CHAPTER III

REVIEW OF LITERATURE

3.1 INTRODUCTION

The present chapter has made an attempt to present a review of the recent related studies so a conducted on mango cultivation, in order to understand the production, the cost of cultivation, the marketing activities and net income that could be got through mango cultivation and such other details.

Rahman et.al.,\(^1\) has pointed out that the mango cultivation is a profitable venture in the study area although the returns might be negative during the first four years of its cultivation. The yield is found to be higher in the Dinajpur district as compared to that of the yield in the Chapalnawabganj district. The study brings out that it to be 2.23 per cent and 2.54 per cent for the Chapalnawabganj and the Dinajpur districts respectively. Even 20 per cent of mango is found to be profitable for the Chapainawabganj district and it is 19 per cent for the Dinajpur district. In the study area the farmers have faced problems like lack of adequate good seedling, lack of insecticides, natural disasters and the like during mango cultivation.

Sangeetha Shroff\textsuperscript{2} has indicated that the gross returns from the yield per hectare across all size groups of farmers is 11,581 fruits or 965 dozens; small farmers have the highest yield of 1,058 dozens per hectare while the large farmers have the lowest yield of 944 dozens per hectare. The gross returns per hectare across all the farmers are ₹1, 26,415 per hectare and are the highest for the small farmers amounting to ₹1, 35,107 per hectare. The gross returns across all the size groups of farmers are ₹1,264 per tree and the cumulative cost per tree is ₹856.90 and the net revenue of ₹407 per tree are obtained which came to ₹40,710 per hectare. The maximum net returns are earned by the large farmers, which amounted to ₹47,377 per hectare. The highest gross returns are more in the case of large farmers as they has lower costs than the small farmers and have also obtained a better price.

Vishwanatha Reddy and Pramod Kumar\textsuperscript{3} have pointed out that the prices of raw fruits and processed products are highly fluctuating in the domestic as well as in the international markets, thereby causing a higher amount of risk, particularly to the small scale processing units. Consequently, the small scale units are not working on their own account; and instead they are working on a pre contract basis. Lack of domestic demand for mango pulp is reported to be a major

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problem by 7 per cent of the firms studied. The domestic demand act as a cushion against the demand and the price fluctuations in the international markets.

Rivera⁴ has stated that the mango is a high value and bigger earner crop, compared to the traditional crops like rice, corn, coconut and sugarcane, where income ranges are only from a profit ₹15,000 to ₹60,000 per hectare a year. That is why most of the farmers growing traditional crops have remained poor. Mango could easily give a profit ₹1,00,000 to ₹5,00,000 per hectare per year with mango trees of 10 to 20 years old. Inter-cropping in the mango orchard with seasonal or cash crops like grains and vegetables would add more to the farmer income. The mango tree is benefited by the cultivation and application of fertilizers to it. More income per unit area could be better attained by growing mango with other crops. The distance of mango planting at 20 to 30 metres of interval would allow bigger and more productive mango trees to flourish well with less production costs and with less of pest and disease problems. The care, cultivation and fertilization of the intercrop would also benefit the growth and the productivity of the mango trees.

Mahasik et al.,\textsuperscript{5} study have revealed that the mango is the main crop of the Konkan region which has a large export potential. The adoption of the recommended cultivation practices could increase the productivity and the quantity of production of the mango crop. The Government and non-Government organisations have made many efforts to disseminate the recommended technologies among the farmers. This might have helped to increase the knowledge and awareness about the technologies among the farmers, and ultimately their adoption, as knowledge is a pre-requisite for adoption to take effect. Hence, the study is conducted with the objective of assessing the extent of adoption of the recommended mango cultivation technologies by the mango growers and to understand the constraints faced by the mango growers in adapting to the recommended mango cultivation technologies. The study is conducted during the year 2003 in the Sindhudurg district of the Konkan region in the Maharashtra state, which has the maximum area in the production of mango in the region. It is found that 23.24 per cent of the respondents have adopted the mango blossom protection schedule developed by the Konkan Krishi Vidyapeeth, Dapoli. The various constraints are also reported by the mango growers in the adoption of the recommended mango cultivation technologies.

Munirkhan et.al.,\(^6\) study reveals that the production of mango in Pakistan has increased due to the adoption of improved and better management practices. Despite an increased production and a rising demand in the export market, the potential of mango export has not been fully achieved. Pakistan has a comparative advantage in the production of mango and an enormous potential have existed for its exports of mango in the vast Middle East markets.

Sharma and Vishal Rana\(^7\) have conducted a study that has found out the appropriate harvesting time for ‘Dashehari’ and ‘Langra’ cultivars of mango under the sub-montane region of Himachal Pradesh. Fruits are harvested at weekly intervals under near maturity conditions and have been evaluated for different types of fruits and for their physical and chemical characteristics. This study has concluded that under the low hill conditions of Himachal Pradesh, the Dashehari variety of mango got ready for harvesting even by the middle of July whereas the fruits of langra cultivar have attained harvest maturity only by the first week of August.


Khuda Bakhsh et al., have stated that the cost of production and the returns obtained by growing mango orchards could be estimated in different ways compared to the raising of the annual crops. Their study has been designed to investigate the cost of production, and the returns per acre over the entire life time of the mango trees. A sample of 20 mango growing farmers is purposively selected from the various villages of the Multan district. The objective of their study have been to work out benefit cost aspect and net present worth of growing mango orchard. A net present worth of ₹1,55,607 per acre have been is estimated for the sample respondents which have indicated that the mango cultivation has fetched higher returns whereas the benefit cost ratio have been reasonably high and it has worked out to ₹ 2.61 implying that by investing one rupee in mango cultivation would return earn a of ₹2.61. These results have indicated that investing in the mango orchard would bring about huge returns to the farmers on the one hand and also for the country at large in the form of foreign exchange earnings on the other hand.

A study conducted by Naik has revealed that the farmers have used an excess quantity of labour and a lesser quantity of the insecticides. The marginal value of productivity is compared with the use of a factor to assess the efficiency

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of the resource use. The ratio of the marginal value to the factor cost for human labour and for manures have been observed to be less than unity which have indicated an excess utilization of these resources and has shown that the use of the insecticides and the fertilizers should be curtailed for the maximization of the profit levels.

Jalathi et.al., \(^\text{10}\) have pointed out that the mango exports and its export competitiveness has revealed that as regards earnings through exports of fresh mango from India at the over all level, is concerned, the simple growth rate has increased significantly to the level of ₹29,020 thousands at the current levels of prices it is and at constant prices ₹5,573 thousands. There are upward and downward swings in the exports of mango both in respect of volume as well as in respect of value which has indicated the instability in the quantum and in the earnings through mango exports. The variability in respect of mango exports has indicated that the co-efficient of variation have been more at an overall level for almost all the items of exports both by quantum and by value. There is maximum variability in respect of other mango processed products to the extent of 79.46 per cent followed by pulp to the extent of 36.36 per cent and fresh mango to an extent of 34.10 per cent and mango pickle and chutney to the extent of 29.11 per cent.

Govinda Reddy et.al.,\textsuperscript{11} have studied about the problems of the mango growers in the Srinivasapur region of the Karnataka state. The major constraints faced by the mango growers at the production level are the lack of knowledge about the application of the balanced fertilizers. Nearly 88 per cent of the respondents have followed the wrong methods due to their lack of awareness about drip irrigation 84 per cent, have not adopted the proper technology heavy rain and wind during the flowering and the fruit development state have been reported by 82 per cent, the non availability of credit by 80 per cent, the non availability of labour by 78 per cent, the high cost of inputs by 74 per cent, lack of knowledge of technical guidance by 43 per cent, high incidence of pests and diseases by 36 per cent and the non-availability of quality grafting by 26 per cent. The major constraints in mango exports are lack of nearby processing units, lack of storage facilities, lack of pre-cooling units, lack of knowledge in the chemical treatments of the units, absence of regulated markets and the lack of improved harvest practices. The other problems faced by the farmers are exploitation by the middlemen, lack of grading of the products to be sold and such other problems.

A study made by Nagaraj and Prakash\textsuperscript{12} has indicated that the total fixed capital investment in the fruit processing unit is ₹3, 38,258. The fixed costs have accounted for 12.15 per cent of the total processing costs. The total fixed cost per k.g., of the fruits processed have worked out to ₹0.78 and the total working capital investment of the fruit processing unit is ₹24,46,631.

Rajgopal\textsuperscript{13} has conducted a study on the marketing of apple, guava and them mango fruits and have reported that the producer’s share in the consumer’s prices is found to be the highest in apple followed by mango and guava. The cost of marketing is found to be higher in guava than in mango and apple. It has revealed that apple cultivation is economically viable even to the small growers.

Krishna Rao and Chowdry\textsuperscript{14} has been conducted a study on the capital productivity measures which have indicated that an investment in the mango gardens in the region is a profitable proposition. The investment can be recovered by the farmers in about 11.5 years and the benefit cost ratio is 1.46:1. The positive net present value has indicated about the soundness of the investments made in mango cultivation. The internal rate of returns has also indicated about the favourable nature of the returns.


Sunayini Parchure\textsuperscript{15} has identified that the major objective of the horiticultural development scheme has been to provide complementary revenue to raise the economic status of the small, and the marginal farmers and the weaker sections of the rural community and also to accomplish better land utilization. Under the scheme, 50 percent of the total cost is given to the beneficiary as a loan up to one hectare of irrigated land or up to two hectares of unirrigated land for mango and for the other crops like custard apple, lime, oranges and such other fruit crops.

Jogindar and Kulwinder\textsuperscript{16} have indicated that the mango has become a good foreign exchange earner. Out of a total number 1000 varieties, 20 are commercially viable while only Deshehar and Alphonsa varieties are exported to Afghanistan, Bahrain, France, Kuwait, Malaysia, Qatar, Singapore and the USA.

Veerkar and Borude\textsuperscript{17} have pointed out that the capital investment in preparing the mango products is quite high and have observed that out of total investment of ₹2.81 lakhs for pickle making 31.42 per cent or ₹ 88 lakhs have been invested in capital and 55.25 per cent is found to have been invested as fixed


capital and 59.06 per cent as working capital. Among the three mango processed products, the capital investment is found to be the highest amount of ₹5.04 lakhs in making raw slices in brine and the lowest amount is ₹1.60 lakhs in the chutney making business.

Patil\(^\text{18}\) has studied about the mango orchards from some selected villages and has classified those under two dimensions with respect to size of the orchards and with respect to the age of the orchards. The per hectare investment on the Alphonso orchards is estimated at ₹21,116. And the per hectare investment is found to be the highest for the large sized orchards at ₹21,738 followed by the small sized orchards at ₹20,544 and the medium sized orchards at ₹20,328. The per hectare net returns on Alphonso orchards is higher for the large sized orchards at ₹16,248 as compared to the small sized orchards at ₹7,360 and at ₹12,400 for the medium sized orchards. The per hectare average net returns for the over all size of the Alphanso mango orchard is found to be ₹11,684.

Chasa\(^\text{19}\) has pointed out that among all the fruit exports, mango has accounted for 36.40 per cent of the total volume of the fruits exported. During the year 1992-93 32.5 per cent of the volume and 33.4 per cent of the value of total exports have been accounted for by mango. Even though India have been the


largest producer of mango in the World. The export of mango has been quite static due to the exclusive dependence on the Alphonso variety of mango for its exports to the other countries.

Gurao\textsuperscript{20} has found that the raising of mango is quite a profitable proposition with a net return of ₹30,000 with an internal rate of return of 19.33 per cent on investment. The benefit cost ratio has been found to be greater than one. The payback period have been estimated to be 11 years. The per hectare cost of cultivation has worked out to ₹24,920 and the cost of marketing is found to be ₹17,409.

Kumar et.al.,\textsuperscript{21} have been studied the major processed products from fruits include averages 30 per cent followed by juice pulp and concentrates to the extent of 21 per cent and pickles and chutney to the extent of 11 per cent. Since fruits are seasonal and perishable by nature, and the absence of processing is one of the major reasons for the high magnitude of wastage that has occurred in these commodities.


\textsuperscript{21} Kumar, Praduman and Mruthyunjaya, “Demand for Fruits and Vegetables in India”, \textit{Agricultural Economic Review}, Vol.8 (2), 1991, pp.7-17.
The study conducted by Shaikh\textsuperscript{22} has indicated that the almost all the mango growers have been found to adopt technologies related to soil requirements, spacing and filling of pits, while 50 per cent of the farmers have adopted the recommended dose of fertilizers and less than 25 per cent of the growers have adopted the technology to prevent diseases and for pest control, for transplanting the seedlings during July-August and for adopting irrigational practices. Only 11.67 per cent of the growers are found to have adopted the improved varieties, while none of the farmers has adopted the seed treatment technology.

Azad and Sikka\textsuperscript{23} have studied about the production and marketing of the temperate fruits and have applied various project evaluation measures to study the economic viability of fruits such as apples, peaches, plums and apricots. The net present value have been found to be ₹26,257 for apples ₹89,222 for peaches, ₹1,17,837 for plums and ₹1,60,541 for apricots. The internal rates of returns have been 22, 33 and 47 per cent respectively. The benefit-cost ratios have been found to be 1.36, 3.87, 4.62 and 5.10 respectively for the four types of fruits.


Koujalagi\textsuperscript{24} has evaluated the financial feasibility of the pomegranate orchard in the Bijapur district of Karnataka. The study has shown that the per acre net present value for the entire life period of the project have been found to be ₹8,283.81. The discounted benefit - cost ratio at 12 per cent discount have been worked out to be 1.53. The payback period has been calculated to the 6.56 years and the internal rate of return has been found to be 15.55 per cent.

The study conducted by Venugopala Reddy\textsuperscript{25} has revealed that nearly one half 49.17 per cent of the respondents are medium level adopters of the recommended package of practices for mango, followed by a low level of adopters 42.50 per cent and a high level 19.33 per cent of adopters. He has further reported that a large percentage of them have partially adopted the recommended plant protection measures. The practices such as soil testing, the use of hybrids, the recommended age and types of grafts, the recommended number of plants per acre, the application of manures and fertilizers in the pits, better water management practices, the use of the growth regulators, better and improved packages and storage facilities for fruits have not been adopted by a large proportion of the respondents.


Ajayakumar\textsuperscript{26} has reported that the constraints faced by the grape growers are the diseases, the poor bud burst, and the non-availability of sufficient number of labourers, micro-nutrient deficiency, and rains during the pollination stages, and lack of irrigation water and absence of weed management. The constraints faced by them in the marketing of grapes have been the lack of regulated markets, exploitation by middlemen and low prices for their produce.

The study conducted by Patil\textsuperscript{27} has revealed that when the contract is made at the time of the flowering stage, the price received by the growers is found to be the lowest $28.50 per crate though the crate size is quite big. The average price for the Alphanso mango that has been received by the growers is only $29.40 per crate. Finally the direct sale to the consumer is the most profitable one and the sale through the pre harvest contractor is the least profitable channel.

Bastine and Radhakrishnan\textsuperscript{28} have found that the cost of cultivation of plantains per hectare is of the order of `36,249. The return per hectare has worked out to `45,068 and the net income to `8,819. The main items of expenditure are the costs of both family as well as hired labour as also the manure applied per

\textsuperscript{26} P. Ajayakumar, A Study on Adoption Behaviour and Information Consultancy Pattern of Grade Growers in Renga Reddy District of Andhra Pradesh, Unpublished M.Sc.(Agri) Thesis, Department of Agricultural Extension, University of Agricultural Sciences, Bangalore, 1990, pp.107-108.
hectare of plantain cultivation. The contribution of family labour has accounted for about 30 to 50 per cent of the total expenditure that has been incurred for labour. The contribution of family labour has shown a decreasing trend as the size of the holding increased.

Ishita Mukherji Edwards\(^\text{29}\) has pointed out that fruit marketing is in essence an examination of the marketing efforts of the cultivators. Certain characteristics of these cultivators have been found to have has a direct bearing upon marketing practices. The fruit cultivator has generally relied upon the services of middle men for the marketing of their fruits. The construction of roads leading to the villages in recent years and the availability of trucking services in most of the fruit producing villages have reduced the cultivators reliance upon the middlemen services. The middlemen share in the marketing of fruits has dropped to around one third of the total marketing costs of fruits of the Poona district.

The study conducted by Subramaniyam\(^\text{30}\) has revealed details related to the costs and returns of the mango orchards in Karnataka. It has been observed that on an average, the establishment of a mango orchard has required a sum of `3,000 per hectare. The maintenance costs of the mango orchards are found to be only ₹200

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\(^{30}\) K.V. Subramanyam “Economics of Investment in Mango Cultivation in Karnataka”, *The Mysore Journal of Agricultural Sciences*, 1987, pp.200-211.
per hectare. The gross returns from one hectare of mango orchard are found to be ₹1,200 in the Karnataka state.

Mathaiya\textsuperscript{31} study has shown that the predominant problems faced by a high proportion of the mango growers are the high costs of inputs as reported by 78.33 per cent, of the respondents the incidence of pests and diseases according to 73.33 per cent, of the respondents inadequate irrigation facilities according to 69.16 per cent, inadequate extension support according to 65.00 per cent, high fluctuations in the market prices according to 61.67 per cent, high labour wages according to 55.83 per cent and lack of credit facilities according to 52.50 per cent of the respondents.

The study conducted by Nirmaladevi\textsuperscript{32} has revealed that the low price for the produce, the lack of quick transport facilities, lack of storage facilities, the non-availability of regulated markets, exploitation by middlemen and the non-availability of nearby processing units are the market related constraints faced by the guava cultivators.

\textsuperscript{31} K. Mathaiya, Knowledge and Adoption of Mango Growers, Unpublished M.Sc. (Agri.) Thesis, Agricultural College and Research Institute, Tamil Nadu Agricultural University, Madurai, 1987, p.78.

An attempt has been made by Schoorl and Holt\textsuperscript{33} to analyse the three markets for mango namely, the domestic fresh fruits; the domestic processing of fruit and the mango for markets exports. The current fresh fruit out puts and prices have been quantified and meant for the main metropolitan markets. A price throughout the time model have been generated which has shown the expected negative relationship between price and supply and which has become amplified as the season progressed. The substantially constant price range is superimposed on the price supply relationship, reflecting consumer assessments about quality. The market for processing and exports has also been explored by the authors.

Raikar\textsuperscript{34} study has indicated that the per hectare net present value is found to be ₹28,440 in the case of small orchards, ₹16,780 in the case of large orchards and ₹ 21,034 in respect of an average sized orchard. The ratio at 12 per cent discount ratio is 2.87 in respect of small orchards 12.25 in the case of large orchards and 2.49 in the case of an average orchard. The payback period is calculated to be 8.90 years 9.38 years and 9.18 years respectively for small and the large for over all orchards, respectively. The internal rate of return is found to

\textsuperscript{33} D.Schoorl and J.E. Holt “An Analysis of Mango Production and Marketing in Australia” \textit{Agricultural system}, Vol.2 (3), 1986, pp.177-188.

be 20:22, 17:88 and 18:88 per cent for the small, the large and for the average sized orchards respectively.

Paranjape and Borade\textsuperscript{35} have conducted a study on resource - use efficiency in Alphanso mango production in Deogad taluk of Ratnagiri district. The regression co-efficient for age, costs of plant protection and use of chemicals are found to be significant at 0.01 level both according to Cobb-Douglas and according to the Linear functions. The co-efficient of human labour is found to be significant at the 0.01 level in the Cobb-Douglas function and at 0.05 levels in the linear function. These features have indicated that the age of the orchards, the use of the plant protection chemicals, human labour and the proportion of the fruit bearing trees has made a positive contribution to the total production of the Alphanso mango. The sum of the total of the elasticities in the Cobb-Douglas function is found to be ₹2.9035, which indicates the operation of the increasing returns to scale. The $R^2$ value indicates that the variations explained by the selected variables are to the extent of 79 per cent in the Cobb-Douglas function and to the extent of 83 per cent in the linear function. This has shown that the linear function has disclosed a comparatively better fit.