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CHAPTER I

INTRODUCTION

Agriculture has been and will continue to be the backbone of Indian economy as it contributes to about one fourth of GDP of country. It also sustains livelihood of about two third of population and is the lifeline of agro-based industries. It also brings in about 13 per cent of the total Indian export earning, apart from its role as supplier of food. The agricultural development also acts as a driving force for overall economic growth, employment generation, poverty alleviation, food security and susceptibility.

Horticulture today contributes over 24.5 per cent of country's agricultural GDP, over 10 per cent of the total agricultural export earnings and supports more than 19 per cent of the labour force of the country. India is the second largest producer of fruits and vegetables in the world. In India fruits are grown over an area of 3.73 million hectares contributing to an annual production of 46.4 millions tons. Indian fruit basket comprises a wide variety of fruits ranging from the tropical fruits like mango, banana, citrus, papaya, guava, grapes, etc, to apple, pear, peach, plum, almond and walnut in the temperate fruits and anola, ber, pomegranate, annona, squamosa, etc. and the arid zone.

Grapevine cultivation, particularly in semi arid regions, has got more significance. It is practiced over an area of 0.043 million hectares in the country (1.14 per cent of total area under fruits) with the production of 1.083 million tons. Maharashtra is one of the leading states in the country in grapevine cultivation.

Farmers have selected grapevine crop as an alternative and profitable crop in the dry and semi arid regions of Maharashtra. Sangli, Pune, Nashik, Aurangabad, Solapur, Osmanabad, and Latur districts of the state have emerged as a significant area for grapevine cultivation. This crop, due to its lucrative gains in the region has replaced the cultivation of sugarcane on irrigated lands considerably.

The study region is situated in a drought prone area of semi arid tracts of India. It lies in southern, district of Maharashtra and is a part of the Deccan plateau. The region is largely influenced by physiography, climate, water resources and soils. The scarcity of the surface and ground water is the major problem of drought prone area. As a result the irrigation facilities could not be developed much. However, to cope up with environmental hazards like drought, some innovative farmers of the
region have adopted grapevine cultivation on trial basis in the beginning of 1960s by producing seeded grapes. The development of grapevine cultivation took place from 1970. The progressive grape growers of the region have innovated some new varieties of grape like Tas-A-Ganesh, Manik Chaman, Sonaka, by selection method from Thompson seedless during the 1970s and 1980s. The Tasgaon tahsil has emerged as the major grape growing pocket of Maharashtra.

Temporal development of the grapevine cultivation in this area is the testimony of the gallant, innovative and industrious farmers. The semi arid climate of the zone has promoted the development of grapevine cultivation. During the last decade, Sangli district has attained significant position in respect of area under grapevine, production and quality of the grapes. Grapevine cultivation has established its credibility in improving productivity of the land, generating employment opportunities, improving socioeconomic condition of grape growers, enhancing export potential and above all providing nutritional security.

Grapevines are very sensitive to climatic changes, fog, hail, uncertain rainfall, high humidity and severe cold result in failure of the crop. Beside the costly inputs, inadequate market and infrastructural facilities create obstacle in the growth of grapevine cultivation. However, the regional variations are observed in agricultural practices, growth, productivity, crop economy, by-product processing, marketing and regional variation in infrastructure with regard to post harvest care and management of this crop.

**OBJECTIVES:**
In view of the above facts, the present study aims:

- To review the physical determinants of grapevine cultivation.
- To assess the role of the socio-economic and behavioral determinants in grapevine cultivation.
- To study the historical and spatial pattern of grapevine cultivation.
- To analyse the areal variations in grapevine cultivation regarding yield, production, productivity and attribute these to various parameters at micro-level.
- To compare the economics of grapevine cultivation with those of the traditional crops.
- To study the by-products of grape with special emphasis on raisins production.
To analyse the marketing systems of grapes and raisins.
To investigate the problems and prospects of grapevine cultivation.

HYPOTHESES:
In the present study, the following hypotheses are formulated to test:

- The returns from grape vine cultivation vary according to the size of holdings, types of soils, varieties grown and methods of cultivation.
- The raisin (value added product) gives more returns than table grapes in domestic market.
- Direct export of grape by individual or groups of growers enhances the profitability of grapevine cultivation.

STUDY REGION:
The study region selected for present investigation is Sangli district of south Maharashtra plateau Fig.1. It is located between 16° 45' & 17°33' North latitudes and 73° 42' East & 75° 40' East longitudes occupying an area of 8562 sq km and supporting 2,581,835 population. The region has diversified physiography and it is administratively divided into nine tahsils. The western border is demarcated by Western Ghats. The eastern part of the district is a part of the Khanapur plateau. Intermediate river valleys are found on the eastern offshoots of Western Ghats. The soils vary from laterite patches in the west to deep medium black alluvial of the river tracts in the central part and poor grey soils in the east. The monsoon climate dominates the region. The region receives rainfall mainly from southwest monsoons, ranging between 2000mm to 500mm from west to east. The region to the east of Krishna frequently experiences severe drought conditions.

The researcher has selected the Sangli district for the present investigation, based on the following considerations.

Sangli district has emerged recently as one of the foremost producers of grapevine in the state.

The region presents heterogeneous characteristics in environmental conditions reflecting regional variations in agriculture.

There is greater awareness among the farmers of the semi arid tracts to modernize the horticulture for maximizing production.
INDEX MAP
SANGLI DISTRICT

MAHARASHTRA STATE

STUDY REGION SANGLI DISTRICT

FIG.1.1
It is observed that since the early seventies, farmers especially with small and medium sized holdings have shifted their cropping pattern from food crops to cash crops with application of new technology.

The crop influences the regional economy to a considerable extent due to high returns per hectare. Thus it has become a boon to the farmers of the dry areas since this crop requires less water compared to other crops.

There is spatio-temporal variation in regards to the area, concentration, production, consumption, marketing and economy of the grape cultivation in the district.

The extents of microclimate, soil, altitude, availability of surface and groundwater for irrigation have determined the development of grapevine cultivation. Thus regional pattern of grapevine cultivation corresponds with facilities of irrigation.

The application of fertilizer, growth regulators, pesticide, fungicide, intercropping, manuring, methods of cultivation like cutting, pruning, training vary within the boundaries of the region which is closely related to the quality and productivity of this crop.

The region is basically agricultural and rural, cultivating traditional crops with low returns. It is necessary to compare this new cropping pattern in terms of optimization of benefits and risk reduction.

The researcher is born and brought up in the same region and is a grape grower himself.

All these conditions have motivated the researcher to undertake a geographical inquiry of grapevine cultivation in Sangli district.

**DATABASE:**

**PRIMARY DATA:** The importance of the study lies in the fact that the entire analysis is based on empirical data collection through intensive fieldwork. It is supplemented by secondary data wherever necessary. Questionnaires and schedule techniques are employed for the collection of the facts regarding the grapevine cultivation, raisin production and marketing. More stress has been given on informal discussions with grape growers and persons concerned with grape culture. The schedules were filled in at the time of spot survey. Interviews and discussions with the
grape growers were attempted during these visits. Villages and farms are considered as micro areal units. For the detail analysis, 10 per cent villages and grape growers are selected by stratified random sampling. These discussions provided base to the vital issues involving some of the information, which could not be covered in the structured schedule used for the growers.

SECONDARY DATA: The secondary data has been collected from the office records of Govt. and Non Govt. agencies and research organizations. Among these agencies worth mentioning are the offices of 'Training and Visits' scheme, Zilla Parishad, Sangli, 'Soil and Water Conservation and Survey' Department, Taluka Revenue Offices, Office of Directorate of Horticulture, Pune and Sangli, Office of Superintendent of Agriculture Sangli. District Central Cooperative Banks, Sangli, Bank of India, Sangli, Branch. Secondary data pertaining to these issues have also been collected from various agricultural marketing organizations such as Cooperative marketing societies of grape growers, Chamber of Commerce, Market Committee, Grape Grower Cooperative Marketing Federation, Sangli, Grape Growers Federation, Pune. Beside this, the websites of APEDA, FAO, USDA and INDIA AGRO are also used as source of information.

METHODS USED:

The taluka has been selected as an areal unit for regional analysis. Whereas, village and farm plots have been chosen as an areal unit for micro level analysis.

SAMPLING: The stratified random sampling (10 per cent) method has been adopted for the selection of the villages, and stratified purposive sampling method has been used for the selection of grape growers.

The market agencies were selected on their regional dominance such as agencies exporting the grapes to Middle East countries and Europe. The private agents are also considered in this respect.

To avoid the impact of climatic hazards if any, on agriculture the triennial averages for the years 1999-2000, 2000-2001 and 2001-2002 were considered for investigation whereas for the specific purpose the period from 1980 to 2002 is taken into consideration. Grapevine has a productive period of about 20 years. The first harvesting season is generally considered as the trial season. The real commercial harvesting begins from the third year. In view of this, for the cost estimation and
marketing purposes above-mentioned years have been considered, which covers three commercial seasons. The collected data through different sources were edited; processed, classified and specific statistical techniques were employed to investigate the attributes among various factors. The cartographic techniques such as isopleth, choropleth, graphs etc are used to represent the processed data. Various statistical techniques are used to calculate the indices like concentration, intensity, composite index, Index of satisfaction, Index of sprouting, flowering and harvesting. The details of these techniques have been explained at appropriate paragraphs in the text. Each chapter ends with the list of references cited in the text.

LIMITATIONS:

Being a micro level study there are some limitations regarding the collection of the data for certain aspects. The data on irrigated cropping pattern, per hectare production of crop, fertilizer consumption, seasonal fluctuations in water table etc. were not available in published form. Many grape growers have not maintained the record of inputs expenditure, production, marketing return, turn of irrigation watering to crop etc. Most of the farmers, due to illiteracy could not give correct and relevant information. These lacunas however, were rectified by consulting the educated and knowledgeable farmers of the neighborhood.

When the village level units are considered for regional analysis, only source of information are the Government offices like Talathi and Gramshevak. The consolidated records from these officials in some cases were not made available. The researcher in such situation has to restrict the area of inquiry. To make good of these deficiencies sample surveys were undertaken covering various aspects of grapevine cultivation.

REVIEW OF LITERATURE:

Grapevine cultivation being a highly specialized form of agriculture. Hence, very few attempts have been made by geographers to study it. However, attempts have been made by climatologists, agricultural scientists, economists and scholars from other disciplines to study the different aspects of grapevine cultivation.

Edmond, et al (1977) has given scope and importance of horticulture. They have classified the crops based on their properties and uses. Subramaniam et al
(1982) studied the relationship of climate with some specific horticultural crops like mangoes, grapes and banana. Jules Janick (1982) has dealt with the origin and growth of horticulture and the conceptual analysis. He has distinguished horticulture from agriculture in the sense the former includes only the garden crop. Aesthetic use of plants is the unique feature, distinguishing from other agricultural activities including agronomy and forestry. He has made use of the terms pomology, oleri-culture, and floriculture and landscape horticulture. At international level 'table grape' production has been studied by J. Perer and Harvey et al. (1994), Orth (1994). Patil and Chavan (1989) have described the development of Indian grape cultivation. They have also given the history of grapevine cultivation, necessary atmosphere and process of marketing the products of grapes. Table grape production in India was also studied by J.V. Possingham (1994) and Shikhamani (2003). Sham Singh et al. (1967) attempted the study of fruit cultivation in India. Singh Ranjit (1969) highlighted the production of mango, banana, guava and grapes with an objective to bring out the rich and diverse varieties of fruits from India.

The economic analysis was undertaken by W.N. Hays (1902), Patil P.C. (1925) who adopted route method for studies on the production cost. Another method of economic analysis is the survey method, introduced by G. F. Warren (1932). While calculating cost of cultivation, different concepts were used in estimating the cost of cultivation, as standardized by FAO and ECAFE.

As the grape crop requires skillful management in different operations, various changes were calculated according to the fiscal commission (1949-50) by Agrawal (1952). Cost of production has been analysed by Patil (1932), Norman (1950), Singh (1951) to obtain land charges, labour charges and charges for the enterprises. Bandnhop (1964), Panse (1954), Salunkhe (1964) and Sharma (1964) have calculated the depreciation charges on equipment. Adam and Patil (1921) have studied interest on working capital. The cost of establishment has been studied by Baily (1948) and Winkler (1956). Megnon and Ramanna (1982) have concluded that grape enterprise requires fairly high initial investment as well as high operation cost. Singh G. (1983) has supported the same.

Input output relationship has greater importance in micro economic planning and development. Rajamane (1966), Bhujabal (1988), Pande (1923) have studied variety-wise returns from grapevine cultivation. R. J. Smith (2004) has analysed the
cost of establishment of vineyard and production of wine grapes in the north coast region of the Sonoma, California. The website www.indiaagro.net explains economic importance of grape production, cultivation practices, harvesting and post harvesting along with handling techniques. In a research article Crocker et al. (2001) explained production of 'muscadine grapes' and returns from it. Singh (1983) has studied the grapevine cultivation and concluded the operational cost is very high as compared to other crops. Phunde (1973) has concluded that gross returns are high from Thompson seedless variety as compared to Anab-A-Shahi and Selection-7. Mali (1984) studied the two aspects i.e. grapevine cultivation and the marketing problems. Khilari (1991) has explained various problems related to the grapevine cultivation in Pune and Nashik. Dan Bryant (2000) S. J. Vasquer (2003) have attempted cost-benefit analysis.

Justin R. Moris (1980) has analysed the post harvest changes in grape quality and taste. Gulati et al. (1994) have analysed the aspects of export competitiveness of selected agricultural commodities. Singh and Krishnamurthi (1964) in their book have highlighted the Indian fruit production, harvesting problems, aspects of preservation and cold storage inducing the preparing and marketing of fruit products. The Aube (www.actahort.org) discussed the problems of marketing of table grapes. He used the term 'table grape industry'. Nalawade (1994) stated that grapes are perishable produce and therefore, for exporting, it is necessary to develop cold storages in India. Choudhari (1994) and Bansal (1994) have also explained various problems of grapes export.

In case of perishability Shrivastava (1963) and Bert Mason et al. (1997) have analysed the scope of fruits and vegetable preservation in India. Susan Pollack and Agnes Perer (1997) have used the term grape industry and analysed the temporal trends of grapes used in export. Amonor Boadu et al. (2003) have also used the term grape industry and explained in details the U.S. grape juice industry. www.acorn.org gave an account of grape export industry. www.rubens.ana.edu is a student's project focusing on the grape drying process in Australia. Shrivastava (1989) assesses the potentials in the present profile of agro-processing industry and the recent trend in India. Patil (1995) explained that 80% of raisins in the world are manufactured without any chemical processing. Almost all the countries in the world are drying grapes in sunlight. Sopan Kanchan (1995) has emphasized on the quality of grapes for better export and market potentials. Nalawade (1992) has studied various methods of
raisin making and cost analysis of raisin production. Giridharilal et al. (1998) have explained principles of preservation, commercial canning, preservation of different fruits, in the form of jam, jelly, beverage etc. Hicks (2001) noted that the increased food production alone could not guarantee food security. Increased income through value addition to agricultural raw materials is one way to achieve this. G.A. Kali (1995), Larry et al. (1995) explained the potentials of grape as an alternative crop for the development of the region. Mary and Bill Weaver (2000) have given some guidelines for new grape grower to avoid the faults in cultivation, harvesting and post harvesting handling practices.

While studying about economic use of water Watson et al. (1985) during their study of Australian experience of drip irrigation on vineyard has observed that, there was a significant increase by 11 percent in the coverage of drip irrigation for grapes. They further observed that many of the leading wineries located in South Australia have been the leaders in the adoption of drip irrigation for grapevine and also developed its application on many other crops as well. A. Joshi (1989) observed extensive use of drip irrigation system in grapevine cultivation in Tasgaon tahsil of Sangli District. Poling, et al. (1994) has explained the grapevine growing habits and water requirement according to the growing stage.

Thus, research work comprising scientific techniques of production of the crops are carried out. Along with this, production, marketing and cost estimation has been also carried out. However, none of them have attempted the spatial organization of grapevine cultivation. Beside this, attempts to consider the role of natural and cultural factors in the growth and development of grapevine cultivation have also not been made. Geographers have not given due attention to such studies till date. However, recently Pawar and Phule (1999) have attempted to highlight various aspects of fruit farming with special reference to pomegranate in drought prone area of Maharashtra. Aher (1989) studied the grape cultivation of Nifad tahsil of Nashik district. Kodag (1998), Mali (1984), Mali (1989) and Katare (1988) studied the grapevine cultivation in Miraj, Tasgaon, and Jath tahsil of Sangli district. On this background, it becomes necessary to evaluate the success of grapevine cultivation as compared to the traditional farming practices as well as to assess the natural and cultural environment favourable for grapevine cultivation in the study region. The present investigation is an attempt in this direction.
ORGANISATION OF THE RESEARCH WORK:

The entire work has been organized into nine chapters. The first chapter opens with the introduction, which includes statement of the problem, study region, objectives, methodology, database, sampling techniques, review of literature, limitations and the organization of the work. The second chapter presents geographical setting, climatic conditions, including temperature, rainfall, humidity, fog, soil and variations therein in view of suitability of grapevine cultivation in the region. The third chapter deals with demographic, economic and infrastructural determinants and behavior of the farmers regarding the grapevine cultivation. Spatio-temporal growth and development of grapevine in India, Maharashtra and in the study region is the subject matter of the fourth chapter. The fifth chapter is concerned with the micro level analysis of grapevine cultivation. Beside this geographical inquiry of water management, inter-crop culture, weeds controlling and microclimates are the core parts of this chapter. The sixth chapter deals with the economy of grapevine cultivation, analysis of cost benefit according to the size of holdings, soil type, variety grown and the method of cultivation. Chapter Seven highlights the raisin production with 'backward' and 'forward' linkages, present status, potentials and its economy as an agro-based industry. The eighth chapter deals with the marketing of grapes and raisins. It also includes the export profile of grape and raisin and the price reserved by growers through agent and private companies. The ninth chapter deals with the problems and prospects followed by the list of appendices and bibliography.

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