Chapter-I

Introduction

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Chapter - I
Introduction

1.1 Introduction:

Agriculture is the mainstay of the Indian economy. Agriculture and allied sectors contribute nearly twenty five percent of gross domestic production, while about 65 to 70 percent of the population is dependent on agriculture for their livelihood. Therefore study of agriculture through geographical perspective in general and grape cultivation in particular hardly need any explanation.

India, with its wide variability of climate and soil, has good potential for growing a wide range of horticultural crops. Since the mid eighties, the government identified horticulture crops as a means of diversification for making agriculture more profitable through efficient landuse, optimum utilization of natural resources and creating skilled employment for rural masses. The changing scenario encourages private investment to go for hi-tech horticulture with micro-propagation, protected cultivation, drip-irrigation, fertigation, integrated nutrients and pest management and post-harvest measures. As a result, horticulture crop production has moved from rural confines to commercial ventures.

India has a large range of varieties of fruits in its basket and accounts for ten percent of the world's total fruit production. Among fruits, grape occupies the first position in the world in terms of area and production. Viticulture and enology (wine making) have increased greatly in importance and popularity over the last few decades. Cultivation of fruits contributes to the health, wealth,
happiness and prosperity of the people. The standard of living of the people can be judged by production and consumption of fruits per capita.

The grape (*vitis vinifera*) is an important and economic proposition for the farmers among the horticultural crops grown in India. Grape is one of the most delicious refreshing and nourishing fruits. Ripe grapes are easily digestible. It is fairly good source of minerals like calcium, phosphorus, iron and vitamins like B₁ and B₂. Grapes are good source of sugar like glucose, fructose and sucrose. Among the grape products grape juice and unfermented grape juice is universally popular. Ripe fruits are supposed to be the best table fruits. Wine making from grapes is flourishing industry in many countries. Grape also makes good Jelly and Syrups, fruits are used for making raisin.

Fruits are the most important constitute of human diet. Their consumption varies from country to country depending upon the tastes, preference and income of the people of a country. At present, India is the second largest producer, of fruits in the world. It’s share in world production of fruits is 10 percent. India is among the first ten in the production of apples, papaya, oranges, pineapples, grapes and pomegranates and largest producer of mangoes and banana.

Grape is one of the most commercially important fruit crop in world. It is believed to have originated near the Caspian Sea in Russia from where it seems to have spread west-ward to Europe and east-ward to Iran and Afganistan. In India grape cultivation is one of the most remunerative farming enterprises. Famous Indian medicine scholars, Sasruta and Charaka in their medical treatises entitled
‘Sasruta Samhita’ and ‘Charaka Samhita’ respectively written during 1356-1220 BC, mentioned the medicinal properties of grapes. Kautilya in his ‘Arthashastra’ written in the fourth century BC mentioned the type of land suitable for grape cultivation. Native sp. Resembling *Vitis lanata* and *Vitis palmate* grow wild in the northwestern Himalayan foothills. Indigenous varieties known as ‘Rangspay’, ‘Shonltu White’ and ‘Shonltu Red’ are grown in Himachal Pradesh even today.

Cultivated grapes are believed to have been introduced into the north of India by the Persian invaders in 1300 AD, from where they were introduced into the south (Daulatabad in Aurangabad district of Maharashtra) during the historic event of changing the capital from Delhi to Daulatabad by king Mohammed bin Tughlak. Grape was also introduced in the south into Salem and Madurai districts of Tamil Nadu by the Christian Missionaries around 1832 AD, and into Hyderabad province by HEH, the Nizam of Hyderabad in the early part of the 20th century. From Delhi, Daulatabad, Madurai, Salem and Hyderabad, grape cultivation spread to different parts of the country.

Grape fruits are very nutritious containing various nutrients in various amounts. (Table No. 1.1)

Fresh grape contains many vitamins. Fairly good amount of vitamin ‘A’ is present which retains in dehydrated grapes also. It is one of the most delicious, refreshing and nourishing fruit. Ripened grape fruits are easily digestible. The can be consumed in any forms such as table grapes, raisins, juice, canned form and wine. Grapes juice is a nourishing thirst quencher, a stimulant to kidney and as
as laxative. The principle product made from grapes is wine. Table purpose grapes must have an attractive appearance, good eating quality, good shipping and storage quality.

**Table No. 1.1 Nutritive Value of Grape Fruits**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Nutrient</th>
<th>Percent Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Carbohydrates</td>
<td>15.25</td>
</tr>
<tr>
<td>2.</td>
<td>Proteins</td>
<td>0.001-0.01</td>
</tr>
<tr>
<td>3.</td>
<td>Minerals</td>
<td>0.03-0.6</td>
</tr>
<tr>
<td>4.</td>
<td>Vitamin A</td>
<td>A</td>
</tr>
<tr>
<td>5.</td>
<td>Water</td>
<td>75-85</td>
</tr>
</tbody>
</table>

*Source: Chadha, 1984.*

Among the continents Europe is the largest producer of grapes. Grapes are grown mostly for wine making in Italy, France, Spain the United States, Turky, Argentia and South Africa. The total area under grape in the world is estimated to be about 8.2 million hectares.

Of the world's total production of 60 million tones, about 68 percent of grapes are used for wine making producing 29 million tones of wine. The percentage utilization of annual harvest approximates to 68 percent for wine, 1 percent for fresh juice, 20 percent for table grapes and 11 percent for raisins.

In India grapes are cultivated in almost all the important states from Kashmir to Kanyakumari. Presently grape cultivation is concerned in the peninsular India accounting for 90 percent of the
total area. Major grape growing states are Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu and North Western region covering Punjab, Haryana, Delhi, Western Uttar Pradesh, Rajasthan and Madhya Pradesh.

India is emerging as a major producer and exporter of grapes in the world. India produces about 18.78 lakh tones of grapes annually, of which about 1.18 lakh tones are exported in the year 2008-09. In India area under grape is 80,000 hectares and total production of grape is 18.78 lakh tones. The productivity of grape in India is 23.5 tones per hectare, which is higher in world.

Maharashtra is a leading state in production of grapes in India followed by Karnataka, Punjab, Andhra Pradesh and Tamil Nadu. In regards to agriculture land under grape cultivation and grape production, Nasik and Sangli districts are at forefront in the state. Apart form these, grapes are also grown in the districts of Ahmednagar, Pune, Satara, Solapur, Latur and Osmanabad. In recent year grapes are produced and exported by Latur district of Maharashtra also. However, Nasik and Sangli districts are ahead in the production of grapes in a scientific manner. The progressive farmers in these districts have also entered in the grapes exports and grapes processing sector. But, major grapes are produced for table purposes and limited quantity is utilized for the production of liquor, dry fruits like raisins etc.

Area under grape in Maharashtra is steadily increasing day by day. The varieties, which are grown in Maharashtra, are Thompson seedless, Tas-A-Ganesh, Sonaka, Manikchaman, Sharad seeless and cheema Sahebi. Grape is a fruit of semi-arid, sub-tropical region and
requires dry summers and cool winters with moderate rainfall. Dry cloudless weather during flowering, fruits setting and fruit development is must for successful cultivation. In Maharashtra above favourable climatic condition, availability of transport, good demand in country and foreign for grapes provides an ideal situation for grape cultivation. Grape has also social importance. It helps in solving employment problem. Grapes provide employment in cultivation, raisin making, packaging, transportation and wine making industries. Grape has great potential for its export. In gives precious foreign exchange to country and helps in solving the problems in foreign trade.

In Latur district area under grape crop was 896.16 hectares and productivity 23 metric tones per hectare. The varieties cultivated by farmers are Thompson seedless, 2-a-Clon, Tas-A-Ganesh, Manikchaman, etc.

Grape is a perishable fruit crop, having very short shelf life and cannot be stored for longer period under ordinary condition. Grapes need careful harvesting within stipulated time since the berries are very delicate and generally sent to distant market. They also need very sophisticated packing, quick transportation, good storage facilities and quick selling agencies in distant markets. Due to its perishable nature, many times when the production of grapes in much more and sufficient domestic market in not available for sale of grapes, farmers have to sustain heavy financial losses. Further, as process of grapes production basically requires major capital investment, if sale or exports of grapes in not possible in time, farmers do suffer a lot. Thus, efficient marketing plays an important
role in the development of any enterprise. Hence, it was found necessary to examine the economics of production, prevalent marketing systems and channels, the marketing costs, margins and price spread.

1.2 Classification of Grapes:
Species Used For Fruiting:

Many species, especially of the American vines, produce fruits that may be regarded as palatable. The grapes grown extensively in Europe and other important grape growing regions outside the United States are either pure vinifera hybridized with one or more American species.

Even in the United States about 90 percent of total production is of pure vinifera varieties. These are grown mostly in California, with a limited average in Arizona, Oregon and Washington.

Hedrick (1907) lists some 1,400 varieties of American grapes. Analysis of the percentage of these varieties shows that 27 percent are pure species, 53 percent are hybrids of known parentage, and the remaining 20 percent are of unknown origin.

Pure Species: The varieties representing pure species have been derived from 13 species as follows in the order of their contribution: Labrusca, aestivalis, riparia, rotundifolia, lincecumii, longii (solonis), doaniana, rupestris, candicans, monticola, and berlandieri. Of these 68 percent are of labrusca, 10 percent aestivalis and so on until only 0.3 percent are of candicans, monticola or berlandieri.
Hybrids: The hybrid varieties have been obtained by crossing a variety of one species with a variety of another species or with a hybrid previously produced. In some instances two hybrid varieties have been crossed with each other. Of the many hybrids, 42 percent are crosses involving only labrusca and vinifera. Only 8 percent do not contain labrusca in their ancestry and only 6 percent contain neither labrusca nor vinifera.

Species used for Rootstocks:

Two soil pests of the grapes—phylloxera and nematodes—are largely controlled by the use of species or hybrids that are resistant.

Rootstocks resistant to phylloxera—So far, the only practical means of controlling phylloxera, the grape root louse (Daclylosphaera vitifoliae shimer), is to use rootstocks that resists its attack.

The first varieties used for rootstocks were selections from the wild vines. These were mostly pure species or natural hybrids.

Most rootstock varieties used today are hybrids of two or more species. The principal American species used in producing the hybrid rootstocks resistant to phylloxera are: aestivalis, berlandierii, cordifolia, monticola, riparia, and rupestris. Of much the greatest importance are riparia, rupestris, and berlandierii.

It still seems, however, that long-time control of nematodes will depend on the use of resistant rootstocks. The principal species showing resistance, either in pure from or as hybrid rootstocks are v. candicans, v. champini, v. solonis, v. rufotomentosa, and v. rotundifolia.
Commercial Classes of Grapes:

The grapes of commerce are divided by use into four major groups and one minor group. These are: table grapes, raisin grapes, wine grapes, sweet juice grapes and — the minor group — canning grapes.

Table Grapes: Grapes intended for use as fresh fruit, either for food or decorative purposes, are commonly designated table grapes. They must be attractive in both appearance and eating quality, must have good shipping and keeping qualities, and must be produced and sold at reasonable cost.

Appearance is influenced by: size of berry; shape of berry; shape, size and compactness of cluster; colour of berry; and physical condition. In general, the demand is for berries of uniform and large size, and most of the well-known table grape varieties are characterized by large berries.

Raisin Grapes: These are grapes that produce an acceptable dried product. Thus, raisins are actually dried grapes, but the product varies greatly with different varieties and different methods of drying. Hence raisins are distinguished from “dried grapes” in most grape-growing regions. To be a good raisin variety, the dried product must possess: soft texture; seedlessness, a market, pleasing flavor; large or very small size; and little tendency to become sticky in storage.

Many varieties satisfy some of the requirements to a fair degree, but only a very few satisfy the requirements to an unusual degree. Such varieties are used almost exclusively in commercial production. They are (a) Thompson seedless (Sultanina and
Sultanieh in Near East, oval Kishmish in Asia; Sultana in South Africa and Australia; Chekirdeksiz in Turkey and Ak-Kishmish in Russia); (b) Black Corinth, Zante Currant, or panariti and (c) Muscat of Alexandria (Gordo Blanco in Australia).

Wine Grapes: By far the most extensive use of grapes is in producing wine. The production of wine grapes occupies most of the vine yards of Europe, North Africa, South Africa, and South America about two-fifths of those Australia, and one third of those of the United States. A wine grape may be defined as a variety known to be capable of producing an acceptable wine in some locality. Wine are roughly classified in two groups: table wines and dessert wines. Table wines contain less than 14 percent alcohol; these are also referred to as "light", "natural" or "dinner" wines. They contain little or no unfermented sugar and therefore are said to be "dry". Yet it is not uncommon for some of them to have a residue of natural grape sugar. Historically, the French southern are always sweet; all other table wines are produced from grapes of only moderately high sugar content and of moderate or higher acidity. Champagne is table wines.

Sweet Juice Grapes: The varieties known as sweet juice grapes are those whose juice produces an acceptable beverage when it is preserved by pasteurization; germ-proof filtration, or other means. Most vinifera varieties, including the strong-flavoured Muscats, lose their fresh flavour and acquire an unpleasant "cooked" taste when pasteurized by the usual methods. The strong flavored American varieties, particularly the concord, are affected less by pasteurization. This fact largely accounts for the general use of the
concord for juice in the United States and, of course, many people like the flavour of this variety. Concord juice is also used in quantity for making jelly, either commercially or in the home. In recent years, large quantities have been used as a blend in the production of a sparkling red wine—Cold Duck.

From geographical point of view, micro level spatial analysis of grape cultivation is essential for intensive agricultural land use planning.

1.3 Review of Related Literature:

The knowledge of research work done in the past relating to the research problem under study is necessary and helpful to proceed in the right direction. The researcher would be able to make an improvement over the existing studies and also expand the horizon of investigation on the subject matter. The review could also help refuting the concepts and statements made in earlier studies as well as for supporting the findings of the present study. Therefore, it forms an integral part of any systematic research work.

Gole, H.V. (1915):

He in his article entitled “Grape Growing in Nashik District”, reported the success of viticulture near Nasik District. In this study he also explained the role of physical and socio-economic factors in the development of grape cultivation.

Gandhi, S. R. (1928):

He in his article entitled “Grape Culture in Western India”, reported the success of grape cultivation in western India and also
mentioned the importance of Physical and socio-economic factors in development of viticulture.

**Mahalnobis, J. M. (1970)**:

He reported that the storage charges normally vary between 70 to 75 paise per basket contains 5 to 7 Kg. grapes. In Calcutta the grape were sold through commission agents who deducted commission at the rate of five percent of gross sale proceeds. Beside the consignor had to pay another 20 to 25 paise per basket towards entry tax, labour, cartage, cleaning charges etc. The usual difference between wholesale and retail price was about 30 to 35 percent. The wholesale prices of grapes imported from Chennai, Hyderabad and Maharashtra during the year 1970 ranges from Rs. 400 to Rs. 500 per quintal. The price in Nasik and Hyderabad for small variety is between Rs. 600 and Rs. 700 per quintal during the same period respectively. The retail price for indigenous varieties throughout that year ranges from Rs. 400 to Rs. 800 per quintal.

**Marshashi, V. L. & Kamble, K. (1974)**:

They have examined newly established marketing channels in Japan where farmer co-operative associations were observed to be the most efficient means of distribution. The advantage of direct sale was increased income and self determination of prices co-operative sale showed a higher efficiency of marketing than direct sale by individual farmer.

**Halfacre, R. G. et al. (1974)**:

He states that horticultural crops profuse more food per hectare per man hour in comparison with food crops, the production of fruits
per unit of land is always more, they also fetch high profits per hectare.

Winkler, A. J. et al. (1974):

They in their book entitled “General Viticulture” state that grapes (vitis venefera) is one of the earliest fruits grown by man. It is the most widely cultivated fruit in the world. Viticulture, growing of grapes, begin in Asia minor in the region between and to the south of black and Caspian sea and from their culture of grapes spread to west and east. Reasonably comprehensive work is presented in the book entitled General Viticulture. It accounts for the factors influencing the development of various components of the mature grapes, improving and preserving the quality of the table grapes, raisin production, propagation, training support, wine yard operations, including weed control, irrigation and even mechanical harvesting of wine and raisin grapes. But this book does not take much account of the viticulture in the tropics in general and India in particular.

Nagraj, K. (1975):

He studied the marketing channels, marketing efficiency and the problems of producers and market intermediaries in case of important fruits and vegetables in Karnataka state. The main channels observed for grape marketing were

1) Producer ⇒ Pre- harvest contractor ⇒ wholesaler ⇒ commission agent ⇒ Retailer ⇒ consumer

II) Producer ⇒ Pre- harvest contractor ⇒ wholesaler ⇒ commission agent ⇒ Hawker consumer.

III) Producer ⇒ Co-operative marketing society ⇒ consumer.
Iv) Producer ⇒ Co-operative marketing society ⇒ Consumer.

The producer received just one-half of the consumer’s rupee. The retailers gained relatively high profit margin. It was 19.98 percent and 14.58 percent in case of Anab-e-shahi and Thompson seedless respectively. The producer’s share in case of Anab-e-shahi and Thompson seedless was 56.33 and 59.72 percent respectively. The important for the success of grape co-operative as told by the grape growers were need for increase in storage and transportation facility, increase purchase capacity, operation of more number of retail outlets, modifying working hours and provision of timely adequate credit.


They pointed out that total marketing cost in case of sweet oranges (per dozen), Apples (per kg), Grapes (per kg) and Mangoes (per kg) was Rs. 0.99, Rs. 0.76, Rs. 0.44 and Rs. 1.99 respectively. Wholesaler generally made the payment of these costs to producer after deducting marketing cost. The per unit expenses incurred by producers in the case of sweet oranges (per dozen), Apples (per kg), Grapes (per kg) and Mangoes (per dozen) worked out to Rs. 0.51, Rs. 0.62, Rs. 0.92 and Rs. 2.03 respectively. The margin of wholesaler was around five percent of the consumer’s price in case of all the fruits. The marketing cost paid by the producer for different marketing services involved in moving the fruits from farm to the market rages from 5 percent to 19 percent of consumer’s price while the retailer’s expenses ranged from 8 to 25 percent of consumer’s price.

They conducted the study on marketing of grapes in Haryana state and observed that the grading and packaging together formed 72.60 percent of the total marketing cost in the primary market and 64.13 percent in the terminal market. Transportation accounted for another 10.96 percent and 34.24 percent of the total marketing cost for sale in these markets respectively. The producers got the maximum share of consumer's rupee (71.48%) by selling produce to retailer through commission agents in the primary market. The producers share in consumer’s rupee was minimum (53.70%) when sold to pre-harvest contractor.

Tawade, M. D. (1980):

In his book entitled 'Geography of Fruit Farming' refers to micro climate as the climate of a small area. Horticulture production, by nature, is location specific because of its specific climate requirements. Here it defers form the usual agriculture and Tawade calls this field 'Geography of Fruit Farming' the commercial production of fruit is not evenly distributed over agricultural region but trends to concentrated in limited areas of the world natural environment that is needed by fruit crops for a longer duration than that by field crops, has a strong and uncompromising association with the fruit cropping. The present study therefore discusses such micro climatic topography and edaphic conditions in the context of the viticulture in the study region.


He stated in his article 'Trends in California Viticulture' that the latitudinal expanses of viticulture which mainly lies in warm
temperate zone, especially between $34^\circ$ to $49^\circ$ latitudes – this expanse suggest that most parts of India is not suitable for grape cultivation but the present day success of viticulture in India establishes the fact that the seasonal variations in temperature, the topographic and the edaphic conditions in some parts of the country provide favourable conditions for cultivation of grapes.

Phadtare, V. R. (1986):

He studied that a majority of the grape growers from Tasgaon tahsil of Sangali district had less than five years experience in grape garden while 35.00 percent of the cultivators had 6 to 10 years experience.

Anonymous, (1986):

He studied cultivation practices adopted by grape growers and indicate that 46.16 percent of farmer had 0.21 to 0.40 hect. are under grape, while 35.68 percent of them had less than 0.20 hect. and 18.36 percent of the respondents had more than 0.41 hect. of are under grape.


In his study of Dindugul Tahsil of Tamilnadu, he found that the net income always remained above the total cost despite the decline in the yield as the age of the plant increases.


He in his article “Profitability and factor shares in grape cultivation vis- a- vis other field crop in Andhra Pradesh,” compared the profitability of grape cultivation with that of the other field of crops and conclude that the cultivation of grapes is highly remunerative.
Shanmugavelu, K. G. (1988):
He has made important contribution in providing valuable information in his book entitled “Viticulture in India”. In his book he gave analytical account regarding the climate, soil, varieties, crop improvement, propagation, establishment of vineyard, training and pruning, nutrient requirements, cropping and harvest, economics of grape cultivation, pest and disease management, post harvest handling and marketing, processing of grapes etc.

Aher, B. M. (1989):
He explained in his unpublished Ph.D. thesis, the economics of grapes cultivation in Nifad Tahsil of Nasik District and concludes that grapes is a high return crop in this part of the district.

Subbarao, K. & Raju, (1990):
They pointed out in their article “Marketing of Grapes Around Hyderabad” that the marketing channels like channel- I Producer ⇒ pre-harvest contractor ⇒ wholesaler / commission agent ⇒ vendor ⇒ consumer. Channel–II Producer ⇒ pre-harvest contractor ⇒ wholesaler/commission agent ⇒ vendor ⇒ consumer.

He has studied spatio-temporal aspects of grape cultivation in Jath circle of Sangli district in Maharashtra and made an attempt to show the spatial and temporal variation in the distribution of grape cultivation.
Deshpande, B. S., et al. (1992) :

They have identified the marketing channels of grapes in their article "Price spread in different channels of marketing of grapes in Latur district". They identified following channels.

i) Producer ⇒ Aditya ⇒ Retailer ⇒ Consumer,

ii) Producer ⇒ Wholesaler ⇒ Retailer ⇒ Consumer

iii) Producer ⇒ Retailer ⇒ Consumer

iv) Producer ⇒ Consumer

The study revealed that the minimum marketing cost of Rs. 76.60 per quintal of grapes was in channel iv. The channel (i) and (ii) had the highest marketing cost of Rs. 166.95. The producer's share in consumer's rupee was maximum (91.34 percent) in channel (iv) inducting maximum producer's share when produce was sold directly to consumer.


They pointed out the impact of producer's association on the marketing price in their article. "Impact of Producer's Associations on Marketing of Grapes and Banana in Jalgaon and Sangli Districts of Maharashtra." The result shows that the major proportion of total produce was go through the marketing channels. The producers associations of grapes growers sent the supervisors for supervising fruit trade in wholesale markets and also for providing marketing intelligence to producers. Among the various items of cost of marketing, the transport from assembling center to wholesale market occupied prominent share. The cost on account of transport, commission of wholesalers and marketing agencies was lower for the member of producers association than non-members. The
producer's profit margin of grape was 24.20 percent for members as against 20.38 percent for the non-members. The members of producers association would therefore, device relatively higher profit margin from fruit trade than non-members on the whole; it would be concluded that, the producers associations played an important role in the marketing of banana and grape.


They have studied the details of channels involved in grape marketing for cultivations in Sangli district. This investigation of marketing channels revealed that almost 96 percent of produce was purchased by the pre-harvest contractor, who reaches directly to wholesale markets. While only 4 percent were sold by producers through the retailers to the consumers and the producers and the producers sold very negligible quantity directly to the consumers. Per quintal cost of marketing of grapes through the pre-harvest contractors was estimated to be Rs. 194.00. Though packing was very important item of cost, it accounted only to 20.62 percent of total marketing cost. If the pre-harvest contractors sale their produce to the retailers directly instead of selling it through the commission agents the saving in total cost was to the 26.81 percent.


They have conducted a study on marketing of grapes in Dhule district and observed that farmers preferred to sell their produce to pre-harvest contractors (66.67 percent.) The producer share in consumers rupee was highest (75.93 percent) in channels; Producer-Wholesaler- Retailer-Consumer. There was so much variation in net returns earned by grower in different channel of marketing.
Hinge, B. J. & Tilekar, S. N. (1993):

They have conducted a study on marketing of grapes in domestic and export market for grape cultivators in Nasik district. They concluded that in the case of export marketing, per quintal cost of export to London market was Rs. 4593.75 and for Gulf market, it was Rs. 2461.75. The per kilogram gross price realized in London market was Rs. 66.15 as against the per kilogram cost of export of Rs. 45.95 resulting net price of Rs. 20.21. In case of Gulf market the per kilogram gross price realized worked out to Rs. 38.00 as against per kilogram cost of export of Rs. 24.61 resulting in to per kilogram net price of Rs. 13.39 only. Concluding that, export of grapes to London was more paying than export of grapes to Gulf countries.


They analysed the table grape cultivation in Hissar district of Haryana state and concluded that the average establishment cost was Rs. 88164 per hectare. They further examined that operational cost increases with the age of vineyard upto 7th year and thereafter remains relatively constant. Positive returns were obtained in the 4th year of establishment. Grape cultivation provided net-discount returns of Rs. 61734, an internal rate of return of 23 percent, a payback period of 8 years and a benefit cost ratio of 1.8. Grape cultivation is an economically viable enterprise and thus should be encouraged by the Govt. by means of incentive and creation of marketing and processing infrastructure.


He worked out the cost of marketing of table grapes and its relation with the cost of production and profits in the Maharashtra.

They studied comparative economics of grape cultivation by different methods of irrigation. The study was conducted in three tahsils in Latur district. Data for 1991-92 was collected by means of personal interviews with a sample of 80 cultivators (40 using drip and 40 using traditional method of irrigation). Profitability of grape cultivation was (Rs. 15964 per hectare) higher for drip irrigation due to savings in cost of labour manure, fertilizers and plant protection chemicals. Adoption of drip irrigation resulted in labour displacement of 207 man-days per hectare.


They undertaken a study on economics of drip irrigation in plantation crops-grape and pomegranate in western Maharashtra. The study was conducted in Solapur and Nasik district of Maharashtra. It was observed from the study that cropping and irrigation intensity have been increased to a greater extent because of the adoption of drip irrigation system, there by resulting in to increasing the water use efficiency. Because of drip irrigation method, there was considerable saving in the cost of human labour, bullock labour, machinery, manures and fertilizers, plant protection and irrigation. The per hectare cost of production of grapes in conventional and drip irrigation method worked out to Rs. 145870.92 and Rs. 146167.26 respectively.

Dangat, S. V. et al. (1997):

They conducted a study of marketing of grapes through co-operative in Narayangaon area of Pune district of Maharashtra state. The three co-operative marketing associations formed by the grape
grower in the study area. Co-operative societies render technical guidance to their members and also arranged transport and sale of grapes. The sample grape growers sold their produce in Mumbai, Delhi, Ludhiyana, Dubai and England through co-operative as well as independently, about 16 percent of produce has sold in garden itself. The net price realized by exporting grape was three times more than that realized through sale in gardens.


They studied the prospects of drip high-tech system in export potential. The study was conducted in Nasik district for the year 1996-97, covering sample of 60 grape growers comprising of 30 adopting conventional irrigation system. The results of the study revealed that, the cropping intensity has increased from 180 percent before drip irrigation system to 258 percent after the adoption of drip irrigation system. The average per hectare cost of cultivation of grapes worked out Rs. 1.08 lakh and 1.05 lakh for conventional and drip method respectively. It was conclude that drip system not only increases irrigation intensity but also saved cultivation expenses and produced good export quality products.

Tomer, B.S. et al. (1997):

They undertaken a study to work out the marketing cost and margins for grapes and citrus in Hissar and Sirsa district of Haryana state for the period 1990-93. The findings on the cost of marketing and margins for these fruits indicated that the producer’s share in consumer’s rupee was around 50 percent, when the producer directly sold his produce the market. However if the crop is sold through pre-harvest contractors, the share of the producer in the consumer’s
rupee declined to about 29 percent for grapes. The marketing margins charged by the middlemen were invariably higher which arranged from 14 to 28 percent of the consumer's price for pre-harvest contractors and 28 to 32 percent for the retailer. Thus, high margins of intermediaries reduce the share of producers in the consumer's price.


In his research article entitled 'Export Marketing of Grapes: Issues and Challenges,' he opinions that Indian grapes have sufficient international market potential as they have been identified to be of premium quality. However, infrastructural constraints have prevented quality production and exports of grape to exploit the potential in international market.

Gawade, B. B. et al. (1998):

They studied the marketing of grapes in Tasgaon region of Sangli district, for organized and unorganized cultivators. They concluded that amongst the marketing cost, packaging material cost accounted to be the highest followed by commission charges and transportation. As regards the sale in different market places, 78 percent of the total produce was sold at Mumbai market followed by Delhi (19.98 percent). The per quintal price received was higher in Delhi market (Rs. 2059.20) than Mumbai market (Rs. 1974.80) As regards, sale of produce through different channels, 80 percent was through co-operative organization followed by 13.60 percent through commission agents. The per quintal received was higher in co-operative organization (Rs. 2000-01) than through commission agent (1910.60).
Handiganar, S. S. et al. (1998):

They studied the cost and return in grape cultivation in Bijapur district, Karnataka during the year 1993-94 based on the data of 80 grape growers. The initial investment was worked out Rs. 1,79,475.14 in spacing –I, Rs. 1,50,634.19 in spacing –II under telephone trellis system. The maintenance cost up to gestation period was worked out to Rs. 1,17,874.44, Rs. 1,00,100.67, Rs. 87,176.69 and Rs. 72,538.18 for four spacing under two systems respectively. The total cost of production of grape for four spacing under consideration during the period was Rs. 1,57,519.80, Rs. 1,35,508 Rs. 1,11,529.14 and Rs. 99,591.85 and the net income for the same was Rs. 1,97,051.66, Rs. 1,36,523.89 and Rs. 1,10,786 and Rs. 1,25,779.59 respectively.


They worked out cost and returns in grape cultivation in Bijapur district of Karnataka state in 1993-94 for 80 grape growers. Establishment costs, production costs, returns and net profit were shown for the parallel system and telephone trellis system at two level of spacing. The study revealed that the grape cultivation in Bijapur district was profitable.

Sakhare, P.B. (1998):

He observed that 63.45 percent of the drip adopters for grape orchard in Baglan tahsil of Nasik district were found in younger age group, whereas 32.66 percent of respondents were in middle age group and only 4.00 percent of the respondents found in old age group.

They pointed out that, the grape orchardists from Maharashtra marketed their produce either through forwarding agents in wholesale market or through forwarding agents in wholesale market or through commission agents or directly to the wholesaler. The per box (4kg) total marketing cost was estimated to be the highest when the produce was sold through forwarding agent in the wholesale markets as compared to the produce sold through other marketing channels. The practice of pre-harvest contractors was adopted by majority of grape growers which facilitated risk free finance to them. But this practice reduced the amount of profits occurring to cultivators and discouraged them from large scale production. The study has suggested the need for improvement in the efficiency of marketing system.

To sum up, it is clearly indicate that the marketing channel.
Producer ⇒ Producer Association ⇒ Wholesaler ⇒ Retailer ⇒ Consumer and Producer ⇒ Private Trader ⇒ Wholesaler ⇒ Retailer ⇒ Consumer are the efficient channels. It was be to higher producer’s share in consumer’s rupee and low marketing cost per quintal.


He has made important contribution in providing valuable information in his book entitled “The Grape”. In his book they gave explanatory account regarding the climate, soil, varieties, crop improvement, propogation, establishment of vineyard, training and pruning, nutrient requirements, cropping and harvest, economics of
grape cultivation, pest and disease management, post harvest handling and marketing, processing of grapes etc.

Satpute, S. V. (1999):

He observed that the grapes were graded into their grades (Grade I, II, III). Grade I produce was observed to be 49.78 percent. It was noticed that highest quantity (51.03 percent) of produce was packed in 4 kg boxes. More than 50 percent grape grower transported the produce by both trucks and tempos. Pattern of disposal of grapes indicated that 91.80 percent of produce was transported. He observed six marketing channels of which channel III, Producer-, Commission Agent- Retailer- Consumer was the most common one through which 35.61 percent quantity was disposed. The price premium received per quintal between different grades, and marketing agencies and sale during different months are found to be considerably high.

Salunke, V. (1999):

She studied the nature of grape farming in Nashik district in which many geographical aspects of grape cultivation were analysed.


He observed the grape orchards in the study area were either under increasing production stage or under constant or decreasing production stage. The study showed a sharp increase in per acre annual gross maintenance cost as well as returns of grape orchardists during the phase the production rose before leveling off to a constant stage and thereafter, these were seen to decline.
The per acre estimated quantity of grape production was seen to be 75.28 quintals for the marginal category, 85.25 quintals for the small category, 87.99 quintals for the medium category and 88.53 quintals for the large category with an overall average production of 87.41 quintals for the average category of producer.

Kamble, B. H. (2001) :

He has worked out the variety wise establishment cost and cultivation cost for producing vineyard. In his study he has observed that per hectare total cost of establishment was the highest i.e. Rs. 1,96,447.51 in case of Thompson seedless, followed by Rs. 1,90,948.51 in case of Tas-A-Ganesh and Rs. 1,86,356.59 for Sonaka. Cost ‘A’ constituted major proportion to the extent of nearly 84 percent in the total cost. The major items of the items of the total cost were cost of supporting structure, cost of plant protection and cost of manures and fertilizers.

As regards the per hectare cost of cultivation of producing vineyard, cost ‘A’ was maximum i.e. Rs. 92,839.20 in case of Sonaka followed by Thompson seedless with Rs. 92,158.95 and Tas-A-Ganesh with Rs. 91,560.29. The proportionate share of hired human labour in cost ‘C’ was about 11 percent. The share of plant protection and growth regulators together constituted about 15 percent in the total cost. However the family labour cost was very less and it constituted nearly 6 percent in the total cost.

Jadhav, M. S. & Patole, S. D. (2002) :

They calculated per hectare and per quintal cost of cultivation for several varieties of grapes in western Maharashtra. The average per hectare cost of cultivation was the highest and it was Rs.
2,61,495.59 in Sonaka, Rs. 2,06,454 in Thompson seedless, Rs. 1,71,061 in Tas-a-Genesh and Rs. 1,42,761 in Manik Chaman. The share of cost ‘A’ in the total cost ranged 40.12 to 54.39 percent in all varieties. The share of insecticides and pesticides was observed the highest and it range 9.25 to 21.15 percent followed by hired human labour days (4.55 to 14.45 percent) and manure (2.15 to 6.24 percent). The per hectare cost ‘B’ share value was 94 to 97 percent in all the varieties. The per quintal cost of production thus in Thompson seedless, Sonaka, Manik Chaman, Kismis, Tas-a-Ganesh, Sharad Seedless and Flame seedless variety of grape worked out to Rs. 945.93, Rs. 1029.80 Rs. 848.96 Rs. 1410.37, Rs. 883.03, Rs. 1043.79 and Rs. 1065.12 respectively. The benefit cost ratio at cost ‘C’ worked out to be 1.44 in Thompson Seedless, 1.33 in Sonaka, 1.55 in Manik Chaman, 0.94 in Kismis, 1.60 in Tas-a-Ganesh, 1.90 in Sharad Seedless and 2.28 in Flame Seedless variety.

Mohite, V. S. (2002): In his study the marketing management of grapes in Dhule district observed that, about 93 to 96 percent grape growers followed early October pruning (15 September). Grapes were graded in to three grades. Grade I produce was observed to be 52.16 percent. It was noticed that highest quantity (51.13 percent) of produce was packed in 4 kg boxes. Pattern of disposal of grapes indicated that 92.24 percent of produce was marketed. Five marketing channels were identified. Channel III, Producer- Commission Agent- Retailer-Consumer was the most common one, through which 44.29 percent quantity was disposed. The per quintal net average received in
channel III was Rs. 1660.07, nearly 34.40 percent share was galloped by their various market intermediaries.

**Autkar, V. N. & Nagpure, S. C. (2003):**

In their article 'Export of Grape in Global Market' reported that production of grapes in India is estimated to be 6.03 lakh metric tons and area under cultivation of grape is 35920 hectare, in terms of area and production: Maharashtra is the leading state in country followed by Karnataka, Andhra Pradesh, and Tamil Nadu. The average productivity of grape appears to be 23.73 metric tons. The export of grape has steadily increased from 0.04 lakh metric tons during 1997-98. The percentage share of export of grapes to total production is to 2.48% of total production from 0.98% during 1989-90.

The major importing countries of grapes are U.K., Bangladesh, Netherlands and UAE. Thus, globalization of agriculture offers an opportunity of deriving large benefits through massive increasing export. Specially export of high value crop and labour intensive allied agriculture product. Thus globalization calls for diversification of Indian Agriculture, which can take place after generally large agriculture surplus.

**Bagal, A. A. & Ulemale, D. H. (2003):**

In their study the data analyzed in order to know the marketing channels, marketing cost, producer’s share in consumer’s rupees in export grape from Tasgaon area. The per quintal cost of marketing for export market was Rs. 6891.67 in London market and Rs. 5767.40 in Holland market and producers share in consumer rupees was 39.17 and 36.87 respectively. Per quintal average net price
realized by the grape grower was Rs. 5305.21 for the grapes sold in export market.

**Bondar, V. S. et al. (2003):**

In their study on marketing of grapes in Osmanabad and Latur district, he observed that most of the (42.51 percent) grape grower sold their produce through pre-harvest contractor. Per quintal cost of marketing of grapes near by market and distant market as worked out is to be Rs. 276.82 and 507.55 respectively. The per quintal cost of market of grapes to London market was estimated to be Rs. 4240/- while price received was @ Rs. 7000 per quintals.


They conducted study on marketing of grapes in Nashik district and concluded that at overall level the average per quintal cost of marketing was Rs. 5570.10. The major items of cost were packing (35.32 percent) followed by transport (32.23 percent) and commission (19.39 percent). Per quintal cost of marketing observed to increase with an increase in size group of holding.

**Deshmukh, S. N. (2004):**

He observed that grape growers of the Solapur district sold 68.00 percent of their produce in the markets of other states. Small size group grape grower sold 44.32 percent to total quantity in the local market. On an average per quintal price received was Rs. 1505.73. The medium size group grape growers fetched highest price in all the markets. On an average per quintal price realized at over all level together with all grades was Rs. 1455.46. Per kilogram cost of marketing was Rs. 4.60. The costs of transportation, packing
and commission charges were the major items of the marketing cost comprising to 90.87 percent.

**Bhosale, S. S. et al. (2004):**

They found that among the 83 countries producing grapes in world, India's share in area was 0.54 percent and it was 1.19 percent in production. In case of productivity of grapes, the India first in the world with productivity of 26137 kg/ hectare India's share in export of grape was 0.64 percent and per kg price realized was Rs. 27.35 on an average, the grape export from India has been increased by 2.60 percent per annum and per kg price realized was increased 9.41 percent annually in the last eleven years. The present per annum increase of grape export was more in Germany (34.65 percent,) Srilanka (26.89 percent) and other (28.32 percent). The average quantity exported of grapes was 16,601 tones and the variability was 28.26 percent during the last 11 years.

**Murthy, D. S. et al. (2004):**

During the study in Karnataka he observed that 15 percent of total production in the region goes for fresh grape market and remaining 85 percent was used for marketing raisins.

The major marketing channels observed in local Bijapur market were Farmer → Commission Agents (Local) → Wholesalers (Local) → Retailer (Local) → Consumers (Local) and more than 75 percent of grapes in marketed through this channel in Bijapur, though Farmers → Wholesalers (Local) → Retailers (Local) → Consumers (Distant ) channels is also in practice but with little quantity. Farmers → Commission Agents (Local) → Wholesaler (Local-Distant) → Retailer (Distant), Consumers (Local)
is major marketing channel in distant Bangalore market and more than 75 percent is marketed through this channel in Bangalore.

**Chavan, S. S. (2005):**

He indicated that majority (56.00 percent) of the grape grower from Sangali district belonged to medium age group, while, 26.00 percent and 18.00 percent of them belonged to the category of young and old age group respectively.

**Dhakane, S. S. (2005):**

He observed that 44.46 percent of grape grower in Barshi tahsil of Solapur district belonged with younger age group, while 35.34 percent and 20.00 percent of grape growers belonged to middle and old age group respectively.

**Patil, S. N. et al. (2006):**

In his article he stated that in India grapes are cultivated in almost all important states such as Maharashtra, Andhra Pradesh, Haryana, Karnataka, Punjab and Tamil Nadu. Maharashtra state is a leading producer of grapes in the country; total area under the grapes in the world was 7.32 million hectares in which India’s share was only 0.82 percent in the year 2005. The world area under the cultivation of grapes has declined continuously but however the production and varietal improvement. The world production of grapes has increased from 54.44 metric tones to 66.53 metric tones from 1991 to 2005. In India area, production and yield has increased significantly from 1991 to 2005. Exports of India’s grapes are mainly to UK, Holland, Germany, the Middle East and Sri-lanka. India’s exports of fresh grapes increased with a positive percentage change of 33.37 from 2001 to 2005. In case of export of value added
products of grapes (raisin, wine and juice) share of India is negligible i.e. 0.017, 0.003 and 0.003 percent in the total world exports. Imports of these value added products of our country is higher than the export both in terms of products receive better price in the market. This clearly indicated that there is a scope for the production and export of value added products for earning foreign exchange and improving the income and ultimately the standard of living of grape growers and other people engaged in this industry.

Shah, Deepak (2007):

In his research article entitled ‘Assessing Economics of Grape Cultivation in India’, he states that the gross returns from grape orchards during various stages of production are noticed to be twice the cost of production for various categories of orchardists. His results of financial analysis show a B-C ratio for various categories of orchardists with an average of 2.07. He also stated that the cultivation of grape is to be a lucrative proposition for all categories of orchardists because of substantially high element of profit involved in the cultivation of this high value crop.

Todkari, G. U. (2010):

He has studied the impact of environmental factors on crop landuse in Solapur district with special reference to grapevine cultivation. In which he explained the role of physical and cultural environment in grapevine cultivation.

With the development of viticulture in India, research in grapes is carried out at various levels. Most of the studies and research carried out is largely related to economics and marketing of grapes.
Literature search also indicate that more research work is carried out with regards to wine producing varieties of grapes as it is one of the important industries in Europe and North America. The lines of spread of wine varieties different from those of raisin and table varieties because of differences in custom and religion between the people on the northern and southern shores of the Mediterranean. This suggests that studies regarding the table grapes worth various aspects have a good scope not only in India but elsewhere also.

This review of literature, though not complete, shows that the geographical aspects of grape cultivation in general is much neglected therefore an attempt has been made here in this direction to present the geographical analysis of grape cultivation in Latur district.

1.4 Choice of the Region and Topic:

The region under study i.e. Latur district lies to the south-east part of Maharashtra on the border of Maharashtra and Karnataka states. The district of Latur lies between 17°52 North to 18°50 North latitudes and 76°12 East to 77°18 East longitudes. It is surrounded by Beed and Parbhani district in the north, Nanded district in the north-east, Karnataka state in the south-east and Osmanabad district in the north-west and west. District has an area 7157 sq. km. and provisional population is 24,00,691 as per 2011 census.

The region under investigation has been influenced by several considerations.

1. Latur district comprising ten tahsils of Maharashtra state has a significant location on Maharashtra plateau. District as a
whole is monotonously underlain by Deccan trap basaltic lava flows. This lava flows on account of weathering which gives rise to undulating topography. Whole district lies on the Balaghat plateau. The height of the region is ranging from 450 to 750 m. from mean sea level. On the basis of topography region is divided into two basic units i.e. Balaghat plateau region and The North-Eastern Region. The Manjra is the major river of the region. As a result of this physical characteristics, make this region distinct physical entity and homogeneous unit for geographical investigation.

2. Climatically entire region falls in the rain shadow area. Climate of the region is generally dry except, during south-west monsoon season. There is a spatial as well as temporal variation in the distribution of rainfall. The rainfall variability is more in the study region.

3. Soils of the region are mainly derived from trap rocks. Basaltic rock structure is the main parent material for the formation of soils. Agriculture is developed in the region of deep and medium black soils, where irrigation facilities are available.

4. Economy of the region has an agrarian base. Out of the total working population nearly 80.00 percent working population is engaged in primary economic activities, especially in agriculture and allied activities.

5. Out of the total gross cropped area in the study region about 17.00 percent area is under irrigation. Irrigation has played an
important role in transforming the agricultural landscape and life of the rural people in the study region.

6. The study region has a fairly good system of road and rail network. Transport plays an important role in the economic development of the region and rural-urban interaction.

7. The physical and socio-economic environment of the region has provided a good potential for the development of grape cultivation.

8. The author who is born and brought up in the study region i.e. Latur district is quite aware and well acquainted with geographical environment of the area. So it helps to field work and required data collection for the purpose of study.

9. The work on the Micro Level Spatial Analysis of Grape Cultivation in Latur District has not been yet attempted by any geographer and such type of work can be useful for preparing and implementing development schemes regarding agricultural land use and cropping pattern on sectoral and spatial levels, so the author has selected this region and topic for the purpose of geographical investigation.

1.5 Objectives of the Study:

Following are the main objectives of the study.

1. To examine the role of physical determinants on the development of grape cultivation in the study region.

2. To assess the impact of non-physical determinants on the growth of viticulture.
3. To analyse the changes in the general landuse and cropping pattern of the study area.
4. To analyse the basic aspects of grape cultivation.
5. To evaluate the spatial distribution of grape cultivation and grape productivity in the study area.
6. To assess the cost and return structure of grape cultivation i.e. economics of Grape cultivation.
7. To analyse the socio-economic characteristics of sample grape growers.
8. To know the disposal system of grapes and marketing channels of the study area.
9. To find out the problems associated with grape cultivation in the study area and suggest appropriate measures to solve them.

1.6 Data Base and Methodology:

Data has been collected through primary and secondary sources. Primary data has been collected through field visits to the grape orchards with interview schedule for which special interview schedule was prepared by considering objectives of the study. Data regarding the grape orchards was collected by observation of the grape gardens and personal talk with the grape growers. Secondary data has been obtained from socio-economic reviews of the district, district census handbooks, gazetteers, agricultural epitomes, bulletins, periodicals, seasons and crop reports, etc. The data thus collected through primary and secondary sources has been classified, tabulated and analysed by using various statistical techniques and be presented by using various cartographic methods.
For micro level study, the three stages stratified selected sampling technique is adopted for the selection of tahsil, villages and grape growers of the study area.

Selection of Tahsils:

There are ten tahsils in the study area. Three tahsils are selected for the study, one each from high, moderate and low concentrated areas of grape cultivation. Ausa tahsil is selected from high concentrated area, Nilanga from moderate concentrated area and Ahmadpur from low concentrated area.

Selection of Villages:

From Ausa tahsil four villages are selected for field work, namely Killari, Karla, Sirsal and Lamjana. From Nilanga tahsil three villages are selected, namely Nadi-Hattarga, Ambulga and Jewali and from Ahmadpur tahsil one village is selected i.e. Shirur-Tajband. Thus total eight villages are selected.

Selection of Grape Growers:

The forty grape growers are selected from Killari, Karla, Sirsal and Lamjana villages of Ausa tahsil. Eighteen grape growers are selected from Nadi-Hattarga, Ambulga and Jewali villages of Nilanga tahsil. Two grape growers are selected from Shirur-Tajband village of Ahmadpur tahsil. Thus total sixty grape growers are selected for the study from all over the study area.

While selecting the grape growers, due weightage is given to large, medium and small size grape cultivators, at the same time weightage is also given to production stage of grape orchards. On the basis of area under grape cultivation, selected grape growers are grouped in to small, medium and large size. The data regarding the
Sample grape growers has been collected by actual field work by using interview schedule.

In the present study various methods and techniques have been used. However, it is not appropriate here to give all details. The details regarding various methods and techniques are discussed in the thesis at appropriate places.

Some of the methods used in the analysis of present study are given below:

In the present study 'crop yield and crop concentration indices ranking co-efficient' technique is used. This technique is introduced by Jasbir Singh (1976). The procedure of this technique is explained as follows.

I. \[ Yi = \frac{Yae}{Yax} \times 100 \]

Where:

- \( Yi \) = the crop yield index
- \( Yae \) = the average yield per hectare of crop ‘a’ in the component enumeration unit, and
- \( Yax \) = the average yield of the crop ‘a’ in the entire region.

II. \[ Ci = \frac{Pae}{Par} \times 100 \]

Where:

- \( Ci \) = the crop concentration index
- \( Pae \) = the percentage strength of crop ‘a’ in the total harvested area in the component enumeration unit i.e. tahsil and
Par = is the percentage strength of crop ‘a’ in the total harvested area in the entire region i.e. Latur district

The crop yield and concentration indices thus derived for all the regional units and the crops are ranked separately. Yield and concentration ranks for individual crop are added and there after divided by 2, thus giving the crop yield and concentration indices ranking coefficient.

<table>
<thead>
<tr>
<th>Crop Yield &amp; Concentration Indices</th>
<th>Crop Yield index</th>
<th>Crop concentration index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rankin co efficient for crop ‘a’</td>
<td>Ranking of Crop ‘a’ + ranking of crop ‘a’</td>
<td>2</td>
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To determine the per hectare cost of establishment, per hectare cost of cultivation and cost and returns structure of grape cultivation, three cost concepts viz. cost- A, Cost- B and Cost- C is used.

**Cost- A :**

It includes the cost on account of hired human labour, total machinery labour charges, cost of grafts, cost of manure and fertilizers, cost of insecticides and pesticides, cost of bamboo, cost of training structure, irrigation charges, depreciation of implements and farm building, land revenues, cesses and other taxes as well as interest on working capital. Thus cost ‘A’ is sum of value of all above items.
Cost- B:

Comprises of cost ‘A’ plus imputed rental value of owned land and imputed interest on fixed capital (excluding land).

Cost- C:

Comprises cost ‘B’ plus imputed value of family labour.

The grape garden once established, one can harvest grapes every year. The production activity can be continued up to 20 years. However, standard life of grape garden was considered as 15 years. On the basis of above the establishment cost was amortised (a) by using following formula.

\[ a = \frac{Ar (r+1)^n}{(r+1)^n - 1} \]

Where,

\( a = \) Amortised cost
\( A = \) cost c
\( r = \) Rate of interest
\( n = \) Economic life of grape orchard (yrs.)

The economic life was considered as 15 years and rate of interest was 9 percent per year.
1.7 Chapter Scheme:

The entire work is organized into seven chapters.

Chapter – I
Introduction

The chapter first deals with the introduction of the problem, classification of grapes, review of related literature, choice of the region and topic, objectives of the study, data base and methodology, and chapter scheme etc.

Chapter – II
Geographical personality of the study region

The chapter second throws light on the physical & socio-economic aspects of the study area. Physical aspects like geographical location, relief, natural drainage system, climate, soil types, etc. and socio-economic aspects like, irrigation, population, distribution of settlements, industrial development, market system, transport & communication etc. are considered to determine the geographical personality of the region with respect grape cultivation.

Chapter – III
General Landuse and Cropping Pattern

The Third chapter is mainly concerned with the ‘General Landuse and cropping pattern of the study area’. It includes the changes in landuse, and cropping pattern over a period of fifteen years (1991-92 to 2005-06) of the study area.
Chapter – IV

Basic Aspects of Grape Cultivation

Forth chapter deals with basic aspects of grape cultivation. It includes the study of location and site of grape orchard, topography, climate, soil, varieties, propagation, training of grapevine, pruning, growth and productivity, nutrition, water management, weed control, diseases and their management, pests and their management, quality improvement, quality of grapes, post harvest management, processing of grapes, transportation & Marketing.

Chapter – V

Spatial Distribution of Grape Cultivation

Fifth chapter devoted to spatial distribution of grape cultivation. It includes the study of Grape growing regions, Annual growth cycle of grapevine under different regions of India, Spatial Analysis of grape cultivation, Analysis of grape productivity and grape concentration.

Chapter – VI

Analysis of Survey Work

Sixth chapter deals with Analysis of Survey Work. This chapter is completely based on the field survey data. It includes the economics of grape cultivation i.e. cost of establishment, cost of cultivation of grapes, cost, returns and profitability of grapes, socio-economic characteristics of grape growers and marketing of grapes.
Chapter – VII
Conclusions, Problems and Suggestions

Last chapter deals with conclusions, problems and suggestions. In this chapter results emerged from the analysis of the data in the preceding chapters are stated in form of conclusions. The problems related with grape cultivation discussed in detail. The important suggestions are given in this chapter to improve the overall condition of the grape cultivation in the study area.
References


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