SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The horticulture sector in India, contributes more than 24.5 per cent to the GDP from agriculture from mere 8.5 per cent of the cultivated area. The fruit production in India has risen from 5.5 million tonnes in 1952-1953 to 49.5 million tonnes in 1998-1999, an increase of more than nine times. The fruit crops play an important role in augmenting the farm-family incomes through higher returns and generating additional employment opportunities. Being labour-intensive, production of fruits should be encouraged in a labour-abundant and capital-scarce country like ours.

In Punjab, with an increasing concern against over-exploitation of natural resources like water, soil nutrients, etc. by the present cropping system of paddy- wheat, the voices of diversification are being raised high. Agricultural production and crop yields in Punjab have nearly stagnated leading to its predominantly agrarian economy in deep economic crisis. Punjab’s paddy-wheat dominated agriculture is rapidly becoming economically as well as ecologically non-sustainable. The present pattern of agricultural production needs to
be changed and the marketing system reoriented to meet the challenges of the fast changing national and international market scenario, otherwise the future of agricultural sector of the state remains entangled in grave imbalance in terms of economic viability and environmental sustainability.

Thus, the present study has been attempted with the following objectives:

1. To study the cost of production of major fruits of Punjab and, the returns from each of the fruit crops.
2. To evaluate the economic rationale of resource use.
3. To find out the problems of farmers producing fruit crops in Punjab and suggestions thereof.

Both the secondary and primary data were collected to achieve the specified objectives of the study. The primary data pertaining to the agricultural year 2001-02 were collected for five major fruits of the state viz., kinnow, guava, grapes, mango and pear. Thirty fruit growers were selected for collecting the primary data for each fruit crop. For each of the selected fruits one district was selected where the fruit was being grown on the maximum area. The primary data pertained to the socio-economic features of the fruit cultivating
households, the costs of cultivation and investments required for the selected fruit crops, problems of production and marketing etc. In all, the data were collected from 150 fruit cultivators growing the five selected fruits. The secondary information regarding area and production of fruit crops was obtained from Director of Horticulture, Punjab, whereas the data on exports were collected from the official publications of APEDA.

The compound growth rates for area, production and export of fruits has been worked out by fitting the exponential function. To examine the allocative efficiency of resources in fruit orchards under study, Cobb Douglas production function was adopted. The resource use efficiency was judged on the basis of marginal value productivity (MVP).

There has been an increase in the share of area under fruits (in total geographical area) from 0.93 per cent to 1.85 per cent. Although the share in the area under fruits has increased, yet it is still insignificant. Keeping in mind high per capita income and positive and high-income elasticity of demand for fruits and fruit products there is a great scope for enhancement of cultivation of fruits. Even bringing the share of fruit crops to 5 per cent from the present level of 1.85 per cent can result into diversion of around 1,50,000 hectare of the land
from traditional crops to fruit crops which can help in the
diversification of Punjab agriculture.

All the fruits except plum have shown a significant growth in the
area during 1985-86 to 1998-99. The total area under fruit crops has
shown an overall increase of 5.06 per cent per annum. There has
been significant increase in the share of kinnow, litchi, peach and ber
crops in total area under fruits. The percentage increase in share in
area under mango, guava and grapes was found to be non-significant
indicating that there has been not much increase in the share of
these fruit crops in total area under fruits. Orange and malta, lemon,
pear, plum and miscellaneous fruits have shown non significant i.e.
negative growth rate in the share in area under total fruits.

Moreover, the area under total fruit in triennium ending 1998-99
also showed an increase of 72 per cent over the triennium ending
1987-88. Kinnow, mangoes, litchi, guava, peach, grapes and ber
indicated higher increase in the area under these crops.

There has been an increase of about 70.42 per cent in the
production of total fruits in the state. Especially, kinnow, grapes,
guava and litchi have shown a considerable increase in the
production. The production of mango, lemon, orange and malta,
peach and miscellaneous fruits have increased at a lesser rate. Thus,
it can be concluded that kinnow, grapes, guava and litchi have proportionate contribution in fruit production more than the production of total fruits in the state.

The overall exports of agricultural products from India during the period 1993-94 to 2001-02 have grown at an annual compound growth rate of 10.88 per cent. The quantum of exports of fresh fruits has increased from 78.51 thousand tonnes in 1993-94 to 169.56 thousand tonnes in 2001-02 with an annual compound growth rate of 6.98 per cent. The annual compound growth rate of share of exports of fresh fruits in total agricultural exports was negative but non-significant to the tune of 3.52 per cent. The decline in the share of exports of fresh fruits can be attributed to the increase in domestic demand of fresh fruits. The share of processed fruits and vegetables in total exports showed a marginal decline. The export of processed fruits and vegetables in terms of value increased from Rs. 268.48 million during 1993-94 to Rs. 1100.57 million during 2001-02 highlighting a very high and significant annual compound growth rate of 21.14 per cent.

The analysis of socio-economic profile indicated that the average age varied from 46.30 years for grape growers to 55.20 years for mango growers. The average number of years of education
of household heads also varied from 9.80 to 12.50 years. All the types of fruit growing farms are observed to have permanently hired labour, as cultivation of fruits is a labour intensive activity. Total area operated by kinnow, grapes, guava, mango and pear-growing farms was observed to be 10.95 hectare, 5.77 hectare, 7.5 hectare, 6.42 hectare and 6.35 hectare respectively. It comes out clearly that larger farms, in general, are opting for fruit cultivation as compared to their small counterparts. The proportion of fruits in the total cultivated area varied for different fruits. The proportion of area under fruits was the highest with the kinnow growers, the minimum being with the grape growers. It comes out clearly that the fruits have assumed considerable importance in the production pattern of such farms. A lot of variation in the average total income and the share of different sources has been observed for different fruits. The total income amounted to Rs. 944828.00, Rs. 320787.00, Rs. 483138.00, Rs. 366710.00 and Rs. 294209 on kinnow, grapes, guava, mango and pear growing farms respectively. The share of fruit crops varied largely in total household income. It was as large as 78 per cent for kinnow and as small as 11 per cent for guava. Crops and livestock were the other two other important sources of income for the households. It may be due to difference in profitability of different fruit
crops, access to other sources of income and various other socio-economic and locational factors.

The total annualized cost of investment is Rs. 31428.125 per hectare for kinnow, Rs. 57598.59 per hectare for grapes, Rs. 29253.125 per hectare for guava, Rs. 32063.125 per hectare for mango and Rs. 27355.625 per hectare for pear. Human labour and chemical fertilizers were the major components of such expenditure. Likewise, the average annual cost of maintenance on kinnow, grapes, guava, mango and pear is Rs. 49248.22, Rs. 47827.24, Rs. 27706.82, Rs. 30724.98 and Rs. 47637.75 per hectare respectively.

The net returns for all the five fruits ranged between Rs. 33323.00 per hectare to Rs. 59155.02 per hectare. It was lowest in case of kinnow and largest in case of mango orchard. The net return for grapes, guava and pear orchards thus worked out to be Rs. 56611.61 per hectare, Rs. 49513.18 per hectare and Rs. 43304.25 per hectare respectively. The ratio of gross return to variable costs in all the fruit crops was observed to be more than one indicating that fruit growing can be feasible and profitable enterprise in the state.
The marketed surplus of all the fruits was around 95 per cent of the total production. The gross and net returns were estimated at Rs. 82571.50 and Rs. 33323.28 per hectare from kinnow, Rs. 104438.85 and Rs. 56611.61 per hectare from grapes, Rs. 77220.00 and Rs. 49513.18 per hectare from guava, Rs. 89800.00 and Rs. 59155.02 per hectare from mango and Rs. 90942.00 and Rs. 43304.25 per hectare from pear respectively. The fruit cultivation was observed to be a profitable enterprise as indicated by the ratio of gross returns to variable costs, which was significantly more than unity.

The plant protection chemicals were found to be significant determinants of output in case of kinnow, guava and grapes, whereas, irrigation was found significant in the cultivation of kinnow and mango. There were decreasing returns to scale in the cultivation of all the selected fruits i.e. all the fruit growers were operating in the second zone of production function. There appears more scope of using the plant protection chemicals and irrigation to increase the output and hence the returns from fruit cultivation. The extension efforts aimed at ensuring optimal resource use on the fruit orchards can help in achieving such objectives and in encouraging fruit cultivation on relatively more area in the state.
Very high value of MVPs for different inputs such as FYM and chemical fertilizers, plant protection chemicals, irrigation and human labour indicates increased returns from higher use of these inputs. Prominent inputs among these are chemicals and irrigation.

Majority of the farmers expressed no problem concerning picking/plucking, grading and packing, packing material. However, there is a need for proper government intervention to encourage grading and packing of fruits. Providing incentives for the establishment of well-equipped grading/packing centers, imparting skills to the labour through extension activities, ensuring timely availability of good quality packing materials at economic costs will definitely help the fruit cultivators in realizing the full benefits of fruit cultivation and will also encourage the fruit cultivation in Punjab. The pre-cooling facilities are not proper especially in the areas cultivating grapes and mango. The farmers expressed no incentive for pre-cooling, which may largely be due to the inadequacy of pre-cooling facilities. The farmers might have experienced no additional benefit relative to the risk involved due to inadequacy of pre-cooling facilities in the area. The problems of cold storage were almost similar to that of pre-cooling in the area. It is very important that pre-cooling and cold storage infrastructure are strengthened in the fruit growing
areas. The National Horticultural Board also provides cheaper credit for building such infrastructure.

The major problems faced by the fruit cultivators concerning transportation are non-availability of transport vehicles, which can result into higher spoilage and thus reduced prices. The lack of refrigerated vehicles limits the options of the producer to sell in far-off markets at higher prices. It increases the risk of spoilage and lower prices during the marketing of the fruit crop.

The problems of deducting more charges, not taking consent while selling and quoting lower prices negatively influence the net returns to the fruit growers and erode their initiatives to further carry on fruit cultivation.
Some important policy implications of the conclusions have been recounted from the study.

1. There is an urgent need for planned development of fruit cultivation in the state. Land use and credit policies should be oriented to encourage the growth of fruits by including large-scale cultivation and processing operations as well.

2. Incentive price support policy for fruits will help reducing the price risk to the fruit cultivators and will therefore encourage the area under fruits in Punjab.

3. A system of crop insurance may be necessary to protect cultivators against the very high yield variations and in view of the long gestation periods of some crops.

4. An integrated marketing approach instead of the conventional commodity, functional or institutional approach for fruits will help ensuring better prices to the producers. Organized and regulated market structure for fruit crops will help in increasing farmer’s share in consumer rupee.

5. Direct contact between producers and processing factories should be encouraged. Such direct contacts between
producers and processors can ensure better prices for the producers.

6. More attention needs to be given to transport infrastructure and the devising of an appropriate framework of marketing in order to avoid high marketing costs.

7. Proper packaging will reduce transit losses and help maintain the quality of the product that reaches the consumer. This will also help to cut down costs. Further, grading and sorting should be done at the production site. These operations ultimately imply higher prices for the consumers.

8. Marketing intelligence network, particularly in interior producing areas require strengthening. A link is required to be formed between the orchardists and the agencies to provide latest position of prices in different markets of the country.

9. The extension services are to be further strengthened. Despite a large number of horticultural experts in the state, the dissemination of required information to the fruit cultivators is slow and not up to the mark.

10. In order to exploit the export potential fully, the information dissemination with regard to the requirements of import
regimes of trading partners is crucial. Our exports are likely to slow down with the emergence of an array of technical restrictions, and sanitary and phyto-sanitary restrictions by importing countries. There is requirement of appropriate facilities for processing to reach international standards and cultivation in with PPM restrictions.