

## **PRODUCTION OF FRUITS IN INDIA**

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### **Abstract**

India has diversity in soil & climate for agriculture and horticulture crop providing plenty chances for the advancement of fruit-industry. The biggest challenge in the present is- to produce sufficient fruits to feed the growing population. Fruit is very essential to human-beings & plays a significant role in spiritual performs, tradition & art. Fruits are delicious and have many of the nutrients which are necessary for the human-health. India is 2nd major grower of fruit in the whole world. The study is based on the production of fruits and its associated challenges and issues in the country. The production of fruits is very important and needful to every human and in demand that also greatly helpful in the development of Indian economy. The production of fruits is largest in the three main state of India: H.P(Himachal Pradesh), Jammu & Kashmir (J&K) & in Uttar-Pradesh (U.P.). India's massive agricultural resources alone makes huge prospective for investments in its fruit processing and equipment industry. Major areas holding scope for valuable processing are in the canning, dairy, packaging and food processing and thermo-processing industries. Fruit crops are concerned heavyweight expenditure on research, development and regulatory approval and market hurdles limit the profitable application of Biotechnology. The development of new technologies is future strategy to solve the problems of hunger, poverty, malnutrition and the diseases in the economically developing countries and underdeveloped nation

**Key words:** Cultivars, Fruits, Grown, Management, Production, Supply chain

### **Introduction**

India is amongst world's chief manufacturer of vegetable and fresh-fruit, major spices, fibrous crops, milk, fresh meat such as- staples like millets, castor oil, jute & ranks amongst world's 5th largest producer. Around 80% agriculture crop items that includes cash crop like cotton & coffee [1]. India's large geographical area integrated with differ climatic condition facilitates to plant varieties of fruit & vegetable. Per capital obtainability of fruit &vegetable is slightly less due to the post-harvest loss that account around 25-30% of the manufacture in India [1]. India is the 2nd largest creator of fruit & vegetable. India is leading in producing different fruits like Mango, Pomegranate, Banana, Sapota, Aonla and Acid Lime. A Per capital availability of fruits in India's population is around 189 gm/person/day & has been helping in supplementing nutrition's. Indian harvests all deciduous fruit that includes pome-fruits like- Apple & stone-fruits and pear. These all are mainly grown in the Northern West Indian States of H.P., U.P. and in J&K hills. The Northern East Hilly regions including of State of Arunachal-Pradesh, Meghalaya, Manipur, Nagaland & Sikkim grow deciduous fruit on partial measure. An apple is significant in terms of manufacture & degree. An apple was familiarized from British in the Kullu-Valley of the H.P. in the year 1865 while the "Delicious" group/class of an apple was presented in the hills of Shimla of Himachal-Pradesh State in the year 1917. Apple's cultivar 'Ambri' measured to the native to state of Kashmir & grown a long earlier the West overviews. Other deciduous fruit and pears was domesticated positively in the 20th century that were stated to happen in semi-wild circumstance, earlier. Apricots were grown in drier pocket of northern west Himalayas & the two apricot's varieties, also known as "Rakchaikarpo" and "Halman" are reported to a native to Leh&Ladakh area of Jammu & Kashmir State. Sweet cherry was familiarized by the Europe formerly Indian independence, the year 1947. Commercial cultivar of sour-cherry has been found in recent years in U.S.A. The European & Japanese plum selection is grown in high

& low both hilly areas. A variety Plum “Santa-Rosa” has been found a hybrid between American & Japanese species pre-dominates that is 70%-80% of plantations in hilly areas[2]. Cultivar of low chilling of nectarine & peach like Sunred nectarine, Flordasun and Flordared are the successful overview to Northern Indian plains. The Local selection of the peach like Sharbati, Shan-e-Punjab, plum, Alubhokhara, sand-pear & Jamuni like Patharnakh are cultured on a commercial scale from the subtropical peripheral North-Indian chilling-areas, also.

## 1.1 Present condition of Fruit Crops Farming:

### 1.2.1. Grown crops

India grows crops like- peach, apple, plum, apricot, pear, sweet cherry and sour cherry on commercial scale.

### 1.2.2. Different Cultivar

The various promising cultivar of the different temperate-fruit in three main fruit growing state in India (Table 1).

Table 1: Favorable Cultivar of Fruit in Main Manufacture Region in India[2]

Fruit	Uttar Pradesh	Himachal Pradesh	Jammu and Kashmir
(Sweet Cherry)	Black Heart, Governors' Wood, Bedford Prolific	Sue Sam, Napoleon, Black Tartarian, Lambert Bing	Black heart ,Bigarreau Napoleon
(Pear)	Flemish Beauty, Thumb Pear, Victoria, William's Bartlett, Beurre Hardy, Doyene du Comice	Manning's Elizabeth, Devoe, Max Red Bartlett, Bartlett, China, Flemish Beauty, Winter Nellis	Beurre Hardy, William, Goshbagu, Beuree D. Amanlis, Vicar of Wakefield, Kashmir Nakh
(Peach)	Flordasun, Sharbati Safeida, Shan-e-Punjab	July Elberta, Burbank, JH Hale, Alton, Sharbati, Shan-e-Punjab	Sharbati, July Elberta, Flordasun, Quetta, Elberta, Shan-e-Punjab,
(Plum)	Jamuni, Kelsey, Santa Rosa, Titron	Titron, Satsuma, Santa Rosa, Kelsey, Mariposa	Titron, Burbank, Satsuma, Santa Rosa, Grand Duke
(Apricot)	St. Ambrose, Turkey, Sharmagz Kaisha, Moorpark.	Charmagz, Castle, Nugget, Kaisha, Saffeida	Charmagz, Halman, Rachkaikarpo, Shakarpara, Nari
(Apple)	Early Shanburry, Fanny Benoni, Red Delicious, Buckingham, Chaubattia Princess, Starking Delicious, Rymer	Tydemans Early, Starkrimson, Red delicious, Schlomit, Mollies Delicious, Red Spur, Richared, Red Chief, Granny-Smith, Top Red, Oregon Spur, Michal, Golden Spur, Starking Delicious.	Benoni, Ambri, Cox's Orange Pippin, Red Delicious, White dotted Red, American Apirouge, Irish Peach, Golden Delicious

### 1.2.3. Root-stocks

Apple has originated specifically on seedling stock of apple. Clonal root-stocks haven't found beneficial among the apple growers. Clonal root-stocks have preferred for high-density orchard only. In pear, seedling stock of *Pyrus-pashia* (Kainth) is commercially being used. Seedling of wild apricot have found to be best that gives a smooth-merger & dynamic scions development. Peach can even be used as root-stock specially for light & dry soil. Myrobolan-plum which is recommend purposely for high-moisture condition of soil. Peach is implanted on a wild-peach seedling, plum & on apricot. Wild-peach produce is healthy & high yielding plant. Apricot root-stocks that impart dwarfing is used for controlling tree size. Commercial plantation of sweet-cherry was raised specifically on Mazzard & Mahaleb root-stocks. Seedling is raised up from a late matured cherry cultivar & stone of the Misri and Waterloo cultivar & is often use as a root-stocks. Rooting of a cherry sucker is promising

with the use of the rooting hormone like- (IBA) Indolebutyricacid in a grouping with Napthaleneaceticacid (NAA).

#### **1.2.4. Area & production**

Deciduous fruit is grown in North-Western Hilly areas of our country mainly in the states of H.P., U.P. and J&K and also in the North-East Hilly areas in State Arunachal-Pradesh, Meghalaya, Nagaland & Manipur. In North western Himalayan areas, peach comprises huge potential because of the utilization purpose for dismissing. Peach are mainly grown in low & mid hilly-areas except low-chilling cultivar that belongs to group Florida that can grow well under subtropical area environment.

### **1.2 Planting material production:**

#### **1.2.1. Nursery**

There is huge sum of Private & Government nurseries involved in the development of implanting materials of various deciduous type fruit-crop. State-Agriculturing-University & Research-Institution enhancing implanting materials of the better-cultivar for the marketting & the distribution for the farming community. Indian Government had maintained establishment of huge number for fruit's nurseries in public sector & private sector both. The existing nurseries that are covering public as well as private sector is enough to meet their need of implanting fruit crop.

#### **1.2.2. Propagation & Root-stock Information**

In every fruit vegetative-propagation technique- budding and grafting are followed aimed at the development of implanting material on standard-root-stocks, raise from both seeds and by clonal method.

### **1.3 Establishment of orchards:**

Land preparation and planting, spacing.

### **1.4 Care & management of orchard:**

Training & pruning, Manures and fertilizers, weeding and mulching, supplementary irrigation, pest disease control.

### **1.5 Intercropping;**

### **1.6 Harvesting and yield:**

### **1.7 Marketing;**

### **1.8 Processing;**

### **1.9 Potential for fruits:**

Area expansion, widening the cultivar base, Management practices, processed products.

### **1.10 Constraints in food production:**

Large number of old orchard are decreasing in term of growth & fruits produce. These old tree don't yield enough extension able-growth. A Large-scale re-planting is hence desirable. Apples are grown in negligible land & fertilizer is not-applied to trees. The efficiency of water & fertilizers use is very poor. Spring-frost &

hailstorms are poor weather parameter that leads to the low productivity. Efforts to increase food production for both domestic and export consumption purpose have stimulate the interest in the usage of good quality seeds. Currently, there is an insufficient supply of good planting material in India to cope up with the increasing demand.

## **Literature Review**

Fleshy & stone-fruit contributes considerably in the cultivation Indian budget. Apple-production controls section and organized agriculture & the selling of the apple changes the rural-income in North Western hilly part of our country. Latest ideas & determined effort is require for change in the selection mixture and supplying-of-quality of implanting product by best clone on index clonal root stocks. The water management, high density planting that includes micro level irrigation, combined plant nutrients organization & IPM plan for the plants protection in some of the areas that needs larger R&D to be focused. Implementation of the postharvest management practice & infrastructured development for classifying, package, storage and pre cooling of product need intensive development attention. The Value-addition & the export advancement mainly of: an apple is drawing attention towards the developmental activities in an Indian country. Research on fruits is done mainly by three states that are basically involved in Agriculture and that are J&K, Himachal Pradesh & Uttar Pradesh.

State government is involved in quality of trees. There is determined programme in every state to promote expand & replant with new better-quality varieties. Apple- control & postharvest handling sector is focusing responsiveness in improvement plans. Apple industry of India is controlled by Delicious-varieties. Ravi Nandi et al. [3]studied the valuable mark to relevant government related agencies in term of supporting the plan of policies for raising of organic food manufacture, marketing and getting the target public. Firm involved in organic food business might also see profits when depicted information in demand to regulate marketing-strategies. T.K. Hazarika et al.[4] studied on the wild edible-fruit of the state Mizoram which is used as an ethno-medicine in India & also studied the therapeutic values of some fruits to enhance their safety and effectiveness to preserve the high value fruits. Wild eatable fruit is an essential part of Mizoram life & culture but the regional awareness of the local people has shifted verbally by generation-to-generation with-out proper documentations. J.S. Pruthi [5] studied the chemistry, physiology and technology of fruits. He studied many morphological, physiological, taxonomic, agri-horticulture, mycological, chemical and various nutritional aspects of various varieties of fruits. V. Kavitha, M. Umanath et al. [6]studied the factors of consumption probability and Demand for Fruits in India and identified the factors of probability and amount of demand for major fruits at the domestic level in India by applying customer expenditure examination data that were collected by National-Sample-Survey-Organization.

Kristi A. Steinmetz, et al.[7] studied the connection between vegetables and fruits intake and risk of cancer. They studied the protecting effect of vegetable and fruit consumption for cancers of stomach, lung, pharynx, pancreas and colon. Arpita Mukherjee et al. [8] studied the a picture of consumption of Fruit and Vegetable consumption and its accessibility and implication for Phytonutrients Intake and determine the actual intake patterns of fruit and vegetable in India and compared it to World-Health-Organization (WHO) endorsed measure for an adult & to find the reasons for loss where it exists & make policy approval. Rais M, et al. [1] studied the possibility of Supplying-Chain-Management in the Fruit and Vegetable in our country India & found that the Administration (Government) & private operator need to work collaboratory to improve the somatic infrastructure, information-sharing & provision essential for quality growth of the supply-chain. Dr. Rosa S. Rolle[9] studied the ways to improve the post-harvest-management & advertising in the asia-pacific region and its issues and challenges and found that reducing postharvest losses result in social and economic benefit of the country. Gundewadi BB [10] studied the role & performance of cold-storage in agriculture of India and studied that the primary development effort for agricultural post-production infrastructure has been in the form of warehousing and cold stores for holding inventory for prolonged durations. Despite the rising focus on post-harvest management the cold-chain production in India, is still at an emerging stage. The objective of the study is to-find-out the manufacture of several fruit in various state of India and to determine the factors effecting its production that comprises postharvest losses and the different cultivars of main fruits that covers various regions of the country, India.

## **Discussion**

The (F&V) Fruits & Vegetables sector have been a powerful strength in motivating a vigorous growth trend in Agriculture of India. The growing share of high-value supplies in total cost of agriculture output and its growth-potential this portion is likely to control agriculture growth in the coming years and shows an exclusive role in economy of India by improving the profits of the rural population. Agriculture of these crops are labor demanding and they create a lot of employment prospects for the rural-people. India grows crop like pear, apple, plum, peach, sweet cherry, apricot, sour cherry on commercial-scale. Favorable cultivar of different fruit in three main rising state of India- J&K, Uttar Pradesh and Himachal Pradesh.

**Apple-** Around 700 succession of apples introduced from U.S.A, Canada, Germany, U.K., Russia, Israel, Switzerland, Australia, Netherlands, Denmark & Italy tested during last 50 years. Various groups of cultivar prevail the apple's market. The area covered under cultivar are 83% under apples in State of Himachal Pradesh, and 30% in the U.P and 45% in the J&K.[2] In recent times, enhanced types and color mutants with 20 to 50% better yield likely favored in Himachal Pradesh [2]. Serious complications of apple shell ailment and outpouring of early leaf falling and unpleasant of the red spiders' mite which causing great-concern. The hills of Uttar Pradesh specifically Kumaon hills separation include the characteristic benefit of early-harvest of fruit apple because of cultivation of mature varieties like Fanny, Benoni and Early Shanburry. The growing diversities harvested 2-3 weeks earlier from the arrival of the fresh-apples from the state Himachal Pradesh and J&K raise well-paid price.

**Pear-** For higher altitude conditions in pear, varieties that require high chilling are mainly grown. The Red colored strain of the pears like Red Bartlett, Max Red Bartlett and Starking are altering yellow color cultivars. In the sub-mountainous parts of Himachal Pradesh & Punjab that are warmer, pears cultivar like Kieffer, Baghugosha, sand pear Patharnakh and China are cultivated for both processing & table purposes, commercially.

**Apricot-** Apricot are of two types: bitter kernel type and sweet kernel. 81 Exotic successions & 19 native cultivars were first collected & then evaluated. The Local type: Rakhaikarpo and Halman have popular while exotic introduction like Kaisha, New Castle, Shakarpa and Nari, are favorable. All these cultivars are suggested for cold & dry areas. U.S.A variety is self-productive that bears attractive & sweet colored fruit.

**Peach-** The cultivars of peach which are of colder conditions July Elberta, Quetta, Peshwari, Elberta, Stark Earliglo and Burbank are well-developed Cultivars of low-chilling by Flordasum, Sharbati, Shan-e-Punjab and Sunred have popular in sub-tropical belts of Uttar Pradesh & Punjab State.

**Plum:** A huge cultivar about 283 introduced in India. European plum accomplished well in hills whereas plums of Japan adopted in submountainous low elevation. Santa Rosa is Prominent cultivar in hilly areas. Small matured cultivars in the Northern Indian plains like: Kelsey, Titron, Kala Amritsari and Alubukhara showed improved performance. A huge number of low chilling hybrids of Florida, Redgold, Sungold are under valuation.

**Cherry-** Sweet cherry cultivars have Familiarized from USSR, Europe and British Columbia. Favorable mysterious cultivars like Black Heart, Bigarrean Napoleon, J&K's Guigne Noir. Also Napoleon Sam, Black Tartarian Bing, Sue Shella cultivars of H.P. have identified. Cultivars from hotter climate that is Sunburst, Summit, Stella, Lapins and Compacat have found to be encouraging.

Supply Chain Management (Figure 1) signifies the administration of the whole set of manufacture, marketing and distribution activities through which customer is supplied by a preferred produce. Supplying chain management includes management & planning for all the activity that get involved in source earning, transformation, & logistic management. This also includes management & association with the channel partner that might providers, mediators, customers of third party or service provider. Supplying-chain management includes demand and supply of management with-in companies & through companies. Supplying-chain management is well-described as strategy & process of management, financial & physical system that need to

handover good & service from manufacture for ingesting unit in a well-organized and operative manner. The whole supplying-chain management procedure is price series wherever blockage, values factors & responsibility factor are acknowledged & address thus allowing retailed association in having well-organized supplying-chain. Retail operations confirms that precise produce is in right place: at right cost & at right-time. From this study, we have found that production of fruits is maximum in 3 State of India: J&K, Himachal Pradesh and Uttar Pradesh. On a commercial scale, India grows apple, peach, pear, plum, apricot, sweet cherry, and sour cherry. In three of India's major fruit-growing states, promising cultivars of various temperate fruits have been identified. Some deciduous fruit is grown on small-scale in the North-Eastern-Hills, which includes all states of Meghalaya, Arunachal Pradesh, Nagaland, Manipur and Sikkim. From all the firms, Apple is most important in output & distribution. A huge number of old groves are experiencing growth and fruit yield declines. The extension growth of such old trees is insufficient. Replanting on a large scale is thus necessary. Apple trees do not receive fertilizer and are grown on very little ground. Water and fertilizer usage efficiency is generally low. To create a strong or healthy country, the government should take appropriate measures to increase fruit crop planting and raise awareness, especially among the younger generation, about the importance of including fruits in one's daily diet.

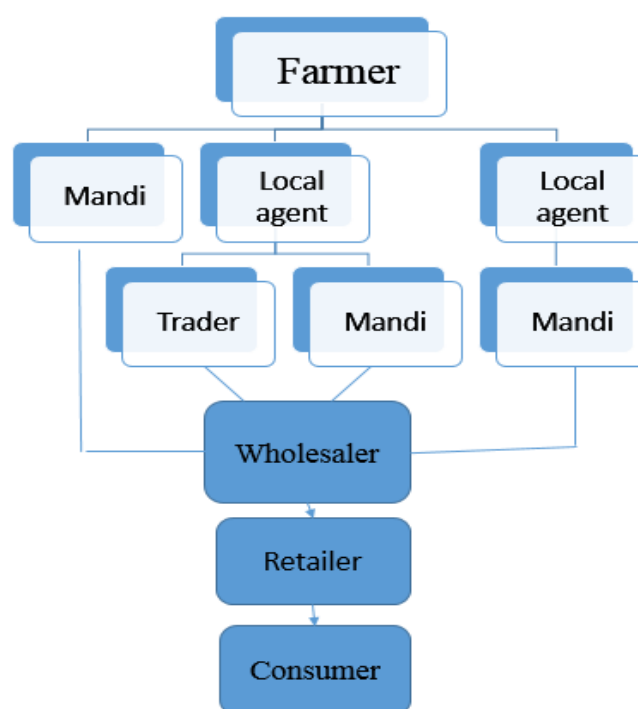


Figure 1: Illustrating the Whole Process of Supply Chain for Fruits in India

## Conclusion

The study has discovered that consumption of all fruits has increased with rise in income in both rural and urban areas. Fruit consumption is highly income elastic, in India. Apart from income, own price and price of other food groups also determine the consumption of fruits. The rising spiraling food prices have affected the income groups, particularly low- and middle-income groups in India. Any increase in price of fruits would lessen their purchase probability and expenditure on fruit consumption. In addition, increase in the values of other high-value commodities like fish, meat and egg also reduces the consumption spending on fruits. On the other side cereals, pulses and vegetables act as complementary to fruit consumption because the consumption spending on fruits increases with the increase in prices of commodities. A very large number of groves are exhibiting decrease in fruit yield and growth. Delicious group of cultivars constitute the main share of apple production in the country. The cultivars that are low-chilling of stone-fruits covered huge area of subtropical parts of Punjab, Uttar Pradesh & Himachal Pradesh. Hilly areas likely cultivars recognized essential spread. The fruit sector has most promising force in enhancing a vigorous growth in India's Agriculture. Cultivation of fruit crops is high in

demand that makes many opportunities in employment for the countryside people. The consumption of vegetables and fruits has significant role on human health. The less consumption of fruits is due to dietary choices of individual which is much towards cereals, in India. The reason of lower consumption of fruits is the lack of availability or production and their high cost. Availability, Accessibility, taste and likings, consumer attentiveness, quality awareness, expanding development, opening of food malls, easy availability of packed food and drinks, irregular food habits and changes in lifestyle act together in a complex manner to figure decision-making and dietary consumption patterns of individuals and households. It is important to study the causes of selection and consumption of various fruits among rural and urban population which effect fruit consumption pattern. Fruit production is high in mainly three states of India: J&K, Himachal Pradesh, Uttar Pradesh. Each variety of fruit and each kind of tree has its specific climate alterations and limits. Fruits like papaya, banana and pineapple are appropriate for temperate-climate, stone-fruits like: peach, cherry and plum achieve top in the warmer-regions of moderate climate zones. The fruits that are developed external their climate range, lowest air temperature in winter may fall lower the existence limit of the tree and spring frost might kill the flowers.

The increasing segment of high-cost supplies in total cost of farming production and their growing prospective, this section is possibly determining agriculture growth in the coming years and plays an important role in Indian economy by effective income of rural people. Cultivation of crop is employment demanding and create lot of employing openings for rural population. Our country, India grows crop like apple, plum, pear, apricot, peach, sour cherry, sweet cherry on a profitable scale. The household features like having food away from home, households under woman management and upper age and educational level of household-head have showed a positive impact on fruit consumption. The share of per-capita intake spending on fruits in all the income groups has been found higher in urban area than in rural area in India. This may be because of higher convenience of urban population to fruits. Among the fruits, the intake is more of banana, mango and apple.

The government should adopt suitable measures to increase plantation of fruit crops and should also create awareness, particularly among the younger generation about the recommended consumption of fruits in daily diet so as to build a strong or healthy nation. There are huge number of Private & Government nurseries that are involved in implanting material of fruit crop. The State Agriculture Universities & Research Institutions increase preservative material of better-quality cultivars for sale & distribution to agriculture populations. The Indian Government had sustained creation of huge fruit nurseries in public & private sectors both for strategic undertakings. Number of nurseries involved in manufacture of stone & pome fruits are not-known. Though already existed that is more than 600 nurseries that cover public institutions & private Institutions as well that stand enough to fulfil the requirements of implanting materials of fruit crop.

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