

Role of the Himachal Pradesh Horticulture Produce Marketing and Processing Corporation in the Development of Horticulture in Himachal Pradesh

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Introduction

The state of Himachal Pradesh with a geographical area of 55,657 km² and a population of 4.28 million lies in the foothills of the Himalaya. It is situated in the extreme northwest of India and bordered by Jammu and Kashmir to the north, the Punjab to the west and southwest, Haryana to the South, Uttar Pradesh to the southeast, and Tibet to the east.

Himachal Pradesh was created from one of the 30 princely states in 1948 and, later in 1951, was enlarged by the merger of one more state, Bilaspur. The adjoining hills areas of the Punjab were also merged with Himachal Pradesh in 1966 during the bifurcation of the Punjab. At present, the state has 12 districts: Bilaspur, Chamba, Hamirpur, Kullu, Kangra, Mandi, Kinnaur, Solan, Sirmour, Shimla, Lahul and Spiti, and Una.

The state is by and large mountainous, the height of its hills increasing from south to north; the Shivaliks, the lower foothills, ascend from 610 to 1220 m above sea level. The inner ranges vary from 1220 to 3660 m and the northernmost Piranjol Range soars up to about 6710 m. Correspondingly, the state is endowed with diverse agroclimatic conditions. Broadly, the entire state can be divided into three different zones:

the outer Himalaya, the inner Himalaya, and the alpine zone. The average rainfall is 1600 mm per annum and the climate varies from cool to cold, depending on the season and elevation of the terrain.

The total population of the state was 4.28 million as per the 1981 census, out of which 90 per cent live in villages, depending on agriculture as their main source of livelihood. Out of the total geographical area of 55,675 km², only about 11 per cent is being cultivated. Among the farming community, small and marginal farmers dominate; more than 77 per cent of holdings are less than 2 hectares, accounting for only 34 per cent of the total cultivated areas. Agriculture, including horticulture, is the most important sector of the state economy as it contributes about 50 per cent of the state domestic product.

Himachal Pradesh, a vast complex of hills and valleys, not only nourishes agriculture, horticulture, forestry, and animal husbandry, but is also rich in mineral and other natural resources. The melting snows and glaciers feed the numerous rivers which sustain life in the Indian plains. There is a vast hydroelectric power potential which is gradually being exploited in a systematic and planned manner. It is paradoxical that in a region with such rich natural resources the people have remained in abject poverty for so long. With a view to improve the living standard of the people, various development programmes were initiated by the state government during post-Independence era, the main emphasis being laid on the development of horticulture in this area.

The Horticultural Sector of Himachal Pradesh

Rationale for Horticultural Development

Land is one of the most important natural resources in the hills and its rational use assumes the utmost significance for the economic upliftment of the rural masses. It is obvious that the land use pattern in hilly areas is bound to be different from that in the other parts of the country, because of the type of terrain and unique climatic conditions. The continuous cultivation of agricultural crops has been responsible for the deterioration of the land resource base over the years. Besides, increasing population pressures and the adverse topography have forced farmers to expand cultivation to steep slopes which are not inherently capable of sustained and intensive agricultural use without loss of soil productivity as a result of soil erosion. Apart from this, even from land physically fit for cultivation, the yields are lower than those obtained in the plains. The possibilities of expanding irrigation for agriculture in the hilly areas are also limited. The slopes and land aspect also limit the availability of sunlight to a great extent. Difficult access from farms to markets is

yet another factor inhibiting the remunerative sale of crops other than high-value crops.

The only choice open to the hill farmers is to take advantage of climatic conditions by growing high-value crops. The wide range of altitude, temperature, and precipitation found in Himachal Pradesh in fact creates conditions for growing a large number of temperate and sub-tropical fruits such as apple, pear, peach, plum, almond, walnut, citrus fruit, mango, grape, guava, and litchi. The cultivation of these perennial horticultural crops enjoys certain advantages over other crops: it yields higher returns; it generates more employment opportunities; it conserves soil and reduces land degradation, besides avoiding silting of dams; it helps to maintain proper ecological balance; and it provides raw material for the development of fruit-based processing industries. Therefore, it is clear that the cultivation of perennial fruit crops in hilly areas can improve the income of the rural masses without disturbing the soil and destroying the ecology of the areas.

With this in mind, the state government formulated policies and programmes to induce farmers to take up horticulture on a commercial basis. Owing to the persistent efforts of the state government during the last three decades, horticulture has emerged as an important sector of the state economy, intimately linked to the economic uplift of the farming community.

The progress achieved on this front is evident from the fact that, whereas in the 1950s only about 800 hectares of land was devoted to fruit cultivation, this increased to 134,985 hectares in 1987 with an annual production potential of about 0.5 million tons.

Among the fruits, apples occupy the top position, claiming over 38 per cent of the area and 58 per cent of the total fruit production. Himachal Pradesh is now known as the 'apple state in India'. With a view to developing all the areas of the state simultaneously, efforts are also being made to induce farmers in the lower belts of the state to take up horticulture as an ongoing occupation to supplement their income. The results achieved so far reveal that there has been a rapid expansion of the area under sub-tropical fruit.

Trends in Apple Production and Prices

The phenomenal expansion of the apple industry in the state has been due to both an expansion of apple orchards and a rise in productivity, as is shown in Table 17.1.

AREA EXPANSION

At present, the total area under apples is recorded at 53,999 hectares, or about 10 per cent of the net cultivated area of the state. The area under

TABLE 17.1

Compound growth rates of area, production, productivity, and prices of apples

Period	Area	Production	Productivity	Prices
1961-1965	35.34	21.47	-8.62	1.37
1965-1968	15.78	32.22	16.27	2.60
1968-1973	8.06	5.19	-18.28	0.08
1961-1974	15.20	21.40	2.30	0.90
1974-1978	4.95	18.12	11.55	0.25
1979-1985	3.60	8.10	0.80	11.50
1974-1985	4.10	9.60	4.50	7.30
1961-1985	8.10	10.00	3.10	3.50

Source: HPMC

apples increased at a compound growth rate of over 8 per cent per annum from 1961 to 1985. However, period-wise analysis indicated higher growth rates in the initial plan periods which subsequently declined. On average, about 2000 hectares of land was brought under apple cultivation each year from 1961 to 1985. The compound growth rate of the area declined to 4 per cent in 1974-1985, as against 15 per cent for the period 1961-1974. Apple cultivation in the state picked up momentum only in the post-Independence era.

PRODUCTION

Expansion of the area under apples was accompanied by an increase in production which registered a compound growth rate of over 10 per cent per annum against 8 per cent in the case of area. A glance at the production figures reveals that the production pattern has been erratic during the period under study. It further reveals that the extent of fluctuation in production was high before 1975, whereas, during the later period, fluctuations were contained to some extent. The lowest growth rate was observed from 1968 to 1973 and the highest from 1965 to 1968. This can be attributed mainly to the climatic conditions prevailing during those periods.

PRODUCTIVITY

Interestingly, in the initial years, the negative growth rate in productivity was perhaps due to the method adopted to estimate growth rates. These were obtained by dividing production by total area (bearing and non-bearing). Although this method has some inherent deficiencies, because of lack of data a suitable alternative could not be developed to estimate productivity more accurately. The productivity figures indicate

an improvement of 2.3 per cent during the period 1961–1974 and 4.5 per cent during the period 1975–1986, as against negative figures in the early 1950s.

PRICES

The wholesale price of apples (Delhi market) increased at a compound growth rate of 3.5 per cent per annum. A sharp difference in the price behaviour for the periods 1961–74 and 1975–85 is rather interesting. The growth rate was very low, i.e. 0.90 per cent, particularly before 1974, but this improved to 7.30 per cent later, showing a very positive achievement in this period. The positive effect on prices in the post-1975 period is attributed to the implementation of an International Development Agency-aided Himachal Pradesh Processing and Marketing Project which helped to build up the necessary marketing infrastructure, on the one hand, and created desirable competition in the fruit market on the other, consequently completely avoiding price crashes in main markets, a recurring phenomenon observed in earlier years. Period-wise comparison indicates that the period 1979–1985 registered the highest compound growth rate of over 11 per cent in the price of apples. It is worthwhile to mention that this was the period during which most of the Horticultural Produce Marketing and Processing Corporation's activities and infrastructural facilities were placed on a commercial basis.

Conventional Marketing Arrangements

MAIN FEATURE OF THE SYSTEM

The apple crop is normally ready for picking in the second or third week of July, particularly in lower areas, and continues until October. August and September are the peak harvesting periods, when 60–80 per cent of the crop is despatched to various markets. The growers are required to make advance arrangements for procurement and packing material so that the fruit can be marketed immediately after picking, sorting, and packing. Generally, the fruit is picked by hand, placed in a basket (or Kilta) and brought to a common place for grading and packing. Conventionally, apples are classified into various homogeneous lots based on their size and quality. The quality specifications followed in the state are A, B, and C. The A grade should have over 50 per cent of the colour characteristics of the variety, should appear clean and bright, be free from blemishes, and be of typical shape. Fruit of B grade may have less than 50 per cent of the colour characteristics of the variety and may have a slightly abnormal shape also. C category fruits include those which are not fit for competitive marketing, for example, fruit with fresh injuries, spots, or an irregular shape. The A and B categories are again classified

on the basis of size, such as super large, extra large, large, medium, small, extra small, and pittoo. Size grading is generally done by hand.

After grading, the fruits are wrapped in old newspaper and packed in wooden boxes. The size specification of wooden boxes varies; however, there are two types more commonly in use: the Shimla box and the Kullu dabba. The former can hold about 18 kg. The packed boxes are marked with specifications such as name and variety, size and quality, grade, and name of orchard. After packing, the produce is hauled to the nearest roadhead and despatched to the market. The produce is generally despatched through forwarding agents who operate in large numbers during the season. These forwarding agents make arrangements for transport to the markets and charge a fee for this service. Sometimes the forwarding agent also makes arrangements for the supply of packing material and labour for local transportation.

Although there are about eight identified channels used by growers to market their produce, the most popular is through a forwarding agency to a commission agent of wholesaler to the retailer in the market. This channel alone accounts for over 60 per cent of the total marketed produce. Delhi is the nearest traditional market for Himachal apples and earlier accounted for over 80 per cent of the total fruit sent from the state.

After the arrival of the fruit in the market, it is auctioned to determine the price for specific sizes and grades. The most common method of selling fruit in the Delhi market is the Hatha system. It is often classified as an auction but is more in the form of a closed tender. Buyers and sellers clasp their hands under a piece of cloth and the prices are determined by feeling each other's fingers. Other participants, including the owner of the lot, do not know the price offered or accepted.

After the sale is conducted, a sale memo is prepared by the commission agent indicating the price per box, gross sale, and expenditure incurred, inclusive of freight, commission, and other charges and the net amount is remitted to the growers.

DEFICIENCIES OF THE CONVENTIONAL MARKETING SYSTEM

With the big increase in apple production, marketing has developed in importance and complexity. The traditional marketing system could not keep pace with the problems that emerged as it had numerous deficiencies. The major deficiencies observed are discussed in the following paragraphs.

Grades and standards constitute an agreed market language which can greatly simplify the marketing process and reduce marketing costs. Product grades and standards also furnish an ethical basis for buying and selling. Without the development of such standards, the principal of caveat emptor would prevail along with confusion and unfairness. Although grades for apple have been developed conventionally, they have

not been followed strictly in the actual grading of produce as this is performed manually on individual farms. This allowed for subjective classification of produce, leading to variations in quality even from box to box, let alone from orchard to orchard. Thus buyers had to inspect several boxes from each lot, a time-consuming process, besides providing scope for commission agents to manipulate and exploit the growers.

There were almost no cold storage facilities in the producing areas, and these are essential to pre-cool the fruit soon after picking to prolong shelf life, avoid gluts, and reduce pressure on transportation during the peak harvesting season. Cold storage also facilitates the sale of fruit in the off-season. Thus far, due to the absence of such facilities in the producing areas, growers have had no option but to sell their entire stock immediately after harvesting, often causing market gluts and frequent price crashes, thereby reducing their returns.

The absence of adequate processing facilities to use available cull fruit was another stumbling block in the conventional marketing system. The availability of fruit for processing was estimated at 15–20 per cent of the total production, and this used to go to waste in the absence of any alternative use or value. Some of this fruit used to be sent to the market, thereby adversely affecting the sale of the good fruits, causing a loss to farmers.

The apple harvesting season in Himachal Pradesh coincides with the rainy season. Roads in the producing areas were not built to all-weather standards and were subjected to wash-outs and frequent blockades. The terrain in the apple-growing areas is so steep that it necessitates portage to the nearest roadhead. Lack of suitable link roads in the apple-producing areas inhibited the quick transportation of produce to markets, resulting in the spoilage of fruit during transit.

The apple marketing system was based on the monopoly of private traders, placing the fruit growers at the mercy of commission agents. The profiteering tendencies of these private traders deprived the growers of competitive prices. One of the peculiar and dominant features of the selling process was the Hatha system mentioned earlier.

The higher marketing cost was another dominant feature of the conventional apple marketing system in Himachal Pradesh. Studies conducted by the Agro-Economic Research Centre, Himachal Pradesh University, revealed that the producer's share was as low as 50 per cent of the consumer's rupee. The main components of the marketing cost were the cost of packing material, labour, and freight and service charges paid to intermediaries.

Delhi was the major market for Himachal apples, receiving over 80 per cent of the state's total apple produce, and there was no horizontal expansion of markets. This sole dependence on one market was risky, as there were frequent manipulated gluts.

The marketing of perishables like apples poses yet another problem. After harvesting, these fruits remain alive, their rate of metabolism mainly depending on temperature, and they are likely to be damaged by heat or cold. Besides, these fruits are bulky and easily damaged by rough handling. Therefore, special attention and expertise is required in post-harvest management to ensure the delivery of quality fruit to the consumers. This special expertise has hitherto been lacking and not enough attention has been paid to the improvement of post-harvest handling.

Government Policies

GOVERNMENT INSTITUTIONS

The main responsibility for the development of horticulture rests with the state government. However, of late, in order to provide proper direction and financial assistance for various related programmes, a separate horticultural division has recently been established in the Central Ministry of Agriculture. Earlier, no separate long-term strategies were formulated for fruit crops at the national level because, until recently, horticulture was only a part of the Crop Division of the Ministry of Agriculture and practically no attention was paid to its development. Recognizing the importance of horticulture at state and national level and in order to support this activity through long-term strategies, the Government of India recently set up a National Horticultural Board.

The state government recognized that fruit production should no longer be a minor adjunct of the daily activities of farmers, particularly where ideal location and climate offer vast potential for its expansion. Therefore, the essential components of fruit production have been built into the state's overall strategy of economic development.

PLANTING MATERIAL AND OTHER INPUTS

The state government policy, with regard to the establishment of nurseries for fruit tree seedlings, is to develop fruit plant multiplication facilities, in the public and private sector, backed by nursery certification regulations. The government has also adopted a unique growth centre approach by establishing a chain of progeny-cum-demonstration orchards and nurseries in all potential fruit-growing areas with the objectives of; stocking progeny trees of outstanding merit for the supply of budwood; multiplying pedigree and disease-free planting materials; and serving as a nucleus for the development of horticulture in this zone. With a view to inducing farmers to adopt horticulture as a vocation, a wide range of economic incentives in the form of institutional credit facilities and liberal subsidies for production inputs are now available from the government.

The state government is also extending help to fruit growers to control fruit diseases, a 50 per cent subsidy being made available for essential pesticides and plant protection equipment. Credit support facilities, both short-term and long-term, are easily available from commercial banks for the development and maintenance of fruit plantations under special schemes refinanced by the National Bank for Agriculture and Rural Development (NABARD).

RESEARCH AND EXTENSION

In order to ensure an effective delivery system and the implementation of horticultural programmes, the state government established a separate Directorate of Horticulture in 1970, charged exclusively with the responsibility to formulate and implement horticultural development plans. Research and development support to the fruit industry is provided by the universities in the state. Earlier, the state had only one agricultural university, but a new university concentrating mainly on horticulture and forestry has recently been set up.

SUPPORT PRICES

With a view to ensure remunerative prices to fruit growers, the state government has introduced price stabilization measures by announcing support prices for various fruits grown in the state. It has been observed that the timely announcement of support prices avoids the otherwise recurring phenomenon of price crashes. Himachal Pradesh is the first state in India to fix support prices for horticultural produce. The fruits covered by this scheme are: apple, hill lemon, orange, kinnow, guava, and lime. The support prices announced particularly favour small orchardists as a special price is given to them. The implementation of the scheme has been assigned to the Horticultural Produce Marketing and Processing Corporation (HPMC) by the state government.

PACKING MATERIALS

Another important state policy is to replace the conventional timber-based wooden containers by corrugated fibre board (CFB) cartons to conserve its fast-depleting natural forest wealth. The state government proposes to switch over to the use of CFB cartons in a phased manner, and there would be a complete ban on the use of wood-based packing by 1990. In order to popularize the cartons, the state government has fixed the sale price of cartons lower than that of wooden boxes. These cartons are at present heavily subsidized by the government. Arrangements for their purchase and sale are assigned to HPMC. A state-owned company has been incorporated for the manufacture of the cartons which would likely to go into production in 1990.

The Himachal Pradesh Apple Processing and Marketing Project

With a view to bring about improvements in the existing marketing system and keeping pace with technological advances in the post-harvest handling of fruit, as introduced in the horticulturally advanced countries of the world, in the late 1960 the state government introduced the idea of an integrated marketing project financed by external sources.

PROJECT FORMULATION

The project was first proposed by the Department of Horticulture. However, a World Bank mission was later invited to study the prospects of modernizing the states apple trade. The mission concluded that the immediate need was to concentrate on improving the marketing system rather than on production. Project preparation was further assigned to experts from the FAO Co-operative Programme in 1972. The project prepared and by the FAO experts included the construction of link roads, packing houses, collection centres, cold storage, and transshipment centres, consulting services, technical assistance and training.

PROJECT COMPONENTS

The World Bank appraised the project in September 1972. It recommended additional items such as an apple processing plant and the construction of cable lines to and from more inaccessible orchards. Further improvements were incorporated in the project by the follow-up appraisal mission in 1973, and these included the establishment of a new state enterprise to administer the marketing and processing of apples. The final project consisted of the following components:

- 12 packing houses;
- three collection centres;
- a transshipment centre;
- four cold stores;
- a juice concentration plant;
- construction of 97 km of new roads and improvements;
- training and technical assistance; and
- project evaluation studies.

The project was broadly divided into two components: (1) commercial buildings, cold storage, an apple processing plant, and a transshipment centre and (2) non-commercial components such as the construction of roads, procurement of road maintenance equipment, and training and technical assistance. The earlier components were to be implemented by the newly set up state-owned HPMC, whereas the latter were to be taken up by the respective state departments. The total project cost was

estimated at US \$ 21.7 million (Rs. 325 million) with US \$ 13 million as IDA credit to cover the entire foreign exchange and 35 per cent of local costs. Funds for the commercial components were channelled by the Government of India through NABARD and participating commercial banks to HPMC and, for non-commercial components, through the State Plans and the Department of Horticulture and the Public Works Department.

PROJECT BENEFITS

The major financial and economic benefits anticipated from the project at the time of appraisal were: (1) surplus funds to be generated by HPMC; (2) incremental income to fruit growers using the HPMC marketing system; (3) incremental income on account of the sale of processed grade fruit which otherwise had no alternative use or value; and (4) incremental income to other farmers in the project area and road user benefits which were expected to be generated by the road development component. The economic rate of return of the project, at the time of appraisal, was estimated at 23 per cent, which was quite attractive. It was, therefore, considered desirable to take up the project for the overall welfare of fruit growers in the state.

Organizational Structure

The IDA agreement envisaged the formation of a marketing institution in the public sector to take up the implementation of the commercial components of the Himachal Pradesh Apple Processing and Marketing Project. Accordingly, HPMC was incorporated in 1974 under the Companies Act, 1956. It is governed by a panel of 14 directors, giving due representation to the fruit growers of the state by nominating them to the board. The managing director of the corporation is also one of the directors. In order to conduct day-to-day administration of the company's business, the Board has delegated power to the managing director.

With a view to initiate effective steps for the implementation of the project components, HPMC was equipped with qualified and competent manpower as per the recommendations of the World Bank. There are five functional divisions: Marketing, Finance, Research and Planning, Engineering, and Personnel and Company Affairs. Each division is looked after by a divisional head reporting to the managing director. The divisional heads are responsible for the efficient functioning of their divisions.

Physical Infrastructure

The HPMC set up the following facilities:

- six packing houses, each with a capacity to grade and pack 5000 tons of apple per season;
- four grading houses, each with a capacity to grade and pack 1500 tons of apple per season;
- five cold stores in the apple producing areas, each with a capacity to store 1000 tons of fruit;
- one apple processing plant with a capacity to process 18,000 tons of apples and 400 tons of peaches per season; and
- one transit warehouse.

Apart from the facilities created under the project, the HPMC operates various other units transferred to it by the state government at the time of its incorporation or developed subsequently. These include one apple processing unit with a capacity to process 2000 tons of apples per season, two cold stores in terminal markets, two transit warehouses located at a strategic locations, and two grading houses set up in the tribal areas. A network of sales offices has been developed, within the state as well as in the major markets of the country, to undertake the marketing of fresh and processed fruit products. With a view to making apple juice the common man's drink, over 400 juice vending machines have been installed at inter-state bus terminals, railway stations, airports, busy shopping complexes, and other important institutions. Chilled, reconstituted, ready-to-serve apple juice is available at these kiosks at a nominal price.

Activities and Functions

From 1974 to 1982, the HPMC devoted itself primarily to the development of essential infrastructure for the post-harvest handling of fruit. However, with the limited facilities available, some of the marketing activities were taken up right from the beginning. A brief description of each activity is given in the following paragraphs.

GRADING AND PACKING

With a view to introduce a system of centralized grading and packing, 12 packing sheds were set up. These packing sheds are equipped with mechanical graders. Rather primitive schemes have been introduced and at some places even facilities for washing and brushing have been provided. This system rids the fruit of possible fungus and chemical residues, besides improving its shine.

The HPMC extends the facilities for grading and packing to fruit growers on a fee basis. However, special concessions are admissible to those growers who patronize the marketing channels of HPMC. The packing shed staff visit the fruit growers well before the harvesting season to book their produce, and open plastic field boxes are delivered to the growers to bring their produce to the packing sheds. Each packing shed is also provided with a truck or tractor to facilitate the timely transportation of fruit from the orchards. The fruit so received is graded as per the grades and standards developed by the HPMC in consultation with the state Horticultural Department and the Government of India.

Grading and packing being a highly seasonal activity, steps have been taken to diversify the activities of the packing sheds. Now the packing sheds also undertake the procurement and sale of various inputs such as fertilizers, insecticides, pesticides, fungicides, and tools and implements and the sale of processed products. Another important activity is the popularization and sale of (CFB) cartons in place of the conventional timber-based boxes. The state government has now entrusted the HPMC with the procurement of fruit at support prices. The packing sheds play an important role in the procurement of fruit. Payment to fruit growers against the purchase of fruit or the sale of fruit through the HPMC network is also made from these centres.

COLD STORES

A cold storage facility close to the fruit production areas in an integral component in the post-harvest handling of fruit. Five cold stores have been established in the apple producing areas. Each cold store consists of four chambers of equal capacity, operated with ammonia refrigerant to maintain the desired level of temperature and humidity. These cold stores are also equipped with modern methods of handling fruit such as palletization and fork-lifts. The facility for the cold storage of fruit is extended to growers for a monthly fee. The HPMC also stores good quality fruit, sorted from fruit purchased at support prices.

TRANSIT WAREHOUSES

With a view to protect the fruit from sun and rain during transit, three transit warehouses have been set up at strategic locations from where the fruit is sent to various distant markets. These warehouses are scientifically constructed for unloading and reloading, and provide suitable shelter and storage to fruit arriving from the producing areas. A nominal fee is charged from the consignor which is realized after the sale of the fruits.

SALE OF FRUITS ON A CONSIGNMENT BASIS

To ensure competitive prices, the HPMC has made arrangements for the sale of fruit in the major markets of the country by introducing healthy competition with private trade.

FRUIT PROCESSING

Another important activity is the manufacture of a wide range of processed fruit products. The HPMC has two modern and highly sophisticated fruit processing plants, the first of their kind in the country. The total crushing capacity of these plants is over 20,000 tons per annum. Earlier, there was no use of the processing grade apples other than to sell them at throw-away prices, to use them as cattle feed, or to destroy them as it was uneconomical to sell. With the development of processing facilities, sizeable quantities of these apples are being processed annually, ensuring remunerative prices to the fruit growers and converting them into value-added and nutritious products. Other fruits grown in the state are also processed. Apple juice concentrate is the major product manufactured at these plants, accounting for over 80 per cent of the total value of products manufactured. Other products are natural apple juice, mixed fruit jam, apple jam, canned potatoes, orange and lemon squashes, ginger appetizer, canned peaches, pears in syrup, canned mushrooms, fruit punch, ginger drink, fruit sauce, and pickles.

SALE OF PROCESSED PRODUCTS

The sale of processed products is organized through sales offices of the HPMC located all over the country. The efforts of these branches have been further intensified by distributors and sub-distributors and retailers in various cities.

At present, the most important channel for the sale of apple juice concentrate is the HPMC's juice-vending machines, numbering over 400, where other fruit products manufactured by the HPMC are also available for sale. Through these vending machines, chilled reconstituted apple juice is made available. This system of dispensing the juice has enabled HPMC to transport apple juice concentrates in bulk barrels, thus avoiding excess expenditure.

CFB CARTONS.

The HPMC has developed CFB cartons for the packing of apples and other fruits as a substitute for conventional wooden boxes. The procurement and sale of the cartons has also been assigned to HPMC by the state government. The complete switch-over to CFB cartons will help to save over 200,000 cubic metres of forest wealth annually.

PURCHASE AND MARKETING OF FRUIT AT GOVERNMENT SUPPORT PRICES

The HPMC is the organization appointed by the government for the purchase and marketing of various fruits at support prices. Prior to implementation of this scheme, the marketing of fruits was faced with the problem of frequent price crashes and government intervention was considered necessary to protect growers from price uncertainties. However, the timely announcement of support prices had a very positive effect on the market prices of fruits and has helped fruit growers to improve their returns and to solve the problems of marketing their produce.

Achievements to Date

PHYSICAL

The most notable achievement of the HPMC has been the experience gained in the post-harvest management of fruit. The performance details of HPMC's main activities, marketing, forwarding, grading and packing, cold storage, processing, and sale of processed products are given in Annex 2. The table reveals that there has been a gradual increase in HPMC's activities, reflecting overall growth. The activity-wise review indicates that the capacity utilization of grading and packing houses is abnormally low. Even after a lapse of five years only 300,000 boxes could be graded and packed against a rated capacity of 1,800,000 boxes. The reasons for the low capacity utilization are discussed under the heading Deficiencies Experienced and Lessons Learned below. Similarly, the achievements of cold storage facilities are low. However, the processing plants achieved over 70 per cent of their installed capacity.

FINANCIAL

The sales and income of the HPMC have shown significant improvement, particularly 1987-1989. The major source of its income is the sale proceeds of processed products, commission from forwarding and sale on a consignment basis, rentals from cold stores, grading and packing charges, and sale of packing material and other items such as fertilizers, fungicides, tools and implements. The income was expected to increase substantially after the completion of the project facilities, but this could not be achieved to the extent expected, mainly due to low capacity utilization, particularly in the initial years. During 1987-1990, a significant improvement was observed and the turnover rose to Rs. 94.2 million against a turnover of Rs. 28.1 million in previous years. This is likely to increase further as more and more fruit growers come into the fold of the marketing organization introduced by the HPMC.

The profit and loss position reveals that the HPMC has been incurring losses continuously right from the beginning, except for one year.

The total accumulated losses as of March 1987 were Rs. 106,800,000 against a paid-up capital of Rs. 35,800,000. As the losses have exceeded the equity and reserves, the net worth has been negative.

An analysis of accumulated losses revealed that depreciation and interest alone accounted for over 80 per cent of the total losses. The losses started increasing steeply from 1981/82 when the project facilities were put into operation, and the trend continued until 1983/84. Thereafter, a declining trend has been observed. The losses were reduced to Rs. 13,100,000 in 1986/87, against Rs. 24,300,000 annual loss in 1983/84. The operating losses (before depreciation and interest) also declined from Rs. 3,789,000 in 1982/83 to Rs. 1,500,000 in 1984/85. During 1985/86, the HPMC generated profits of Rs. 2,400,000 before depreciation and interest and, in 1986/87, the operating profits further increased to Rs. 7,700,000 indicating a continuous improvement in financial performance.

The financial position of the HPMC did not enable it to discharge the due debt-service liability which was to commence in 1985/86. The NABARD has appointed a task force to suggest ways to rehabilitate the HPMC so as to make it financially viable.

Benefits to Producers

Although the performance under this project was not very encouraging in the beginning, the outstanding results now being achieved will give this project a new impetus for trade and the development of horticulture, encompassing a successful approach in all the hilly areas. The HPMC has now become a leading industrial institution at the national level. It is known at national and international levels for the production of quality fruit products and for helping growers to organize the marketing of their produce in a scientific manner. The benefits accruing to fruit growers are briefly described in the following passages.

The immediate benefits to fruit growers have been in the form of remunerative prices ensured to their low grade fruit which otherwise had no use or value. The HPMC directly purchases fruit from the growers to meet the requirements of its processing plants. During 1989/90, it purchased sizeable quantities of various fruits at support prices from the growers.

The fruit purchased by the HPMC at support prices is properly sorted and graded and good quality fruit is cold-stored in open plastic field boxes. The balance, unsuitable for storage, is used by the fruit processing plants and excess quantities are diverted to various non-traditional markets. This avoids reduction prices in the traditional markets where over 80 per cent of the fruit is normally sold. Thus, fruit growers benefit not only from the sale of their horticultural produce to the HPMC, but also

by the regulation of the flow of produce in an orderly manner resulting in the creation of favourable market situations.

The presence of HPMC in the terminal markets, providing improved services for the sale of farm produce, has not only provided an alternative to the unregulated marketing system, but has also helped to curb the profiteering tendencies of private traders, ensuring competitive prices to the growers. This is evident from the fact that the compound growth rate of the wholesale price of apples was 7.30 per cent per annum for the period 1974 to 1985 against 0.90 per cent per annum before the formation of HPMCs.

Another significant benefit accruing to fruit growers is the construction of roads in the project areas. This has increased commercial activities as well as saved time and transportation costs.

The introduction of CFB cartons as a substitute for traditional wooden boxes for the packaging of fruits is yet another significant contribution to the conservation of the fast depleting natural forest wealth of the state. Table 17.2 indicates the number of cartons used by growers and their percentage in the total export of apples from the state in all types of containers.

TABLE 17.2

Cartons supplied to growers and export of apples from Himachal Pradesh

	1986	1987
Total no. of boxes of apples exported (100,000)	158	105
Fruit exported in cartons	14.34	8.48
Percentage of cartons to total exports	9	8

Source: HPMC.

The complete switch-over to the use of CFB cartons for the packaging of fruits in a phased manner would save over 200,000 cubic metres of wood per annum. Besides the ecological improvement, fruit packed in cartons commands a premium in the market as bruising and quality deterioration is insignificant. The comparative analysis of prices for comparable varieties and grades is given in Table 17.3. The prices are based on the sales through HPMC in the Delhi market in 1986/87.

The HPMC has also been instrumental in introducing plastics to horticulture. Earlier, fruit was brought to grading and packing sheds in wooden field boxes which were cumbersome and unsafe. These have now been completely replaced by light weight, smooth, hygienic plastic field boxes. The HPMC has already introduced 50,000 plastic field boxes which are returnable, thus saving wood.

TABLE 17.3
Prices realized from sale of different categories of boxes of apples
 (Rs. per carton or box)

Month	Carton	Wooden box
July	112	109
August	75	68
September	46	42
October	50	48
Average	71	65

Another contribution to the reduction in the amount of wood used for packing has been the purchase of sizeable quantities of fruit at support prices and use of the same either for processing or for marketing in gunny bags or plastic field boxes. The HPMC procured over 25,000 tons of fruit in 1986 and 22,000 tons in 1987, equivalent to 1,375,000 and 1,210,000 standard boxes respectively. These figures clearly indicate that the HPMC has played an important role in minimizing the use of wood for the packaging of fruits. More importantly it has saved Rs. 46.5 million on account of the subsidy that would have been paid had this fruit been sold in cartons by the growers.

Another intangible benefit accruing to society is the improvement in calorie intake from nutritious juice at reasonable prices, manufactured from fruit which was unused in the absence of processing facilities in the state.

Unemployment is a serious problem in developing countries. This project has contributed immensely towards the generation of employment opportunities. There are about 415 personnel employed on a regular basis by the HPMC, generating 72,000 man-days annually for seasonal employment at fruit processing plants, grading and packing sheds, and transit warehouses. The expenditure on salaries and wages is about Rs. 9 million per annum.

The outstanding contribution made by the HPMC to the farming economy in the state has been recognized, at both national and international levels. It won the International Asia Award in 1983, 1984, and 1985, the International Food Award, the Udhyog Rattan Award in 1985, and the Marketing Man of the Year Award in 1988. The HPMC has also won the first prize for apple juice concentrate in the All India Apple Show organized by the Government of India in 1975 and 1981.

Deficiencies Experienced and Lessons Learned

In the beginning HPMC could not achieve the anticipated targets because of the volatile nature of the apple industry, dictated primarily by

the climatic conditions and poor responses of growers towards alien technology. Apart from this, there have been certain inherent deficiencies in project preparation as well as project implementation. This being the first project of its kind both for IDA and India, it was obvious that certain deficiencies would exist.

PROJECT FORMULATION APPRAISAL

One of the major drawbacks at the time of project appraisal was the classification of grading and packing sheds, fruit processing plants, and cold storage as commercial components; consequently, the HPMC had to pay 12.5 per cent as cost of capital, and this proved detrimental to its financial status.

The capacity utilization assumed at the time of project appraisal, 85 and 100 per cent in the first and second year respectively, was unrealistic and over optimistic. It had not been taken into account that such a project requires a considerable gestation period for growers to become accustomed to alternative methods and innovations.

Centralized grading and packing similar to that adopted in Europe, the United States, Australia, and other horticulturally advanced countries is unsuitable for this hill state, where terrain, size of holdings, accessibility, and other conditions are altogether different. In developed countries, large orchards are situated close to the road and the collection of fruit is not a problem. However, under Indian conditions this is a great constraint. Unfortunately, neither were collection centres provided nor proper arrangements made for haulage of crops from orchards to packing sheds. Alternatively, there should have been a network of ropeways connecting the packing sheds from all sides. However, there being paucity of technology, know-how, and financial resources, this work was not attended to and consequently it has reflected adversely on the working of those packing sheds and cold stores established in the producing areas.

The project envisaged the installation of sizing machines (mechanical graders) only. Essential equipment for washing, brushing, and waxing were not provided for in the project. The installation of additional equipment could have encouraged more fruit growers to use mechanical grading and packing as these improve the presentation of the fruit and its quality so that it commands a premium in the market.

The project had no provision for a publicity campaign for apple juice concentrate, a non-traditional item for consumers in India. As a result, the demand for apple juice concentrate did not match the production, resulting in the carrying over of stocks.

TECHNICAL

Technical deficiencies have also been observed in various components of the project.

The installed capacities of grading and packing sheds are not feasible. This is evident from the fact that only two workers have access to the grading section for first quality apples and they are unable to pack these apples as quickly as they come from the graders. As a consequence, first grade apples have to be bulked thus suffering bruising and quality loss. The lay-out of existing facilities does not permit even the addition of a conveyor belt so that more packers could be put to work. Another factor affecting capacity is the frequent discontinuity of fruit for grading and packing. It was overlooked at the time of appraisal that a large number of growers would bring their produce in small lots and that the system would have to be discontinued after the grading of one lot so that it could be properly packed. Apart from this, the installed capacity is based on the assumption that the fruit will be available for a period of 60 days in a season, whereas, in practice, the fruit is not available for more than 30 to 40 days in a particular belt location, thus reducing the working period of the packing houses. It appears that these aspects were not critically examined at the time of project formulation or technical appraisal. These limitations reduced the financial viability of these units considerably. The per hour capacity of machines should have been of a much higher order.

The capacity of the fruit processing plant at Parwanu is based on 180 working days per year. This is not realistic as the fruit is available for a period of 90–120 days a season only. The storage of apples is not economically feasible, hence it is not possible to achieve the installed capacity. This disturbs the financial viability of the plant considerably. Had the capacity of machinery been of a higher order, the targets would have been achieved in a shorter period.

FINANCIAL

The highly unbalanced debt-equity ratio of the HPMC is one of the major reasons for its accumulated losses. It even achieved a debt-equity ratio of 73:27 against a recommended norm of 40:60 for agro-based projects. Had the HPMC maintained at least a 50:50 debt-equity ratio, losses could have been reduced by over Rs. 30 million and its viability would have improved.

Lack of working capital from the very beginning has, however, been another financial snag in operating at the desired level. Although the project envisaged a provision towards the working capital, the HPMC faced severe resource constraints on the completion of the project facilities. As a result, it had to depend heavily upon the commercial banks to meet its daily financial requirements. This situation forced the HPMC

to pay Rs. 2,500,000—3,500,000 annually as interest to banks. This could have been saved had there been adequate provision or availability of working capital. The HPMC has so far paid Rs.1,300,000 to the banks as interest on working capital alone. The working capital required would have been even more than envisaged in the project had the HPMC resorted to outright purchase of fruit as per the project concept. Lack of resources, therefore, not only adversely affected capacity utilization, but also prevented realization of the project concept. Adequate working capital support has recently been extended by the state government under a rehabilitation package.

MANAGERIAL

The composition of the board of directors also needs to be examined closely as all important decisions are taken at board level. Since the state is the sole owner and shareholder of the HPMC, the board is predominantly made up of government officials. There is a near absence of professionally or commercially competent personnel on the board. As a consequence, the decision-making process lacks the basic element of profit-oriented business ethics.

Autonomy is another aspect which requires attention. The basic reason for public sector undertakings was to release them from the rigid rules and regulations prevalent in government and allow them enough initiative and autonomy. It has, however, been observed that all crucial decisions regarding employment, promotions, and transfer are taken at the government level.

The HPMC inherited a government style of working rather than one suited to the business environment. This is mainly attributed to the fact that at the time of inception most of the staff was taken on deputation from the government.

The HPMC could not introduce modern management concepts, such as management by objectives, performance appraisal, participative culture, career planning, reward, and succession planning, and promotions are based on seniority and merit.

TRAINING

Training is an important input which contributes to the efficiency of the total productivity exercise. It has two important components: building up new skills and updating or upgrading existing skills. Since the HPMC introduced an alien technology, it was imperative to impart training to build up new skills to operate the plant and machinery efficiently. This aspect was given due importance in the project by providing training for senior and middle managers in the horticulturally advanced countries of the world where such facilities exist; but the most important aspect,

which did not receive attention, was the on-the-job training of lower functionaries who primarily operate the plants. Similarly, there are no in-house arrangements for conducting training regularly to update and upgrade existing skills so as to meet the ever-growing techno-managerial requirements.

OTHER PROBLEMS

An inadequate number of field boxes inhibited the uninterrupted flow of fruit to the packing and grading sheds. This adversely affected the capacity utilization of these units. The procurement of field boxes should have been matched with installed capacity.

The high cost of setting up packing and grading sheds, cold stores, and processing plants makes them financially non-viable. The cost of a packing house with cold storage facilities is as high as Rs. 6,000,000 and these are almost entirely financed by a commercial bank loan.

Conclusions and Recommendations

Regardless of the various drawbacks observed, projects of this type are desirable for state profitability and should not be neglected. The concept of integrated marketing, introduced nearly one and half decades ago in Himachal Pradesh, has proved successful in augmenting the income of thousands of small and marginal fruit growers through the scientific and profitable disposal of their horticultural produce. This has sustained the entire fruit industry in the state on a viable basis. Realizing their benefits, such projects should be replicated elsewhere with suitable modifications in the light of experience gained from this project. Some of the major points which should be considered when formulating an integrated market project are given below.

One important experience gained from this project concerns the response of fruit growers to new technology. It was found that their response was very slow. It took five to eight years to motivate growers to adopt the new system, which, in this case, was responsible for upsetting the entire commercial character of the organization. The situation deteriorated to the extent that the organization developed symptoms of sickness. In order to avoid such situations, it is recommended that these institutions should be classified as horticultural development corporations, with the primary responsibility of developing suitable infrastructural facilities and operating them until they become commercially viable. If such an enterprise is to be classified as commercial, the well-established financial norms of debt-equity ratio should be strictly followed besides providing adequate financial support for working capital. If these norms are not followed projects are bound to fail.

Selection of technology is of vital importance and local conditions should be studied in detail for the successful introduction of technology. From the experience gained so far, it is apparent that a large, centralized system of grading and packing does not suit the terrain or conditions in the state. It is, therefore, recommended that medium-sized packing sheds at village or panchayat level are more appropriate for the hilly regions.

When formulating such projects, each packing shed should be provided with an adequate number of collection centres, so that the desired quantity of fruit can be regulated and procured by the packing sheds for grading and packing.

Packing sheds should not be equipped only with mechanical graders, but should have a complete system with chemical washing, brushing, waxing, and packing installed so that growers can enjoy all the benefits of increased value.

To operate packing sheds along commercial lines, the investment cost should be kept as low as possible. It has been observed that in hilly areas the cost of civil works is high, thereby making the entire system uneconomical. Therefore, steps should be taken to minimize the cost of civil works by constructing sheds rather than concrete buildings.

The activities of packing sheds should not be confined only to packing and grading fruit; efforts should also be made to develop backward linkages by taking up the sale of fertilizers, fungicides, pesticides, insecticides, power sprayers, and other orchard management equipment. This will help to develop a close liaison with the fruit growers and improve the financial position.

The concept of setting up cold storage facilities nearer to the fruit producing areas needs rethinking for places where the majority of fruit growers are small and marginal and cannot afford to store their produce. Therefore, a system of making advance payments against stored boxes is imperative for the success of cold storage. Apart from this, the construction of cold storage is highly capital intensive. In addition, the factors of seasonal work and low capacity utilization in the initial periods together inhibit the functioning of cold storage facilities on commercial lines. The viability, however, can be improved if the organization undertakes the outright purchase of good quality fruit, storing the same in bulk-bins and undertaking the packing and grading in the off-season. The introduction of this concept would require adequate finances for the purchase of sizeable quantities of fruit. This would help to make full use of available cold storage facilities as well as of the benefits of off-season sales.

The construction of small air-cooled stores at farm or village level may also be considered, as these are economical.

Cold stores in the producing areas will be of little importance unless refrigerated vans are provided to transport the fruit to terminal markets. It has been observed that the transportation of apples in ordinary trucks

causes fruit deterioration, because of high temperatures in the months from March to June in the plains. Therefore, the provision of refrigerated vans is imperative for the success of cold storage in the producing areas.

The cold storage of processing grade apples to prolong the processing season is not economically feasible. Therefore, while designing processing plants, the per hour capacity should be more relevant so as to undertake the entire processing of fruits within the season.

A detailed market potential survey should be undertaken as well as the designing of suitable marketing strategies at the project preparation stage. This assumes assigning more importance to items that are non-traditional in nature and appropriate marketing strategies need to be designed to educate the masses regarding the nutritional value of fruit-based processed products. Necessary financial support to undertake publicity and other promotional campaigns should invariably form part of the project cost.

Such institutions should be equipped with a full-fledged technical division with a multidisciplinary team of experts in quality control, plant protection, post-harvest management, and other fields to impart necessary training to fruit growers as well as to the various functionaries of the HPMC.

Annex I

Area and production of apples and other fruits in Himachal Pradesh

Year	Area (ha)		Production (metric tons)			
	Apples	Other fruits	Total	Apples	Other fruits	Total
1950/51	400	392	792	—	—	1,200
1955/56	1,023	1,007	2,030	—	—	—
1960/61	3,250	2,979	6,229	12,000	6,710	18,710
1965/66	12,711	9,647	22,358	24,000	12,910	36,910
1966/67	15,146	11,114	26,260	28,900	16,470	45,370
1967/68	17,588	12,717	30,305	39,344	23,852	63,196
1968/69	20,230	14,347	34,577	50,524	30,557	81,081
1969/70	23,482	15,968	39,450	72,250	37,319	109,569
1970/71	26,735	17,594	44,329	103,120	45,460	148,580
1971/72	28,308	19,261	47,569	125,060	53,270	178,330
1972/73	31,003	20,452	51,455	29,800	50,020	52,020
1973/74	32,127	23,412	55,539	118,676	67,510	186,186
1974/75	33,628	25,895	59,523	43,299	33,140	76,439
1975/76	35,076	28,309	63,385	200,000	45,882	245,882
1976/77	3,734	32,016	68,750	121,896	15,331	137,227
1977/78	38,925	35,979	74,909	131,617	18,936	150,553
1978/79	40,655	39,688	80,343	121,896	15,331	137,227
1979/80	41,947	43,986	85,933	135,475	24,586	160,061
1980/81	43,356	49,111	92,467	118,013	21,815	139,828
1981/82	45,360	54,724	100,084	306,798	35,145	341,943
1982/83	47,379	61,322	108,701	139,086	38,768	177,854
1983/84	48,292	65,759	114,051	257,913	46,362	304,275
1984/85	49,840	70,740	120,580	170,629	45,291	215,920
1985/86	51,103	77,667	128,770	17,461	33,124	207,742
1986/87	—	—	134,985	359,321	41,187	400,508

Source: HPMC

Annex 2

Physical performance, 1983/84 to 1987/88

Activities	Units	1983/84	1984/85	1985/86	1986/87	1987/88 (targets)
Sale of fresh fruit on consignment basis						
No. of boxes	(No., lakh)	1.76	1.54	1.17	3.41	3.70
Gross billing made	(Rs., lakh)	—	78.61	64.83	202.39	245.50
Commission earned	(Rs., lakh)	3.84	4.14	4.64	8.96	10.78
Forwarding of boxes						
No. of boxes	(No., lakh)	10.92	6.92	8.62	17.45	14.50
Gross turnover	(Rs., lakh)	—	—	68.56	156.14	125.05
Commission earned	(Rs., lakh)	4.02	3.05	3.56	7.02	8.30
Boxes graded/packed	(No., lakh)	1.01	1.95	1.67	2.93	5.90
Boxes cold stored	(No., lakh)	0.35	0.19	0.53	0.94	1.25
Cold storage revenue from terminal markets	(Rs., lakh)	38.58	43.74	62.63	66.16	65.00
Outright sale of fresh fruit and vegetables	(Rs., lakh)	—	—	—	48.84	65.00
Processing of fruit						
Apples	(Tons)	5007	1034	8307	13,391	12,000
Other fruits	(Tons)	75	121	1181	754	800
Sale of processed products	(Rs., lakh)	122.22	152.81	137.37	180.12	428
Gross turnover	(Rs., lakh)	355.11	526.90	372.73	942.93	

A lakh is 100,000.

Source: HPMC.