ICIMOD

MOUNTAIN FARMING SYSTEMS

Discussion Paper Series

ROLE OF THE HIMACHAL PRADESH HORTICULTURAL PRODUCE MARKETING AND PROCESSING CORPORATION IN THE DEVELOPMENT OF HORTICULTURE

R. S. Rana

MFS Series No. 9

1990

International Centre for Integrated Mountain Development

ROLE OF THE HIMACHAL PRADESH HORTICULTURAL PRODUCE MARKETING AND PROCESSING CORPORATION IN THE DEVELOPMENT OF HORTICULTURE

R. S. Rana

MFS Series No. 9

R. S. Rana was the Managing Director of the HPMC and also an advisor on horticulture to the Himachal Pradesh Government. He has now established his own consultancy.

1990

International Centre for Integrated Mountain Development (ICIMOD)

Kathmandu, Nepal

PREFACE

ICIMOD's approach to problem oriented research involves both knowledge reviews and field, studies. The focussed reviews and field studies conducted by the Mountain Farming Systems' Division cover various aspects of agricultural development. Since early 1988, a series of 'State of the Art' reviews of agricultural policies and programmes were sponsored by ICIMOD in different countries of the HKH Region. The purpose of these studies and the subsequent National Workshops in different countries was to understand some of the constraints and prospects of mountain area development. These exercises were also aimed at acquiring comparative perspectives of development approaches and strategies in different countries.

This paper was a part of this series of studies commissioned by ICIMOD, and was also presented at the Workshop on "Horticultural Development in the Hindu Kush-Himalayas organised by ICIMOD, the Ministry of Agriculture of HMG (Nepal) and the Food and Agriculture Organisation of the United Nations (FAO), in Kathmandu, Nepal, from 19-21 June, 1989. The focus of the paper is the advent, establishment, and role of the Himachal Pradesh Horticultural Produce Marketing and Processing Corporation in the development of horticulture. The author has traced and outlined its current constraints and opportunities. The paper also contains a number of recommendations for future consideration.

CONTENTS

Introduction

The State of Himachal Pradesh with a geographical area of 55,675 km^2 and inhabited by 4.28 million people lies in the foothills of the Himalayas. It is situated in the extreme north-west of India and bordered by Jammu and Kashmir in the north, the Punjab to the west and south-west, Haryana to the south, Uttar Pradesh in the south-east, and Tibet in the east.

Himachal Pradesh came into being as a result of the of 30 Princely States in 1948 and, later in 1951, the merger of one more State, Bilaspur. The adjoining hilly 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, namely 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 foot hills, ascend no more than 610 to 1,220 MSL. The inner ranges vary from 1,220 to 3,660 metres and the northernmost Piranjal Range soars up to about 6,710 metres. Correspondingly, the State is endowed with diverse agro-climatic conditions. Broadly, the entire State can be divided into three different zones, namely, the Outer Himalayas, the Inner Himalayas, and the Alpine Zone. The average rainfall is 1,600 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 people, as per the 1981 Census, out of which 90 per cent live in villages, depending primarily on agriculture as their main source of livelihood. Out of the total geographical area of 55,675 km^2, 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 two 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 plains down below in India. There is a vast hydro-electric 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 improving the living standard of the people, various development programmes were initiated by the State Government during the 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 comparatively 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 ones.

The only choice open to the hill farmers is to exploit the advantage of climatic conditions by growing high value crops. The wide range of altitude, temperature, and precipitation, found in Himachal Pradesh, in fact, create conditions for growing a large number of temperate and sub-tropical fruits such as apples, pears, peaches, plums, almonds, walnuts, citrus fruits, mangoes, grapes, guavas, and litchis. The cultivation of these perennial horticultural crops enjoys certain advantages over other crops, e.g. (i) higher returns, (ii) more employment opportunities, (iii) conserves soil and reduces land degradation, besides avoiding silting of dams etc., (iv) helps to maintain proper ecological balance, and last, but not least, (v) 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 may be the only way to 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 various fruits, apples occupy the top position, claiming over 38 per cent of the area and 58 per cent of the total fruit production. Thus, Himachal Pradesh is now known as the 'Apple State of 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 in this State.

Trends in Apple Production and Prices

The foregoing discussion reveals that the apple industry in the State has experienced a phenomenal expansion during the last three decades. As is shown in Table I, the increase in production has been due to both an expansion of apple orchards and a rise in productivity.

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 apples increased at a compound growth rate of over eight per cent per annum during the period from 1961-85. However, period-wise analysis indicated higher growth rates in the initial plan periods which subsequently declined. On average, about 2,000 hectares of land was brought under apple cultivation each year during the period from 1961-85. The compound growth rate of the area declined to four per cent in 1974-85, as against 15 per cent for the period from 1961-74. It can be seen that apple cultivation in the State picked up momentum only in the post-independence era.

Table I: Compound Growth Rates of Area, Production, Productivity, and Prices of Apples

Period	Area	Production	Productivity	Prices
1961-65	35.34	21.47	-8.62	1.37
1965-68	15.78	32.22	16.27	2.60
1968-73	8.06	5.19	-18.28	0.08
1961-74	15.20	21.40	2.30	0.90
1974-78	4.95	18.12	11.55	0.25
1979-85	3.60	8.10	0.80	11.50
1974-85	4.10	9.60	4.50	7.30
1961-85	8.10	10.00	3.10	3.50

Source : HPMC

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 eight per cent in the case of area. A glance at the production figures would reveal that the production pattern has been erratic with no set pattern emerging during the period under study. It further reveals that the extent of fluctuation in production was higher before 1975, whereas, during the later period, fluctuations were contained to some extent. The lowest growth rate was observed in the period from 1968-73 and the highest during 1965-68; 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 2.30 per cent during the period from 1961-74 and of 4.5 per cent during 1975-86, as against negative figures in the early fifties.

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 from 1961-74 and from 1975-85 is rather interesting. The growth rate was very low, i.e. 0.90 per cent only, 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 IDA 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 from 1979-85 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 HPMC's activities/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 2-3rd week of July, particularly in lower areas, and continues until October. August and September are the peak harvesting periods, when about 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/grading, and packing. Generally, the fruit is picked by hand, placed in a basket known as a *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 characteristics. The quality specifications followed in the State are A, B, and C. 'A' grade should have over 50 per cent of the colour characteristics of the variety, should appear clean and bright, free from blemishes, and be of typical shape. 'B' grade fruit may have less than 50 per cent of the colour characteristics of the variety and may accommodate 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. '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 known as 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, name of the orchard, etc. After packing, the produce is hauled to the nearest road-head 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 of these is through a forwarding agency to a commission agent/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 conducting the sale, 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. It is worthwhile to mention here that with the big increase in apple production, marketing has developed in importance and complexity. The age old traditional marketing system could not keep pace with the problems that emerged as the system involved 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 principle of *caveat emptor* would prevail along with confusion and unfairness. Although grades for apple have been developed conventionally, these 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 for (i) pre-cooling the fruit soon after picking to prolong shelf life, (ii) avoidance of gluts, and (iii) reduction of pressure on transportation during the peak harvesting season. Such facilities also facilitate the advantage of selling 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 adversely affecting their returns.

The absence of adequate processing facilities to utilize 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/value. Some of this fruit used to be sent to the market, thereby adversely affecting the sale of the good quality 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 porterage to the nearest road-head. 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, freight, and service charges paid to various 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 the post-harvest management of these fruits so as 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 recognised the fact that fruit production should no longer be a minor adjunct of the day to day activities of farmers, particularly where ideal location and climate offer vast potential for the expansion of fruit production. 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, both 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 objective of i) stocking progeny trees of outstanding merit for the supply of budwood, ii) multiplication of pedigree and disease-free planting materials, and iii) to serve 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, recently, a new university concentrating mainly on horticulture and forestry has been set up.

Support Prices. 'With a view to ensuring 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 various fruits covered by this scheme are: apples, hill lemons, oranges, *kinnows*, guavas, and limes. 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 HMPC 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 the fast depleting natural forest wealth of the State. The State Government proposes to switch over to the use of CFB cartons in a phased manner, and there will be a complete ban on the use of wooden based packing by 1990. In order to popularise 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 and is likely to go into production in 1990.

The Himachal Pradesh Apple Processing and Marketing Project

With a view to bringing 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 sixties 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 modernising the State 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-Cooperative Programme in 1972. The project prepared by the FAO experts included the construction of link roads, packing houses, collection centres, cold storage, transshipment centres, consulting services, technical assistance, training, etc.

Project Components. The World Bank appraised the project in September, 1972. The appraisal team, however, recommended additional items to be included in the project 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:

- twelve 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 (i) commercial buildings, cold storage, an apple processing plant, and a transshipment centre and (ii) 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 company known as the Himachal Pradesh Horticultural Produce Marketing and Processing

Corporation Ltd (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 PWD.

Project Benefits. The major financial and economic benefits anticipated from the project at the time of appraisal were (i) surplus funds to be generated by HPMC, (ii) incremental income to fruit growers utilising the HPMC marketing system, (iii) incremental income on account of the sale of processed grade fruit which otherwise had no alternative use or value, and (iv) 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 (ERR) 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.

The Himachal Pradesh Horticultural Produce Marketing and Processing Corporation Limited (HPMC)

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. The Corporation 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 on the Board. All policy decisions having financial implications are approved by the Board of 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 initiating effective steps for the implementation of the Project components, the Corporation was equipped with qualified and competent manpower as per the recommendations of the World Bank. There are five functional divisions viz, 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 respective divisions.

Physical Infrastructure

The Corporation set up the following facilities

- six packing houses, each with a capacity to grade and pack 5,000 tons of apple, per season;
- four grading houses, each with a capacity to grade and pack 1,500 tons of apple, per season;
- five cold stores in the apple producing areas, each with a capacity to store 1,000 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 Corporation 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 2,000 tons of apples per season, two cold stores in terminal markets, two transit warehouses located at 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

During the period from 1974-82, the Corporation 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 introducing a system of centralised grading and packing, twelve packing sheds have been 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 Corporation 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 Corporation 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, tools and implements, and sale of processed products. Another important activity is the popularisation and sale of Corrugated Fibre Board (CFB) cartons in place of the conventional timber-based boxes. The State Government has now entrusted the Corporation with the procurement of fruit at support prices. The packing sheds play an important role in the procurement of fruit. Payments 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 is 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 on a monthly fee basis. Besides, the Corporation also stores good quality fruit, sorted from fruit purchased at support prices.

Transit Warehouses. With a view to protecting 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/storage to fruit arriving from the producing areas. A nominal fee is charged from the consignor which is realised after the sale of the fruits.

Sale of Fruits on a Consignment Basis. To ensure competitive prices, the Corporation 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 undertaken by the Corporation is the manufacture of a wide range of processed fruit products. The Corporation 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 on the one hand and converting them into value-added and health giving nutritious products on the other. Apart from apples, other fruits grown in the State are also utilized for processing. 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 appetiser, 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 Corporation located all over the country. The efforts of these branches have been further intensified by appointing distributors/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 Corporation are also available for sale. Through these vending machines, known as 'dispensers', reconstituted apple juice is made available in a chilled condition. This system of dispensing the juice has enabled HPMC to transport apple juice concentrates in bulk barrels thus avoiding excess expenditure.

CFB Cartons. The Corporation has developed Corrugated Fibre Board (CFB) cartons for the packing of apples and other fruits as a substitute for conventional wooden boxes. The procurement and sale of such CFB 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 Government Support Prices. The HPMC is the organisation 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 Corporation 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 of fruits, fruit processing, and sale of processed products are given in Annex II. 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 utilisation 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 various reasons for the low capacity utilisation have been discussed under the heading *Deficiencies Experienced and Lessons Learned*. 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 Corporation have shown significant improvement, particularly during the last three years. The major source of Corporation income is from the sale proceeds of processed products, commission from forwarding and sale on a consignment basis, rentals from cold stores, grading/packing charges, and sale of packing material and other items such as fertilizers, fungicides, tools, implements, etc.. The income of the Corporation 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-utilisation, particularly in the initial years. During the past two or three years, a significant improvement has been observed and the turnover has risen 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 organisation introduced by the Corporation.

The profit and loss position reveals that the Corporation 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 of the Corporation 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 have been 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 only in 1984-85. During 1985-86, the Corporation 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 the financial performance of the Corporation.

The financial position of the Corporation did not enable the Corporation to discharge the due debt-service liability which was to commence in 1985-86. The NABARD has appointed a 'Task Force' to suggest ways and means for the rehabilitation of the Corporation 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. 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 organise the marketing of their produce in a scientific manner. The benefits accruing to fruit growers are briefly enumerated 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 alternative use/value. The Corporation directly purchases fruit from the growers to meet the requirements of its processing plants. For the last two years, the Corporation has been purchasing sizeable quantities of various fruits at support prices from the growers.

- The fruit purchased by the HPMC at support prices is properly sorted/graded and good quality fruit is cold-stored in open plastic field boxes. The balance, unsuitable for storage, is utilised by the fruit processing plants and excess quantities are diverted to various non-traditional markets. This avoids any adverse effect on the prices of fruit 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 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 from 1974-85 against 0.90 per cent per annum before the formation of HPMCs.

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

- The introduction of Corrugated Fibre Board (CFB) cartons as a substitute to 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 2 given below 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.

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 the bruising of and the quality deterioration in fruit is insignificant. The comparative analysis of prices for comparable varieties and grades is given in Table 3 below. The prices are based on the sales through HPMC in the Delhi market in 1986-87.

Table 2: Cartons Supplied to Growers and the Export of Apples from the State

		1986	1987
1.	Total no. of boxes of apples exported from the State (in 100,000s)	158	105
2.	Fruit exported in cartons	14.34	8.48
3.	Percentage of cartons to total exports	9	8

Source: HPMC

Table 3: Prices Realised from the Sale of Different Categories of Boxes of Apples (Rs per carton/box)

Month	Carton	Wooden
July	112	109
August	75	68
September	46	42
October	50	48
Average	71	67

- The Corporation 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. This has now been completely substituted by light weight, smooth surfaced, hygienic plastic field boxes. At present, the Corporation has already introduced fifty thousand plastic field boxes which are utilised as returnable containers thus saving wood.

- 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 utilising the same either for processing or for marketing in gunny bags/plastic field boxes. The Corporation 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 Corporation has played an important role in minimizing the use of wood for the packaging of fruits. More importantly the Corporation 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 by providing nutritious juice at reasonable prices, manufactured from fruit which used to remain unutilized 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 Corporation, generating 72,000 man-days annually for seasonal employment at fruit processing plants, grading/packing sheds, and transit warehouses, etc. The expenditure of the Corporation on salaries and wages is about Rs 9,000,000 per annum.

The outstanding contribution made by the Corporation towards the farming economy in the State has been recognized both at national and international levels. This is evident from the tally of awards won by the Corporation. The International Asia Award, 1983, 1984, 1985, the International Food Award, the *Udhyog Rattan Award*, 1985, and the Marketing Man of the Year Award, 1988 were won by the Corporation. Besides, the Corporation 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, therefore, obvious that certain deficiencies would exist and the same are discussed in the following.

Project Formulation Appraisal. One of the major drawbacks inherent at the time of project appraisal was the classification of grading/packing sheds, fruit processing plants, cold storage, etc. 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 over-estimation of capacity utilisation assumed at the time of project appraisal to be 85 and 100 per cent in the first and second year respectively, was yet another unrealistic and over optimistic assumption. 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.

Centralised grading and packing similar, to that adopted in Europe, the USA, Australia, and other horticulturally advanced countries, is unsuitable for this hill State where the conditions are altogether different in respect of terrain, size of holdings, accessibility, etc. 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 utilise mechanical grading and packing as these improve the presentation of the fruit along with its quality and the fruit then 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. These are described in the following passages.

- 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 and thus causes 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/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 Corporation is one of the major reasons for its accumulated losses. The Corporation even achieved a debt-equity ratio of 73:27 against a recommended norm of 40:60 for agro-based projects. Had the Corporation 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 faced in operating at the desired level. Although the project envisaged a provision of Rs 20,000,000 lakhs towards the working capital, the Corporation 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 day to day financial requirements. This situation forced the Corporation to pay Rs 2,500,000 - 3,500,000 annually as interest to banks. This could have been saved had there been adequate provision/availability of working capital with the Corporation. The Corporation 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 Corporation resorted to outright purchase of fruit as per the Project concept. Lack of resources, therefore, not only adversely affected capacity utilization, but also failed to realize 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 Company, the Board is predominantly made up of government officials. There is a near absence of professionally/commercially competent personnel on the Board. As a consequence, the decision making process lacks the basic element of profit-oriented business ethics which one would expect from private business.

- 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 Corporation 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 Corporation staff was on deputation from the government.

- The Corporation 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 cum merit.

Training. Training is an important input which contributes to the efficiency of the total productivity exercise. It has two important components: (a) building up new skills, and (b) updating or upgrading existing skills. Since the Corporation 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 level 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 up-date and up-grade 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/grading sheds. This adversely affected the capacity-utilisation of these units. The procurement of field boxes should have been matched with installed capacity.

- The high cost of setting up packing/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 of the important experiences gained from this Project concerns the response of fruit growers to new technology. It was found that their response was very slow. It took nearly 5-8 years to motivate growers to adopt the new system which, in this case, was responsible for upsetting the entire commercial character of the organisation. The situation deteriorated to the extent that the organisation developed the 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 centralised system of grading and packing does not suit the type of terrain/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 shed rather than concrete buildings.

- The activities of packing sheds should not be confined only to packing and grading fruit, but 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-related 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 utilisation in the initial periods together inhibit the functioning of cold storage facilities on commercial lines. The viability, however, can be improved if the organisation undertakes the outright purchase of good quality fruit, storing the same in bulk-bins and undertaking the packing/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 fully-fledged technical division with a multidisciplinary team of experts in the fields of quality control, plant protection, post-harvest management, etc to impart necessary training to fruit growers as well as to the various functionaries of the Corporation.

ANNEX I

Area and Production of Apples and Other Fruits in Himachal Pradesh

Year	Area (hectares)			Production (metric tons)		
	Apples	Other	Total Fruits	Apples	Other	Total Fruits
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	1,09,569
1970-71	26,735	17,594	44,329	1,03,120	45,460	1,48,580
1971-72	28,308	19,261	47,569	1,25,060	53,270	1,78,330
1972-73	31,003	20,452	51,455	29,800	22,220	50,020
1973-74	32,127	23,412	55,539	1,18,676	67,510	1,86,186
1974-75	33,628	25,895	59,523	43,299	33,140	76,439
1975-76	35,076	28,309	63,385	2,00,000	45,882	2,45,882
1976-77	3,734	32,016	68,750	1,21,896	15,331	1,37,227
1977-78	38,925	35,979	74,909	1,31,617	18,936	1,50,553
1978-79	40,655	39,688	80,343	1,21,896	15,331	1,37,227
1979-80	41,947	43,986	85,933	1,35,475	24,586	1,60,061
1980-81	43,356	49,111	92,467	1,18,013	21,815	1,39,828
1981-82	45,360	54,724	1,00,084	3,06,798	35,145	3,41,943
1982-83	47,379	61,322	1,08,701	1,39,086	38,768	1,77,854
1983-84	48,292	65,759	1,14,051	2,57,913	46,362	3,04,275
1984-85	49,840	70,740	1,20,580	1,70,629	45,291	2,15,920
1985-86	51,103	77,667	1,28,770	1,74,618	33,124	2,07,742
1986-87	-	-	1,34,985	3,59,321	41,187	4,00,508

Source : HPMC

ANNEX II

Activity-wise Physical Performance of the Last Five Years

Activities	Units	1983-84 Actual	1984-85 Actual	1985-86 Actual	1986-87 Actual	1987-88 Targets
1. Sale of fresh fruit on consignment basis.						
a) No. of boxes	No Lakh[1]	1.76	1.54	1.17	3.41	3.70
b) Gross turnover	Rs Lakh	-	78.61	64.83	202.39	245.50
c) Commission earned.	- do -	3.84	4.14	4.64	8.96	10.78
2. Forwarding of boxes						
a) No. of boxes	No Lakh	10.92	6.92	8.62	17.45	14.50
b) Gross billing made.	Rs Lakh	-	-	68.56	156.14	125.05
c) Commission earned	- do -	4.02	3.05	3.56	7.02	8.30
3. Boxes graded/ packed	No Lakh	1.01	1.95	1.67	2.93	5.90
4. Boxes cold stored	No Lakh	0.35	0.19	0.53	0.94	1.25
5. Cold storage revenue from terminal markets	Rs Lakh	38.58	43.74	62.63	66.16	65.00
6. Sale of fresh fruit & vegetables on out-right purchase basis	- do -	-	-	-	48.84	65.00
7. Processing of fruit						
i) Apples	Tons	5007	1034	8307	13.391	12.000
ii) Other fruits	- do -	75	121	1181	754	800
8. Sale of processed products.	Rs Lakh	122.22	152.81	137.37	180.12	428
9. Gross turnover	- do -	355.11	526.90	373.73	942.93	

Source : HPMC

Note : 1. A lakh is 100,000 rupees

ICIMOD is the first international centre in the field of mountain development. Founded out of widespread recognition of environmental degradation of mountain habitats and the increasing proverty of mountain communities, ICIMOD is concerned with the search for more effective development responses to promote the sustained well being of mountain people.

The Centre was established in 1983, and commenced professional activities in 1984. Though international in its concerns, ICIMOD focuses on the specific, complex, and practical problems of the Hindu Kush-Himalayan Region which covers all or part of eight Sovereign States.

ICIMOD serves as a multidisciplinary documentation centre on integrated mountain development; a focal point for the mobilisation, conduct, and coordination of applied and problem-solving research activities; a focal point for training on integrated mountain development, with special emphasis on the assessment of training needs, the development of relevant training materials based directly on field case studies; and a consultative centre providing expert services on mountain development and resource management.

Mountain Farming Systems constitutes one of the four thematic research and development programmes at ICIMOD. The programme deals with agriculture defined broadly to cover all land-based activities (cropping, horticulture, forestry, livestock farming, etc) and their support systems. Currently the major focus of the programme is on the factors and processes contributing to the sustainability/unsustainability of mountain agriculture. This is carried out by examining (through both knowledge reviews and field studies) the sensitivity of public and private interventions to specific mountain conditions. The explicit consideration of the latter conditions can alone assure a mountain perspective to public policies and programmes in the agricultural sector.

Director: Dr. E.F. Tacke Deputy Director: Dr. R.P. Yadav

International Centre for Integrated Mountain Development

G.P.O. Box 3226, Kathmandu, Nepal

Telex : 2439 ICIMOD NP Cable : ICIMOD NEPAL

Telephone : (977-1) 525313 Fax : (977-1) 524509