

HORTICULTURE FOR NUTRITIONAL SECURITY

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Nutrition, food security and sufficient family incomes are some of the major challenges in India for one's complete well being. Maximum population lives in rural areas. Hunger and malnutrition are often linked to poverty. Providing economic opportunities through horticultural production will not only help in providing promising family incomes, but would also address the problem of hunger through food security and nutrition. Training women to produce and market horticultural crops can also be helpful in nutrition security of India as well as in reducing burden of various nutritional deficiency diseases and can go a long way in improving the overall health scenario in India.

Nutritional security means all people at all times have physical, social and economic access to food, which is safe and consumed in sufficient quantity and **quality** to meet their dietary needs and food preferences, and is supported by an environment of adequate sanitation, health services and care, allowing for a healthy and active life." (Committee on World Food Security, 2012). The term 'horticulture' is derived from the Latin terms 'hortus' (garden) and 'cultura' (cultivation), which means garden cultivation. Horticulture is the science and art of gardening which is associated with the cultivation of fruits, vegetables, flowers, spices, ornamental plants, plantation crops, tuber crops, medicinal and aromatic plants. Horticulture is more or less a smaller version of agriculture. While agriculture deals with cultivation on a large scale, horticulture is gardening done on a smaller scale.

Horticulture for Nutritional Security :

India is currently producing about 283 million tonnes of horticulture produce. It has proven beyond doubt that productivity of horticulture crops is much higher compared to productivity of food grains. Productivity of horticulture crops has increased by about 34 per cent between 2004-05 and 2014-15. India is the second largest producer of fruits and vegetables globally. India is a leader in producing fruits like Mango, Banana, Pomegranate, Sapota, Lime and Aonla. Per capita availability of fruit to the



Indian population is 189 gm/ person/ day and has been helping in supplementing nourishment. Productivity of vegetables in India continues to be low compared to world average productivity. Per capita availability of vegetables in India is 357 gm/person/day, which is helping in fighting malnutrition. India is second largest producer of vegetables after China and is the leader in the production of vegetables like peas and okra. Besides, India occupies the second position in production of brinjal, cabbage, cauliflower and onion and third in potato and tomato in the world. India is the largest producer and exporter of spices in the world. (nhm.nic.in/Archive/Statewise-Horticulture-Status.doc). The growth of horticultural crops is economically rewarding. This sector is expected to grow and contribute to food and nutritional security, provided, the sector is nurtured with focused infrastructure development.

Importance of Fruits and Vegetables in Diet:

Many of the horticulture crops and their products find place in our meals and diet. Human body requires vitamins, minerals, proteins, energy etc. for its health. All these are supplied by horticultural crops. The carbohydrates, fats and proteins are the macro elements which are required in large quantities whereas vitamins and minerals are the micro elements which are required in small quantities. The carbohydrates provides energy which includes cereals, proteins are derived from animal sources (egg, meat and milk products) and plant sources like (pulses), fats are also required to provide energy and sources are (butter, ghee etc).

Fruits and vegetables are the chief sources of vitamins and minerals. They are recognized as protective foods as they are necessary for the maintenance of human health. Vitamins and minerals present in fruits and vegetables are rich in phyto-nutrients and contains Vitamin C, Iron Vitamin A, dietary fibre, pigments and many other nutrients.

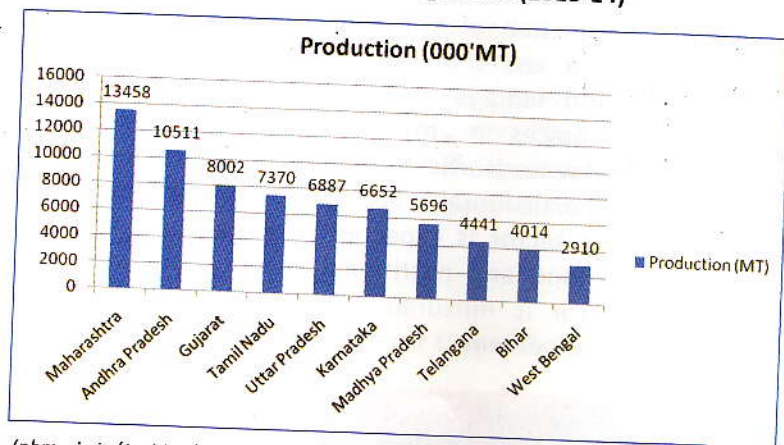


Deficiency of any vitamin and mineral or nutrient is depicted by the human body by giving typical symptoms. Majority of people obtain most of their carbohydrates and proteins from cereals and pulses, but their diets must also contain significant amount of fruits and vegetables to ensure that they get the vitamins and minerals which are not provided by the staple cereal foods.

Major Nutritional Deficiency Diseases in India:
The major prevalent nutritional deficiency diseases are:

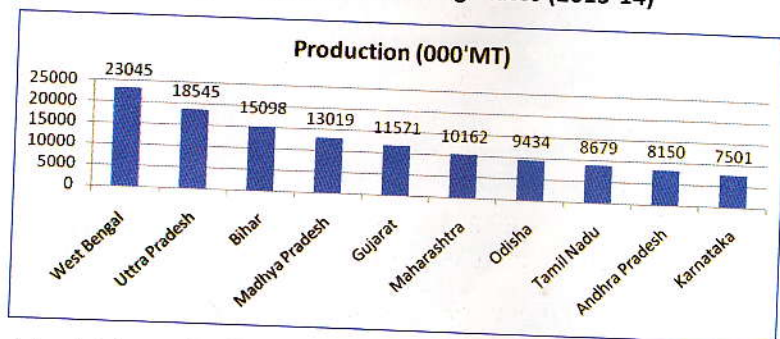
1. Protein Energy Malnutrition.
2. Iron Deficiency Anemia.
3. Iodine deficiency disease.
4. Vitamin A deficiency.

Major Fruit Producing States (2013-14)



(nhm.nic.in/Archive/Statewise-Horticulture-Status.doc)

Major Vegetable Producing States (2013-14)



(nhm.nic.in/Archive/Statewise-Horticulture-Status.doc)

Protein Energy Malnutrition:

Malnutrition refers to the situation where there is an unbalanced diet in which some nutrients are in excess, lacking or wrong proportion. It is categorized as under-nutrition and over-nutrition. Some of the major causes for malnutrition in India is economic inequality. Due to the low social status of some population groups, their diet often lacks in both quality and quantity. Women who suffer malnutrition are less likely to have healthy babies. In India, mothers generally lack proper knowledge in feeding children.

The prevalence of underweight children in India is among the highest in the world. The 2015 Global Hunger Index (GHI) Report ranked India 20th amongst leading countries with a serious hunger situation. The FAO of

the UN declared 2014 as the year of family farming with the intention of making each family a farming unit to meet the nutritional requirement.. "There is a horticultural remedy for every nutritional malady" says Prof. M.S. Swaminathan. Fruits and vegetables are the reservoirs of much needed fibre, vitamins, minerals, anti-oxidants, lipids, flavourants, odourants and essential phyto-chemicals.

Iron Deficiency Anaemia : Adolescent girls and pregnant women are more prone to Anemia. The main causes are inadequate intake of iron, poor bioavailability (only less than 5 per cent is absorbed) Excessive loss of iron (menstruation, rapid pregnancies, hookworm infestations, other illnesses). Effects of anemia increases the risk of maternal and fetal mortality and morbidity Increase susceptibility to infection due to impaired cellular response and immune functions Reduction of work performance and productivity. The richest sources of iron are green leafy vegetables like spinach, amaranth, jaggery, pomegranate figs and apple. Fruits in diet help in combating iron deficiency anemia. By introducing these fruits and vegetables in diet help in reducing the iron deficiency anemia.

Iodine Deficiency Disorders (IDD): IDD refers to a spectrum of disabling conditions arising from an inadequate dietary intake of iodine. IDD affects the health of humans from foetal stage to adulthood. Consuming foods with low Iodine content, Crops grown in iodine depleted soil. Demand of Iodine is increased during the stage of rapid growth (Infancy, Puberty, pregnancy, lactation).

Vitamin A Deficiency: Vitamin A is a fat-soluble vitamin also known as retinol that is necessary for proper vision in the eye especially night vision. Vitamin A helps to prevent night blindness. It also helps keep the skin, lungs, intestine, and urinary tract healthy and protects against infections. Vitamin A also acts as an antioxidant. Vitamin A deficiency can affect the immunity, the vision and skin, lungs, urinary tract. It leads to night blindness which may ultimately lead to permanent blindness.

Vitamin A is available in food in two forms. Retinol which is preformed vitamin A occurs only in foods of animal origin. Fruits and vegetables have vitamin A in the form of carotenoids. Carotenoids are plant pigments, responsible for the red, orange, and yellow color of fruits and vegetables. Provitamin

A carotenoids are found in plants, mostly in green leafy vegetables like broccoli, spinach and carrots. Carotenoids are best absorbed from cooked or homogenized vegetables served with some fat or oil.

Challenges of Nutritional Security :

Although, India has the highest productivity with respect to some horticultural crops like grape and banana, much needs to be done for rest of the horticultural crops, The land resources available are shrinking day by day for agricultural related activities due to increasing urbanisation and industrialization. Major efforts are needed from different agencies to reclaim such marginal and degraded soils and bring them under productive cultivation. Focused efforts are required to promote container-growing and kitchen gardening in the urban areas to meet the nutritional requirements of families. The technology for container-growing of fruits and vegetables is available in a number of research organisations. Such technologies can be popularised among the urban population to ensure adequate nutritional supplementation. The demand for organic fruits and vegetables is increasing at a rapid pace. Such horticultural produce grown through organic means is nutritionally superior and free from the injurious pesticide residues that are otherwise found in inorganically grown produce. Growing awareness, therefore, about the organic fruits and vegetables would further enhance the supply of nutrients in a safer way.

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