, diverse varietal wealth, labour intensiveness, high market price and prospects of processing, value addition and export, they play an important role in employment generation, and livelihood improvement. Vegetable cultivation is highly intensive form of farming. In the area nearer to cities often called as peri-urban areas, the land is usually of high value, the average land holding is small and to secure maximum returns from every unit land, vegetables fit well in the cropping system. With increasing purchasing power of people in the country, the demand for vegetable crops has increased enormously leading to sharp increase in their prices and it has been the dominant factor for high inflationary pressure in Indian economy during recent years. Since India is endowed with diverse agro-climatie conditions, right from sea shore to snow bound Himalayas, therefore almost all kind of vegetable crops can be grown in one or other corner of the country. More than 60 different vegetable crops are being grown in India for diet diversification but 15-20 are important commercially.

Benefits of including vegetable crops in the cropping system:

- Higher productivity and profitability per unit area and time.
- More number of crops can be grown on the same piece of land on account of their short duration growing period.

- Diversification minimizes weather and pests risk involved.
- Higher quantum of micro nutrients, vitamins, minerals and other health protective phytochemicals would be available.
- More opportunities for employment generation due to labour intensive operations and related secondary activities like transportation and marketing.
- Better scope for value addition, processing and other agro- industries.
- Important component as vegetable seed industry
- Improvement in physical, chemical and biological health of soil especially with inclusion of legume vegetables.

Present status and future prospects:

India is the second largest producer of vegetables next to China (48%) in the world and contributes about 14% to total global output of 1012.5 million tonnes. The vegetable production in the country has reached to 156.3 million tonnes (including potato) from an area of 8.98 million ha with productivity of 17.4 tonnes/ha during 2011-12. At the time of independence, vegetable production was merely 15 million tonnes from an area of about 2 million ha which increased to 58.53 million tonnes from an area of 5.59 million ha during 1991-1992. During last two decades, there has been tremendous increase in production as well as productivity of vegetables which has increased the availability and consumption also. With our current population of 1210 million and considering 25% post harvest losses and 5% export and processing, per capita availability of vegetables is about 230g per day which is reasonably below than 300g of recommended dietary allowance (RDA) suggested by ICMR (Indian Council of Medical Research) and it reflects the shortage of about 30 million tonnes of vegetables. The dieticians advocate for intake of 125 g leafy vegetables, 75 g other vegetables and 100 g root and tuber vegetables everyday to make our diet balanced. With the projected population of 1330 million in 2020 and 1650 millions in 2050, we have to produce at least 190 and 240 million tonnes, respectively. With increasing focus on processing and exports, the production targets are likely to increase further and creating more opportunities for vegetable growers.

Out of total vegetable production in the country, major share goes to potato (28.9%), tomato (11.3%), onion (10.3%), brinjal (8.1%), tapioca (5.5%), cabbage (5.4%), cauliflower (4.6%), okra (3.9%) and peas (2.4%).

India is the largest producer of okra in the world

Share of major vegetable crops in total production of India (2010-11)

Vegetable Crop	Area (Million ha)	Production (Million Tones)	Productivity (tones/ha)
Potato	1.863	42.34	22.7
Tomato	0.865	16.53	19.1
Onion	1.064	15.12	14.2
Brinjal	0.680	11.90	17.5
Tapioca	0.221	8.08	36.5
Cabbage	0.369	7.95	21.5
Cauliflower	0.369	6.74	18.3
Okra	0.498	5.78	11.6
Peas	0.370	3.52	9.5

West Bengal is the leading state in vegetable production contributing about 18.2% followed by U.P (12.1%), Bihar (10.0%) and Andhra Pradesh (8.1%). Vegetables are exported in fresh, dried and preserved form or as processed products. The value of export from total horticultural products were Rs. 6964.6 crores out of which fresh onion alone contributed about 25 % (1741.55 crores) and share of others fresh vegetables were 12.8% during 2010-2011. With the rapid industrialization, growing urbanization and higher employment opportunities and income level, purchasing capacity is multiplying and awareness for nutrition is increasing which creates more demand of vegetables. The emerging modern retail business and new innovations to minimize post harvest losses would create more opportunities for processing, value addition, export, seed business and other ancillary services.

Vegetables are the cheapest sources of vitamins and minerals and providing adequate amount of vegetables to each country men can make the country nutritionally secure and people will be more healthy and productive. It is essential to educate people including women and children especially in rural areas regarding importance of vegetables in their diets for overcoming problems of under nutrition. The production and productivity of vegetable crops will have to be enhanced to meet the requirement of increasing population. The input use efficiency of all resources including land, water, labour, chemical, seed and others should be increased by various technological options and future innovations to make the vegetable production system sustainable in long run. There is an urgent need to minimize the high post harvest losses in handling, storage and transportation by improved packaging, maintenance of cool chain from farm to fork and rapid refrigerated transport system.

Development of modern retail marketing system can play a big role in this area and farmers will grow vegetables as per the consumer preference and consumers will get better quality product at competitive price. Value addition and processing of different vegetables will get more attention due to changing food preferences and food habits especially in urban areas and secondary agriculture has much potential of generating employment opportunities in both rural as well as urban areas in vegetable based industries.

ACTIVITY/EXERCISE

1. Search Indian Horticulture Database of NHB and FAO database for knowing the current trends of area, production and productivity of major vegetable crops.
2. Visit the website of APEDA for knowing the current trends of export of vegetables and its products to different countries.

Check your progress

Short answers:

1. How much vegetables you should eat daily for a balanced diet?
2. Why vegetables are considered as protective food?
3. Vegetable cultivation is considered more remunerative. Justify the statement.
4. How vegetables can play a significant role in achieving nutritional security?

Fill in the blanks

1. India stands ……in global vegetable production.
2. The daily availability of vegetables per person is……
3. ……is the leading state in vegetable production.
4. Vegetable rich in vitamin A is…….
5. Calcium rich vegetable is……
6. ……contributes major share in fresh vegetable export.

Long answers

1. Describe the present status of vegetables in India and also explain its future prospects.