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Conclusion
Suggestions
Conclusion and Suggestions

Fruit Culture and its present pattern in the state of Jammu and Kashmir in general and in District Rajouri in particular have been evolved within the framework of geographical environment like landforms, drainage, soil and climate. Climate however, played the basic role because cultivation of fruit trees on such a large scale as in Jammu and Kashmir was not possible in any other type of climate. The District Rajouri lying in the foot hill of mighty Pir Panjal represents a structural unit comprising valleys with gentle as well as steep slope. The area is well drained by the river Manawar Tawi, Ans and a host of their tributaries, with the result that an ideal setting for fruit culture is evolved. The cultivation of orchards along the slopes and in the plain valleys adds to the scenic beauty provided by the natural landscape of the region.

The slopes of the surrounding mountains around the valleys are almost gentle. Fruit cultivation in certain areas has, therefore been extended to upland, enabling an observer to see the demarcation zone between the low level and the mountains. The tributary valleys of the river Manawar Tawi form a significant physical unit for the cultivation of fruits.

A number of snow-fed streams move down through Thannamandi Darhal and Budhal areas which are located in the west, north and east of district headquarter. Along the sides of these valleys are found some patches of meadows, apricot, peach, plum and walnut trees. These areas are also well known for their natural scenery. Where walnut, almond and apple orchards are dotted about, depending upon the suitability of the slope and soil.

The state of Jammu and Kashmir for its peculiarities in the variation of temperature, precipitation and humidity can be classed as a separate climatic region. Its climate ranges between temperate to subtropical. Spring begins after March and lasts till May. This is the rainiest season of the year.
Summer Monsoons cannot reach in some parts of the area because they are checked by the Pir panjal mountain barrier towards south west.

July is the warmest month with temperature being 35°C and the coldest months are January and February with minimum temperature between -1.9°C and 0.3°C. The average annual rainfall in 550 mm considering the climatic requirements for fruit culture, it is observed that annual rainfall in very important and any decrease in the amount of minimum rainfall may adversely affect the fruit crops. Further the growth of fruit trees will also be affected and it is very likely that some of the trees which otherwise can bear fruits may not at all have fruits. Favourable climatic factors, coupled with geomorphic processes have very much helped in the formation of the present category of soils. Some of these soils are ideal for fruit culture and a few others are well-suited to the cultivation of important commercial items and other food grain crops. It has been absorbed for the whole state that as the altitude increase, the immature soils are encountered on the mountain slopes. Higher up, the soil cover becomes thinner till the confined only to the valley bottoms. This is perhaps the main reason that orchards are generally found in the bottom of the area.

The present land use patterns, which have evolved under the prevailing climatic conditions and the soils, reveal that out of the total area under different categories of land use, only a small area devoted to fruit culture. It is interesting to note that one third of the total population of Jammu and Kashmir directly or indirectly engaged in fruit farming where as only a small percent of the cultivated area in under fruit culture. This small area is supporting about one-third of the valley population.

It is further observed that most of the orchards are not located within the irrigable tracts. Many are generally scattered over the elevated lands where irrigation facilities cannot be provided. The orchards which have been developed over upland areas usually depend upon rainfall that is expected during the spring season. It is therefore true to say that cultivation
of fruit to a large extent lays at the mercy of available rainfall. In the years when there is any deficiency of rainfall, fruit crop does not give normal production.

The horticulture experts are of the opinion that irrigation is very essential for the crop especially during fruit bearing period. It helps in the overall development of the fruit trees and makes them resistant to various minor diseases. Besides, size of fruit and colour, according to variety are directly linked with occasional watering of the orchards. Hence in the absence of proper irrigation facilities size and colour of fruit are adversely affected. It results in poor grading of the fruits both from the point of view of size and colour and thus the growers have to incur great losses.

In view of the urgency of meeting the water requirement of fruit trees particularly on higher lands, perennial streams should be tapped at suitable parts so that irrigated water wherever necessary could be made available to the orchards. This scheme will surely step up fruit production in the years to come. It is observed that the paddy lands, particularly in the areas like Thannamandi, Darhal and Budhal paddy does not ripe fully till the harvesting time, may be substituted by orchards, which can give better yields. Cultivation of fruit in such areas may be the proper use of the land.

According to the information available from the state government, Cereals and non-cereals including vegetables occupy more than half of the cultivable land in the state and about forty percent of the total population of the state is engaged in agricultural activities. From this one can easily infer that smaller area under orchards in supporting large mass of the population where as large land under and non-cereal crops can support forty percent of the population. Further people, who are engaged in fruit cultivation, are far better of than those who are growing food and non food grain crops excluding orchards. It seems therefore, most logical that more area should

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1 Information collected from the Directorate of Evaluation and statistics, old Secretariat, Srinagar.
be earmarked for orchards. This slight change will not only solve the existing problems of unemployment but is likely to enhance the profits to the growers.

To illustrate the point cited above, a comparative picture of the productivity of cereals, non-cereals including vegetables on the one hand and fruit production on the other can be considered. Looking at the productivity figures, it is found that one tonne per hectare is obtained from lands under cereals and non-cereals whereas from the same area, about eight tonnes of fruits can be produced. Allowing for the costs incurred in both the cases. The net income from the orchard is approximately eight to ten times greater than that in the case of cereals and non-cereals. If this calculation is accepted by the government, then the future development programmer in the sphere of agriculture should be reorganized and restructured in such a manner that more areas should be allowed to orchards then to cereals and non-cereals. This change in the existing land use will go a long way in ushering an era of happiness and prosperity to the people of the area.

In Rajouri like the other parts of state orchards are usually located on the elevated lands where settlements have also come up during the last few decades. This trend is gaining momentum and construction of new houses and development of towns is taking place on the elevated lands where orchards are located. As a result of this tendency the present area under orchard is gradually decreasing and sometimes fruit trees have been felled to make houses for settlement purposes. The higher areas being safer for settlement, people like to be away from the level plain the valley which is often subject to floods during the rainy season or when the snow melts. Beside the Gujjaras and Bakerwals like to settle at slopes because of the open space free from friction for their cattles.

Further, during summer time, higher areas are cooler than the low lying plains, thus people like to settle down on relatively higher available
lands. In view of this fact and because of the ban imposes by the Jammu and Kashmir government, for growing orchards in the irrigable area lying in the plains cultivation of fruit trees can be extended to areas which are uncultivated excluding fallow lands, presently, the area under this category of land is one and half times greater than the area under existing orchard lands. This area in future should be covered with orchards so that decrease in the area under orchards on account of encroachment by the development of new colonies could be compensated.

It has been observed during field studies that about seventy percent of the operational holdings under orchard are less than one acre and this small holding is distributed among the ninety percent of the fruit growers. Enquiries reveal that small size holding give better yields than large size holding. The reason for this seems to lie in the fact that small size holding are looked after by the family member, who perform necessary operations in the orchards, where as in large size holdings, family member alone cannot do all the work associated with the orchards. Hence labour is to be employed.

In the whole state labour is very expensive because of its being a tourist centre and also because of the fact that large number of labour is busy in the production of food crops. Therefore labour according to need and at the proper time in not available for work in the orchards. Lack of required number of labour in large size holding leads poor yields. This is a serious problem with which the big owners of orchard are faced. If it is not solved properly, this might adversely affect the fruit culture, in the state.

In view of the difficulties posed earlier, it many be suggested that fruit cultivation should be mechanized wherever possible so that problem of labour could be solved to a certain extent, because with mechanization less manual labour will be needed. This change over is only possible when the big owner of orchards realize the utility of mechanized farming.
Another important suggestion needs consideration that the small owner of orchards may form cooperative societies which may look after their interest. In this way they can be in a position to use the modern techniques on fruit culture, use of insecticides for spray of other disease killing medicines can easily be possible with cooperation. These devices are likely to enhance the overall products of fruits with fewer expenses.

Further it has also been observed that two main types of orchards exist; (i) mixed kind of orchards, like, apple, walnut, pear, almond and (ii) mixed variety orchards, for example different varieties of apple are grown in the same orchard, e.g. ambri, red delicious, maharaji, american and white dotted red. Field survey reveals that these types of orchards create many complications. For example, the rate of vertical growth, as well as horizontal differs from kind to kind and even among different varieties of the same kind. It leads to overlapping of branches and thereby obstructing sunrays, which are very essential for every fruit plant from the point of view of growth, healthy development of fruit and power of resistance against bacterial attack. Similarly some kinds of fruit like walnut do not allow other kinds of plants to grow successfully in their vicinity because of the toxicity of the tree.

On the personal experience of the researcher, it is found that there are certain varieties of fruits which are more liable to infection caused by certain disease. In such cases, the owners of the orchards have, as a precautionary measure, to arrange for spray the whole orchard with a view to wipe out the disease from the orchard. Such operations involve heavy expenditure, which small growers cannot usually meet. Hence in many cases, the fruit trees are very much damaged. Further. It has also been noted that not only different kinds of fruit but even different varieties of the same kind of fruit, ripe at different times. As a result the orchard has to be looked after for a maximum period of the year this entails an additional expenditure which the owner of the orchard has to bear.
Another main drawback in mixed kind and variety wise orchard is that their fruit bearing period and the time of harvesting differs. As a result it causes variation in the seasonal requirement of fertilizers. Hence the application of particular manure at a particular time no doubt is beneficial for a particular kind or variety of fruit but it may create complications for other kind and variety of fruit growing in the vicinity. These problems very often cause set back to the owner of such orchards of the state.

To avoid such inconvenience and the other unnecessary expenditure involved in such type of orchards it is suggested that each orchard should have one kind and one variety of fruit. This practice will surely reduce the burden of additional expenditure and thus may provide relief to the growers.

Fruits grown in association with one another not by more chance but rather as a result of deliberate option and as such choice is limited by ecological and habitat factors such as physiographic, climatic and biotic conditions prevailing at that time. Thus the study of the association of fruit crop is not only concerned with the physical setting but also with the human response that is involved in a diversified and complex environment.

It is revealed that besides physiographic, soil and climatic conditions, socio-economic conditions are also responsible to a great extent. It has been observed from the fact that wherever the fruit growers' economic condition is a bit stabilized, cultivation of walnut and almond are encouraged. In order to increase the area under orchard people of the area particularly Gujjars and Bakerwals should be encouraged to enhance the cultivation of fruits on their land by providing them necessary infrastructure facilities.

In the whole state of Jammu and Kashmir, fruit trees very often is exposed to the ravages of pests and disease. With the result that they reduce not only the productive capacity of trees but also adversely affects the
quality of fruits. In order to control the diseases, the government of Jammu and Kashmir is helping the growers to get fungicides at subsidy.

If the incidence of the famous disease ‘apple scab’ remained unchecked by some economical measure it may adversely affect the production of apple and thus the growers will be put to great losses. It is possible that the cultivation of this category of fruit may in due course of time become uneconomical. The major cause of the ‘apple scab’ disease is that it perpetuates through fallen leaves in the orchards and assumes serious proportions when wet weather conditions prevail. In view of this fact, it is suggested that instead of spending huge amount of money on fungicide subsidy, some amount should also be kept at the block level for the award of cash prizes. It will provide an incentive to the orchardists for keeping their orchards free from scab infection. In the absence of fallen leaves in the orchards which are the main carrier of the disease i.e., scab, it is very likely that the infection of the disease will be reduced to about ninety percent when cash prizes are given to the grower for keeping their orchards free from scab and fallen leaves.

Similar programme of incentives in the form of special prizes and certificates may be started at the state level. Such incentives will generate a sense of competition among the growers to keep their orchards free from scab and other diseases. This will improve the situation and will also prove much economical and beneficial than the subsidy grated for fungicide spray.

‘Boron’ deficiency is another great challenge to orchardists. Its deficiency symptoms have been invariably recorded in crops like apple, pear, apricot and plum. In general, visual symptoms of boron deficiency are sever on fruits than on the vegetative parts of the fruit trees. It is adversely affecting the size and quality of fruit. In case of apple, fruit develops internal or external cork. The internal cork develops any time after the fruit is ready to harvest. But if it develops earlier, the internal lesions are brown, round and irregular in shape. It may remain small-sized and may also drop
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prematurely. Such fruits are called as ‘monkey fruits, they are commonly observed in some varieties of apple like ambri, white dotted red and boldwin.

The vegetative symptoms occur under severe deficiency. It results in crashing of the bark of the stem and branches. Such symptoms have been detected in the case of ambri apple. In case of puma, its deficiency symptoms have been commonly observed in grand duke variety of plum. In general, its deficiency results in malformed fruits with brown spotting almost like sun burn. As compared to plum boron deficiency are more readily exhibited by apricots. Its symptoms are external browning, shriveling and acute malformation of the fruit surface.

The fruits growing areas of the state are far away from the big market centers of the country like Bombay, Calcutta, madras, Bangalore and may others. Due to mountainous terrain it is very difficult to remain connected for the whole year because these areas remains blocked for a number of days due to heavy landslides in the rainy season and snowfall in the winter season.

This typical geographical location has created many marketing problems. For example, if the fruit is directly sent by the individual growers to the distant markets like Bombay, Calcutta and madras through trucks where rates are attractive there will be high freight charges and other additional charges that are usually levied on account of detention of trucks in the transit. The net result will be that the individual growers may not have profit because of heavy freight charges and also because of the chances of spoilage of packed fruit due to unfavorable temperature conditions during the journey time. The latter factor reduces the price of the fruits and the growers under such circumstances find themselves in a great dilemma.
The other possible alternation is to send the fruits through wagons specially attached to express goods trains. This alternative is also not very helpful because unloading of the trucks and then reloading of the fruit boxes may incur huge expenditure and moreover due to carelessness of the laborers huge quantities of fruits are likely to be spoiled.

The third alternative is to send the fruit trucks to the nearest big marking like Delhi, Amritsar and Chandigarh, but these markets usually receive sufficient supplies from Himachal Pradesh with the result that any further supply will result in lowering down the rates of various categories of fruits. Thus the growers may be loser to a large extent.

The fourth alternative is to put the surplus product, in the cold storage, for off-season marking which unfortunately at present cannot accommodate favorable percentage. The most tragic part of the problems lies in the fact that if cold storage facilities are provide to the growers, they would not put their surplus product for off-season marketing because they need immediate cash. These poor growers need cash facilities for their surplus commodities which neither the government nor the private agencies could ensure. The small growers placed in this situation seek the intermediates who always try to derive maximum benefit from such situations.

These intermediaries include preharvest, post-harvest contractors, forwarding and commission agents and a large number of wholesale and sub wholesale merchants. They have spread over the entire area and as such have grown so powerful that it is very difficult to get the growers free from their grip in the absence of some suitable arrangements. As per an estimate of the Department of Horticulture planning and marking, these intermediaries are annually snatching away more than sixty percent of the profit.
On the basis of detailed analysis of the various situations and also on the basis of the field studies conducted by the researcher, following suggestions are made. As soon as fruit sets, there should be some government agency, to play the role of preharvest contractors by advancing the fruit growers some portion of the purchase price. The rest of the cost can be paid at the time when the final disposal of the fruits takes place.

Procurement of fruits from thousand of such small growers in the state is readily time consuming factor as well as it involves much difficulties. Hence the feasible solution seems to be that some collection and disposal centers should be selected at suitable locations. Such centers do not exist at the present movement as far as fresh fruits are concerned. In the opinion of the researcher, such centers may be located at the block headquarters in the area where production of apple is on large scale.

It should be connected with big town by mettle road.

It should have the facilities of mechanical apple grader.

There should be more cold storage facility in the vicinity of such centers which can accommodate at least thirty percent of the production of the area attached to this centre. After harvesting the fruit in the orchards it is to be collected through the locally available transport like Trucks, Tongas, and then sent to the collection centre for further processing. At each collection centre the fresh fruits have to be mechanically graded as far as possible and then packed.

Further, from the collection centres, after grading and packing processes are over, the product should be directly sent to the market which has quoted the highest rates for that particular size and variety of fruit, without unloading the trucks at any other centre. Past experience shows that despite possible precautions, unloading and reloading of fresh fruits at the different stations, involves much loss on account of spoilage of fruits.
In view of this fact, it is suggested that trucks loaded at the collection centres may be unloaded at distant market even if the cartage is relatively high. This demand-oriented slow supply will not lead to lowering down the market prices. In this way the grower will not be the looser because he will be paid handsome amount even after deduction of expenditure incurred on collection, gradation, package and other transport charges. This step will serve the purpose of the growers on manifold ways:

i) It will raise the income of the growers many fold which actually they deserve and will also raise the income of the state.

ii) It will create permanent job opportunities to a large number of people who may be entrusted with supervisory work, technical and non-technical work and many other relevant duties.

Besides, it will provide seasonal job opportunities in each of the areas where collection centre is located in the form of laborers, watchman and accountant. Some local transporter may be benefited because of the transport of products from the orchards to the collection centres. Further, it will create job opportunities for the female population of the area also for packing of the products after gradation.

iii) The last but not the least, consumers will also get benefit because of reasonable market rates of the scientifically graded fruits, true to size, colour and variety. This will indirectly raise the chances of the market demand.

The importance of the fruit preservation industries need not to be over emphasized. It not only consumes the third quality fruits but also raises the value of such fruits, which may otherwise fetch very low prices in the markets. In view of this fact, development of fruit culture can only become economical and profitable, if the fruit preservation industries are also developed so that the low grade fruit could be preserved in different forms.
iv) It will increase the job opportunities for a greater number of the rural population.

Amongst all the fruits, production of apple and its marketing is to the tune of about eighty percent. As such about twenty percent of the population is engaged directly and indirectly in the various processes related to its production and marketing. In areas where apple production is on a large scale and where cold storage facilities are not available according to need, low quality apple can be consumed in the form of juice. In extraction of juice, small units with small expenditure can be established at various parts where raw material is available easily. Finished articles can be sent to big markets within the state and also to other parts of the country.

From the present study it become quite clear that fruit culture in Rajouri in partial and the whole state in general has to face a number of problem right from setting of the orchard till its marketing. These problems are in the form of restricted area available for orchard development, encroachment upon the orchards on account of construction of houses, diseases, pests and influence of middle men. These facts may be considered as the red signals for the orchardists in particular and the state government in general to give a serious thought over the problem so that necessary solution could be found out.

Any more neglect in respect solution of these problems may result in greater poverty among the people of the Jammu and Kashmir. In the absence of suitable measures to boost the economy of the state through horticultural innovation which may ensure better economic conditions for the people of the area by creating more job opportunities, proper consumption of low grade fruits in the form of jams, Jellies, pickles and juice.