CHAPTER - IX
SUMMARY, CONCLUSIONS AND
POLICY RECOMMENDATIONS

India is one of many important fruit and vegetable producing countries in the world. In production, it ranks second after Brazil in the case of fruits and secures same position in the case of vegetables after China. With the introduction of improved production technology, fruit and vegetable production has been increasing in India. The fruits and vegetables occupy a place of special significance in human nutrition. Punjab is well known as a cereal producing state. Since the advent of Green Revolution, agriculture of Punjab has slowly shifted from subsistence to commercialized one. Due to good yields and minimum support price, wheat-paddy rotation became most popular in Punjab state. But as the time passed wheat-paddy rotation had resulted in various problems related to the soil and environment. Recently, increased emphasis has been placed on the diversification of Punjab agriculture. Fruit and vegetable farming is considered to be good replacement for wheat-paddy rotation. But farmers are less interested to adopt fruit and vegetable production as these crops cannot provide assured returns to the farmers on the account of their perishable nature, forces of demand and supply, inefficient marketing system, inadequate storage facilities, processing, etc.
Realizing the importance of fruits and vegetables, particularly in view of the present national strategy of bridging the demand-supply gap, this study is undertaken. The main purpose of this study is to examine critically the production and marketing structure in terms of production, marketable surplus, seasonal variations in arrivals and prices, marketing costs, marketing margins and to identify the constraints in the production and marketing of fruits and vegetables. The specific objectives of the study are as follows:

1. To assess the area, production and productivity of fruits and vegetables.

2. To examine the marketed surplus of fruits and vegetables at farm level.

3. To judge the seasonal behaviour of arrivals and prices of fruits and vegetables.

4. To find out alternative marketing channels in the marketing of fruits and vegetables.

5. To assess the marketing costs, marketing margins and price spreads in the marketing of fruits and vegetables.

6. To identify the constraints/problems of fruits and vegetables growers during the process of production and marketing.

7. Finally, to suggest policy recommendations for improving the production and marketing of fruits and vegetables.
Conceptually, the study is classified into two parts. Part-I deals with production aspect; and part-II deals with marketing aspect.

Patiala district is purposely selected for the study. The present study was conducted on a sample of 150 farmers, 25 commission agents/wholesalers and 25 retailers. Three fruits, i.e., guava, ber and mango and three vegetables, i.e., potato, tomato and peas were finally selected for the study. Both the primary as well as secondary data had been used to achieve the objectives of this study. Two different well designed questionnaires were used to collect the relevant information from the sampled farmers, commission agents/wholesalers and retailers. The secondary data were collected from various journals and departments mainly State Agricultural Marketing Board, Market Committees, Directorate of Marketing of Punjab, Department of Horticulture, Patiala, etc. Appropriate statistical techniques like time series analysis, regression analysis, correlation analysis, simple averages, etc. were used for the analysis of data.

**Main Findings of the Study**

The primary survey showed that all the growers live in villages and majority of them are in the age group 30-65 years. Most of the farmers are uneducated and approximately less than 20 per cent farmers are educated up to the middle level. Further, it has been found that no land is left unirrigated. The tubewells and canals are the main source of irrigation, and the growers use tractors for the cultivation of land. Some
farmers have their own tractors and some hire the tractors. Farmers in the study area also hire labourers for plucking, cleaning, loading purposes, etc. The fertilizers/manures are used to grow fruits and vegetables. There are several fertilizers/manures like Farm Yard Manure (F.Y.M.), Urea, D.A.P., etc. which are used by sampled farmers to grow fruits and vegetables. The insecticides/pesticides/fungicides like Bavistin, Thymite (Forate), M-45 (Mancozeb), Karathene, Indosulphane, Confidor (imidaclopride), etc. are used for the protection of fruit and vegetable crops from several diseases/insects. The study brings out that means of transport used by sampled farmers in Patiala district are tractor-trolley, tempo and cantor. A very few number of farmers have their own means of transport while most of farmers use hired means of transport.

It has also been observed during the survey that mainly four facilities such as shed, pucca floor, sufficient space and drinking water are provided to the sellers of fruits and vegetables in Patiala district. But many sellers demand rest house/place for short time rest, proper parking place and storage facilities. So, it is clear that proper facilities like cold storage, rest house, parking place, etc. are not available in Patiala district markets. Not only this, other facilities like drinking water, sufficient space are also improper.
Trends in Area, Production and Yield

The results reveal that in the case of growth in area, yield and production of both fruit and vegetable crops combined, at the state level as well as at the district level, all the three variables showed a positive increase. The production increased at an annual compound growth rates of 4.54 per cent and 5.31 per cent both at the state level and at the district level respectively. Both area and yield played a positive role in this production performance. However, growth in production is mainly attributable to increase in area rather than enhancement in yield both at the state and district level, which increased at a rate of 3.60 per cent per annum and 3.91 per cent per annum respectively. Taking fruits separately, at the state level, the compound growth rates of area and yield registered an increase of 0.70 per cent and 3.83 per cent respectively. As a result, production has increased at a rate of 4.55 per cent per annum. But at the district level, the area under fruits has diminished at a rate of 0.28 per cent per annum and yield has increased at a rate of 2.85 per cent per annum. This means that enhancement in yield is solely responsible for production growth performance of fruits both at the state and district level. So far as vegetables are concerned, both at the state and district level, the production growth performance is mainly due to expansion in area rather than enhancement in yield. At the state level in the case of vegetables, the C.G. R. of area registered an increase of 4.96 per cent per annum. Consequently, production has
increased at a rate of 4.46 per cent per annum irrespective of yield that declined at a rate of 0.50 per cent per annum. However, at the district level, both area and yield played a positive role in production. Again, the growth in production owes itself primarily to expansion in area rather than enhancement in yield, which increased at a rate of 5.26 per cent per annum and 0.81 per cent per annum respectively.

**Relationship between Production and Marketed Surplus**

The relationship between production and marketed surplus has been pursued at two levels, i.e., at micro level (based on primary data) and at macro level (based on secondary data). Micro level was based on a sample study, which consists of 47 farmers for fruit crops and 103 farmers for vegetable crops. The macro level analysis was based on year-wise data of market arrivals in Patiala district markets for each of fruit and vegetable crop.

The computed results make it evident that during the year 2008-09, a large percentage of the produce of both fruit and vegetable crops by sampled farmers constituted the marketed surplus and a very small part was kept for retention. In the case of fruits, the sampled farmers sold about 99.12 per cent of their fruit produce in the market and a small part, i.e., about 0.88 per cent consumed for various purposes. In the case of vegetable crops, the total percentage of consumption and marketed surplus were 3.82 and 96.18 respectively. There exists an elastic relationship between marketed surplus and production. In other
words, as the level of production rises, there is a tendency of marketed surplus to increase at a rate higher than that of increase in production. The marketed surplus of fruits as well as vegetables was 99.56 per cent and 97.57 per cent of the produce respectively in the case of large farmers. However, in the case of small farmers for each of the two crops, it was 98.75 per cent and 96.12 per cent of the total produce respectively.

The share of marketed surplus in the produce has a positive relation with the scale of the production. Further, it has been found that in the case of fruit crops, it was consumption requirement that comprised of 54 per cent of the retained part of the produce and it was seed requirement that comprised of 90 per cent of the retained part of the produce in vegetables. In other words, it was consumption requirement that appear to be dictating the retention level of the produce in case of the fruit crops, and it was seed requirement that dictates the retention of the vegetable crops.

While analyzing macro behaviour, the computed results point out that there was no such significant relationship in the market behaviour of individual households (marketed surplus) and their macro aggregates (production). The typical macro behaviour is due to the reason that in Patiala district, the market is deficient in the production of fruit and vegetable crops, and these are imported from outside to make them available throughout the year.
Seasonality of Market Arrivals and Prices

The increase in level of production and marketed surplus of fruits and vegetables have created a situation in which most of the farmers have been confronted with a glut in the market and consequent fall in prices. Therefore, market price information in the case of fruits and vegetables is important for the orchard owners to make decision regarding choice of market and time, and to maximize returns from the sale of their produce.

The study on arrivals and prices brings out that market arrivals are not homogeneously distributed and their nature is such that the bulk of the produce of both the crops reached the market soon after the harvest. In Patiala district markets, in the case of guava, the market arrivals were low in the month of June and arrivals were more in the month of August. For ber, the peak month was March and in the case of mango it was June. In the case of vegetables, the arrivals were the highest in peak months and the lowest in lean months. For potato, the peak month was February and lean month was August. In the case of tomato and peas, the peak month was March and lean months were November and July. The relative weights of year-wise arrivals for fruit and vegetable crops were computed for peak, mid and lean periods. When the year-wise data were examined, the weights of peak periods were found to be more in the case of mango than other fruits. Whereas in the case of vegetables, the weights of peak periods of peas were more
than other vegetable crops. The response of product prices to month-wise arrivals is such that when the arrivals were high the prices were generally low. Due to seasonal behaviour of arrivals and prices, there exists an inverse relationship between market arrivals and prices. The seasonal nature of fruit and vegetable crops creates glut in the market during the post-harvest season, which leads to sharp fall in prices and affect the producers adversely in Patiala district. The analysis of seasonality behaviour also reveals that like arrivals, prices also exhibit seasonality in Patiala market. The seasonality index depicts the maximum price during lean periods and minimum during peak periods. The negative value of correlation coefficients computed between month-wise arrivals and corresponding market prices confirm the existence of inverse relationship between market arrivals and prices.

**Marketing Costs, Marketing Margins and Price Spreads through Different Channels**

Findings of the study regarding the marketing channels reveal that in Patiala district, there are three main marketing channels for fruit and vegetable crops.

**Channel-I:** Producer-Commission Agent/Local Wholesaler-Retailer-Consumer.

**Channel-II:** Producer-Consumer.
**Channel-III:** Producer-Pre-harvest Contractor-Commission Agent/Local Wholesaler-Retailer-Consumer.

The growers of guava sold their produce through all the three channels. Whereas, ber was sold through the first two channels, i.e., channel-I and channel-II. As far as mango is concerned, it was marketed through channel-I only. In the case of vegetables, for potato and peas, the farmers sold their produce through channel-I and channel-II but in the case of tomato the produce was sold through only channel-I.

The results of study on marketing costs, margins and price spreads reveal that there are large number of intermediaries who operate between the producer and consumer, resulting into a wide gap between the producer and consumer price of these commodities. As in the case of guava, in channel-II, where no intermediary is involved, the producer received 96.43 per cent of the consumer’s rupee after incurring a cost equivalent to 3.57 per cent of the same. But in channels I and III, the producer got only 70.53 per cent and 77.64 per cent respectively of the consumer’s price after incurring costs equivalent to 6.10 per cent of the same. In the case of ber, in channel-I, the producer received a net price of Rs.832.79 per quintal which is equivalent to 62.85 per cent of the consumer’s rupee after incurring a cost of 7.87 per cent of the same. But in channel-II, where the produce is directly sold to the consumer, the producer received a net price of Rs.1100.22 per quintal, which is equivalent to 95.86 per cent of the consumer’s rupee. Lastly, in the case
of mango (as the producer sold through channel-I only) the producer’s share in consumer’s rupee was 58.44 per cent after incurring a total cost of 5.96 per cent of the same.

The study further brings out that the total costs incurred at producer’s level were the highest in the case of mangoes, i.e., Rs.119.28 per quintal followed by ber, i.e., Rs.104.24 per quintal and guava Rs.103.73 per quintal. At wholesaler’s level, the commission charges occupied a lion’s share. It ranged from Rs.65.14 per quintal to Rs.64.41 per quintal in the case of guava and mango, and Rs.46.85 per quintal in the case of ber in total marketing costs. Total costs incurred at retailer’s level were the highest in the case of mango (Rs.80 per quintal) followed by guava (Rs.53 per quintal) and ber (Rs.43 per quintal). The net sale price per quintal of fruits earned by the producer was to the tune of Rs.1199 for guava in channel-I, Rs.1350 in channel-II and Rs.1320 in channel-III; for ber Rs.832.79 in channel-I and Rs.1100.22 in channel-II and for mango Rs.1168.86 in channel-I. The average margin per quintal of fruits earned by the commission agent/local wholesaler was Rs.80.01 in the case of guava, and Rs.128.64 and Rs.195.93 for ber and mango respectively. The margin per quintal of fruits earned by the retailer varied from Rs.147 to Rs.132 in the case of guava and ber, and Rs.320 for mango.
In the case of vegetable crops, for potato in channel-I, the producer’s share in consumer’s rupee was found to be 47.88 per cent after incurring a cost equivalent to 13.89 per cent of the same. Whereas in channel-II, where produce is directly sold to the consumer, the percentage share of producer in consumer’s rupee was found to be 94.41 after incurring a cost equivalent to 5.59 per cent of the same. In the case of tomato, where the produce was sold through channel-I only, the producer incurred a cost equivalent to 11.82 per cent of the consumer’s rupee and received a net price equivalent to 47.22 per cent of the same. Lastly, in the case of peas, in channel-II, where no intermediary is involved, the producer received more than 90 per cent share but in channel-I, the producer got only 55.56 per cent share. The costs incurred by the producer in channel-II were only 8.30 per cent of the consumer’s rupee whereas in channel-I, these were 9.83 per cent of the same.

It has also been found that the total costs incurred at producer’s level were the highest in the case of peas, i.e., Rs.165.60 per quintal followed by tomato, i.e., Rs.91.63 per quintal and potato, i.e., Rs.71.95 per quintal. At wholesaler’s level, the commission charges occupied a lion’s share. It ranged from Rs.55.09 per quintal in the case of peas to Rs.22.88 and Rs.16.00 per quintal for tomato and potato respectively. Total costs incurred at retailer’s level were the highest in the case of peas, i.e., Rs.90 per quintal followed by tomato Rs.71 per quintal and
potato Rs.48 per quintal. The net sale price per quintal of vegetables earned by the producers in the case of potato was to the tune of Rs.248.06 in channel-I, Rs.346 in channel II; for tomato Rs.365.97 and for peas Rs.936.14 in channel-I and Rs.1325 in channel-II. The average margin per quintal of vegetables earned by the commission agent/local wholesaler was that of Rs.51.19 in the case of potato; Rs.101.22 in case of tomato and Rs.149.09 for peas. The average margin per quintal of vegetables earned by the retailer varied from Rs.245 in the case of peas to Rs.104 and Rs.70 for tomato and potato respectively.

Similarly, the percentage margin over producer’s price also depicts that as the number of intermediaries in the marketing channel increases, the difference between purchaser’s price and producer’s price also increases. As in the case of guava, the percentage share at producer’s level was 3.70 per cent. With the introduction of other functionaries like pre-harvest contractors, commission agents and retailers, the margin became 28.79 per cent and 41.79 per cent respectively. For ber, the percentage margin at producer’s level in the smallest marketing channel was 4.32 per cent. With the introduction of commission agents and retailers, this margin became 59.10 per cent for ber and 71.11 per cent for mango. **In case of vegetables**, the percentage margin at producer’s level in the smallest marketing channel, i.e., Producer-Consumer (where no intermediary is involved) was 5.93 per cent for potato and 9.06 per cent for peas. However, when commission agent and retailer entered
between the producer and consumer, the percentage share became (magnified) 108.82 per cent for potato and 111.77 per cent for tomato and 79.9 per cent for peas respectively.

**Production and Marketing Constraints**

Despite a wide variety of fruits and vegetables produced, Patiala district has not done well on production and marketing front. The cultivation of fruits and vegetables in the district is affected by many factors like low yield, poor quality, lack of proper use of fertilizers, etc. as a result of which, farmers do not get adequate economic returns and a very little incentive to improve their farm management. The problems faced by the producers and sellers during production and marketing of fruits and vegetables are discussed as under:

**Production Constraints**

**Long Gestation Period:** The main constraint in the way of increasing the area under fruits is the long waiting period (up to 4-5 years). It requires a lot of patience on the part of farmers. The fruit crops like mango, pear comes into bearing very late. During all these years, the growers have to spend money from their own pocket for various operations like irrigation, fertilizers, weeding, plant protection, etc. and a small or middle level farmer cannot wait such a long period without substantial income.
**The Size of Farm Holdings:** It has been identified from the survey that 70 per cent of fruit and vegetable growers in Patiala district have uneconomic holdings. Because of sub-divisions and fragmentation of the farms, the farm management practices like planting the trees at an appropriate distance, spray of insecticides, etc. cannot be efficiently used. Therefore, this results in lower output.

**Bacterial Diseases:** The survey identified that the invasion of fungi, bacteria, insects and other organisms on fruits and vegetables is a major problem. These micro-organisms spread easily because of humid weather and mild temperature. Late-blight of tomato and powdery-mildew in the case of peas are quite common. In the case of guava and ber, the attack of insects and pests like fruit fly adversely affect the yield of the crop, thereby giving low returns to the farmers.

**Ignorance to New Methods of Cultivation:** From the survey it has been found that the sampled farmers in Patiala district are ignorant to advanced agricultural practices like soil testing, seed testing, appropriate time of sowing, timely irrigation, proper time of harvesting, etc. They are following traditional methods of cultivation to grow fruit and vegetable crops. As a result, there is no significant improvement in the yield of these crops.
Marketing Constraints

The main marketing related constraints faced by producers/sellers in Patiala district are:

**Large Number of Functionaries:** It has been found during the survey that the large number of functionaries/intermediaries such as pre-harvest contractors, commission agents, wholesalers, retailers, etc. operate in the unregulated and unsupervised fruit and vegetable market of Patiala district, resulting in a large gap between the producer price and consumer price. Prevalence of intermediaries in the marketing channel results in unfair and exploitative practices in marketing of fresh produce. Dominance of many of the intermediaries in between the supply chain rob the lion’s share of the producers by deeply penetrating the consumer’s pocket.

**No Government Policy:** In the case of wheat and paddy, the government announces minimum support prices (MSPs) for both these crops. The actual procurement at the minimum support price is done for wheat and paddy only. But in the case of fruit and vegetable crops, there is no such government intervention. Government does not announce any support price or procurement price of these crops. The prices of these crops traded in the wholesale market of Patiala district are governed by the forces of demand and supply. Sometimes farmers do not get appropriate returns for their produce.
Lack of Infrastructure Facilities: The fruits and vegetables are more perishable than other crops such as wheat, rice, pulses, etc. and cannot be stored for longer periods. Therefore, infrastructural facilities like cold stores, processing industries, cheap transportation charges, etc. are necessary in the marketing of fruits and vegetables. But, the survey found that in Patiala district, these infrastructural facilities are not appropriate. As a result, 20-40 per cent of the produce goes waste and producers are compelled to sell their produce at unexpected lower price.

Malpractices Adopted by the Middlemen: A number of middlemen, operating between producer and consumer, adopt a number of malpractices during the auction of the produce and in price fixation such as under weightment, low prices through collusion and refusal to purchase the low graded produce, etc.

Government Policy

In order to remove the major constraints, the government has adopted various measures such as creation of infrastructural facilities for the marketing of fruits and vegetables, market promotion through advertisement, setting up of Quality Control Labs, Research & Development in identifying new techniques and practices including those for packaging. The main State Plan Schemes and Centrally Sponsored Schemes are discussed in this section:
State Funded Schemes

1. **Diversification of Agriculture through Development of Horticulture:** The main objective of this scheme is that the department farms and nurseries should be equipped with modern machinery and the quality of perlette type of grapes can be improved by following improved management techniques. During the 11th Five-Year Plan (2007-12), this scheme has been reframed by merging the three schemes, i.e., development of horticulture including sericulture, diversification of agriculture through horticulture and improvement of quality of perlette variety of grapes.

2. **Demonstration-cum-Fruit Preservation Laboratories and Community Canning Centers:** The objective of this scheme is to train and educate the fruit growers about the latest techniques for the preservation and preparation of various products like squashes, jams, jellies and other canned products from fruits and vegetables. At present, six government fruit preservation laboratories and 14 Community Canning Centers are functioning in the state. Under the Community Canning Scheme, fruit products are also prepared on custom basis on nominal charges.

3. **Strengthening the Citrus Estates:** Under this scheme, five citrus estates are established at Badal, Abohar, Tahliwala Jattan (Ferozepur), Chaunni Kalan (Bijwara) and Hoshiarpur to improve the quality and
productivity of kinnnow and other citrus varieties. The facilities like pre-cooling chambers and waxing of fruits are created in these estates.

4. **Strengthening of Horticulture by Production of Disease Free Fruit Plants and Vegetables:** The main objective of this scheme is to protect the yield of fruit and vegetable crops from severe attack of insects/pests and diseases. Under this scheme, it is proposed to provide insecticides/fungicides/pesticides to the farmers at 50 per cent subsidy. This will help the farmers to minimize their input costs as well as production costs.

**Centrally Sponsored/Funded Schemes**

1. **State Share of National Horticulture Mission:** National Horticulture Mission (NHM) has been implemented for the development of horticulture. From the year 2007-08, the schemes have been changed to 85:15 ratio of GOI and state share. The main objective of mission is to enhance horticulture production, post-harvest management, processing of fruit and vegetable; and to create opportunities for employment generation. Apart from this, there is also a provision of financial assistance for the establishment of Green-House, organic farming, strengthening of nurseries with infrastructure.

2. **Crop Estimation Survey on Fruits and Vegetables, and Minor Crops:** It is a staff scheme. Under this scheme, reliable data regarding area, production and yield of fruits and vegetables are obtained by
conducting crop cutting experiments. This scheme is run by two departments, i.e., (i) Agriculture Department and (ii) Horticulture Department.

3. **Rashtriya Krishi Vikas Yojna (RKVY):** Under this scheme, the plastic crates are provided on 50 per cent subsidy, for the safe handling and marketing of fruits and vegetables. Besides this, 170 Net-Houses have been installed in the state with the financial assistance of Rs.68 lakh (Rs.40,000 per net house) by the Department of Horticulture, Punjab. This will help to encourage the cultivation of vegetables under Net-House and to improve economic condition of farmers.

**Policy Implications and Recommendations**

In view of the findings of this study, various sets of new policies will be needed. The study of growth trends of area, production and yield of fruits and vegetables in Punjab state as well as in Patiala district reveals that in the case of fruits both at the state and district level, the growth in production owes itself primarily to enhancements in yield, whereas production growth performance of vegetables separately and of fruits and vegetables combined together in Punjab state as well as in Patiala district is mainly attributable to changes in area, whereas yield revealed no such positive role. So, enhancement in yield is observed to be the need for fruits and vegetables production growth. Therefore, it is
recommended that government should create awareness among the fruit and vegetable growers regarding modern/advanced agricultural practices. Technology should be developed in such a way to ensure the improvement in the yield as well as quality of both fruit and vegetable crops. Fruit and vegetable crops should be genetically modified to increase their shelf life, e.g. Flavr-Savr is a transgenic tomato with higher shelf life by transferring genes, which does not allow it to decay during storage. This can be applied to other fruits and vegetables. Therefore, these crops become more stable, adaptable to climate and disease resistant. Further, in fruits and vegetables, there is a major loss in productivity and quality due to attack of many insects. Large amount of chemical pesticides are sprayed particularly on vegetables to protect these crops from pests. This besides leading to financial losses to farmers, has a bad effect on human body and also deteriorates the environment. So, government should allow the cultivation of genetically modified crops such as Bt brinjal, Bt cabbage and such other vegetables, which are quite safe and quite common in other advancing countries like USA and Argentina. Only then the area under fruits can be increased and productivity of vegetables may be improved.

As far as production and marketed surplus are concerned, the computed results point out that there exists an elastic relationship between production and marketed surplus. It is also found that the share of the marketed surplus in production increases with the increase
in size of farm and with marketing infrastructure available in the market. Anyhow, the macro behaviour analysis brings out that there was no significant relation between market arrivals and production in Patiala market in the case of fruit and vegetable crops. In view of the findings of this study, it has been recognized that in order to increase the marketed surplus of fruits and vegetables, there is a need to increase the production by adoption of modern technology and by enlarging the farm size. Enhancement in the size of market is equally important. So, it is recommended that the government should enlarge the size of holdings of the farmers. Necessary steps should be taken to consolidate the small holdings of the farmers to make the agricultural holdings more economical.

The study of arrivals and prices showed that the bulk of the produce by the sampled farmers reached in the Patiala district markets soon after the harvest, which leads to sharp fall in prices during the post-harvest season and affect the producers of Patiala district adversely. The major reasons are the perishable nature of the produce and non-availability of cold stores and storage techniques. Also, the farmers require immediate cash to meet their financial obligations for various purposes. The inverse relationship between market arrivals and prices of fruits and vegetables was also supported by value of correlation coefficients. On the basis of above findings, it is felt that proper cold storage facilities, quick transportation and processing industries should
be developed so that supply of these products can be regulated and gluts in the market can be minimized. For better utilization of cold stores, there is a need to create awareness among the cultivators regarding the benefits of storing the produce in the cold stores. Farmers are also needed to be supported financially, that would help the producers to increase their retention power by storing their produce during peak periods and receive comparatively higher prices during lean periods. So, government should provide the cold storage facility as well as financial assistance to the farmers. Due attention should also be given towards investment in the agro processing units in Patiala district to avoid wastage of these perishable products. Therefore, instead of providing subsidy at production level, it may be provided to the farmers, for setting of mini processing units, at village level. This would help in long time storage and marketing to far-off places, besides generating employment and more remunerative prices to the producers.

The analysis of the marketing margins, costs and price spreads revealed that due to involvement of large number of intermediaries, the producer’s share in consumer’s rupee is very less. In view of the findings, it is recommended that government should enter in fruit and vegetable trade as in the case of wheat and paddy. So, to improve the marketing of both fruit and vegetable crops, there should be adequate procurement policy. The government agencies like nafed, markfed, etc. should come forward to purchase the produce so that farmers can get
appropriate price of their produce. The government should also form a team of market officials along with the representatives of fruit and vegetable growers in order to check the malpractices adopted by the middlemen. Foreign private participation is also one of the important measures to boost the fruit and vegetable sector. FDI in retail sector would also help the farmers to get the remunerative price of their produce. There is also a need for the farmers to form co-operatives so that they may get due share of the consumer’s price. Again, this would be a step towards improving the existing marketing system of fruits and vegetables.

The study also highlighted that the farmers in Patiala district face several constraints, such as ignorance to new methods of cultivation, high cost of inputs, financial difficulties, prevalence of large number of intermediaries and malpractices adopted by them during the production and marketing of their produce. Moreover, the facilities like cold storage, rest house and parking place are improper in Patiala district markets. Other facilities like drinking water and sufficient space are also inadequate. Therefore, the government should develop such infrastructure in Patiala district markets. This will go a long way to encourage the cultivation of fruit and vegetable crops and to achieve the goal of diversification of agriculture. Infact, most of the market reforms in India have mostly been concerned with the foodgrain sector and the marketing of fruits and vegetables have received a little attention so far.
Therefore, it is recommended that the fruit and vegetable marketing is one of the areas in the field of agricultural marketing that requires immediate and urgent attention of the government.