Chapter -1

Introduction
1.1 Introduction

Horticulture is the area of agriculture that deals with garden plants cultivation, the science and art of growing fruits, vegetables, ornamental trees, bushes and flowers. Horticulture (from Latin word hortus ‘garden’ and cultura, ‘cultivation’) is distinguished from agronomy (from the Greek Argos, ‘field’ and nomus ‘arrangement’) which is concerned with the large scale cultivation of field crops such as wheat, cotton, hay and the like. The distinction has become somewhat blurred in recent decades, because many horticultural plants particularly vegetables are often grown as field crops and are considered horticulture commodities rather than garden products. Along with forestry, horticulture and agronomy constitute three broad branches of agricultural science and practice. (Encyclopedia Britannica, 2008).

Indian agriculture has been the mainstay of Indian economy, accounting for 25 per cent of the nation’s gross domestic product, 15 per cent of the export and 60 per cent of the employment. Blessed with varying climate and soil conditions, India has ample opportunity to grow horticultural crops such as fruits, vegetables, tuber crops, ornamental plants, flowers, medicinal and aromatic plants, spices and plantation crops. These crops have a vital role in providing food, nutrition, shelter, besides addressing the employment and environment concerns. India with diverse soil and climate comprising several agro-ecological regions provide ample opportunity to grow a variety of horticulture crops. These crops form a significant part of total agricultural produce in the country comprising of fruits, vegetables, root and tuber crops, flowers, ornamental plants, medicinal and aromatic plants, spices, condiments, plantation crops and mushrooms.

Horticultural crops play a unique role in India’s economy by improving the income of the rural people. Cultivation of these crops is
labour intensive and as such they generate lot of employment opportunities for the rural population. Fruits and vegetables are also rich source of vitamins, minerals, proteins, and carbohydrates which are essential in human nutrition. Hence, these are referred to as protective foods and assumed great importance as nutritional security of the people. Thus, cultivation of horticultural crops plays a vital role in the prosperity of a nation and is directly linked with the health and happiness of the people. Fruits and vegetables are not only used for domestic consumption and processing into various products (pickles, preserves, sauces, jam, and jelly) but also substantial quantities are exported in fresh and processed form, bringing much-needed foreign exchange for the country. These groups of crops also provide ample scope for achieving bio-diversity and diversification to maintain ecological balance and to create sustainable agriculture and can make an impact on the national economy in the years to come.

India with more than 28.2 million tonnes of fruits and 66 million tonnes of vegetables is the second largest producer of fruits and vegetables in the world next only to Brazil and China. However, per capita consumption of fruits and vegetables in India is only around 46g and 130g against a minimum of about 92g and 300g respectively recommended by Indian Council of Medical Research and National Institute of Nutrition, Hyderabad. With the present level of population, the annual requirement of fruits and vegetables will be of the order of 32.58 million tonnes and 83 million tonnes respectively. To meet this requirement the National Commission on Agriculture has projected an area of 4 million hectare and 8 million hectare under fruit and vegetable crops respectively by 2000 A.D.

The recent emphasis on horticulture in our country consequent to the recognition of the need for attaining nutritional security and for more profitable, land use has brought about a significant change in the outlook of the growers. The need for great utilization of available wastelands against
the background of dwindling water and energy resources has focused attention to dry land, arid and semi-arid tracts and to horticultural crops which have lesser demands on water and other inputs besides being 3 to 4 times more remunerative than field crops. It is estimated that India has 240 million acres of cultivable wasteland and is lying idle, which can be brought under orchard crops without curtailing the area under food crops. The country has abundant sunshine throughout the year, surplus labour and varied agro-climatic conditions, which offer high potential for successful and profitable commercial horticulture.

The analysis for horticulture development in India can be divided into four phases. The first phase involves the period prior to the independence of the country. The pre-independence horticulture was growing of flowers or fruits around the house, characterized by selection of plants based on performance and conservation of few cultivars by vegetative method of propagation. No science was involved in horticulture but it was a profession of specific community. Growing of many horticultural crops was a household activity. (Singh, 2004)

The second phase of the development of horticulture, covered the year which was influenced by indigenous thinking of sectoral growth of commodity in the regions of importance. This phase also saw the importance of development of fruits in tropical and sub-tropical regions through the establishment of centres. During this phase only few crops were favoured and growth was limited to the expansion of the area.

Third phase is considered as the period of consolidation both for research and development. At central level, highest position in development and research were created and efforts for development were triggered. Many states, provided attention to horticulture recognizing its role in nutrition security, employment generation and enhancing the farm income.
Central Institutes and Directorates were established which benefited farmers in adaptation of improved technology.

In the fourth phase due to marked technological changes there recorded quantum jump in plan allocation, formation and association by farmers, unprecedented increase in production, enhance availability of produce, which is now marked as golden revolution. (Singh, 2004)

The role of horticulture in enhancing the productivity of land, generating employment, value addition, improving economic conditions of the farmers and entrepreneurs increasing export and above all providing nutritional balance to the people has been well acknowledged.

The district Rajouri under study covers an area of about 2,630 Sq km out of the total area of the Jammu and Kashmir State (2, 22,236 Sq km) including the illegally occupied area by Pakistan and China. It consists of seven tehsils (Sub-Division) and eight blocks. However department of horticulture has divided the district into eleven horticultural blocks for bringing improvements in horticulture by providing infrastructural facilities. The district apart from is charming landscape, beautified by snow capped mountains, bubbling streams, meandering and deep cutted rivers, and is well renowned for its colourful flowering meadows, and orchards along with other parts of the state since ancient times. It possesses a rich history of fruits cultivation. The apple of the area has lived upto its distinguished reputation, being one of the choicest fruit. It used to be regularly served at the table of Mughal emperors and their courtiers. The other important varieties of the fruits include apricot, cherry, peach, pear, plum, walnut, almond and ber, besides these fruits the production of subtropical fruits is also recorded.

It was however during the latter part of the 19th century that the cultivation of fruits in the state of Jammu and Kashmir received a fillip. With the introduction of European grafts and since then the Jammu and
Kashmir has become an orchard of India. Consequent upon the reorganization of agricultural programme and diversification of agriculture, large tracts of non-irrigated lands, have been brought under orchards. However the potential of fruits farming as a viable vocation, remain un-exploited till the down of independence. This is perhaps due to the lack of technical know-how as well as of inadequate transport facilities, cold storage and marketing facilities.

Horticulture form the major chunk of the economy of the Jammu and Kashmir State, it generates about as 120,000 million rupees annually and provides employments to about 0.25 million people both directly and indirectly. The total earning includes a foreign exchange component of Rupees 140 crore (US $ 31.1 million). The State has the largest area under horticulture production and a variety of fruits are grown which ideally suit for the cultivation of almost all kind of temperate and some varieties of subtropical and tropical fruits. The present study is concerned only with the cultivation of fruit crops in Rajouri district of Jammu and Kashmir state. (Agencies, 2005).

At present about 8.1 lakh hectares of area is under horticulture in the state. There are sufficient amount of orchards in all the district of the states, but in the districts of Srinagar, Baramula, Pulwama and Kupwara the area and production of horticultural crops is on top. The other districts also have variable amount of orchards. The district Rajouri under study has a great potential of fruits cultivation and to become a major hub of fruit growers because of its favourable climate, soil, drainage and relief features. There is the dire need of improvement in this field both by government and local agencies. Horticulture sector has a pivotal role in the socio-economic development and transformation of the area by providing employment opportunities increasing income, developing infrastructure facilities by generating educational facilities, better housing conditions, health and hygiene. Therefore modernization of horticulture will promote higher
productivity and better quality agro-produce and in turn higher economic return, income and employment to the people. There is a phenomenally increase noted in fruits production from just over 1.56 lakh metric tonnes in 1971-72 to a record figure of more then 11 lakh metric tones (1100,000 MT) during 2006-07, like wise area under orchards was 0.50 lakh hectares in 1971-72 which now increase to 20 lakh hectares in 2006-07. The Department of horticulture planning and marketing has now proposed plan to provide opportunities to maximize land under horticulture and its production as well as opportunities to the perspective buyers for buying the fruits at various places in the state by establishing the markets and helping to improve the socio-economic conditions of the people in the state.

The present work entitled ‘Horticulture development and Socio-Economic conditions in Rajouri District of Jammu and Kashmir’ is an attempt to study the geographical factors, which have not only given to the district a unifying homogeneity and a socio-economic viability at low level of technology but have also set limits to fruits cultivation within the region. It has been observed that physical landscape, coupled with climatic conditions has largely been responsible for the present spatial distribution of fruits culture.

The study is based on block wise data. Prior to the year 2000, relevant data about fruits culture was not available for the entire district, and hence the study is based on post 2000 data. Data related to area and production under different fruits crops in different blocks have been rated from the department of horticulture Rajouri. Some of these data has been presented in tabular form, wherever possible, diagrams and graphs have been drawn based on the original data to illustrate the problem.

1.2 Objectives of the Study

The present study is concerned with the development of fruit crops only. The objective of the study is to examine the structure of fruits
cultivation in district Rajouri of Jammu and Kashmir state and to find out its role in the regional development. To make it more concrete, the objective of the study would be:

(a) To understand the geographical distribution of fruits crops.

(b) To study various fruits plants grown, their uses and importance.

(c) To assess the potentiality of area to enhance further cultivation of fruits.

(d) To find out the weak links responsible for dwarfing the fruit crops.

(e) To examine the intra village variations in socio-economic development created by the variation in fruits culture.

(f) To trace out the problems related to fruits culture and their management.

(g) Finally, to trace out the main findings and suggestions as guidance for planners, policy makers and agriculturists.

1.3 Hypotheses

The hypotheses have been tested and proved as under:

(i) Area under fruits cultivation and the regional development are to a large extent proportionate to each other i.e., more the area under fruit in any village or household, higher the level of socio-economic development achieved and vice-versa.

(ii) Fruit culture has proved itself to be the remunerative crop of the area.

(iii) The limited extension of fruit cultivation in Rajouri is mainly regulated and dominated by unawareness, illiteracy, climatic factors and unfolded prejudicial views.

1.4 Research Methodology

A research programme is always based on certain technical procedures. In the beginning of the research primary as well as secondary
data are collected, which are analyzed to get the meaningful results. As such research methodology forms a vital link between the crude data and the final analysis. The present study is based on both primary and secondary data. The present study has been conducted at two levels.

**Meso level:** In the meso level blockwise study of district Rajouri has been taken as the unit of analysis. This study is based on secondary source of data.

**Micro level:** Where household chosen from the selected villages taken as a unit of analysis and observation. This study is based on primary source of data.

### 1.4.1. Sources of Data

**Secondary Data**

The Secondary source of data have been used for detailed analysis of geographical background, socio-economic development, land utilization, cropping pattern, cropping intensity, agricultural productivity, fruits productivity. The data have been collected from various published and unpublished records of the government or semi-government publications, earlier research, reports, books, journals, magazines, websites, newspapers, tehsil, blocks and revenue records.

**Primary Data**

In order to bring out the clear-cut picture of the villages, primary data has been collected with the help of well structured questionnaire/schedules.

### 1.4.2. Sampling Technique

There are various methods of sampling but in the present study Random sampling techniques has been adopted to obtain data and information. Among the 22 districts of Jammu and Kashmir State, the
district Rajouri has been selected for the purpose of this study. The district comprises of 7 Tehsils namely Rajouri, Kalakote, Sunderbani, Nowshera, Thannamandi, Budhal and Darhal. There are eleven horticultural blocks in district Rajouri. All blocks have been selected purposively for the purpose of study.

Selection of the Villages

After getting a list of all villages from all selected blocks, eleven villages (one village from each block) namely village Choudhary Nar from Rajouri, Manyalan from Doongi, Kotli Kalaban from Manjakote, Behrot from block Thannamandi, Darhal from Darhal Malkan, Panjnara from Kandi, Badhal from Budhal, Barmandal from Kalakote, Keri from Tryath, Siot from Sunderbani and Hanjana Thakra from Nowshera have been selected randomly for the purpose of study. To get the village information a well prepared schedule has been used.

Selection of the Households

Respondents belongs to different fruits productivity regions have been selected randomly from each selected village on the basis of 5 per cent of the total household which amounts to 154. The respondents have been exhaustively interviewed personally with the help of structured collective questionnaire.

1.4.3. Questionnaire Design

The questionnaire is divided into two sections and mainly consists of the following information:

Economic structure

It contains the size of holding of the respondents which include small, medium and large size of holdings, agriculture cultivation, land under fruits cultivation, types of cultivation, plough used, irrigation,
livestock, electricity, telephone, mobile, cycle, motor cycle, ration card, television, dish/VCD, income, bank account and insurance.

Social Structure

Social structure of the respondents includes questions on age structure and composition of the respondent's family members, headship, category or caste, place of origin, facilities of drinking water, toilet, bathroom, kitchen, fuel used. It also includes educational status, housing type which deals with housing condition of the respondents like kaccha, pacca and mixed type houses, household ownership.

1.4.4. Analysis of Data

The data after collection have been processed and analyzed in accordance with the outline laid down for the purpose. Therefore, first of all, the collected data (Primary as well as Secondary) has been edited in order to detect errors and omissions and to correct these. Editing is done to assure that the data are accurate, consistent with other facts gathered and as complete as possible.

To analyze the data standard statistical techniques have been applied like simple percentage, Z-score, composite Z-score techniques and various diagrams have been prepared to display the data and the results. The maps are prepared by GIS Arc view 3.2 versions and the results are exposed in sharp focus through a set of maps and graphs.

1.5 Design of the Study

In view of the mentioned broad objectives and the analysis thereto, the entire body of the thesis is divided into seven chapters, which throw light on various aspects of the present study.

First chapter deals with introductory concepts of the role of agriculture especially of fruits crops in regional development, objective of
the study, hypotheses, research methodology and data base, sources of data, sampling technique, questionnaire design, analysis of data, design of the study and review of literature has also been given in this chapter.

The second chapter discuss about the geographical personality of the study area: it includes relief, drainage, climate, soil, natural vegetation and cultural settings of the study area. The relief, it is observed has affected the growth of plants in two ways. Firstly it brings out local variations in the climatic conditions and secondly, it modifies the edaphic factors of the habitat.

Drainage is also very important because well drained areas are suitable for almost all type of fruit plants. However, fruits plants cannot their well water standing around their roots. In the area under study the rivers of Manawar Tawi originating form Pir Panjal snow caped mount aims drains most of the area besides its tributaries the other areas are also drained by river Ans, and many other small rivers that drains the mountains slopes constitute the drainage network of the district Rajouri.

The climatic factors like temperature, rainfall, humidity effects the fruits growth in several ways. For example, the amount of temperature during the growing seasons not only sets the time limit of ripening but also determines the quality of fruits. Similarly the low and high rainfall adversely effects the development, growth and size of fruits. Relative humidity is also an important factor because of its role in controlling the rate at which transpiration from the leaves takes place formation of soils is the result of the climatic factors and geomorphic processes. Soils besides climatic conditions are the basis of fruits culture in Rajouri and whole of the state, as in the more suitable soils less managing is required.

Third chapter deals with the growth of different fruits crops, their importance and uses. The fruits of Rajouri district can be divided into two broad categories on the basis of climatic conditions under which they grow
and produce. In the first category they may be grouped the apple, pear, the European plum and the walnuts which do under severe winter conditions and also at higher attitude while the peach, the Japanese plum, the apricot, almond, grapes, ber and mango thrive in comparatively warmer climatic conditions and at lower elevations.

The chapter fourth covers the areas and productions of different fruits crops in different blocks of Rajouri. It has been observed that the area and production recorded an overall increase with variations, because of many reasons of drought and dry spell, lack of general awareness, lack of infrastructure facilities and amenities, lack of government interest.

Chapter fifth discusses about problems related to fruits, insects, pests and diseases, their management and necessary measures, it also covers fruit marketing and related problems.

Chapter sixth deals with the socio-economic conditions of the selected village from eleven blocks of district Rajouri. In this chapter different socio-economic indicators have been studied and their development has been undertaken.

Finally in Chapter seventh the study is concluded on the basis of some main findings and suggestions, which are given for future planning with the hope that the study will be useful for policy makers, administrators and academicians interested in the type of study related to socio-economic development in an agricultural economy.

1.6 Review of Literature

For the purpose of detailed studies and precise research work, an in depth study of literature work already done by different scholars and experts related to the research work are necessary. It helps the researcher to know deeply about the problems related to the study. In the present section, a
body of literature relevant to the present study has been reviewed on various aspects of the subject and is presented in a systematic manner.

Bruce (1915) wrote about the flora and fauna of Kashmir after his visit to Kashmir, he describes the fruits and forest of Kashmir with variations from season to season and from one region to another.

Kaul and Dar (1985) observed that the vegetation of Kashmir changes from time to time. It changes from glaciations to deglaciations and from that period to the present situation. They studied the past and the present conditions of vegetation and got variations with both time and space aspects. According to them there is a major change in the production and distribution of flora in the valley of Kashmir from ancient to the present time.

Kanth (1985) explained different morphological, physical, stratigraphic feature of Jammu and Kashmir State, which plays a crucial role in the horticulture and agricultural development with variations in different parts of the area.

Javed (1985) studied the origin and introduction of flora including fruits trees in Kashmir valley. He also finds out that with various climatic variations different type of species developed and migrated from different countries and region to Kashmir.

Gupta (1985) pointed out that land is tiller’s most valuable asset; grains are the fruit of his sweat and toil. But unfortunately land resources are tremendously degraded due to number of reason such as soil salinization and alkalization. So to save the economy of the nation effort should be made to save the soil to save the whole nation.

Singh (1999) pointed out that modernization of agriculture will promote higher productivity and better quality agro produce and in turn high economic return, income and employment to the people.
ZenHong (1999) studied twenty-one-year-old pink wax apple trees managed using the bald cut cultivation system in Taiwan. Fruits and fruiting shoots were harvested at commercial maturity in late December. Position on the tree had a marked influence on fruit quality. It has been found that the fruits on the lower trunk were the heaviest and largest. Upper inner fruits were smallest but had a more intense red colour. For high soluble solids concentrations, it is desirable to harvest wax apples from the lower inner position.

Chandra and Padaria (1999) experimented that the problems to establish shoot bud culture techniques for litchi, the problems of microbial contamination, phenol exudation and explants browning were controlled to a great extent by using mercuric chloride or sodium hypochlorite.

Narayana, et al. (1999) propounded that mango fruits harvested at the Tapka stage having a specific gravity less than 1.00 are considered to have attained optimum maturity. However, the majority of mature fruits of Baneshan mango harvested at this stage had a specific gravity less than 1.00. No clear relationship was observed between the fruit size or fruit weight and specific gravity of this cultivar.

Baez, et al. (1999) examined that application of quality standards for grades of fresh fruits and vegetables in Mexico are non-restrictive, however, there are some private Mexican Companies that have their own standards to sell high quality products.

Kumar and Singh (1999) studied about the field experiment conducted at Central Horticultural Experiment Station, Ranchi during 1988-89. Banana cv. dwarf Cavendish was irrigated at 3 frequencies and mulched with grass cuttings. He got result that the greatest growth and yield were recorded with irrigation at 120 mm CPE. Mulching increased fruit yield.

Chadha (1999) examined and discussed improved technologies for varietals development, propagation, agronomy, crop protection, post harvest
management. Strategies and programme for horticultural research are proposed.

Arora, et al. (1999) explained physicochemical characteristics of fruits of eight ber varieties in relation to fruit fly infestation. Fruit fly infestation was positively correlated with fruit weight, pulp-stone ratio, total soluble solids and total sugars, whereas, it was negatively correlated to acidity, vitamin C and total phenols. The varieties high in pulp content, total soluble solids, total sugars, low acidity, vitamin C and total phenols were highly susceptible to fruit fly attack.

Sharma, et al. (1999) noted that four mango cultivars, Dashehari, Langra, Mallika and Amrapali, were introduced from different sources and grown at the Regional Fruit Research Station, Abohar (Punjab), during 1982-83 to allow evaluation under arid-irrigated conditions. Fruits of Dashehari and Langra matured during the second week of July whereas those of Mallika and Amrapali matured in the third week of July. On the basis of yield and quality observed under Abohar conditions, cultivation of Dashehari, Langra, Mallika and Amrapali cultivars are recommended for cultivation in the arid-irrigated region of Punjab.

Das and Hazarika (1999) examined that mulching promoted the quality of pineapples cv. Kew, grown in India. Good quality fruits were observed in the black polythene mulch and rice husk treatments. The best quality fruits were obtained in the black polythene mulch treatment where plants were mulched throughout the cropping period.

Rajan, et al. (1999) developed various models account for the effect of weather variables on the success of veneer grafting in mango under Lucknow conditions.

Sharma, et al. (1999) studied the effect of rootstock on fruit drop was investigated for mandarins grown in high density plantings in India. Plants on all 3 rootstocks showed 2 distinct waves of drop “a very heavy drop in
April-May and severe preharvest drop in September-October. Plants on Troyer citrange showed the lowest fruit drop in April-May and the highest pre-harvest fruit drop compared with the other rootstocks.

Dwivedi and Padmanabh (1999) gave a review of guava wilt in India. According to them, a brief account of the economic importance of guava is followed by the occurrence and symptoms of the disease. The modes of infection, causal organisms, and environmental and chemical factors that guide the development of the disease have also been emphasized.

Joubert, et al. (2000) applied different pruning methods to higher density orange, grapefruit, and orange orchards in South Africa, in 1996-99, which had become overcrowded five to six years after planting.

Saroj, et al. (2000) investigated that peach orchard can be raised successfully even on degraded land by adopting site specific agro-technique. The porous profile with only 60 cm top soil depth favored better vegetative vigour of peach plants as compared to those sites having soil only throughout the profile. The drip system of irrigation had good response on plant survival but overall plant vigour was not influenced much in juvenile peach plants compared to rain fed control under humid subtropical climate.

Nand (2000) studied the flowering biology and bearing behavior of hog plum. The studies were conducted with special reference to the variety ‘oval’. The trees bore pure panicles at the terminal end of last years growth. The flowering took place on naked shoots with the advent of the spring season.

Shukla, et al. (2000) investigated by an experiment conducted in Faizabad, Uttar Pradesh, India, during 1995-96, the effect of irrigation and mulching on growth of aonla.
Gupta and Bhatia (2000) examined that fruit fly population was monitored with the help of bottle traps in mango and guava orchards of sub-mountainous region of Himachal Pradesh, India. There was a significant positive correlation between the trap catch and maximum and minimum temperatures during both the years for both the hosts. The maximum catch coincided with the ripening period of fruits.

Gowswami (2000) studied the problems and prospects of marketing of horticultural crops in north eastern states of India. His main focus was on the productivity of horticultural crops in the region as compare to other states. According to him lack of adequate market infrastructure is responsible for low productivity which creates many other problems.

Devaraj (2000) tried to explain the channels of price spread in fruits and vegetable marketing in Mysore district of Karnataka. He focused the present marketing practices followed by the cultivators of fruits, vegetable and flowers. Cost and returns associated with the present method of market transaction. To get a desired result a sample of 50 fruits, 50 vegetables and 50 flowers was undertaken. It was concluded that there is the need to control the activities of the commission agent for encouraging self marketing. Steps like advancing production and marketing credit against hypothecating the future product and need for cooperative societies.

Dag and Gazit (2000) determined that effective insect pollination is essential for good fruit set and yield in mango. Insects visiting mango bloom were collected for 3 years (1994-96) in 10 commercial orchards located in all major mango-growing areas in Israel. According to him the following species played a significant role in mango pollination in most orchards: two blow flies (Chrysomya albiceps and Lucilia sericata), the honeybee (Apis mellifera) and the housefly (Musca domestica).

Dahiya and Saraswat (2000) Analysed the marketing of apples in Himachal Pradesh, India, shows that despite the price support for apples
announced since 1981, the marketing system is riddled with myriad problems. Farmers had marketing margins of 41 per cent in 1984-85 and 42 per cent in 1995-96. It is suggested that multipronged strategies should be explored for the future development of horticultural crops in the state in order to achieve better returns for the growers.

Orta, et al. (2000) conducted study in Turkey in 1997 and 1999 to investigate the effects of different irrigation methods and regimes on the vegetative growth of "Starking Delicious" apple trees under Thrace conditions. Drip irrigation gave better results than surface irrigation when irrigation water requirements, evapo-transpiration, and vegetative growth parameters were evaluated together.

Kumar and Singh (2000) conducted field experiments in 1995-96, 1996-97, and 1997-98 at Faizabad, Uttar Pradesh, India, with aonla and Kanchan to determine the effective fungicides against aonla rust. Pooled data revealed that all tested fungicides, except tridemorph, reduced the rust per cent disease index.

Prasher (2000) presented an Economic analysis of post harvest losses of apple in Himachal Pradesh. The main focus of his work lies on the fact that location of fruits producing areas in the interior, difficult hilly terrain with high altitude, weak transportation, lack of fragile commodities, lack of fruit storage facilities and delay of fruits by the post harvest system leads to quantitative as well as quantitative losses, which effect both internal and external trade.

Pramanick, et al. (2000) described the effects of low black polyethylene tunnels on the performance of strawberry cultivars investigated at Shimla, India, during 1996-98. Covering beds with black polyethylene hastened flowering by approximately one month, prevented soil erosion, reduced weed growth and winter injury, and increased total yields by 20 per cent Variation in cultivar performance was also observed.
Under uncovered conditions, Shimla Delicious gave the highest number of fruits per plant while Etna and Belrubi the highest yield per plant.

Singh and Attri (2000) studied that the West Indian cherry, a rich source of vitamin C, has a problem in propagation through seeds. According to him the hard wood cuttings treated with 1500 ppm IBA were most successful for the vegetative propagation of West Indian cherry.

Sharma (2000) examined that horticulture is best suited avocation for the hilly areas where typical climate, soil and topography provide better situation for horticulture crops as compare to other agricultural crops. The main focus of his study lies on the fact that economy of the hilly region is primarily due to adaptation of horticultural crops by the farmers, growers and orchardists, who had a vision of the future. The study traces the reasons for popularity of horticulture in the hills, and the importance and nutritive values of different horticultural crops.

Dris, et al. (2000) experimented that ‘Lobo’ apple fruits subjected to preharvest CaCl2 spraying treatment, pre-storage heat treatment, and CaCl2+heat treatment. Respiration and ethylene production rates were monitored and soluble solids, juice pH, firmness, and total dry matter and macronutrient contents were determined. Additionally, the incidence of physiological disorder and pathological disease were recorded. Respiration and ethylene production rates slightly decreased in heat-treated apples and increased in CaCl2-treated apples.

Sood, et al. (2000) showed that the rate of strawberry propagation through conventional technique is quite low and it is difficult to maintain plant material during the summer months. The protocol for tissue culture propagation has been further improved by using liquid medium with four layers of surgical bandage in it.

Brahm (2000) in his paper showed the current status of agro-processing of horticulture commodities in India. The review of his study
lies to identify the constraints experienced by fruits and vegetable processing industries and to project the prospects of fruits and vegetable processing and suggesting of policy measures for strengthen the network of fruits and vegetable processing industries. He concluded that a major technological change in agriculture can improve the status of horticulture crops.

Meghwal, et al. (2000) standardized a method for the quick establishment of aseptic cultures in guava from mature field-grown stock plants for micro-propagation through enhanced axillary’s branching technique. The problem of phenolic browning was also minimized to a great extent by leaching of phenolic compounds due to agitation in antioxidant solution as well as by proper drying of explants prior to inoculation.

Gorakh, et al. (2001) conducted a trial in Uttar Pradesh, India, to determine the effect of pruning dates on guava fruit yield. He find out that as compared to pruning in February and March, pruning from April through June, enhanced the number of shoots and flowering percentage. Shoot growth was reduced in May- and June-pruned trees. The total yield during winter increased significantly in May- and June-pruned trees than the unpruned trees of both cultivars. May pruning significantly increased the harvest in the winter season. Pruning from February to March did not respond well for winter fruiting. May pruning significantly increased the quantum of fruit yield harvestable in December and January.

Jana (2001) stressed that self incompatibility is one of the main problems causing low productivity of apple. In his experiment data on self pollination were recorded in first year to facilitate cross pollination in the following year. Controlled pollination was done following the standard method of emasculation and pollination on selected flower clusters.

Misra (2001) said that Powdery mildew caused by Odium mangiferae, is the most important disease of mango. It is reported from 35
countries in the world and reportedly cause up to 90 per cent loss in India. Besides inflorescence infection, it causes different types of symptoms on leaves and fruits. Based on epidemiological studies and control measures conducted he proposed that disease can easily be controlled by adopting suitable cultural practices and timely application of spray schedule. As the disease is weather-sensitive, need-based control measures are suggested based on the prevailing environmental conditions.

Singh, et al. (2001) studied the fruit quality of apricot cv. New Castle at 45, 50, 55, 60, 65, 68, and 73 days after full bloom in Ranichauri, Uttranchal, India, from February to June 1999. He find that fruit length and weight significantly increased whereas chlorophyll content substantially decreased, then remained stable until the harvesting period. Fruit weight, volume, and specific gravity, pulp weight, and total soluble solid, total sugar, and non reducing sugar contents increased until harvest.

Nigam and Kumar (2001) studied L. chinensis fruits harvested from 16-year-old trees grown in Pantnagar, Uttar Pradesh, India, which were subjected to various postharvest treatments and stored under ambient or cold storage conditions for 8 days.

Reddy, et al. (2001) studied five mango orchards in Nuzuvid (Andhra Pradesh), Srinivasapur (Karnataka), and Krishnagiri (Tamil Nadu), and were evaluated for leaf and soil nutrient status. Fruit yield was positively correlated with the available soil N at the pea-size fruit stage and with available soil K before and during flowering, and at the pea-size fruit stage.

Gorakh, et al. (2002) conducted experiment and find that the effects of foliar application of urea is the main source of N on the growth and leaf N composition of the guava cultivars. Sardar and Allahabad Safeda were determined in a field experiment conducted in Lucknow. Crop yield in both cultivars decreased with increasing urea concentration during the rainy season.
Gursharan (2003) has taken the biotechnology as a technology of the new millennium with the development or revolution of information technology. It is being presented as a panacea, a cure to solve the problem of 21st century food security, controlling pests and increasing field.

Patel (2004) examined that diversification of agriculture to Horticulture is very essential from the angle of minimizing risk, enhancing profit, generating nutritional and economic security and healthy environment.

Reddy (2004) wrote that high density orcharding is a holistic production management system, which promote and enhances agro-ecosystem, health, biological cycles, organic farming etc. It needs emphasis so that there is reduction in labour requirement, removal of human drudgery, cost reduction and timely operation resulting in improvement in quality and quantity to compete in global trade at cheaper rates.

Agro Economic Research Centre for North East India (2004) highlighted the prospect of commercial cultivation of fruits and vegetables in Assam. The trend of vegetable production in the potential area is quite encourageable. Development of marketing goods storage facilities, Hybrid varieties and quick transportation along with development of agro processing and agribusiness supportive service at private and public sector are essential to make vegetable crop cultivation enumerative. It also tries to find out that the profitability of vegetable crops cultivation as compare to other cereal crops are quit enumerative and studied the problem and difficulties faced by the grower in marketing, storage and transportation.

Paulraj (2004) stressed that nutrition is an important indicator for human health, The nutrition policy recognizes that “nutrition effects development as much as development affects nutrition” According to her the principal challenge of the future would be to put in place an effective sustainable approach that is capable of postering a healthy childhood.
Shaheen and Gupta (2004) elaborated that agro processing industries offer vast opportunities for increasing income, generation of employment and earning foreign exchange. He examined that apple crop dominates the horticulture industry and has an important role in economic scenario of Jammu and Kashmir and involving about half a million household. It plays a key role in rural economy of the state.

DMI (2004) in this article noted that the Directorate general of foreign trade Department of commerce and industry has notified directions of marketing and inspection for the export of fruits and vegetables to European Union. The DMI has harmonized eighteen standards of important fruits and vegetables.

Jairarath (2004) provided information about the capital investment subsidy scheme, growth and development of cold storage, effect of cold storage, preservation of the fruits in the cold storage and finally suggested about the whole process.

Kanwat (2004) presented that India shows the sign of playing a significant role in the world market. Apart from increasing the domestic demand export of fruits, vegetables and other food grain crops has also increased significantly. Besides in production system of flowers a significant change has also been observed.

Kalam (2004) reported that there is a two part series propounded on the nine missions for the prosperity of Jammu and Kashmir State. The first part of the mission includes horticulture and education entrepreneurship. In horticulture mission it has been shown that with its rich soil and climate the state Jammu and Kashmir become the natural hub of the whole nation and also this will enable application of research, technology and management for promoting high quality products in a coherent manner.

Lal and Sharma (2005) examined the dynamics and transformation of agriculture in western Himalayan region. Lahual and spiti Districts were
undertaken for their studies which are regarded as the most developed tribal areas and undertaken as a model for development of other tribal regions of the country. They show that tribal people have made steady and spectacular progress and are even better than non-tribal of the region. The socio-economic transformation in the region is due to development of tribal development programme through modernization and commercialization of agriculture and horticulture.

Agro economic Research Centre New Delhi (2005) pointed out that ministry tries to analyze the existing marketing infrastructure and services for fruits and vegetables in regulated whole sale markets of Delhi, to identify the major market arrivals buying and selling activities, major marketing channels and cost for selected fruits and vegetable in Delhi markets. The conclusion lies on the fact that all this is to evaluate share of farmers in consumers and rupee for selected vegetable and work out economic of vegetable cultivation with other competing crops.

Agencies (2005) showed that fruit farming in Kashmir got boost of development. Horticulture in Kashmir has a pivotal role in the socio-economic transformation. The horticulture produce and Marketing Corporation has entered into agreements with Indian Dairy Machinery Co. Ltd. Anand and Friek India Limited for setting up an integrated pack house at shopian in the Kashmir valley with an estimated cost of 388 crore. The main focus of the article is that the horticulture sector shell play pivotal role in the socio-economic transformation of the state with this agreement. According to the article the pack house will have cold storage and pre-cooling.

National commission on farmers (2005) referred that the government has constituted the national commission on farmers which submits the medium term report for food and nutrition society in the country in order to move towards the goal of universal food security within 3 months.
In this article by The Economic Times (2005) it has been stressed that floriculture along with pomology becomes an integrated part of rural economy in the north east India and different initiatives have taken by the union govt. agency (ADEDA) of motivating growers to taken up cultivation of some exotic, ornamental flower according to suitable agro climatic region to improve rural developmental condition.

Sharma (2005) told that the union government through its annual budget emphasized that the main thrust on agriculture sector would be to achieve further diversification in form activities. He also emphasized that Horticulture, dairy, floriculture, poultry, finesses would also developed.

Nanwal and kumar (2006) pointed out that sustained and meticulous research, planning and conscious efforts by the scientist, extension workers and farmers have given our agricultural a resilience to come out unscathed through a series of drought in Indian agriculture. India’s success on food has received international attention but have many challenges yet to increase ago-production on sustainable basis.

Sood (2006) pointed out that to generate higher level of awareness on technology inputs and modern applications in the agriculture sector, the sixth Krishi-expo was organized which highlighted the enormous potential of horticulture with latest technologies to increase production market interventions and processing techniques of viable addition.

Gandhi (2006) presented the export prospects of processed vegetables from India. He tries to explain that 20-25 per cent of total horticulture produced in the country is lost due to the poor harvesting practice. The article lies on the fact that the Indian food processing activity is still largely based on primary processing. He concluded that ministry of agriculture is extending financial support to boost the vegetable and fruit processing by setting new units and modernization and upgrading of already existing units.
Khan and Basharat (2006) presented that after achieving the self sufficiency in the food grain production the government laid special emphasis on the production of horticultural crops. Agricultural sector witnesses two major changes in the Jammu and Kashmir as technological and institutional which increase the production of fruits and vegetables with variations in different regions.

Guledgudda (2006) find out that the appraisal of financial investment in cashew plantation in Karnataka helps the cashew production in such a way that this industry plays a potential leading role in the social and financial upliftment of the rural and poor area. The main focus lies on the fact that cashew nut has gained impetus in the post liberalization period.

Agencies (2006) examined that the state Jammu and Kashmir with agricultural being the mainstay of 80 per cent of the population, making all efforts to create self sufficiency in this sector. Agricultural support about 80 per cent of state population and contributes about 60 per cent of the state revenue. Thus in such a situation the over all economic growth depends primarily on the progress made in the agricultural in general and horticulture in particular.

Gandhi (2006) tried to find out the export prospects of processed fruits from India. His main focus lies on the quality and advanced fruits processing technologies that have helped a great deal to boost the production of quality hygienic fruit juice and concentrate, Jams and jellies. The conclusion drawn from the study shows that processed fruits have emerged as an important export item in which many multinational companies are engaged directly and indirectly.

Jagdish (2007) examined the attention of people towards a newly development horticulture research in Kandi belt of Jammu region. His main focus lies on the fact that this horticulture research centre has all the varieties of fruit plant that can be planted only on rain water in the Kandi
areas of Jammu and likewise other region. While giving the locational analysis of this centre he added that the government has provided an institution for horticulture research in dry land at Rayha 28 km from Jammu city which can helps to a great extent in development of horticulture in the region.

According to P.T.I (2007) there is high requirement of industry or status of industry to the fruit grower in Kashmir. This article focus on the fact that many sorts of diseases and pests infect the fruits in Kashmir due to lack of proper steps taken by the government. The conclusion drawn lies on the fact that if the government failed to take some concrete step the grower will soon get deprived of livelihood. Facilities, I.P.M.C would set up the pack house where as the cold storage and pre cooling unit would be done by friek India.
References


Agro economic Research Centre. (2005). Fruit and Vegetable Mandies Located in Urban and Semi-Urban Areas of Delhi, Agricultural Situation in India; Vol. 61, pp.799-801.


Chapter-1


Advancement of Horticulture, N.D. University of Agriculture and Technology, Kumarganj, Faizabad, India, pp.37-38.


**WEBSITES**

http://www.kashmirhotravel.com/weather.asp

http://ikashmir.net/geography/chapter1.7.html

http://www.kashmirhub.com/geography-of-kashmir/


http://rajouri.nic.in/