Dynamics of horticulture in Kashmir, India

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Abstract

Kashmir has rightly been described as, the land of fruits. Its land environment and salubrious climate has provided greater facilities for horticulture industry to grow more rapidly. The apparently growing fruit industry has changed the social and economic status of our rural Kashmir and helped its people in reshaping their economy to some extent. Presently, a total of 347,223 hectares (68, 64,460 kanal) of land are under fruit cultivation in Jammu and Kashmir with 230,187 (46, 03,740 kanal) hectares in Kashmir and 117,036 (23, 40,720 kanal) in Jammu region. Of this 1.76 lakh hectares are under apple cultivation alone. The vibrant fruit industry of Kashmir holds key to remedying the economic ills as well as containing the widespread joblessness in the state.

Keywords: cultivation, economy, environment, horticulture, salubrious

Introduction

Horticulture is defined as the art and science of growing fruits, vegetables, herbs, nuts and ornamental plants (trees, shrubs, flowering plants and turf). The separation of Horticulture from agriculture as a distinct activity is usually dated from the middle ages in Europe. Although horticulture and agriculture have many practices in common (weeding, fertilizing, watering etc.), horticulture is distinguished from agriculture by its specialized practices, for example, grafting, and by the smaller scale of its operations Horticulture can be divided into three main sectors: fruit growing (pomology); market gardening (vegetables and herbs) and ornamental plants, which some call floriculture and landscape horticulture, can be further divided, for example, into arboriculture (woody plants) and floristry. Nut cultivation (used to produce oils, fats and ornaments) and grape growing (viticulture) are smaller horticultural divisions (Edwinna von Baeyer, 1983). Kashmir is famous for its picturesque landscape and lush green meadows and apart from tourism, fruit industry forming important constituent as far as Kashmir’s economy is concerned. it stands as a pillar of strength and plays pivotal role in providing sustenance to a large number of people. Fruit production in the valley is around 15-17 lakh metric tonnes annually, though Kashmir has a capability to produce 25-30 lakh metric tonnes every year.

Historical perspective of horticulture in Kashmir

Kashmir has been the home of large varieties of fruits. Ancient records of Kalahans Rajtarangi and that of Alberunis records mention the existence of numerous varieties of Fruits in the state. History of fruit production in Jammu and Kashmir dates back to even 2000 B.C; when apples were reported to have been cultivated. Its cultivation got extended during the reign of Laltaditya in 1089 A.D. Bamzai (1987) reports that these fruits were indigenous and grown for local consumption only. Apples of Kashmir have found mention in Tuzki jahangiri, where Lawrence
has called, Kashmir valley as fruit country in his famous book, ‘The valley of Kashmir’. However, horticulture started in an organized form in around 1865 when Ermins, head gardner of public works department in France, after preliminary survey, introduced some fruit plants and planted at Cheshmashahi Srinagar in 1875. The collection of about 25,000 wild fruit stocks by one R.Gollan and their plantation at Banghi Sundri near Sopore, for grafting and distribution in state orchards, marked the beginning of nursery which provided the corner stone for the development of horticulture in state.

The horticulture sector further encouraged with the establishment of department of Agriculture-Sericulture in around 1906 which latter on bifurcated into separate departments of Agriculture and Sericulture. Considering the potential of fruit cultivation in state a separate Department of Horticulture was carved out in 1962 which gave further fillip to the horticulture sector in the state. This was followed by establishment of department of horticulture planning and Marketing and Jammu and Kashmir Horticulture produce and Marketing Corporation (JKHPMC) in 1983. During the early five year plans, priority was assigned to achieve self sufficiency in food grains production. Over the years, horticulture also emerged as an important and growing sub sector of agriculture, offering a wide range of choices to the farmers for crop diversification. It also provides ample opportunities for sustaining large number of agro industries which generate substantial employment opportunities. With agriculture and allied sectors finding alternate ways of increasing productivity of crops, horticulture as a sub sector, is a revelation, showing remarkable signs of progress in the state. Jammu and Kashmir State is well known for its horticultural produce both in India and abroad. The state offers good scope for cultivation of horticultural crops, covering a variety of temperate fruits like apple, pear, peach, plum, apricot, almond, cherry and sub tropical fruits like mango, guava, citrus litchi, phalsa and berete. Besides, medicinal and aromatic plants, floriculture, mushroom, plantation crops and vegetables are cultivated in the state. Apart from this, well known spices like saffron and black Zeera are also cultivated in some pockets of the state. Horticulture is gaining momentum in the state as its contribution to GSDP remains around 7-8% over the past few years. As a result, there is a perceptible change in the concept of horticulture development in the state. There are around 6 lakh families comprising of about 30 lakh people which are directly or indirectly associated with horticulture. Horticulture development is one of the thrust areas in agriculture and a number of programmes have been implemented in the past, resulting in the generation of higher incomes in the rural areas, thereby improving the quality of life in villages.

An income of Rs. 4,100 crore has been generated from fruit production during 2011-12 which includes an amount of 495 crore from dry fruits (Directorate of Horticulture J & K). The growth of horticulture sector can be attributed to various initiatives taken by both centre Govt; and State Govt; towards market interventions viz. establishment of fruit mandies, provision for support price, technological support, awareness options, publicity inputs, research extension etc. Apple is the most important fruit. As per the latest horticulture census about 1.76 lakh hectares are under apple cultivation alone. It is also important in terms of production and provides the maximum marketable surplus. About 30% of A-grade, 40% of B-grade and 30% of C-grade of prefalls and culled apples account for substantial quantum of 50 thousand
tonnes which needs to be exploited as raw material for processing industry.

*Trends in area and production of horticulture*

The data of area and production for the last ten years, it would be observed that there has been a continuous increase in trend both in production as well as in area. Table 1 shows that the area under fruits has increased by 5.23 percent in the 2011-12, whereas the fruit production has increased by 26.5% in the same period. A comparison of the area and production can be made with the help of following tables/figures: A perusal of table 1 and fig. 1 shows that both area and production of horticultural crops seem to be increasing simultaneously. The increasing trend of both area and production can be attributed to various factors mentioned below.

Both the centre government and state government has taken initiatives towards market intervention viz. (i) Establishment of Fruit mandies, (ii) Provision for support price, (iii) Technological support, (iv) Awareness options, (v) Publicity inputs and (vi) Research extension.

In addition to this, the continued increase in productivity and area can be attributed to modal factors like commitment of the farmers/orchardists towards this sector, high value of returns earned by exporting fruit commodities particularly apples, Continuous efforts of the Department of Horticulture and Research organization, provision of Hi-Tec facilities for storage to increase the shelf life of various fruits and above all the conducive agro-climatic conditions of the state makes the investment in the Horticulture sector worth increase in area and production. In view of the potential for development of fruit crops and management of existing orchards, Department of Horticulture has a major role to play. Various schemes with a number of incentives are being provided to the fruit growers to keep them actively involved in this economically viable trade.

To advise and assist in the formulation of Development plans of the horticulture sector, to organize promotion and publicity for better marketing of fruits and vegetables, to provide market intelligence and information to the fruit and vegetable growers and those involved in the trade and distribution of these commodities, to conduct or get conducted economic and market studies relating to production distribution, utilization of horticultural produce, to coordinate efforts for providing facilities at different dispatch, distribution and marketing centers.

To supervise and regulate the grading and packing of horticulture produce, to assess and solve problems involved in the marketing, distribution and utilization of horticultural produce and to organize and supervise Fruit Growers Cooperative Marketing and Processing Societies.

*Present role of government in strengthening horticulture in Kashmir*

The horticulture sector is responsible for generating substantial livelihood for people and strengthening the economy. As it offers promises for investors, the state government provides incentives under the micro, small and medium enterprise (MSME) programme. The government has taken various initiatives for rejuvenation and strengthening of horticulture sector in the State so that socio-economic status of the people linked with this sector.
Table 1. Annual production of fruits in Jammu and Kashmir (2001-2013)

<table>
<thead>
<tr>
<th>Years</th>
<th>Area (Hectares)</th>
<th>Production (M.Tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001_02</td>
<td>221512</td>
<td>1097208</td>
</tr>
<tr>
<td>2002_03</td>
<td>231727</td>
<td>1146586</td>
</tr>
<tr>
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<td>1690059</td>
</tr>
<tr>
<td>2009_10</td>
<td>315205</td>
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</tr>
<tr>
<td>2010_11</td>
<td>325133</td>
<td>2220493</td>
</tr>
<tr>
<td>2011_12</td>
<td>342795</td>
<td>2161034</td>
</tr>
<tr>
<td>2012_13</td>
<td>377531 (ending October 2012)</td>
<td>1883500</td>
</tr>
</tbody>
</table>

Source: Directorate of Horticulture J & K

Fig. 1. Yearly Area /Production of fruits in the Jammu & Kashmir

is improved besides the name and fame of Kashmiri fruit industry is revived. The horticulture sector has been streamlined on modern and scientific lines besides upgrading its infrastructure on modern and hygienic trends. The various government programmes for horticulture development in the state are described below.

Rashtriya krishi vikas yojna: About Rs 80 crores were spent under centrally sponsored scheme Rashtriya Krishi Vikas Yojana (RKVY) in Jammu and Kashmir during 2012-13 for the development of agriculture and allied sectors. This includes Rs 21 crore for increasing production and productivity of crops, fruits. Different measures were undertaken for strengthening of infrastructure and increasing agricultural production, 124 Bore wells, 2948 Vermi Compost Units, 9396 Green Houses, 242 Tube Wells, 67 Deep Bore Wells were
established in the division whereas 9182 Irrigation Pump Sets, 942 Power Tillers, 419 Tractors, 214 Motorized Vending Carts, 165 Trolleys, 2800 Foot Sprayers, 8646 Farm Tool Kits were distributed among the farmers.

Technology mission

Technology Mission for Integrated Development of Horticulture in North Eastern region including Sikkim was approved with an outlay of Rs 229.38 crore for the IXth Five Year Plan period. The implementation of the scheme was extended to the States of Jammu and Kashmir, Himachal Pradesh and Uttarakhand during the 10th Five Year plan with an additional outlay of Rs 260.00 crore. The scheme aims at establishing convergence and synergy among various ongoing governmental programmes through their horizontal and vertical integration, to ensure adequate, appropriate, timely and concurrent attention to all the links in the production, post harvesting and consumption chain.

Under Horticulture Mission assistance is available for a wide range of components from nursery raising upto creation of post harvest infrastructure processing facilities. This scheme covers all horticultural crops which even include Floriculture and Vegetable cultivation as well. During 2011-12, an allocation of Rs. 677.95 lakh was earmarked for the scheme against which Rs. 677.95 lakh have been incurred. Expenditure ending November, 2012 was of the order of Rs. 196.00 lakhs, against the released amount of Rs. 237.00 lakhs.

Post harvest management (PHM) The horticulture crops like fruit, vegetables and flowers are perishable in nature and require special attention in their harvesting, handling, packaging, storage and processing operations. It is viewed by experts that 10% losses occur at field level, 5% during transportation, 2% during packaging, 9% at storage and 4% at processing, aggregating to 30%. Keeping in view wastages at various stages, the department is concentrating on development of post harvest infrastructure like cold storage, pack houses and intensive training programme on PHM of horticulture crops.

Plant protection machinery

Plant Protection Machinery is an essential component of all the programmes and plays a significant role in improving the productivity and quality of fruit. Fruit crop has a high return per hectare compared to the conventional food grain crops. The State Government is implementing various schemes to promote horticulture. To encourage the fruit growers and to promote trade, toll tax on export of fruit was abolished from 2002-03. Sprayers and pumps are provided to fruit growers on subsidized rates. The scheme envisages providing of plant protection machinery to the farmers/orchardists on subsidized costs. Up to 2010-11, 5641 power sprayers and 13219 manual sprayers involving a subsidy component of `Rs. 394.87 lakh and Rs.198.28 lakh respectively, were provided to the orchardists, under centrally sponsored scheme Technology Mission. Besides 2166 pump sets and 208 power tillers with subsidy component of Rs. 194.94 and Rs. 72.00 lakhs, were also provided to the orchardists under the said scheme.

Fruit and vegetable mandies

Development of fruit and vegetable mandis scheme was started in Jammu and Kashmir State in the year 1997-98. For developing 36 fruit and vegetable markets, in a phased manner, at an estimated cost of Rs. 9426.00 lakhs, with a view to overcome the marketing challenges for the horticulture produce viz. vegetables and fruit, which have increased manifold over the years. In the first phase, fruit markets at Kulgam, Shopian, Handwara and Pulwama were constructed and made functional. The growers have been
able to sell their produce in these markets to get better returns at their door steps, which is the prime objective of the scheme. The fruit and vegetable markets at Baramulla, Kupwara and Batingoo (Anantnag) Bishnah, Batote and Rajouri are under construction.

In the second phase, four satellite markets at, Poonch, Doda, Zazna (Ganderbal) and Akhnoor Phase-II were constructed. In the third phase, one terminal markets at Jablipora Bijbehara had been constructed to build a complete network of markets to facilitate producers to make them sell their produce to ultimate consumers. At present three main fruit and vegetable markets are operating with one each at Nowpora-Sopore, Parimpora-Srinagar and Narwal-Jammu. These markets are being developed into main centres for collection and sales of fruit and vegetable in bulk. Terminal Market, Sopore covers the maximum Horticulture (Apple) producing areas of the State, spread over 300 Kanals of land. The Department has launched a campaign aimed at implementing the Agricultural Produce Marketing (Regulation) Rules (APMR) Act in every fruit and vegetable market area in consonance with the provisions of the Act. The work to establish 6 fruit and vegetable mandis at Poonch, Rajouri, Akhnoor, Batote, and Bishnah (Samba) in Jammu Division are in progress.

Fruit growers co-operative marketing societies

Planning and Marketing Organisation which helps the small fruit growers and organizes them into co-operative fold, in order to save them from the exploitation by fruit commission agents and money lenders. These societies promote direct despatch of fruit to the markets within the country and help to regulate the supplies within limits to lessen the chances of glut controversy in the market(s). These societies also help the growers in grading and packing the fruit to save excessive damage to the product. To provide more efficient delivery of extension services, work related to procurement and distribution of machinery, green houses etc. to the orchardists, has been taken from the Directorate of Horticulture and assigned to JK HPMC.

After witnessing the losses and exploitation which the fruit growers have to undergo, decided to come up with a CA cold store in order to increase the shelf life of fruits which otherwise farmers have to sell at cheaper rates as there were no storage facilities for them. It is the first farmer driven integrated CA cold store project in Jammu and Kashmir which is mainly dealing with the apples among other horticultural produce. Golden Apple is the state of the art integrated CA cold store facility at industrial estate at Lassipora in Pulwama with an initial capacity of 2000MT of apple. The fruit is exported outside the state by the fruit growers to AzadpurDelhi, Chandigarh, Amritsar, Jaipur, Patna, Kolkatta, Kanpur, Agra, Varanasi, Mumbai, Pune, Bangalore, Indore, Hyderabad, Chennai etc.

Future proposals: (i) Apple insurance scheme

As a significant measure to reform and promote Horticulture Sector, the Jammu and Kashmir Bank Limited has decided to launch Apple Insurance Scheme. The initiative is first of its kind. For introducing modern pre and post harvest technologies in the Horticulture sector, the Government under public-private tie up with Jammu and Kashmir Bank Ltd., has decided to construct a chain of compressed AIR (CA) stores in each district of the State to withstand stiff market competition in the liberal trade regime.

(ii) Development of olive cultivation

Production of Olive is the most extensively cultivated fruit crop in the world. Its cultivation areas have
increased in the past 44 years, passing from 2.6 to 8.5 million of hectares. In India, Jammu and Kashmir alone can earmark 30,000 hectares of area for Olive production. In Jammu and Kashmir, olives can be grown in Poonch, Rajouri, Doda, Udhampur, Ramban, Reasi and in Kathua districts. If we only take Jammu and Kashmir into account and make an effort to have a yield of about 20 to 25 q/ha from these pockets of Olive cultivation areas, the state can produce minimum 600,000 quintals of olives. Roughly 96,000 quintals of Olive oil can be produced from the State of Jammu and Kashmir.

(iii) Walnut cultivation in Jammu & Kashmir

Walnut is a major dry fruit crop grown in J & K State. The Production of this crop has touched 175.09 thousand M. Tonnes in Kashmir Division and 49.50 thousand M. Tonnes in Jammu Division. Latest techniques of walnut budding/grafting have been introduced which have helped in reducing gestation period of this crop. With assistance of APEDA, a Hi-Tech Green House has been set up at Zakura which is being used for raising budded/grafted walnuts. Besides this, one more Hi-Tech green House has been set up at Siot, Rajouri. Walnut cultivation plays a significant role in the economic profile of the farmers living in hilly and backward areas, where economic condition of the people is extremely fragile.

(iv) Provision of cold storage in valley

Lack of cold storage in Valley forces growers to sell produce at cheap rates. The main reason of mismatch in supply and demand is the lack of cold and conditional atmospheric storages in the valley. Government is trying to provide cold storage facilities to growers. Apple from valley has rich taste and contains high nutrient contents compared to those produced by other States, but the valley does not possess a single cold storage facility for apple preservation. According to the figures available, 400,000 tonnes of apple are ruined by the scab every year. Other diseases like alternaria, red might and powdery mildew also spoil the crop. Cold storage facilities are to be created in all the districts of the State where the fruit could be stored for a longer period.

Limitations and future strategies

The major limitations for development of horticulture include:

(i) Fake and substandard supply of pesticides and fungicides caused damage to the apple trees, thereby hitting quality and taste of apples. The fruit industry suffered huge losses due to supply of these fake and substandard pesticides and fungicides. Monitoring the supply of pesticides and fungicides to the state is necessary.

(ii) Global warming experienced during the last two decades adversely affected the production of fruit crops. Late and less snowfall accompanied by late onset of bud dormancy lead to insufficient chilling requirement. Dry spell during May-June affect fruit yield and also affect fruit yield of succeeding years due to poor fruit bud differentiation.

(iii) The uneven distribution of rainfall during the critical fruit development period enables trees to suffer from serious moisture stress during these periods. Water harvesting and water management practices have not been standardized. Most of the orchards lack irrigation facilities. In absence of proper irrigation facilities and water harvesting measures, the crop suffers heavily especially when rainfall is inadequate. Lack of knowledge of moisture conservation and water harvesting techniques also add to the low yield.
(iv) The fertilizer application is made before flowering at a period when rain often occur which leads to leaching of nutrients, hence, rendering soils infertile. The injudicious and untimely fertilizer application result in very low yields of orchards.

(v) The state requires large quantity of planting material, genetically modified, disease resistant for area expansion, renovation and replanting old orchards. There is no organized system in place to produce large quantity of virus free planting material. Further no recognized mother orchards or bud wood banks are available which could cater to the needs of farmers.

(vi) Most of the orchards are 30-40 years old and unplanned. When the trees are older and grow bigger in size, the cropping zone gets farther away from the trunk each year and surface area is increased annually which receives yield per unit area. Besides there is a replant problem in these orchards (Sharma and Jindal, 1997)

(vii) State is located farthest from the terminal market as compared to Himachal Pradesh and Uttaranchal. This increases the cost of carrying fruit to the mandies. Further the supporting infrastructure like roads are either inadequate or in poor shape and cold stores, CA stores or cold chain for maintaining and preservation of quality of fruit is not available to regulate the supplies.

(viii) The marketing in apple is not organized properly. There is no up to date market information system in the state to plan and regulate the market which often results in glut and low returns to the growers. In absence of properly marketing system and infrastructure required for post harvest management, post harvest losses are very high

(ix) Average size of the holdings of the orchards is less than one hectare and large proportion of farmers is marginal farmers which increases the cost of production of fruit per unit area. Further due to difficult terrain in some areas of the state, cultural and postharvest operations cannot be fully mechanized.

(x) Indiscriminate and unplanned fruit production of unknown rootstock and that too in traditional paddy lands has manifested in some serious production problems which in long run will be disastrous for the fruit industry in state.

(xi) Weak support currently available for transfer of technology has been identified as one of the major constraints in improving productivity and quality of horticulture produce.

Future strategies

(i) Raising of new orchards with locally adopted regular varieties grafted on root stocks which can be adopted for high density planting. Disease free planting material-mother blocks with virus cleaned material have to be established-backed by sero-dignostic techniques that ensure freeness of plants from diseases.

(ii) The state government has to play a role for improving the availability of healthy and quality planting material through its own sources and well as promoting public especially NGOs and private sector in this regard in view of enormity of demand.

(iii) With the growing concern over decreased availability of water, micro irrigation needs to be
(iv) Promoted along with high density plantation in horticulture sector, in areas, which are suited to the system. Along with micro-irrigation, liquid fertilizers are also applied to the plants. With this fertigation technique, nutrients are applied with precision directly to root zone which saves more than 30% of fertilizers.

(v) The commodities grown through the use of synthetic materials do not attract the world market, because of health and other related problems. Consequently the demand for organically produced products has increased. The thrust is to reduce use of synthetic materials and encourage the application of inputs from organic source for the production of crops. This is regarded as the best solution to restore our natural resources and to safeguard our environment.

(vi) Horticulture is regarded as input intensive activity, where technological knowhow and operational capacity of growers, work force of concerned departments should of high order. This demands extensive training programmes for growers as well as the extension workers at frequent intervals in specified activities like nursery management, canopy management including top working of old trees, water and soil management, integrated pest management, layout and maintenance of high density plantation. This should be a regular process at zonal or district levels to upgrade the skill of work force. This would also promote transfer of technology to farmers.

(vii) Post harvest losses of fruits in Jammu and Kashmir are very high. It is estimated that these losses are as high as 30-40 per cent. Adoption of proper post harvest management package will reduce losses and increase the acceptance of fruits in the national and international market. Postharvest losses can be controlled through pre-harvest treatments as well as through package of post harvest management.

(viii) Marketing problem of fruits in Jammu and Kashmir and across the country are increasing day in and day out. The marketing costs have been increasing without matching increase in the net returns, notwithstanding the inconveniences involved in the complicated market system. If the horticulture of the state has to be competitive in the domestic as well as export markets, emphasis should be given to cultivate varieties having standard export value. There is need for better understanding of the domestic and export trade and to identify potential areas of marketing. All markets related to horticulture should be linked through Market Information Service through internet.

Conclusion

Development of agriculture in Kashmir needs some critical management inputs particularly that of supply chain management-collaboration among various stakeholders along with efficient vertical and horizontal integration. The horticulture sector in particular has to prioritize development of research in the issues of genetics, biotechnology, integrated and sustainable production systems, post-harvest handling, storage, and marketing and consumer education. Diversification offers an attractive option and a major source of pushing up growth of agricultural sector. While technological up-gradation and associated institutional changes are identified as thrust areas for future development of the horticulture sector, exports are considered to be most important for the growth of the sector. Kashmir can look forward to emerge as a...
major producer of horticultural products and thus secure reasonable market access for its agro exports, which are largely dependent on the competitive technologies that will help in enhancing export potential. This development will also help in overall growth of the economy through generation of extra foreign exchange, creating employment opportunities and also upliftment of the small and marginal farmers, with definite positive implications on income and employment. The government should create a positive environment that will ensure a mutually beneficial relationship between farmers and organized sector. Horticultural crop diversification should be encouraged by intercropping horticultural with non-horticultural crops. This will yield more food, more income and better soil health.

The horticultural development requires a minimum set of basic production factors, an optimal crop management infrastructure, post-harvest infrastructure, entrepreneurial management and horticultural expertise, logistical infrastructure and supporting financial infrastructure. Development of horticultural sector should be accompanied by the growth of the agro processing Industry. Thus the production strategy should target not only meeting the domestic and export demand of fresh products but also of the processed products. There is the need to improve postharvest operations related to handling, storage and marketing of fresh and processed produce. Volumes saved in post-harvest losses are actually the surpluses generated, without additional cost.

References