

Past trends and future prospects of fruits and vegetables in India

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ABSTRACT

Fruits and vegetables are high value commercial crops grown in an area of about 16.19 million hectares with a production of 243.47 million tones in India in 2012-13. Over the years (2001-02 to 2013-14), there is an increase in area, production and productivity of fruits with compound growth rate of 5.71, 6.31 and 1.08 percent respectively. In addition, there is an increase in area, production as well as productivity of vegetables with compound growth rate of 3.99, 6.20 and 2.13 percent respectively. Seasonal variability in fruits and vegetables has shown inverse relationship between arrivals and prices. At the time of harvesting, there is glut in market that adversely affects the prices because of which seasonal indices for arrivals are maximum and corresponding prices are relatively low. Pre-harvest losses occur due to attack of insect-pest, rodents, birds and infestation of weeds and diseases. Post harvest losses for fruits and vegetables occur in different stages of marketing viz. picking/ plucking, assembling, grading, packing, storage, loading/ unloading, transport etc. In India, the scientific storage capacity is only 30 percent of the required capacity. Cold storage facility is available for only 10 percent of fruits and vegetables. Only 2-3 per cent of the produce is processed in India. Due to lack of proper handling (cleaning, sorting, grading and packaging) facilities at the village level with about 30 percent of fruits and vegetables and 10 percent of spices are lost before reaching the market. There is a wide scope of increase in processing capacity for fruit and vegetable industry.

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Introduction

Fruits and vegetables provide a diversified flavored, colorful, tasty, low calorie and protective, micro-nutrient rich diet. Overall, it is estimated that low fruit and vegetable intake is attributable to approximately 2.7 million (4.9%) of annual deaths. Horticulture contributes 30 % of GDP in agriculture and 52% of export share in agriculture from cultivated area of 8.5%. Fruits and vegetables form the single largest sub-sector, sharing about 29.70 percent of area and over 60.76 percent of the total production under horticulture. Fruits and vegetables are high value commercial crops grown in an area of about 16.19 million hectares with a production of 243.47 million tones in India in the year 2012-13. India's share in global market is insignificant, it account for 1.7% of global trade in vegetables and 0.5% in fruits. In mid 80's, the Govt. of India identified horticulture crops as mean of diversification for making agriculture more profitable (Birthal et al, 2008 and Chand et al, 2007). The development of horticulture took place under four different phases. In the first phase (pre-independence), Horticulture as a whole was not considered, but efforts were made to grow fruits, vegetables, flowers, spices in isolated manner. During second phase (1948-1980), no planned efforts were made but specific problems were addressed as technical support and development efforts were made for specific commodities like- spices, coconut, potato, etc. During the third phase (1980-92), consolidation of

institutional support by government of India coupled with the changes in economic policies allowing liberalized introduction of hybrid seed and plant material from other countries resulted in substantial increase in production and export of these crops. During the fourth phase (1993-2003), marked technological changes occurred. There was a quantum jump in plan allocation that resulted in an increase of production and enhanced availability of produce, which is now marked as Golden Revolution. To further develop horticulture, government of India launched National Horticulture Mission Approach in May, 2005 (Economic Survey, 2007). Figure 2 shows the production share of horticultural crops in India. During the year 2012-13, the production share of vegetable is the highest (60.76%) followed by fruits (29.70%), plantation crops (6.36%) and spices (2.31%). Similarly figure 2 shows the annual growth rate of horticulture crops in terms of production. This figure shows an increasing trend in the production of horticultural crops from year 2001-02 to 2011-12. In the year 2002-03, annual growth rate has recorded negative (0.96%), afterwards the AGR has found to be positive. The highest annual growth rate of horticultural crops production (10.13%) has recorded in the year 2008-09.

In spite of all such efforts by the government, only 16 percent of the total plan allocation is spent on horticulture. Still there is a wide scope of utilization of funds for horticulture development.

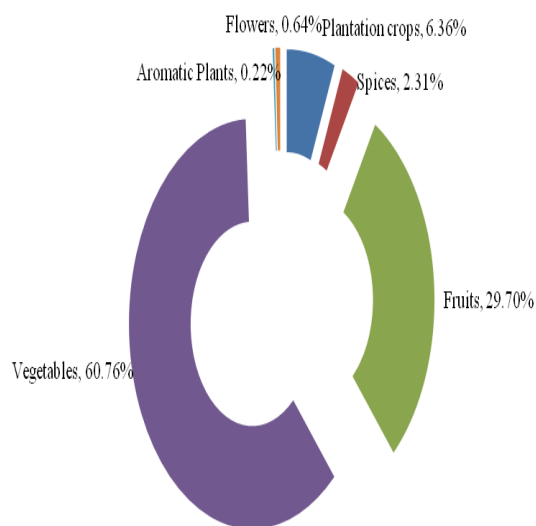


Fig 1. Production Share of Horticultural Crops Year 2012-13

Source: Govt. of India, Indian Horticulture Database, 2013

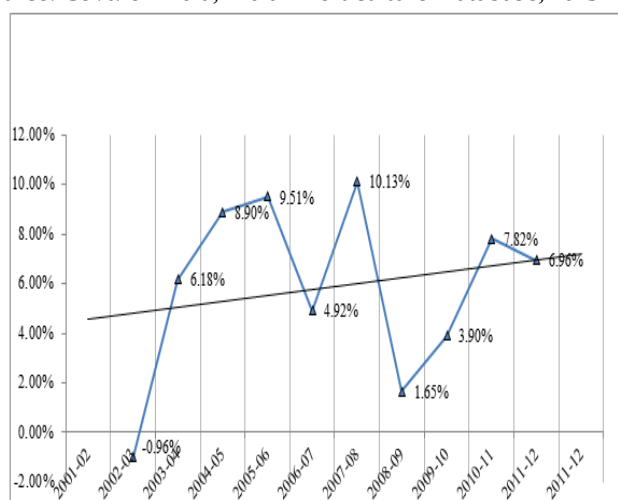


Fig 2. Annual Growth Rate in Horticulture Production

Source: Compiled from Govt. of India, Handbook on Horticulture Statistics 2013

Horticulture can prove a better alternative for employment generation. The average labour requirement for fruit production is 860 man days/hectare/annum as against 143 man days for cereal crops. As horticultural crops are highly perishable in nature, there is an incidence of both pre and post harvest losses. About 35-40 percent of fruits and vegetables go waste due to lack of proper processing and packaging. However, understanding of production and marketing problems of fruits and vegetables in India would help to improve the marketing and production process of these products. Keeping all the facts in view, the present article deals with:

1. Emerging scenario of fruits and vegetables
2. Seasonal variability
3. Pre and Post harvest losses
4. Market Infrastructure

Emerging scenario of fruits and vegetables

India is the second largest producer of fruits and vegetables next to China. India contributes 10 and 15 percent of global production in fruits and vegetables respectively. Production of fruits and vegetables in India in 2012-13 was 243.47 million tonnes with the per capita availability of 490 grams per day against 420 grams as per ICMR norms. But per

capita consumption in India is only 46 grams and 130 grams against minimum of 92 grams and 230 grams, respectively by ICMR and National Institute of Nutrition, Hyderabad. In figure 3, the trends in the production of fruits and vegetable crops shows that during 1991-92 to 2011-12, fruits and vegetables production has increased. The production of fruits has increased from 28.6 million tonnes to 76.4 million tonnes from the year 1991-92 to 2011-12. Similarly, vegetable production has increased from 58.5 million tonnes to 156.3 million tonnes for the same period.

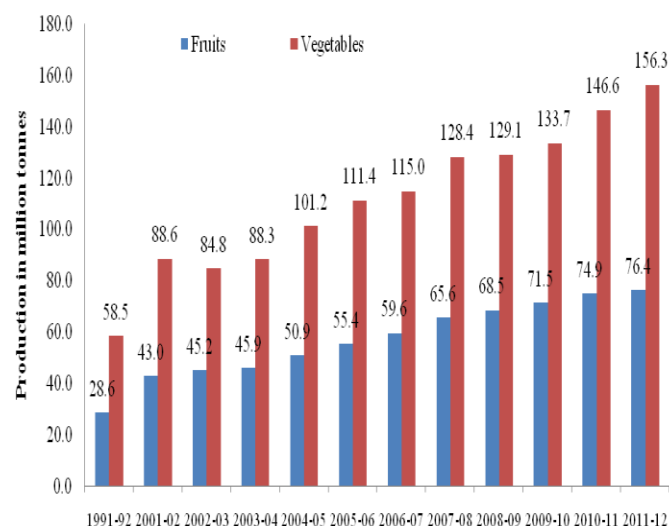


Fig 3. Production trends in fruits and vegetables in India

Source: Govt. of India, Indian Horticulture Database, 2013

The perusal of table 1 shows that over the years from 2001-02 to 2013-14; there is an increase in both area, production and productivity of fruits with compound growth rate of 5.71, 6.31 and 1.08 percent respectively. In addition, there is an increase in area, production as well as productivity of vegetables with compound growth rate of 3.99, 6.20 and 2.13 percent respectively. During the period from 1991-92 to 1995-96, all three parameters viz., area, production and productivity showed an increasing trend in case of fruits as there was a quantum jump in plan allocation by government of India for horticulture development. Later on, productivity of fruits showed a negative growth rate, it may be attributed to various reasons like old senile orchards, high incidence of pest and diseases and environmental factors. which may be attributed to various environmental factors. However, in case of vegetable, there was a positive growth rate both in production and productivity while a negative growth rate in area during 1991-92 to 1995-96.

Seasonal variability

Seasonal variations are periodic movement within a period not more than one year. Seasonal variations are reflected by seasonal indices, which can be worked out by various methods viz., freehand or graphic method, semi-average method, moving average method and method of least square. Various researchers have studied seasonal variability in fruits and vegetables and have found inverse relationship between arrivals and prices.

At the time of harvesting, there is glut in market that adversely affects the prices as a result of which seasonal indices for arrivals are maximum and corresponding prices are relatively low.

Table 1. All India Growth Rate in Area, Production and Productivity of Fruits and Vegetables (CGR %)

Year	Fruits			Vegetables		
	Area	Production	Productivity	Area	Production	Productivity
1991-92 to 1995-96	3.28	9.42	5.91	-1.00	4.67	5.64
1996-97 to 2000-01	1.82	1.80	1.03	3.21	6.92	3.59
2001-02 to 2005-06	8.92	6.43	-2.27	4.27	6.55	2.17
2006-07 to 2010-11	3.62	5.59	1.91	2.48	5.39	2.84
2011-12 to 2013-14	3.74	7.90	3.87	2.39	3.75	1.31
2001-02 to 2013-14	5.17	6.31	1.08	3.99	6.20	2.13

Source: Compiled from data obtained from www.indiastat.com.

However, during the mid season when the arrivals show a downward trend there is an upward trend in price indices. In lean period, arrivals are mainly from cold storages and at that time, producers get maximum returns for their produce. During pre harvesting period, there is more arrival in the market because produce from cold storage is off-loaded by traders. Thus, there is a great fluctuation from month to month in arrival and prices of horticulture crops, therefore, indicating large seasonal variability.

Pre and post harvest Losses

Pre-harvest losses occur due to attack of insect-pest, rodents, birds and infestation of weeds and diseases. Several insect species cause a severe damage to fruit crops. A study by Sharma et al (2005) examined that the insect damage to citrus by citrus psylla, white fly and citrus leaf minor and brown mite is more than 50 Percent. In mango damage by mango hopper was more than 50 percent while by mango mealy bug and shoot borer ranged between 25 to 50 percent. The rats attack seeds and seedlings in nurseries of fruits resulting in felling down of fruit plants. Birds damage several fruits at the bud stage and ripening stage. Parakeet is the major bird pest causing serious damage to guava, peach, pear, grapes, mango and ber. The major damage to grape is caused by mynas. Rana et al (2005) in their study found that the physical and economic losses by birds in kinnow were 11.6 and 7.6 percent respectively in Haryana while for Punjab and Himachal Pradesh it was 9.06 and 6.8 percent; 0.1 and 0.03 percent, respectively. Weeds do harm in Vegetable Production (Loss Ranges 30 to 45 %) in Early Stage of Crop Growth. Diseases also cause a great loss to fruits and vegetables. Post harvest losses for fruits and vegetables occur in different stages of marketing viz. picking/ plucking, assembling, grading, packing, storage, loading/ unloading, transport etc. Wastage of fruits and vegetables due to poor post harvest management and lack of cold chain facilities have been estimated cost up to Rs 13600 and Rs 14100 crores annually. One percent post harvest loss reduction of horticulture produce is expected to save Rs. 230 crores annually. Due to these post harvest losses, the per capita availability of fruits and vegetables declines. ManglaRai (2006) found that with post harvest losses of total fruits and vegetables the per capita availability of fruits and vegetables decline by 30 percent. In 2001-02, the per capita availability of fruits and vegetables was 349 gram per capita per day that was based on production while after considering the loss of 30 percent it declined to 244 gram per capita per day. Based on total production 243.73 million tonne of fruits and vegetables in 2012-13, the per capita availability is 490

gram per capita per day against 420 grams as per ICMR norms.

Market Infrastructure

In India, the scientific storage capacity is only 30 percent of the required capacity. Cold storage facility is available for only 10 percent of fruits and vegetables. Transportation and handling facilities for perishable commodities are inadequate and poor. The processing capacity is also inadequate and mostly inefficient. Physical infrastructure in market yards is inadequate. Most of the rural primary markets have no infrastructure. Due to lack of proper handling (cleaning, sorting, grading and packaging) facilities at the village level with about 30 percent of fruits and vegetables and 10 percent of spices are lost before reaching the market. There is a wide scope of increase in processing capacity for fruit and vegetable industry. Also, low capacity utilization of available processing units is due to the fact that majority of these units are in home and cottage sectors which are plagued by the technological backwardness and lack adequate funds for modernization.

Comparison of cold storage capacity and production of fruits and vegetables in India (table 2) shows that in year 2012 production of fruits and vegetables is higher in West Bengal followed by UP, Andhra Pradesh, Bihar and Gujarat while the cold storage capacity is maximum in UP followed by West Bengal, Punjab etc. The cold storage capacity utilization is higher in Maharashtra followed by Andhra Pradesh, Tamilnadu and Karnataka.

Policy Implications

Improvement in Production

The production can be enhanced by the effective utilization of available arable land by changing crop priorities, promoting use of wastelands for growing suitable horticulture crops, emphasizing horticulture crop production in states having potential for area expansion and by promoting the production of off-season vegetables using green house.

Improving Productivity

Planting of disease free and quality recommended varieties can improve productivity. The orchard efficiency can be increased through substitution of old varieties with improved highyielding varieties in crops like mango, apple, kinnow, malta grape etc.

Reducing cost of production

Reducing the cost of fertilizers and post harvest losses, by the effective utilization and conservation of water, the integrated nutrient management, promotion of integrated pest and disease management, can attain it.

Table 2. State-wise Cold Storage Capacity and Production of Fruits and Vegetables in India (As on year 2005 and 2012)

State	Capacity (000' MT)		Production (000' MT)		Capacity utilized (%)	
	2005	2012	2005	2012	2005	2012
Andhra Pradesh	713.73	901.00	12949.10	26043.80	5.51	3.46
Bihar	910.60	1147.00	16269.35	20574.90	5.60	5.57
Gujarat	948.93	1267.00	9128.00	18933.90	10.39	6.69
Haryana	380.10	393.00	3460.00	5527.40	10.98	7.11
Himachal Pradesh	18.37	20.00	1676.40	2076.80	1.96	0.96
Karnataka	149.52	407.00	8631.34	14461.50	1.73	2.81
Madhya Pradesh	751.45	808.00	4269.32	18024.00	17.60	4.48
Maharashtra	459.43	547.00	14993.00	17793.00	3.06	3.07
Orissa	274.17	291.00	9853.90	11674.40	2.78	2.49
Punjab	1231.68	1345.00	3548.05	5285.10	34.71	25.45
Rajasthan	272.62	324.00	329.75	1590.30	82.67	20.37
Tamil Nadu	178.19	239.00	11031.19	14597.80	1.62	1.64
Uttar Pradesh	8258.81	10187.00	22475.17	26613.00	36.75	38.28
West Bengal	4402.97	5682.00	24103.30	28639.30	18.26	19.84
India	19624.91	24298.00	162321.96	243471.90	12.09	9.98

Source: www.indiastat.com

Value Addition

The processing capacity of existing units needs to be augmented and the existing facilities need to be modernized. Product diversification needs to be encouraged.

Price Stabilization

It can be achieved by timely introduction of market intervention schemes (MIS), minimum support price (MSP), creation of price stabilization fund and collection of reliable database in horticultural crops.

Strengthening of Organization Support

It can be achieved by organizing management training programmes, study tours for small and marginal farmers, training programmes on modern aspect of horticultural crop production and post harvest management.

Changing consumption pattern

If the consumption level shoots up from current 100 grams of fruits and 200 grams of vegetables per capita per day to at least the recommended dietary level of 140 grams and 270 grams respectively, the domestic market for fruits and vegetables could be as large as Rs 50,000 crores at today's price structure.

References

- Birthal, P.S., P.K. Joshi, Sonia Chauhan and Harvinder Singh (2008), "Can horticulture revitalize agricultural growth", *Indian Journal of Agriculture Economics*, Vol. 63, No. 3, July-September, pp. 310-21.
- Chand, Ramesh, S.S. Raju and L.M. Pandey (2007), "Growth crisis in agriculture _ Severity and options at national and state level", *Economic and Political Weekly*, Vol. 42, No. 26, June 30, pp. 2528-2533.

Economic survey (2006-07), Government of India, Ministry of Finance, New Delhi, pp.158.

FAO Year Book (2003), Food and Agri organization of the United Nations, Rome, Vol 57, pp.134.

Govt. of India (2014), Handbook on Horticulture Statistics, Ministry of Agriculture, Department of Agriculture and Cooperation, New Delhi.

Govt. of India (2013), Indian Horticulture Database 2013, Ministry of Agriculture, Gurgaon.

Mangla Rai (2006), "Post Harvest Technology and Storage", Handbook of Agriculture, Directorate of Information and Publication of Agriculture, Indian Council of Agriculture Research, New Delhi, pp.689.

Rana, Rajesh, Pandey, N.K., Karol, Anshuman, Dahiya, P.S., Kumar, S., "Estimation of Post harvest losses in Kinnow Marketing in India," *Indian journal of Agricultural Marketing*, Vol 19 (3), pp.92-102.

Sharma, D.R., Arora, P.K., and Singh, Sandeep (2005), "Insect and Mite Pests of Fruit Crops in Punjab", *Journal of Plant Science Research*, Vol 21 (1-4), pp 54-59.

Singh, Karam, Grover, D.K., Vatta, Kamal and Kumar, Sanjay, (2001), "Pattern of Production and Marketing of fruit crops in Punjab", *Indian Journal of Agricultural Marketing*, Vol 15(2), pp 8-16.

Singh, H.P., Nath, Prem, Dutta, O.P. and Sudha, M. (2004), "State of Indian Farmer: A Millennium Study; Horticulture Development", Academic Foundation, New Delhi, Vol 11, pp 45-51. www.indiastat.com.