MANAGERIAL ABILITY OF MANGO GROWERS ABOUT
SCIENTIFIC CULTIVATION OF MANGO ORCHARD

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FEBRUARY – 2005
(Registration No. 04-4951-2001)
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A

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DOCTOR OF PHILOSOPHY

IN

EXTENSION EDUCATION

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ABSTRACT

Mango (Mangifera indica L.) one of the ancient fruits of India, undoubtedly deserves to be ‘national fruit’ of India. In area, production, nutritive value and popularity of apple, no other fruit can compete with it. Agriculture being an enterprise is not an exception to this. The mango orchard growers as the manager of the enterprise are expected to bring about maximum profit with available resources. Mango growers perform many functions in carrying out the better production such as: preparing a plan of work, giving clear instructions, integrating the work, taking proper decision at right time, implementing the decision etc. in carrying out the management activity in mango orchard. All the above functions involve in one or the other way, many management components viz. planning, organizing, directing, controlling, human relation, leading, coordinating and decision making. Today farming enterprise is becoming more complex and complicated and therefore, management is a key to face these problems. To make mango orchard more productive,
proper management of scientific mango orchard practices should be adopted by mango growers.

Therefore, the present study was designed to measure managerial ability of mango growers about scientific cultivation of mango orchard and find out the effect of selected variables on managerial ability with the following objectives:

1. To develop and standardize managerial ability scale of mango growers about scientific cultivation of mango orchard.
2. To measure the managerial ability of the mango growers about scientific cultivation of mango orchard.
3. To study the selected characteristics of mango orchard growers.
4. To explore the relational analysis of selected variables of mango growers.
5. To study the constraints faced by mango growers in management scientific cultivation of mango orchard.
6. To elicit the suggestions in overcoming the existing constraints for making the effective management of scientific cultivation of mango orchard.

In order to achieve the above objectives, a sample of 200 respondents representing 20 villages from 2 talukas of Junagadh district was drawn by using proportionate random sampling technique. To measure managerial ability of mango orchard growers, a scale was developed using Normalised Rank Approach. Other variables were measured using self rating by the selected mango orchard growers. The findings of the study
are summarized as below.

1. The major indicators of managerial ability scale in descending order as judged by the judges were: knowledge, planning, decision-making, budgeting, organizing, co-ordinating, controlling, human relationship and communication.

2. The managerial ability of mango orchard growers under study was found predominantly medium (60.00 per cent).

3. Three fourth (76.00 per cent) of the mango orchard growers belonged to middle and old age group, more than one half (50.50 per cent) of the mango growers were illiterate and educated upto primary level, more than one half (58.00 per cent) of the respondents had medium adoption of scientific mango cultivation practices, more number (43.00 per cent) of the respondents were from 2.1 to 4 ha size of land holding group. Three fourth (74.00 per cent) of the respondents belonged to medium to high annual income group, more than one half (56.00 per cent) of the mango orchard growers had a medium experience as a mango growers, majority (72.50 per cent), of the respondents had medium extension participation, medium social participation (56.50 per cent), medium farm mechanization index (49.00 per cent), medium mango crop intensity (55.50 per cent), medium irrigation potentiality (67.00 per cent) and medium mango yield index (59.00 per cent).

Great majority of mango orchard growers were found in medium level of category with respect to borrowing of total credit (75.50 per cent) and level of farm wage (64.50 per cent).
Majority (55.50 per cent) of mango orchard growers had extrovert personality. More number (47.50 per cent) of respondents were from less trained group. More than 60.00 per cent of mango orchard growers belonged to the medium achievement motivation and medium orientation toward competitions group. Majority (64.00 per cent) of the mango orchard growers had favourable attitude towards modern agriculture. Further, the majority of mango orchard growers were found in medium level of category with respect to mass media exposure (64.00 per cent), personal guidance on better farming (67.00 per cent), level of aspiration (75.00 per cent) and risk orientation (69.50 per cent).

4. Adoption index, education, annual income, experience as a mango growers, farm mechanization index, mango yield index, training received, attitude towards modern agriculture, mass media exposure and risk orientation were found positive and significantly correlated with managerial ability. While, age was negative and significantly correlated with managerial ability.

5. All the 23 selected independent variables put together explained 63.70 per cent total variation in managerial ability.

6. Adoption index alone accounted 34.10 per cent variation in managerial ability. Adoption index, education, experience as a mango growers, mass media exposure, risk orientation, age and level of aspiration put together explained 60.67 per cent variation in managerial ability.

7. The highest positive direct and indirect effects on managerial ability were exerted by education followed by adoption index.
The first substantial indirect effect was exerted by most of the variables through the variable, education.

8. Major constraints faced by mango orchard growers in adoption of scientific mango cultivation practices were: irregular and insufficient electric power supply, lack of modern spraying equipment, lack of awareness about recommendations, high price of fertilizer, high price and ineffectiveness of fungicides, lack of improved agricultural implements, irregular rainfall and high price of insecticides pesticides.

9. The suggestions offered by mango orchard growers to overcome the major constraints faced were: regular electric power supply should be made available, crop insurance scheme should be introduce in mango, effective control measures of pests and diseases should be evolved, price of pesticides and fertilizers should be low, cooperative society for mango should be started, training should be given to the fruit growers in relation to the best orchard management, remunerative minimum prices should be fixed by the Government and agricultural inputs should be subsidized.
Dr. M. N. Popat  
Major Advisor  
Professor and Head  
Department of Extension Education  
Junagadh Agricultural University  
Junagadh – 362001

CERTIFICATE

This is to certify that the thesis entitled "MANAGERIAL ABILITY OF MAGNO GROWERS ABOUT SCIENTIFIC CULTIVATION OF MANGO ORCHARD" submitted by Shri Jadav Narendra Bhagvanjibhai in partial fulfillment of the requirements for the degree of DOCTOR OF PHILOSOPHY in the subject EXTENSION EDUCATION of the Junagadh Agricultural University is a record of bonafide research work carried out by him under my guidance and supervision and the thesis has not previously formed the basis for the award of any degree, diploma or other similar title.

Place: Junagadh  
Date: 19th February, 2005  
M. N. Popat  
(Major Advisor)
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Date: February, 2005

Junagadh

(N.B. Jadav)
## CONTENTS

<table>
<thead>
<tr>
<th>Chapter No.</th>
<th>Title</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>INTRODUCTION</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>1.1 Statement of Problem</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>1.2 Objectives of the study</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>1.3 Significance of the study</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>1.4 Assumptions of the study</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>1.5 Limitations of the study</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>REVIEW OF LITERATURE</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>2.1 Managerial ability – A Concept</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>2.2 Characteristics of mango growers</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>2.3 Relational analysis of selected variables</td>
<td>26</td>
</tr>
<tr>
<td>3</td>
<td>THEORETICAL ORIENTATION</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>3.1 Conceptual framework of the study</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>3.2 The conceptual model</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>3.3 Definition of some common terms</td>
<td>35</td>
</tr>
<tr>
<td>4</td>
<td>RESEARCH METHODOLOGY</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>4.1 Identification of the problem</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>4.2 Source of data</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>4.3 Area of study</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>4.4 Research design</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>4.5 Sampling technique</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>4.6 Selection of variables</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>4.7 Development and measurement of dependent variable</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>4.8 Measurement of independent variables</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>------------------------------------------------------------------</td>
</tr>
<tr>
<td>4.9</td>
<td>Tools and techniques of data collection</td>
<td>64</td>
</tr>
<tr>
<td>4.10</td>
<td>Method of data collection</td>
<td>64</td>
</tr>
<tr>
<td>4.11</td>
<td>Statistical procedures used for analysis of data</td>
<td>64</td>
</tr>
<tr>
<td>4.12</td>
<td>Research hypothesis</td>
<td>71</td>
</tr>
</tbody>
</table>

V FINDINGS AND DISCUSSION

5.1 Development of managerial ability scale | 74 |
5.2 Relative importance of the indicators of the study | 77 |
5.3 Measurement of dependent variable (managerial ability of mango growers) | 80 |
5.4 Measurement of independent variables (selected characteristics) | 83 |
5.5 Relational analysis between selected variables | 105 |
5.6 Constraints and suggestions in adoption of scientific mango cultivation practices | 139 |

VI SUMMARY AND CONCLUSIONS

6.1 Summary | 145 |
6.2 Major fundings and conclusion | 148 |
6.3 Implications of the study | 154 |
6.4 Suggestions for the further research | 156 |

REFERENCES i - xiv

APPENDICES I- XXIV
<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Statewise area, Production and yield of mangoes in India (1998-99)</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Districtwise area production of mango in Gujarat state Year- 2001-2002.</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Talukawise area and production in Junagadh district.</td>
<td>41</td>
</tr>
<tr>
<td>4</td>
<td>Selected villages and Respondents</td>
<td>42</td>
</tr>
<tr>
<td>5</td>
<td>Relevancy of main indicators of the scale</td>
<td>76</td>
</tr>
<tr>
<td>6</td>
<td>Scale value of different indicators of the managerial ability scale.</td>
<td>78</td>
</tr>
<tr>
<td>7</td>
<td>Distribution of respondents by managerial ability</td>
<td>80</td>
</tr>
<tr>
<td>10</td>
<td>Mango growers’ practicewise adoption of scientific mango cultivation practices.</td>
<td>86</td>
</tr>
<tr>
<td>11</td>
<td>Distribution of respondents by overall adoption</td>
<td>88</td>
</tr>
<tr>
<td>32</td>
<td>Zero order correlation coefficient of independent variables with managerial ability of mango growers.</td>
<td>106</td>
</tr>
<tr>
<td>33</td>
<td>Multiple regression analysis of managerial ability</td>
<td>124</td>
</tr>
<tr>
<td>34</td>
<td>Stepwise multiple regression analysis of managerial ability</td>
<td>128</td>
</tr>
<tr>
<td>35</td>
<td>Stepwise variation accounted by different independent variables in managerial ability</td>
<td>131</td>
</tr>
<tr>
<td>36</td>
<td>Path coefficients showing the effect on managerial ability</td>
<td>135</td>
</tr>
<tr>
<td>37</td>
<td>Constraints faced by the mango orchard growers in adoption of improved mango production technology.</td>
<td>140</td>
</tr>
<tr>
<td>38</td>
<td>Suggestions to overcome the constraints faced in adoption of improved mango production technology.</td>
<td>142</td>
</tr>
</tbody>
</table>
## LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure No.</th>
<th>Title</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Characteristics of mango orchard growers.</td>
<td>34</td>
</tr>
<tr>
<td>2</td>
<td>Map of Junagadh district showing the selected talukas and villages</td>
<td>43</td>
</tr>
<tr>
<td>3</td>
<td>Distribution of respondents according to their managerial ability</td>
<td>82</td>
</tr>
<tr>
<td>4</td>
<td>Practicewise adoption of mango orchard grower about scientific cultivation of mango orchard</td>
<td>87</td>
</tr>
<tr>
<td>5</td>
<td>Mango orchard growers overall adoption of scientific mango cultivation practices</td>
<td>89</td>
</tr>
<tr>
<td>6</td>
<td>Significantly correlated variables with managerial ability of mango orchard growers</td>
<td>122</td>
</tr>
<tr>
<td>7</td>
<td>Total variation accounted in multiple regression</td>
<td>125</td>
</tr>
<tr>
<td>8</td>
<td>Extent of variation accounted in stepwise multiple regression</td>
<td>132</td>
</tr>
<tr>
<td>9</td>
<td>Important variables in path analysis</td>
<td>137</td>
</tr>
<tr>
<td>10</td>
<td>The empirical model</td>
<td>144</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

All the enterprises are basically interested in increasing the productivity. Agriculture being an enterprise is not an exception to this. The farmers as the manager of the enterprise are expected to bring about maximum profit with available resources. Irrespective of the economic, social, cultural, physical and technological environment, the farmers manage a production system to get a return from it, consciously or unconsciously.

Every country feels today an inclination and indispensability for the economic recovery and socio-economic development of its masses. Indian agricultural enterprise sector is vast and has continued to be the backbone of our economy where about 65 per cent of the population depends upon this enterprise. It supports 70 per cent of the country’s population, which contributes 30 to 35 per cent of GDP (Gross Domestic Production) and generates about 20 per cent of export earnings (Mehta, 1998). It provides employment for approximately 62 per cent of the work force (Singh, 2000). It also provide fruits to about 960 million population and raw material to several industries. Fifty years of Indian agriculture is a history of begging bowl image (food deficit) to green revolution and then to self-sufficiency and now exporting fruits. The various revolutions such as Green, White, Blue, Brown and Red are the most striking success stories of the post independence era.
The tenth plan envisages a 4 per cent annual growth rate in the agriculture sector. The achievement of this growth rate would be possible, if the annual growth rate of horticulture is maintained at 6 to 8 per cent (Anon. 2001). This is feasible and achievable. Being prominent crops after food grains and oil seeds, horticulture will be treated as a lead sector in agriculture and rural development.

The massive transformation has been possible owing to concerted efforts in implementing an agricultural strategy that consists of technological break-through and their application in agriculture. There has been a great role of agricultural scientists, extension workers as well as hard and dedicated work by Indian farmers and supportive polices of the government.

India stood second in the international ranking in production of various fruit crops and mango ranked first among all fruit crops. Out of total cultivated area, fruits occupy 33 lakh hactar and 329 lakh tones production. (Anon. 2001)

Mango (Mangifera indica L.) is one of the ancient fruits of India. It was established in India in the pre Christian era. Its cultivation in India is estimated about 6000 years old. In the ‘Ramayana’ and ‘Mahabharat’ forests and gardens of mango have been documented and mentioned by the authors. The Moghal emperor Baber called it was the choicest fruit of Hindustan.

Mango undoubtedly deserves to be national fruit of India. In area, production, nutritive value and popularity of apple, no other fruit can compete with it. It occupies the same position in India as is occupied by the apple in temperate climates and grape in sub tropical. Among all the fruit crops, mango is being cultivated commercially in a number of countries of the world, but no where does it achieve the same premier position as in the
subcontinent of India, where it is actually the king of all fruits. It has great adaptability and thrives in a wide range of climate and soil condition. It has relatively hardy nature, low cost of cultivation and maintenance. It is the choicest of Indian table fruits having the premiere place in the country. It accounts for 38 per cent of the area and 23 per cent of the output of all fruits in the country. India is world’s largest producer of mango accounting for almost 50 per cent of the world’s output of 10 million tones (Singhal, 2003). India exports fresh and processed mangoes to about 80 countries in the world, among them mango pulp exporting accounts about 76735 M.T. worth of Rs. 24134.13 lakhs. India is presently making export promotion efforts to increase its exports in UK, Frankfurt, Dubai, Kuala Lumpur, Hong Kong and Kuwait.

Table 1: Statewise area, production and yield of mango in India (1998-99).

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>State</th>
<th>Area (‘000 Ha.)</th>
<th>Production (‘000 M.T.)</th>
<th>Yield (M.T. / Ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Andhra Pradesh</td>
<td>252.1</td>
<td>2270.0</td>
<td>9.0</td>
</tr>
<tr>
<td>2</td>
<td>Bihar</td>
<td>154.8</td>
<td>1858.0</td>
<td>12.0</td>
</tr>
<tr>
<td>3</td>
<td>Gujarat</td>
<td>57.6</td>
<td>382.5</td>
<td>6.6</td>
</tr>
<tr>
<td>4</td>
<td>Karnataka</td>
<td>123.8</td>
<td>1177.0</td>
<td>9.5</td>
</tr>
<tr>
<td>5</td>
<td>Kerala</td>
<td>84.6</td>
<td>249.7</td>
<td>3.0</td>
</tr>
<tr>
<td>6</td>
<td>Maharashtra</td>
<td>110</td>
<td>196.9</td>
<td>1.8</td>
</tr>
<tr>
<td>7</td>
<td>Orissa</td>
<td>109.8</td>
<td>490.7</td>
<td>4.5</td>
</tr>
<tr>
<td>8</td>
<td>Tamil Nadu</td>
<td>93.2</td>
<td>559.2</td>
<td>6.0</td>
</tr>
<tr>
<td>9</td>
<td>U.P. (plain)</td>
<td>240.5</td>
<td>1775.0</td>
<td>7.4</td>
</tr>
<tr>
<td>10</td>
<td>West Bengal</td>
<td>59.3</td>
<td>339.4</td>
<td>5.7</td>
</tr>
<tr>
<td>11</td>
<td>Other</td>
<td>116.3</td>
<td>483.6</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1402.0</td>
<td>9782.0</td>
<td>7.0</td>
</tr>
</tbody>
</table>

Source: National Horticulture Board
Gujarat is one of the mango producing states in India. Mango has an important place among all the fruit crops growing in the state. The leading mango producing states are Andhra Pradesh, Bihar, Karnataka, U.P. (plain). The yield of mango in A.P and Bihar is 9.0 M.T./ha and 12 M.T./ha, respectively. While in Gujarat state yield of mango is only 6.6 M.T./ha, which is low as compared to other states of the country (Table – 1).

Management, for the purpose of the present study, has been defined as the process by which the farmer is able to enhance return from the farm on a sustained basis for the attainment of family goals. Effective management is crucial for obtaining high return from a production system on a sustained basis. It is essential that the farmers and extension workers are made aware of the need for developing the managerial ability of the farmers.

The probable reasons for low productivity of mango in this area are many, but the adverse effect of climate, as well as less scientific management of mango orchard is major one. As a result the quality of mango is not up to the standard. WTO (World Trade Organization) opened the vistas for the marketing at the global, if the quality is compromised then there is limited scope to survive in the market. Today farming enterprise is becoming more complex and complicated and therefore, management is a key to face these problems.

In broader sense, management means effective use of man, money, equipment, materials and methods (Belshaw, 1974). Mango growers as the manager of the mango cultivation enterprise are expected to bring about maximum output with available resources. How the farmers fulfill this expectation is the test of their managerial ability.
<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of Districts</th>
<th>Area (ha)</th>
<th>Production (M.T.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ahmedabad</td>
<td>300</td>
<td>2400</td>
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<tr>
<td>2</td>
<td>Amreli</td>
<td>5574</td>
<td>67005</td>
</tr>
<tr>
<td>3</td>
<td>Banskantha</td>
<td>200</td>
<td>1286</td>
</tr>
<tr>
<td>4</td>
<td>Bharuch</td>
<td>1848</td>
<td>2682</td>
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<tr>
<td>5</td>
<td>Narmada</td>
<td>605</td>
<td>5000</td>
</tr>
<tr>
<td>6</td>
<td>Bhavnagar</td>
<td>3167</td>
<td>15835</td>
</tr>
<tr>
<td>7</td>
<td>Dang</td>
<td>295</td>
<td>70</td>
</tr>
<tr>
<td>8</td>
<td>Gandhinagar</td>
<td>653</td>
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<td><strong>Total</strong></td>
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Source: Directorate of Horticulture – Gandhinagar
Fruit crops are not producing the greater yield per unit of area, but income from orchard is much higher than field crops. It is generally stated that standard of living of the people of a country can be judged by its per capita production and consumption of fruits. (Anon. 1967).

1.1 STATEMENT OF THE PROBLEM:

The increasing number of scientific studies emphasize that management today is not only an art but also a science. Koontz and O’Donnell (1972) stated, “Managing like the practices... is an art”. It is “know-how”. It is doing things in the light of the realities of a situation. But the practice of managing like other practice, will be better by making use of underlying organized knowledge, whether crude or advanced, whether exact or inexact, that to the extent it is well organized, clear and pertinent, comprise a science. Thus, managing as practice is art; the organized knowledge underlying it may be referred to as a science.

It is generally observed that the mango orchard growers are not well educated and medium knowledgeable. Similarly, they have experience of mango growing but not of scientific management of mango orchard. Thus, neither they have higher knowledge nor they have an experience of management of mango orchard, even though they carry out good production. India being a largest producer of mango fruit occupies a very prestigious position in the world. Therefore, good management of mango orchard is the most essential for the development of Indian horticulture. The cultivation of mango enterprise mainly depends on the managerial role played by the mango growers.
Moreover, the mango growers perform many functions in carrying out better production such as: preparing a plan of work, giving clear instructions, integrating the work, taking proper decision at right time, implementing the decision etc. in carrying out the management activity in mango orchard. All the above functions are involved in one or the other way many management components viz; planning, organizing, directing, controlling, human relation, leading, coordinating and decision making.

Keeping this in view, it was considered highly necessary to carry out the study entitled” MANAGERIAL ABILITY OF MANGO GROWERS’ ABOUT SCIENTIFIC CULTIVATION OF MANGO ORCHARD” and it was also considered worthwhile to make an attempt to find out the effect of different variables on managerial ability of mango growers about scientific cultivation of mango orchard.

1.2 OBJECTIVES OF THE STUDY

The present study was conducted with the general objective of measuring the managerial ability of mango growers about scientific cultivation of mango orchard. The specific objectives of the study are as under.

1.2.1 To develop and standardize managerial ability scale of mango growers about scientific cultivation of mango orchard.

1.2.2 To measure the managerial ability of the mango growers about scientific cultivation of mango orchard.

1.2.3 To study the selected characteristics of mango orchard growers.
1.2.4 To explore the relational analysis of selected variables of mango growers.
1.2.5 To study the constraints faced by mango growers in adoption of scientific mango cultivation practices.
1.2.6 To elicit the suggestions to overcome the existing constraints for adoption of scientific mango cultivation practices.

1.3 SIGNIFICANCE OF THE STUDY

When a farmer manages mango orchard, he acts as manager, shouldering the multidimensional functions of decision making, planning, organizing, directing, supervising etc. He is responsible for carried out various operations from family member and labour for effective attainment of the maximum production goals. This involves satisfaction of the requirements of a wide set of people.

He can influence the course of action and make a difference to the work and lives of other in a significant way. Such work may require considerable initiative, hard work, skill etc. and can create stress, anxiety and doubt.

Many factors affecting the managerial ability of mango grower in cultivation of mango orchard may be organizational and social, creating an environment where they have to work. On the other hand, some factors are entirely personal due to their individual psychological make-up. Hence, it was considered worthwhile to ascertain the factors associated with the managerial ability of the mango growers.
The direct and indirect effects and extent of variation caused by the independent variables on managerial ability of the mango growers about scientific cultivation of mango orchard, in the field, mango growers would be of great use. The constraints hindering the management function and the suggestions to overcome the same will also be useful in designing future strategy for effective management of mango orchard.

The results of the present study will definitely be helpful to formulate the strategies for raising mango production. Moreover, the information regarding knowledge about scientific cultivation of mango orchard will provide the insight of the present technological “know how” to the farmers. It is also expected that the information generated from the study will be of great significance and it may be helpful to the planners, administrators, research scientists and extension workers for reducing the yield gap by removing the constraints and motivating the farmers for managing important variables responsible for management of mango orchard.

This study has both theoretical and practical utility, the findings of this study will add to the knowledge about the managerial role in farming and it is useful in measuring the managerial ability of the fruit growers. The managerial ability will be considered in relation to the factors like innovativeness, achievement motivation and risk taking ability. Therefore, these factors of scientific management of mango orchard will be helpful to the farmers who are concerned with fruit growing enterprise.
1.4 ASSUMPTIONS OF THE STUDY

The study was based on the following assumptions:

1.4.1 All the mango orchard growers of the region had an equal opportunity to possess the knowledge of management in mango orchard about scientific cultivation of mango orchard. The scientific cultivation practices were fully dispersed in the study area.

1.4.2 The scientific cultivation practices of mango crop were sustainable and compatible with mango orchard growers of the area under study.

1.5 LIMITATIONS OF THE STUDY

1.5.1 The study was limited to the mango orchard growers of Saurashtra zone.

1.5.2 Only some of the selected characteristics of the mango growers were studied.

1.5.3 The study was limited to measure only the managerial ability of mango growers about scientific cultivation of mango orchard.

1.5.4 The results drawn in this study were based on the expressed opinions of the mango growers.
CHAPTER II

REVIEW OF LITERATURE

A brief review of literature pertaining to the field of research covered in the present study has been presented in this chapter under the following sections:

2.1 Managerial ability – A concept
2.2 Characteristics of mango orchard growers
2.3 Relational analysis of selected variables

2.1 MANAGERIAL ABILITY – A CONCEPT

England et al. (1971) observed that successful managers are more pragmatic and less idealistic than less successful managers.

Monappa and Saiyaddain (1976) defined an effective manager as one who is properly developed in terms of basic intellectual abilities and the predispositions necessary for carrying out the task smoothly.

Rannorey (1979) found that farmers with higher management orientation adopted more number of practices and higher adoption led to higher economic performance.

Bora (1986) recommended that effective management is crucial for obtaining high return from a production system on a sustained basis. It is essential that the farmers and extension workers are made aware of the need for developing the managerial ability of the farmers.
Narayana and Ramchandra (1986) suggested a model for modern technology promotion programme at local level. It caters management services to the needs of seven operational activities for farmers. i.e. help in proving technical advice, help in getting production inputs, help in getting marketing services, assistance in getting access to credit etc.

Chari and Nandapurkar (1987) developed and standardized an objective scale to measure the managerial ability of farmers and suggested that planning, organizing, human relationship; communication, co-ordination and control where the main components for the development of scale.

Bhatia et al. (1990) stated that the successful integration of agriculture, industries and service / supportive sector in the integrated rural development programme depends on the proper planning, organizing, controlling and directing the various activities. The help / cooperation of target groups and implementing agencies are also highly needed / required. The coordination of above the sectors and the various agencies is a very difficult and challenging task. Only the management knowledge and practice may help in this task.

Sartorius van bach et al. (1993) pointed out that both economies of scale and optimal farm size were functions of management.

Sartorius van bach et al. (1993) revealed that both problem consciousness and managerial ability were closely associated with financial success over the short term and economic survival over the long term.
Bhople and Palaspager (1996) concluded that farm supervisor’s characteristics (labour force, live stock number, education status, length of service, experience) are six components of managerial ability.

Ajobo et al. (1998) reported that principle component was used to examine certain socioeconomic characteristics of 72 coca farmers in an old coca growing area near Ibadan in SW Nigeria. Sixteen principal categories were identified and these accounted for about 85% of the total variance in the data. The first component accounted for about one-fifth of the total variation while the first 5 components explained about half of the total variance. Three-fifth of the 45 variables specified were associated (20 positively and 7 otherwise) with respondent managerial ability, while the remaining 18 were not. With an index of 0.80, all the variables taken together were not too different from one another and they reasonably accounted for the entire identified component.

Everybody wants to be the ‘Best’ and ‘Have Best’. But the sources in terms of man, money, machine and material are limited. Thus, arouse the need for management that would result in efficient and effective utilization of various resources to fulfill the objectives (Anon. 1998)

Patel and Patel (2000) inferred that majority (70.18 %) of respondents possessed medium level of managerial ability for plant protection measures in chilli crop. An equal number of respondents (14.91 %) fall in the categories of low and high level of managerial ability.
Nuthall (2001) concluded that psychology of decision making from farm management perspective, outlines what psychology efforts for changing a person’s attributes, and consider the structures of a research programme aimed at developing methods for improving individual managerial ability.

Trip et al. (2002) revealed that managerial decision-making process has been given new attention, both in theoretical study as well as empirical research explaining difference in farm results.

Alvorez and Arias (2003) suggested that managerial ability has important implication for farm growth.

2.2 CHARACTERISTICS OF MANGO GROWERS

2.2.1 Personal characteristics

2.2.1.1 Age

Chavda (1981) reported that more than one-half (57.33 %) of the mango growers were found to have age between 30 to 50 years.

Prajapti (1987) revealed that majority (68.00 per cent) of the banana growers belonged to middle age group.

Patel (1990) observed that more than one-half (58.00 per cent) of the mango growers were middle age, whereas, 22.00 and 20.00 per cent of the mango growers belonged to old and young age, respectively.

Gorfad (1993) concluded that more than one-half (56.00 per cent) of the mango growers were from middle age group, whereas 21.00 and 23.00 per cent of the mango growers were from old and young age, respectively.
Dangar (1996) reported that 58.00 per cent of the chiku growers were middle aged, whereas 20 and 22 per cent of the respondents belonged to young and old age groups, respectively. It means that more than one-half of the chiku growers were middle aged.

Chothani (1999) inferred that majority (58.00 per cent) of the mango growers were from middle age group (31 to 41 years).

2.2.1.2 Education

Chavda (1981) showed that nearly one-half (49.33 per cent) of the mango growers were educated up to primary level, whereas 28.00 per cent of the mango growers were educated above primary level and 22.67 per cent of them were illiterate.

Satrola (1991) indicated that 48.00 per cent of the respondents were educated up to primary level followed by those having secondary education (32.00 per cent), illiterate (17.00 per cent) and having college education (3.00 per cent).

Sinha et al. (1991) concluded that higher proportion of the tribal dry land fruit growers (44.29 per cent) were illiterate and very few (11.43 per cent) were educated up to high school and above that level.

Gorfad (1993) observed that 52.00 per cent of the mango growers were educated up to secondary level; whereas 17.00 per cent of the mango growers were educated above secondary level and 31.00 per cent of them were illiterate and primary level.
Chothani (1999) revealed that 38.00 per cent of the mango orchard growers were educated upto primary level, whereas 30.00 per cent of them were educated upto secondary school level, 17.00 per cent were illiterate and 15.00 per cent were educated upto higher secondary and college level.

2.2.2 Operational management

2.2.2.1 Adoption index

Katyal (1976) observed that fruit growers of Indian hilly areas were not fully aware of technical knowledge of horticulture crops.

Samonte, et al. (1976) concluded that adoption of coconut farm practices by coconut growers was ranged from 2.16 to 4.34 farm practices out of eleven practices.

Chavda (1981) concluded that more than two fifth (45.33 per cent) of the mango growers were medium adopters of improved practices.

Tarpara (1981) found that mango growers’ average adoption of cultural practices was 42.69 per cent, while adoption of chemical fertilizer practices was 23.44 per cent, for irrigation practices, it was 34.28 per cent and for plant protection measures, it was 4.57 per cent.

Patel (1990) reported that more than one half (52.00 per cent) of the mango growers were medium adopters of mango cultivation practices.
Yawalkar et al. (1991) observed that half of the orange growers (50.00 per cent) adopted recommended plant protection practices to medium extent, whereas more than one fourth (26.19 per cent) respondents were low level of adopters, only 23.81 per cent respondents were found adopting recommended plant protection practices to a higher extent.

Dangar (1993) revealed that majority (55.00 per cent) of the chiku growers were from medium adopters of improved chiku cultivation practices.

Gorfad (1993) found that 63.00 per cent of the mango growers were medium adopters. Whereas, 16.00 per cent were low and 21.00 per cent were high adopters of the improved mango cultivation practices. It can be concluded that majority of the mango growers were medium adopters of the improved mango cultivation practices.

Pandya and Vekaria (1994) pointed out that two third (65.00 per cent) of the banana growers were from medium adopters of banana cultivation practices.

Patel (1996) revealed that majority (65.00 per cent) of the potato growers belonged to the medium level of adoption whereas, 21.00 per cent of the potato growers were found having low level of adoption and fourteen per cent of the potato growers were found having higher level of adoption.

Chothani (1999) reported that 59.00 per cent of the mango growers belonged to medium adoption index group, whereas 16.00 per cent belonged to high and 25.00 per cent belonged to low adoption index.
2.2.2.2 Size of land holding

Chavda (1981) concluded that more than two fifth (42.66%) of the mango growers had large sized orchard land holding.

Patel (1990) indicated that 46.00 per cent of mango growers were having large size of orchard holding, whereas 38.00 per cent and 16.00 per cent of the mango growers possessed medium and small orchard holding respectively.

Patel (1990) revealed that majority (67.00 per cent) of the lime growers having large operational size of farm holding.

Thakur et al. (1991) observed that majority of the mango growers have planted mangoes on 0.51 to 1.0 hectare area of their land.

Gorfad (1993) revealed that majority (71.00 per cent) of the mango growers having large size of farm holding, whereas 11.00 per cent and 18.00 per cent of the respondents possessed small and medium size of farm holding, respectively.

Kansagara (1996) concluded that 47.00 per cent of the respondents were having medium size of land holding followed by small (28.00 per cent) and large (25.00) size of land holding.

Chothani (1999) reported that 43.00 per cent of the respondents were having medium size of land holding followed by large (37.00 per cent) and small (20.00 per cent) size of land holding.
2.2.2.3 Annual income

Kalarya (1989) suggested that majority (73.00 per cent) of the wheat growers had medium annual income i.e. Rs. 8,001 to Rs. 12,000.

Kanani (1998) indicated that about one third of the respondents had low income. About three-fifth of the respondents were from middle annual income while, negligible respondents (5.00 per cent) were from higher income group.

Chothani (1999) revealed that more than one half (53.00 per cent) of the mango orchard growers fall under higher annual income group, while 24.00 per cent and 13.00 per cent fall under medium and lower annual income group respectively.

Jadav (2001) concluded that 46.67 per cent of onion growers belonged to medium annual income group while 23.33 per cent and 30.00 per cent of the onion growers belonged to the low and high annual income group, respectively.

2.2.2.4 Farm mechanization index

Kher (1986) reported that the mean score of farm mechanization index of the contact and non-contact sugarcane growers was 216.34 and 177.35, respectively.

Khodifad (1993) inferred that majority (69.19 per cent) of the respondents had medium farm mechanization index followed by 16.50 per cent and 14.31 per cent of the respondents who had high and low farm mechanization index respectively.
Patel (1995) indicated that the mean farm mechanization index of demonstrator and non-demonstrator groundnut growers was 62.93 and 60.97 per cent respectively.

Jadav (2001) summarized that majority (41.67 per cent) of onion growers were from medium farm mechanization index group.

2.2.2.5 Mango crop intensity

Mathiyazhagan and Singh (1986) revealed that majority of the banana growers had higher acreage under banana crop.

Prajapati (1987) concluded that majority (57.50 per cent) of the banana growers occupied medium (1 & 4 acres) area under banana crop.

Patel (1990) indicated that 66.00 per cent of mango growers were having large sized of orchard holding, whereas 38.00 per cent and 16.00 per cent of the mango growers possessed medium and small orchard holding, respectively.

Chothani (1999) inferred that more than one half (56.00 per cent) of the mango orchard growers were having medium area under mango orchard followed by large (36.00 per cent) and small (8.00 per cent) area under mango orchard.

2.2.2.6 Irrigation potentiality

Patel (1990) pointed out that 65.00 per cent of the lime growers had medium irrigation potentiality whereas 19.00 per cent had low and 16.00 per cent had high irrigation potentiality.
Gorfad (1993) inferred that more than half (59.00 per cent) of the mango growers had medium irrigation potentiality.

Dangar (1996) revealed that 56.00 per cent of the chiku growers were from medium irrigation potentiality, whereas 18.00 per cent were from low irrigation potentiality and 26.00 per cent were from high irrigation potentiality.

2.2.2.7 Mango yield Index

Patel (1990) showed that majority (62.00 per cent) of the lime growers had medium lime yield index whereas 21.00 per cent and 17.00 per cent had low and high lime yield index respectively.

Gorfad (1993) stated that 76.00 per cent of the mango growers had medium mango yield index, whereas equal number (12.00 per cent) of them had low and high mango yield index, respectively.

Chothani (1999) summarized that majority (63.00 per cent) of the mango growers had medium mango yield index.

2.2.3 Strategic management

2.2.3.1 Experience as a mango growers

Bora (1986) concluded that majority of the farmers were from medium farm experience group.

2.2.3.2 Social participation

Chavda (1981) stated that 40.000 per cent of the mango growers had medium social participation followed by low social participation (39.33 per cent), while only 20.67 per cent of the mango growers had high social participation.
Parajapati (1987) found that about 45.50 per cent of the banana growers had membership in one organization.

Patel (1990) revealed that 40.00 per cent of the mango growers had medium social participation followed by low social participation (38.00 per cent), while only 22.00 per cent of the mango growers had high social participation.

Gorfad (1993) expressed that a great majority (70.00 per cent) of the mango growers had medium social participation.

Dangar (1996) revealed that majority (62.00 per cent) of the chiku growers belonged to medium social participation.

Chothani (1999) reported that majority (75.00 per cent) of the mango orchard growers had low social participation followed by medium (22.00 per cent) and high (3.00 per cent) social participation.

2.2.3.3 Achievement motivation

Thakor (1993) indicated that more than three-fourth of the farm women belonged to medium category of achievement motivation.

Shinde (1994) in his study on ‘impact of dairy development programmes’ concluded that nearly equal number of dairy farmers i.e. 39.00 per cent and 37.00 per cent had medium and high achievement motivation, respectively.
Vyas (1995) concluded that majority (86.00 per cent) of the respondents were found to have medium to high achievement motivation.

2.2.3.4 Orientation towards competition

Vyas (1995) summarized that 56.00 and 62.00 per cent of tribal and non-tribal milk producers belonged to medium category of competition orientation.

2.2.3.5 Attitude towards modern agriculture

Trivedi (1984) found that 72.89 per cent of the tribal farmers were having medium overall modernity, followed by 15.55 per cent and 11.56 per cent of them with high and low level of overall modernity, respectively.

Gaikwad (1985) studied effectiveness of information sources persuasion function in the innovation decision process and found that great majority of the respondents (90.01 per cent) had medium overall modernity followed by 5.71 per cent of the respondents who had high overall modernity. Only 4.28 per cent of the respondents had low overall modernity.

Vekaria (1989) revealed that 47.08 per cent of the big farmers had medium overall modernity, while 64.71 per cent of the small and medium farmers had low overall modernity.

Patel (1991) summarized that majority of the marginal farmers (75.93 per cent) were having medium overall modernity.
Chauhan (1994) concluded that nearly half (49.53 per cent) of the general peasants were having low level of overall modernization, followed by 44.76 per cent and 5.72 per cent with medium and high level of overall modernization, respectively.

2.2.3.6 Level of aspiration

Patel and Patel (1985) revealed that slightly less than one half (46.67 per cent) of the farmers had low level of aspiration.

Parjapati (1993) observed that more than three fourth (76.00) of the beneficiaries of social forestry programme belonged to medium level of aspiration category.

Vygas (1995) stated that 90 tribal milk producers (60.00 per cent) and 110 non-tribal milk producer (73.33 per cent) belonged to medium level of aspiration category.

2.2.3.7 Risk orientation

Chavda (1981) revealed that nearly equal (38.67 and 39.33 per cent) of mango growers had medium and high-risk preference, respectively, whereas 22.00 per cent of them were from low risk preference group.

Khodifad (1993) revealed that more than three-fifth (61.67 per cent) of the respondents were from medium risk orientation group followed by low and high-risk orientation group respectively.

Kanani (1998) indicated that more than fifty per cent (53.33 per cent) respondents were from medium risk orientation group.
2.2.4 Extension - communication

2.2.4.1 Extension participation

Patel (1990) summarized that majority (63.00 per cent) of the lime growers had medium extension participation followed by high (31.00 per cent) and low (6.00 per cent) extension participation.

Sakariya (1991) indicated that more than one-half (53.00 per cent) of the respondents had low extension participation followed by high (44.00 per cent) and medium (3.00 per cent) extension participation.

Patel (1996) concluded that majority (83.00 per cent) of the potato growers had medium to high extension participation.

Chothani (1999) revealed that majority (72.00 per cent) of the mango orchard growers had medium extension participation followed by low (15.00 per cent) and high (13.00 per cent) participation in various extension activities.

2.2.4.2 Training received

Chothani (1999) concluded that a great majority (91.00 per cent) of the mango orchard growers need medium training in relation to mango crop production.

2.2.4.3 Mass media exposure

Popat (1984) pointed out that 53.00 per cent of the groundnut growers were observed in low mass media exposure group, while 47.00 per cent of the respondents had high mass media exposure.
Bhople and Ingle (1990) revealed that more than three-fourth (76.66 per cent) of the rural community had medium level of mass media exposure whereas only about one-tenth of the respondents were found to be using mass media either up to high (10.00 per cent) or low (13.33 per cent) extent for getting of farm information.

Solanki et al. (1991) found that 62.50 per cent of the farmers had medium mass media exposure.

Kalsariya (1993) stated that 66.67 per cent of the hybrid-6 growers had medium level of mass media exposure, whereas 20.00 and 13.33 per cent of them had low and high level of mass media exposure, respectively.

2.2.4.5 Personal guidance on better farming

Vyas (1995) concluded that 281 respondents (93.67 per cent) possessed medium to high personal guidance.

2.3 RELATIONAL ANALYSIS OF SELECTED VARIABLES

Appleby (1980) inferred that the achievement motivation and leadership styles do not account for differences in managerial effectiveness.

Vijayasree (1981) observed that managers were highly achievement-oriented persons.

Badachikar (1985) reported that economic motivation, innovativeness, competition orientation and achievement motivation of farmers were positively and significantly correlated with their management orientation.
Rao (1985) concluded significant and positive correlation between management of farm and the farmers’ characteristics such as their education, farm size, training, innovativeness, self-confidence, achievement motivation and risk orientation.

Sreekumar (1985) showed strong relationship between self-reliance and personal guidance with management orientation of farmers.

Bora (1986) suggested that independent variables like farm experience, economic motivation, risk orientation, orientation towards competition and level of aspiration were significantly correlated with the dependent variable returns to management.

Chari and Nandapurkar (1987) concluded that managerial ability was positively and significantly related with innovativeness, achievement motivation and risk taking ability.

Sumathi (1987) stated significant relationship between management orientation of farmers and their education, cosmopolitaness, mass media participation, extension agency contact, extension participation, innovative proneness, risk orientation, competition orientation, self confidence, self reliance and level of aspiration.

Nagaraja (1989) revealed that size of land holding, experience in sericulture enterprise, education, risk orientation, competition orientation, economic motivation, level of aspiration, innovative proneness, scientific orientation, achievement motivation, participation in training programme, personal guidance, contact with extension agency and exposure to mass
media were positively and significantly related with management efficiency of sericulture farmers.

Colin (1992) suggested that large farms tends to use more capital intensive methods of products, while smaller farms were more labor intensive and managerial ability seems to better on larger farms.

Reddy and Jayaramaiah (1998) stated that the achievement motivation was significantly related with job effectiveness of VEOs while, work facility and job involvement had no significant relationship with their job effectiveness of VEOs.

Patel and Patel (2000) revealed that the managerial ability has no concern with entrenched characteristics either like age or like size of land holding and economic conditions. Contrarily, it is highly correlated with literacy level, social participation and extension participation. This clearly shows that managerial ability was not associated with ingrained factors; but it will be more if one keeps more linkage with people and extension.

Patel (2001) reported that quality, discipline possessed, management training received, image and attitudes towards extension were of positive and significant correlated with extension management ability.
CHAPTER III

THEORETICAL ORIENTATION

The chapter is devoted to the development of theoretical orientation for the study. The review of literature related to this study given in the preceding chapter helped in formulating theoretical orientation. The chapter has been subdivided into major heads as under:

3.1 Conceptual frame-work of the study

3.2 The conceptual model

3.3 Definition of some common terms

3.1 CONCEPTUAL FRAME – WORK OF THE STUDY

Management is the process essential to accomplish enterprise goal and objectives. In general, we may say management as the process of working with and through individuals and groups and other resources such as equipment, capital and technology. Managing is always concerted with productivity, which implies the effectiveness and efficiency of individuals. Agriculture is considered as an important enterprise in India, so it is worthwhile to study the related factors responsible for the productivity of the commodities involved in agriculture and its allied field. Orchard growing enterprise also requires the skill and knowledge pertaining to the latest technological know how in the context of management aspects. There are several factors affecting to the productivity of orchard crops. Management is one of the important factors for fruit production for better achievement in the enterprise.
Terry and Franklin (1984) stated that management is a distinct process consisting of activities of planning, organizing, actuating and controlling, performed to determine and accomplish stated objectives with the use of human beings and other resources.

Management is the process by which the farmer is able to enhance return from the farm on a sustained basis for the attainment of family goals (Bora and Ray, 1986)

Congruity theory (Brown, 1965) also helps in understanding the phenomenon of management efficiency. This theory suggests that the motivation for self directed change comes from the dissonance between one’s current self-image and ones ideal self-image. Better management efficient fruit producers think about goals in a way that allow them to experience this dissonance and they may strive to reduce it. In addition, the identity diffusion of better management efficient fruit producers produces good clarity about the self and at the same time, which would increase, felt dissonance.

The phenomenon of management efficiency has been viewed and explained by different social scientists in different ways. Managerial ability in present study has been defined as ‘the degree or ability to which an individual acquires and adopts effective factors in an enterprise to reach higher levels of performance’.

A successful manager is more pragulatic and less idealistic than less successful managers (England et al. 1971), properly developed in terms of basic intellectual abilities and the predispositions necessary for carrying out the task smoothly (Monappa and Saiyaddain 1976). Effective management is
crucial for high return from a production system in sustain basis (Bora 1986), adopted more number of practices and higher adoption led to higher economic performance (Rannorey 1979). The main component of managerial ability scale are planning, organizing, human relationship; communication, co-ordination and control (Chari and Nandapurkar 1987), economies of scale and optimal farm size (Sartorius van bach et al. 1992), labour force, live stock number, education status, length of service, experience (Bhople and Palaspager 1996). Managerial ability in decision-making process has been given new attention, both in theoretical study as well as empirical research explaining difference in farm results (Trip et al. 2002). Managerial ability has important implication for farm growth (Alvorez and Arias 2003). Majority (70.18 %) of respondents possessed medium level of managerial ability for plant protection (Patel and Patel 2000)

Majority of the mango orchard growers were from medium adoption index group (Chavda 1981, Patel 1990, Gorfad 1993, Chothani 1999), were from middle age group (Chavda 1981, Patel 1990, Gorfad 1993, Chothani 1999), were educated up to primary level (Chavda 1981, Satrola 1991, Chothani 1999), had large size of land holding


As regard to the association between selected characteristics of the farmers and their managerial ability, it was observed that economic motivation was significantly associated with managerial ability (Badachikar 1985, Bora 1986, Nagarajan 1989), innovativeness was positively and significantly associated with managerial ability (Bhadachikar 1985, Rao 1985, Chari and Nadapurkar 1987), achievement motivation was significantly associated with managerial ability (Badachikar 1985, Rao 1985, Chari and Nadapurkar 1987), education was positively and significantly associated with managerial ability (Rao 1985, Sumathi 1987, Nagarajan 1989), training was positively and significantly associated with managerial ability (Rao 1985, Nagarajan 1989, Patel 201), risk orientation was significantly associated with managerial ability (Rao 1985, Bora 1986, Chari and Nadapurkar 1987, Sumathi 1987, Nagarajan 1989), personal guidance was significantly associated with managerial ability (Sreekumar 1985), farm experience was positively and significantly associated with managerial ability (Bora 1986, Nagarajan 1989), orientation towards competition was associated with managerial ability (Bora 1986, Sumathi 1987, Nagarajan 1989), level of aspiration was significantly associated with managerial ability (Bora 1986, Sumathi 1987, Nagarajan 1989), mass media exposure was positively and
significantly associated with managerial ability (Sumathi 1987, Nagarajan 1989), extension participation was significantly associated with managerial ability (Sumathi 1987, Nagarajan 1989), attitude towards modern agriculture was significantly associated with managerial ability (Nagarajan 1989). While age was not significantly associated with managerial ability (Patel and Patel 2000), size of land holding was not significantly associated with managerial ability (Patel and Patel 2000)

3.2 THE CONCEPTUAL MODEL

In the light of the above theoretical frame and the hypotheses derived there upon, a conceptual model delineating the relationship between independent variables and dependent variable has been proposed. The variables namely, age, education, adoption index, size of land holding, annual income, experience as a mango growers, extension participation, social participation, mass media exposure, farm mechanization index, mango crop intensity, irrigation potentiality, mango yield index, borrowing of total management credit, level of farm wage payment, personality, training received, achievement motivation, orientation towards competition, attitude towards modern agriculture, personal guidance on better farming, level of aspiration and risk orientation were taken as independent variables, the managerial ability was considered as dependent variable. Based on the above variables, the conceptual model is shown in fig. 1.
FIG 1: CHARACTERISTICS OF MANGO ORCHARD GROWERS  
(THE CONCEPTUAL MODEL)
3.3. DEFINITION OF SOME COMMON TERMS

3.3.1 Management

Management is a process consisting of activities of planning, organizing, actuating and controlling, performed to determine and accomplish stated objectives with the use of available resources.

3.3.2 Managerial ability

The managerial ability has been defined as ‘the degree or ability to which an individual acquires and adopts effective factors in an enterprise to reach higher level of performance.

3.3.3 Mango crop intensity

Mango crop intensity is a percentage proportion of total mango cropped area to the size of cultivable holding.

3.3.4 Mango yield index

Mango yield index has been defined as average fruit yield of mango growers compared with average fruit yield of 100 mango growers in terms of percentage.

3.3.5 Orientation towards competition

Orientation towards competition has been defined as the degree to which a mango growers is oriented to place himself in a competitive situation in relation to other farmers for projecting his excellence in farming.

3.3.6 Achievement motivation
It has been defined as the value associated with mango growers which drives him to excel in his activities and thereby attains a sense of personal accomplishment.

3.3.7 Constraints

It referees to the item of difficulties faced by the mango growers in adoption of scientific cultivation practices.

3.3.8 Adoption

It is degree of use of improve mango cultivation practices by mango growers as recommended by the state department of agriculture and Gujarat Agriculture University.

3.3.9 Farm mechanization index

It is the numerical value of time and labour saving efficient working device (human and bullock) for farm operation possessed by mango growers.

3.3.10 Risk orientation

It is the degree to which mango growers are oriented towards the risk and uncertainty in their enterprise.
CHAPTER IV

RESEARCH METHODOLOGY

Scientific study of any problem requires an investigation to adopt appropriate method and procedures in order to arrive at reliable, unbiased and practical conclusions. This chapter deals with the methods and procedures followed in carrying out the study. It describes and clarifies methods used for measuring the dependent and independent variables and techniques followed for collection and analysis of data. The methodology is described under the following sections.

4.1 Identification of the problem.

4.2 Sources of data.

4.3 Area of study

4.4 Research design

4.5 Sampling technique

4.6 Selection of variables.

4.7 Development and measurement of dependent variable (managerial ability)

4.8 Measurement of independent variables.

4.9 Tools and techniques of data collection.

4.10 Method of data collection

4.11 Statistical procedures used for analysis of data.

4.12 Research hypothesis
Mango is one of the most important fruit crops of Saurashtra region of Gujarat state. Mango cultivation area and production particularly in Junagadh district is 13448 ha and 96456 metric tones respectively. This ranks second after Valsad districts in the state. Management is an integral function of any enterprise, which is working for the betterment of community at large. This function provides an opportunity to the farmers of a given enterprise to exert as much as they can to show their worth. Such an activity also calls for good level of ability of different levels of managers involved in the process of management of mango orchard. Cultivation of fruit is a specialized field where efficient management will help a lot to yield results, which are anticipated. Therefore, management is a pivotal component in a scientific cultivation of mango.

The mango production in the Saurashtra region is carried out by the farmers of Junagadh district. The mango growers have also to perform a role of manager to get maximum production from minimum available resources. Thus, the managerial ability of the mango growers was directly affecting the mango production.

Few studies have been conducted on managerial ability of farmers in cultivation of various crops, but the study on managerial ability of mango growers is lacking. The idea of the research problem was discussed with the members of the advisory committee as well with some leading scientists and it was considered that the study of this nature would be fruitful and will provide new direction in the field of cultivation of fruit. It was, therefore, decided to undertake a study on managerial ability of mango grower in Saurashtra region of Gujarat state.
4.2 SOURCE OF DATA:

The basic information regarding the study was gathered from the records of Gram, Taluka and District panchayat. After the primary survey, an interview schedule was prepared in light of objectives and the mango growers were personally interviewed by the investigator.

The secondary data and other relevant information for the study was collected from the following sources:

1. Published reports, papers and other information from different horticultural agencies.
2. Reference books, reports, bulletins and periodicals related to the subject published by different authors and agencies.
3. Post graduate theses pertaining to the subject.

4.3 AREA OF STUDY:

It was decided to conduct this study in Junagadh district of Saurashtra region with following consideration.

1. Junagadh district had the second largest mango growing area next to Valsad districts of Gujarat state.
2. Proportionately more number of mango orchards and had ideal conditions for the successful cultivation.
3. Among all the fruit crops, mango is the main fruit crop in the area under study.
4. In Junagadh district, Talala and Vanthali were famous for its Kesar mango in India and Abroad.
5. The headquarters of Junagadh Agricultural University is located in Junagadh.

6. The Junagadh is a native of investigator. It is familiar with agro-climatic and agricultural situation of the area under study.

4.4 RESEARCH DESIGN

The present study was confined to “Ex-post facto” research design. The literal meaning of ex-post facto is ‘from what is done afterwards’. It means something done or securing after one event with a retrospective effect on the event. It is used in contradistinction to experimental. Ex-post facto research is systematic empirical inquiry in which investigator does not have direct control on independent variables because their manifestations have already been occurred or they are inherently not manipulable. (Kerlinger, 1969).

4.5 SAMPLING TECHNIQUE

A multistage purposive sampling technique was used for the selection of districts, talukas and villages.

At the first stage, one district from the zone was selected. In the second stage, two talukas were selected from the district. The final stage consisted of selecting 20 villages from the selected talukas. The selection of district, talukas, and villages was based on the highest area under mango cultivation.
4.5.1 Selection of taluka

Out of 15 talukas of Junagadh district, Talala and Vanthali talukas were purposively selected for the study. Two talukas occupied more area under mango orchard cultivation as compared to other talukas in Junagadh district (Table – 3).

Table 3: Talukawise mango area in Junagadh district.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Talukas</th>
<th>Area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jungadh</td>
<td>324</td>
</tr>
<tr>
<td>2</td>
<td>Bhesan</td>
<td>36</td>
</tr>
<tr>
<td>3</td>
<td>Mendarda</td>
<td>627</td>
</tr>
<tr>
<td>4</td>
<td>Vanthali</td>
<td><strong>1755</strong></td>
</tr>
<tr>
<td>5</td>
<td>Manavadar</td>
<td>170</td>
</tr>
<tr>
<td>6</td>
<td>Kutiyan</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>Ranavav</td>
<td>26</td>
</tr>
<tr>
<td>8</td>
<td>Porbandar</td>
<td>30</td>
</tr>
<tr>
<td>9</td>
<td>Veraval</td>
<td>241</td>
</tr>
<tr>
<td>10</td>
<td>Visavadar</td>
<td>334</td>
</tr>
<tr>
<td>11</td>
<td>Talala</td>
<td><strong>4441</strong></td>
</tr>
<tr>
<td>12</td>
<td>Keshod</td>
<td>101</td>
</tr>
<tr>
<td>13</td>
<td>Una</td>
<td>1433</td>
</tr>
<tr>
<td>14</td>
<td>Mangrol</td>
<td>255</td>
</tr>
<tr>
<td>15</td>
<td>Maliya</td>
<td>1246</td>
</tr>
</tbody>
</table>

Source: Deputy Director of Agriculture (Extension)
District panchayat, Junagadh,)
### 4.5.2 Selection of villages

From each selected talukas ten villages were selected by random sampling method. Thus, total numbers of 20 villages were selected for the study as shown in Table 4.

**Table 4: Selected villages and respondents**

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Name of selected talukas and village</th>
<th>Total number of mango growers</th>
<th>Number of selected mango rowers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Talala</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Madhupur</td>
<td>175</td>
<td>9</td>
</tr>
<tr>
<td>2.</td>
<td>Dhava</td>
<td>283</td>
<td>14</td>
</tr>
<tr>
<td>3.</td>
<td>Bhalchela</td>
<td>260</td>
<td>13</td>
</tr>
<tr>
<td>4.</td>
<td>Jasapur</td>
<td>270</td>
<td>13</td>
</tr>
<tr>
<td>5.</td>
<td>Borvav</td>
<td>193</td>
<td>9</td>
</tr>
<tr>
<td>6.</td>
<td>Akolvadi</td>
<td>245</td>
<td>12</td>
</tr>
<tr>
<td>7.</td>
<td>Moruka</td>
<td>308</td>
<td>15</td>
</tr>
<tr>
<td>8.</td>
<td>Hadmatiya</td>
<td>221</td>
<td>11</td>
</tr>
<tr>
<td>9.</td>
<td>Vadala</td>
<td>158</td>
<td>8</td>
</tr>
<tr>
<td>10.</td>
<td>Rasulpara</td>
<td>197</td>
<td>10</td>
</tr>
<tr>
<td>2.</td>
<td>Vanthali</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Vanthli</td>
<td>258</td>
<td>13</td>
</tr>
<tr>
<td>2.</td>
<td>Kanza</td>
<td>167</td>
<td>8</td>
</tr>
<tr>
<td>3.</td>
<td>Nana-Kajaliala</td>
<td>154</td>
<td>7</td>
</tr>
<tr>
<td>4.</td>
<td>Santalpur</td>
<td>102</td>
<td>5</td>
</tr>
<tr>
<td>5.</td>
<td>Dhandusar</td>
<td>175</td>
<td>9</td>
</tr>
<tr>
<td>6.</td>
<td>Navda</td>
<td>155</td>
<td>8</td>
</tr>
<tr>
<td>7.</td>
<td>Dhanfulia</td>
<td>198</td>
<td>10</td>
</tr>
<tr>
<td>8.</td>
<td>Tinmas</td>
<td>215</td>
<td>10</td>
</tr>
<tr>
<td>9.</td>
<td>Sahpur</td>
<td>236</td>
<td>11</td>
</tr>
<tr>
<td>10.</td>
<td>Akha</td>
<td>145</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>4115</td>
<td>200</td>
</tr>
</tbody>
</table>
Fig: 2 MAP OF GUJARAT STATE SHOWING THE SELECTED TALUKAS AND VILLAGES
4.5.3 Selection of respondents

All the mango orchard growers of these 20 villages constitute the population. A separate list of mango orchard growers of all the 20 selected villages was prepared with the help of Gram Panchayat and VLWs. The total numbers of 200 respondents were selected from the list of 20 selected villages by proportionate random sampling methods. The details of selected villages and the respondents from each selected village are given in Table 4.

4.6 SELECTION OF VARIABLES

The selection of variables included in the study was done based on an extensive review of literature on management, consultation with experts and from previous studies taken up on the related subjects. Only those variables, which were found most relevance, were finally selected for the study. The list of the selected variables (characteristics) is as under.

(A) Dependent variables

1. Managerial ability

(B) Independent variables

I. Personal

1. Age

2. Education

II. Operational management

1. Adoption index

2. Size of land holding
3. Annual income
4. Farm mechanization index
5. Mango crop intensity
6. Irrigation potentiality
7. Mango yield index
8. Borrowing of total credit
9. Level of farm wage payment

III. Strategic management

1. Experience as a mango grower
2. Social participation
3. Personality
4. Achievement motivation
5. Orientation towards competition
6. Attitude towards modern agriculture
7. Level of aspiration
8. Risk orientation

IV. Extension – communication

1. Extension participation
2. Training received
3. Mass media exposure
4. Personal guidance on better farming
4.7 DEVELOPMENT AND MEASUREMENT OF DEPENDENT VARIABLE

Fredrick W. Tylor is the founder of the scientific management. Its overall goal was high industrial efficiency in terms of either highest productivity or lower unit cost.

Management has been defined in various ways: (1) According to Harold Koontz, “Management is the art of getting things done through and with people in formally organized groups”. It is the art of creating an environment in which people can perform as individuals and yet cooperate towards attainment of group goals. (2) The ability of a person to accomplish the particular activity despite hardship (3) Using the resources what we have to get the most. (4) The ability of a person in using the techniques and skills in planning, scheduling, guiding, supervising and organizing the resources (man, materials and money).

In the present study, management of orchard has been operationalised as the ability of the mango growers to apply the basic principles of management in scientific cultivation of mango orchard. This has been measured with some select components (function) of the management.

4.7.1 Development of scale to measure managerial ability of mango grower

Researches in this field have used different criteria to measure the performance of the managers. Mitchell (1979) used the teachers rating (perception) for studying principals’ effectiveness in the elementary schools. In the present study, the managerial ability of the mango growers was measured by the indicator performance scale.
4.7.1.1 Selection of main indicators and sub indicators:

The mango growers have to perform many management functions. With this in mind, a good number of main indicators and sub-indicators pertaining to managerial ability were collected through relevant literature, corresponding with experts and discussing with management specialists. In all, 11 main indicators and 105 sub-indicators reflecting managerial ability of mango growers were selected as possible indicators for managerial ability scale. These indicators were then referred to 100 judges, the academic and administrative management personnel working in various universities and institutions in India. The judges were requested to indicate whether each of the indicators and sub-indicators sent to them was relevant or not for inclusion in scale. (Appendix – I). At the same time, judges were requested to rank the main indicator and sub indicator according to their relative importance in measurement of managerial ability of mango growers. The response on relevancy and rank order was received from 64 judges. Finally, responses of 60 judges were considered by rejecting four judges’ responses due to their incomplete response.

Using Normalised Rank Approach recommended by Guilford (1954), scale value for each indicator and weightage for each sub-indicator were worked out. The advantage of this method is that it can be used with any number of variables and does not require large number of judges for ranking the variables.
4.7.1.2 Determining the scale value:

In order to obtain the scale value of each indicator and subindicator ranked by the judges, the centile position ‘P’ based on the method suggested by Guilford (1954) was computed. The ‘C’ values, ‘Rj’ values and finally scale values i.e. ‘Rc’ value were worked out by using the following formula: (Appendix – II).

\[ Rc = 2.357 \times Rj - 7.01 \]

4.7.1.3 Validity of the scale:

Validity of the scale was confirmed by two types of validity tests viz, content validity and criterion validity.

4.7.1.3.1 Content validity

According to Kerlinger (1976), the content validity is representativeness of sampling adequacy, of the content, the substance, the matter and the topics of measuring instrument. In the present study, indicators and sub-indicators included in the scale were arrived at only after wide and critical validation by panel of judges.

4.7.1.3.2 Criterion validity:

A criterion may be an objective measure of performance or quality (Garrett, 1985). In the present study, criterion validity was measured by using criteria of experience as a mango grower. Comparison was made between the managerial ability score of 20 non-sampled respondents with their respective experience as a mango grower. Pearson’s coefficient of correlation was used for appraising correlation between these two sets of scores. The ‘r’ value was 0.376, indicating that the scale was valid.
4.7.1.4 Determining the reliability

In order to measure the reliability of the scale, split half method was used; the scale was administered to 20 non-sampled farmers. The score for the alternative indicators were separated and two sets were prepared. The coefficient of correlation was used for appraising correlation between the two sets of scores. The ‘r’ value was 0.742, indicating that the scale was reliable.

4.7.2 Measurement of dependent variable (managerial ability)

For measuring the managerial ability of mango growers about scientific cultivation of mango orchard, the scale developed for the purpose was applied. The score assign to these equations according to its important. The formula used for calculating the managerial ability index (MAI) was as under.

\[
\text{MAI} = \frac{\sum \text{Score obtained for indicator} \times \text{Scale value of indicator}}{\sum \text{Maximum score for indicator} \times \text{Scale value of indicator}} \times 100
\]

Managerial ability index from each mango growers were calculated. The final managerial ability index of mango growers was determined by averaging the index from respective mango growers. Then, the mango growers were classified in to three categories based on Mean and Standard Deviation viz;

- Low managerial ability = (Mean – S.D.)
- Medium managerial ability = (Mean ± S.D.)
- High managerial ability = (Mean + S.D.)
### 4.8 MEASUREMENT OF INDEPENDENT VARIABLES

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Variables</th>
<th>Measurement technique</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I</strong></td>
<td><strong>Personal</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Age</td>
<td>Structure schedule developed</td>
</tr>
<tr>
<td></td>
<td>2. Education</td>
<td>Structure schedule developed</td>
</tr>
<tr>
<td><strong>II</strong></td>
<td><strong>Operational management</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Adoption Index</td>
<td>Use of adoption quotient developed by Chattopadhyay (1974)</td>
</tr>
<tr>
<td></td>
<td>2. Size of land holding</td>
<td>Structure schedule developed</td>
</tr>
<tr>
<td></td>
<td>3. Annual income</td>
<td>Structure schedule developed</td>
</tr>
<tr>
<td></td>
<td>4. Farm mechanization index</td>
<td>Scale of Singh and Singh (1970)</td>
</tr>
<tr>
<td></td>
<td>5. Mango crop intensity</td>
<td>Scale of Mayani (1987)</td>
</tr>
<tr>
<td></td>
<td>6. Irrigation potentiality</td>
<td>Total area of irrigation in hectare</td>
</tr>
<tr>
<td></td>
<td>7. Mango yield index</td>
<td>The average fruit yield of mango growers compared with average fruit yield of 100 mango growers (q/ha) in terms of percentage</td>
</tr>
<tr>
<td></td>
<td>8. Borrowing of total credit</td>
<td>Index of borrowing of total production credit (Samanta, 1977)</td>
</tr>
<tr>
<td></td>
<td>9. Level of farm wage payment</td>
<td>Index of farm wage payment, Bora, 1986</td>
</tr>
<tr>
<td><strong>III</strong></td>
<td><strong>Strategic management</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Experience as a mango growers</td>
<td>Total mango growing experience</td>
</tr>
<tr>
<td></td>
<td>2. Social participation</td>
<td>Degree to which a mango growers associated with various formal organizations being a member</td>
</tr>
<tr>
<td></td>
<td>3. Personality</td>
<td>Scale developed by Woodworth (1979)</td>
</tr>
<tr>
<td></td>
<td>4. Achievement motivation</td>
<td>Scale of Rani (1985)</td>
</tr>
<tr>
<td></td>
<td>5. Orientation towards competition</td>
<td>Scale developed by Singh (1981)</td>
</tr>
<tr>
<td></td>
<td>6. Attitude towards modern agriculture</td>
<td>Scale developed by Singh (1990)</td>
</tr>
<tr>
<td></td>
<td>8. Risk orientation</td>
<td>Scale of Supe (1969)</td>
</tr>
<tr>
<td><strong>IV</strong></td>
<td><strong>Extension – communication</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Extension participation</td>
<td>Scale of Siddaramaiah and Jalihal (1983)</td>
</tr>
<tr>
<td></td>
<td>2. Training received</td>
<td>Structure schedule developed</td>
</tr>
<tr>
<td></td>
<td>3. Mass media exposure</td>
<td>Structure schedule developed</td>
</tr>
<tr>
<td></td>
<td>4. Personal guidance on better farming</td>
<td>Scale developed by Singh (1981)</td>
</tr>
</tbody>
</table>
4.8.1. Personal

4.8.1.1 Age

Age of the mango growers is operationalized as the calendar years rounded off to the nearest, on the date of response. One score was given for each complete year. The mango growers were classified into three groups viz;

- Young age group (up to 35 years)
- Middle age group (36 to 45 years)
- Old age group (above 45 years).

4.8.1.2 Education

The level of education was measured as level of literacy in terms of educational standard one has passed. Each standard pass was given a one score. The mango growers were classified in to three categories viz

- Illiterate = (unable to read or write)
- Primary = (up to 7th standard)
- Secondary = (8th to 10th standard)
- Higher education = (above 10th standard).

4.8.2. Operational management

4.8.2.1 Adoption Index

The adoption of improved mango cultivation practices divided into 10 practices by consulting the experts in the field. The weightage of the particular practice was determined by seeking the opinion of the 20 experts in the field. The weightage of the particular practice assigned by each expert was summed up and with the help of arithmetic mean, the practicewise weightage was determined as under.
<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Practices</th>
<th>Weightage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tillage</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Variety</td>
<td>17</td>
</tr>
<tr>
<td>3</td>
<td>Planting distance</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>Organic manure</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>Chemical fertilizer</td>
<td>15</td>
</tr>
<tr>
<td>6</td>
<td>Irrigation</td>
<td>12</td>
</tr>
<tr>
<td>7</td>
<td>Insect/pest control</td>
<td>13</td>
</tr>
<tr>
<td>8</td>
<td>Disease control</td>
<td>10</td>
</tr>
<tr>
<td>9</td>
<td>Intercropping</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>Hormones</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

The adoption quotient developed by Chattopadhyay (1974) was used with slight modification.

\[
AQ = \frac{\sum_{p1}^{e1} W_1 + \sum_{p2}^{e2} W_2 + \ldots \ldots \ldots\ldots + \sum_{pn}^{en} W_n}{WXN} \times 100
\]

Where,

- \(AQ\) = Adoption quotient
- \(e_1 - e_n\) = Extent of adoption in terms of score obtained by the mango growers for the particular practice.
- \(p_1 - p_n\) = Potentiality of the mango growers in terms of score obtained for the particular practices.
- \(W_1 - W_n\) = Weightage of the particular practice
- \(W\) = Summation of weightages of all practices included
- \(N\) = Number of years for which adoption quotient was calculated.
For the purpose of adoption quotient, one-year data were obtained. The respondents were grouped into three categories on the basis of mean and standard deviation.

\[
\begin{align*}
\text{Low adoption index} & \quad = \quad (\text{Mean} - \text{S.D.}) \\
\text{Medium adoption index} & \quad = \quad (\text{Mean} \pm \text{S.D.}) \\
\text{High adoption index} & \quad = \quad (\text{Mean} + \text{S.D.})
\end{align*}
\]

4.8.2.2 Size of land holding

It was measured with the help of structured schedule on the basis of total land operated by the respondent. The respondents were grouped into three categories viz;

\[
\begin{align*}
\text{Small size of land holding} & \quad = \quad \text{(up to 2 ha)}, \\
\text{Medium size of land holding} & \quad = \quad \text{(2.1 to 5 ha)} \\
\text{Large size of land holding} & \quad = \quad \text{(Above 5 ha)}
\end{align*}
\]

4.8.2.3 Annual income

The annual income includes quantum of money obtained or earned by all family members during the year from farm and non farm sources.

The data collected from the respondents about their annual income was categorized into three groups.

\[
\begin{align*}
\text{Low annual income} & \quad = \quad \text{(up to 50000)}, \\
\text{Medium annual income} & \quad = \quad \text{(51000 to 100000)} \\
\text{High annual income} & \quad = \quad \text{(above 100000)}.
\end{align*}
\]
4.8.2.4 Farm mechanization index

To measure the farm mechanization index of the mango growers, the index developed by Singh and Singh (1970) was used with slight modification.

\[ FMI = \sum_{i=1}^{n} W_i \times n_i \times t_i \]

FMI  = Farm mechanization index  
W\textsubscript{i}  = Weightage of the \textit{i}\textsuperscript{th} item possessed by the respondent  
ni  = The number of the \textit{i}\textsuperscript{th} item possessed by an individual mango growers  
ti  = The total period in years, the \textit{i}\textsuperscript{th} item has been possessed  
n  = Total number of items selected  
\[ \sum \]  = Summation

The score obtained by each respondent are calculated by above-mentioned formula. The respondents were grouped into three categories on the basis of the mean and standard deviation.

- Low FMI = (Mean – S.D.)
- Medium FMI = (Mean ± S.D.)
- High FMI = (Mean + S.D.)

4.8.2.5 Mango crop intensity

It was measured in percentage of proportion of total mango cropped area to the size of cultivable holding. It was mentioned in percentage of proportion of total mango area to the existing cropping pattern. Following formula is used.
Grossed Mango Crop Area

Mango Crop Intensity = \----------------------------- X 100
Grossed Crop Area

Score obtained by each respondent were calculated by above-mentioned formula. The respondents were grouped into three categories on the basis of the mean and standard deviation. Low (Mean – S.D.), medium (mean ± SD) and High (mean + SD)

Low mango crop intensity = (Mean – S.D.)
Medium mango crop intensity = (Mean ± S.D.)
High mango crop intensity = (Mean + S.D.)

4.8.2.6 Irrigation potentiality

The mango growers were asked to mention the total area being irrigated for the mango and it was expressed in terms of percentage. The mango growers were categories.

Low irrigation potentiality = (Mean – S.D.)
Medium irrigation potentiality = (Mean ± S.D.)
High irrigation potentiality = (Mean + S.D.)

4.8.2.7 Mango yield index

The average fruit yield of mango growers compared with average fruit yield of 100 mango growers (q/ha) in terms of percentage.

\[
\text{Mango yield index} = \frac{\text{Average yield of mango orchard of individual mango growers}}{\text{Average yield of mango orchard of 100 mango growers}} \times 100
\]
The mango growers were classified into three categories.

Low mango yield index \(=\) \(\text{Mean} - \text{S.D.}\)
Medium mango yield index \(=\) \(\text{Mean} \pm \text{S.D.}\)
High mango yield index \(=\) \(\text{Mean} + \text{S.D.}\)

4.8.2.8 Borrowing of total credit

The total amount borrowed annually by a farmer for purchase of variable inputs for management of crops may be regarded as his total management credit is the proportion of total amount borrowed annually from different sources to the total cash requirement for management of crops per acre per year, expressed in percentage. The index was calculated as follows.

\[
\frac{\text{Total amount borrowed for management of orchard}}{\text{Total annual cash requirement for management of orchard}}
\]

The mango growers were classified into three categories viz.,

Low \(=\) \(\text{Mean} - \text{S.D.}\)
Medium \(=\) \(\text{Mean} \pm \text{S.D.}\)
High \(=\) \(\text{Mean} + \text{S.D.}\)

4.8.2.9 Level of farm wage payment

To measure the level of farm wage payment the index developed by Bora (1986) was used. The cost of hired labour for all crops were added and divided by the gross cropped area which gave the level of farm wage payment of a mango grower. The mango growers were classified into three categories viz;
Low = (Mean – S.D.)
Medium = (Mean ± S.D.)
High = (Mean + S.D.)

4.8.3 Strategic management

4.8.3.1 Experience as a mango growers

It was operationalised as number of completed years as mango growers. The mango growers were classified into three categories viz,

Less experience = (Mean – S.D.)
Medium experience = (Mean ± S.D.)
High experience = (Mean + S.D.)

4.8.3.2 Social participation

The mango growers were asked about their association with various organizations within and outside their village. Different scores were assigned for membership in each organization according to the importance of that organization in a particular set up and one more score was assigned for the holding position in an organization. The mango growers were grouped into three categories on the basis of mean and standard deviation.

Low social participation = (Mean – S.D.)
Medium social participation = (Mean ± S.D.)
High social participation = (Mean + S.D.)
4.8.3.3 Personality

There are two types of personality viz, introvert and extrovert. The psychic energy of introvert mango growers is directed inward their thoughts, emotions and desires, whereas, the psychic energy of extrovert training organizers is directed outward to the social environment.

This variable was measured by adopting the scale developed by Woodworth (1979) with slight modification. The scale consisted of nine statements with a two point continuum viz. ‘Yes’ and ‘No’ with score of 2 and 1 for positive and 1 and 2 for negative statements respectively, the reliability of the scale was measured by split-half method and the ‘r’ value was seen to be significant (0.650) indicating the dependability of the scale. The mango growers were classified into two groups as:

\[
\begin{align*}
\text{Introvert} & = \text{Up to mean} \\
\text{Extrovert} & = \text{Above mean}
\end{align*}
\]

4.8.3.4 Achievement motivation

It has been operationalised as the value associated with mango growers, which drives him to excel in his activities and thereby attains a sense of personal accomplishment. It was measured by using the scale developed by Rani (1985) with slight modifications, the scale consisted of eight items with a three point continuum as Agree (3 score), Undecided (2 score) and Disagree (1 score). The reliability of the scale was confirmed using split-half method and the ‘r’ value was seen to be significant, indicating the dependability of the scale. The mango growers were divided in to three categories viz.
4.8.3.5 Orientation towards competition

In present study, orientation towards competition has been operationally defined as the degree to which a farmer is oriented to place himself in a competitive situation in relation to other farmers for projecting his excellence in farming.

Orientation towards the competition was measured by using the scale developed by Singh (1981). The scale consists of 6 items. The statements with serial number (i), (ii), (iv), and (v) indicated positive orientation, while remaining statements indicated negative orientation. Each statement was provided with 4-point response categories ranging from strongly agree to strongly disagree. The favourable statements were given scores for strongly agree-4, agree-3, disagree-2 and strongly disagree-1. Scoring was reversed for the unfavourable statement. The mango growers were divided into three categories viz.

- Low = (Mean – S.D.)
- Medium = (Mean ± S.D.)
- High = (Mean + S.D.)

4.8.3.6 Attitude towards modern agriculture

Attitude towards modern agriculture was measured by using the scale developed by Singh (1990). The scale consists of 8 items. Each statement was provided with 5-point response categories ranging from strongly agree to strongly disagree. Each statement were given scores for strongly agree-5, agree-4,
undecided - 3, disagree-2 and strongly disagree-1, to positive statement and vis-a-versa to negative. The mango growers were divided in to three categories viz.

- Less favourable = (Mean – S.D.)
- Favourable = (Mean ± S.D.)
- Highly favourable = (Mean + S.D.)

4.8.3.7 Level of aspiration

An aspiration usually refers to a person’s or a group of persons’ orientation towards a goal (Haller, 1968). Goals can vary in kind and are usually described with reference to a particular social status or status attribute. High and low levels of aspiration are used to indicate relative level of goal specification (Muthayya, 1971)

The aspiration-ratings for the present and the future developed by Muthayya (1971) had 13 items. Of these, item 11 other home reared animals, being non specific were dropped. Further, it was found that Cantril’s pictorial self –anchoring ladder scale as used by Muthayya (1971) was difficult for the farmers to comprehend. To facilitate clear responses from the farmers, the items were provided with 5-point response categories.

Level of aspiration was measured by the aspiration rating for the present and the future scale develop by Muthayya (1971), modified by Sagar (1983). The scale consists 13 items (two statement under educational) were provided with 5-point response categories, indicating low to high levels of aspiration. 5-Point response categories from 0 to 4 were pretested. The range
of scores was from 0 to 52. The mango growers were divided in to three categories viz.

\[
\begin{align*}
\text{Low level of aspiration} & = (\text{Mean} - \text{S.D.}) \\
\text{Medium level of aspiration} & = (\text{Mean} \pm \text{S.D.}) \\
\text{High level of aspiration} & = (\text{Mean} + \text{S.D.})
\end{align*}
\]

4.8.3.8 Risk orientation

The scale developed by sup (1969) was used with slight modification to measure the risk orientation of the respondents.

The scale consist 6 statements of which two negatives. The respondents were asked to respond on three point continuum rating scale as agree, undecided and disagree giving 3, 2 and 1 score, respectively. The total score were calculated by summing up the score obtained for each statement per respondent. The maximum score that could be obtained for a respondent were 18 and minimum 6.

The respondents were classified in to three categories on the basis of mean and S.D. as following

\[
\begin{align*}
\text{Low} & = (\text{Mean} - \text{S.D.}) \\
\text{Medium} & = (\text{Mean} \pm \text{S.D.}) \\
\text{High} & = (\text{Mean} + \text{S.D.})
\end{align*}
\]

4.8.4 Extension – communication

4.8.4.1 Extension participation

It was measured with the help of scale developed by Siddaramaiah and Jalihal (1983). The scale consist of eight items having different scale values administered to the
respondents and obtained information on the participation of mango growers in different extension activities during the period of previous one year. The extension participation score of an individual of mango growers was the sum total of the scale value of the items in which mango growers has participated.

\[
\text{Extension participation Index} = \frac{\text{Actual total score value}}{\text{Possible total score value}} \times 100
\]

According to the extension participation index of mango growers, the mean and standard deviation worked out and respondent was grouped into three categories.

- **Low extension participation** = (Mean – S.D.)
- **Medium extension participation** = (Mean ± S.D.)
- **High extension participation** = (Mean + S.D.)

### 4.8.4.2 Training received

It refers to the training received on management of mango orchard. The mango growers were grouped into three categories viz, untrained, less trained and more trained

- Untrained = (0 score)
- Less trained = (below mean)
- More trained = (above mean)

### 4.8.4.3 Mass media exposure

The score were assigned to the respondents based on frequency of their use of various sources of information. The scores assigned to various frequencies of uses were regularly (3), frequently (2), once in a week (1), and not at all (0). The scores,
thus, assigned to each type of information, sources of which respondents had responded were summed up. The sum total of the score, thus, obtained was considered as an index of respondents mass media exposure.

According to the mass media exposure of respondents, the mean and standard deviation were worked out and the respondents were grouped into three categories.

Low mass media exposure = (Mean – S.D.)
Medium mass media exposure = (Mean ± S.D.)
High mass media exposure = (Mean + S.D.)

4.8.4.4 Personal guidance on better farming

Guidance available to the farmers, whether from mass media sources like radio, farm publications etc. or from personal cosmopolite sources like extension workers, are in most cases generalized in nature. Even training programmes and field days cannot solve the problems of individual farmers with respect to their own specific farming situations.

In this context, personal guidance on better farming assumes great significance and it may be postulated that the farmers who receive personal guidance will do farming in a better way. Personal guidance is more relevant in case of plot-to-plot variation in the nature and properties of soil.

Personal guidance on better farming was measured by using the scale developed by Singh (1981). The scale had 12 items. Each statement was provided with 4 point response categories viz, very much, much, not so much and very little with
the scale value 4, 3, 2 and 0,1 respectively. The mango growers were divided into three categories viz.

\[
\begin{align*}
\text{Low} & = \text{(Mean} - \text{S.D.)} \\
\text{Medium} & = \text{(Mean} \pm \text{S.D.)} \\
\text{High} & = \text{(Mean} + \text{S.D.)}
\end{align*}
\]

4.9 TOOLS AND TECHNIQUES USED FOR THE DATA COLLECTION

The main tools and techniques used in the present study was interview schedule along with the suitable scales and indices for measurement of dependent and independent variables. (Appendix – III).

4.10 METHOD OF DATA COLLECTION

A pretested structured interview schedule was used for collection of needed data. Initially the interview schedule was prepared after discussing with a group of experts and necessary modifications were made. The data were collected through personal interviews by the researcher using the final interview schedule.

4.11 STATISTICAL METHOD USED FOR ANALYSIS OF DATA

For the interpretation and drawing inferences, the following statistical methods were used in the present study.

4.11.1 Percentage:

Simple comparisons were made on the basis of percentage.
4.11.2 Mean and standard deviation:

Arithmetic mean and standard deviation was used for classification of the mango growers into different categories.

\[
\bar{X} = \frac{\sum X_i}{n}
\]

\[
\text{S.D.} = \left[ \frac{\sum (X_i - \bar{X})^2}{n-1} \right]^{\frac{1}{2}}
\]

Where,

\(\bar{X}\) = General mean

\(X_i\) = Observed values

S.D. = Standard Deviation

\(n\) = Number of observation

4.11.3 Coefficient of variation:

Coefficient of variation was used for comparing the variability present in various independent variables.

\[
\text{C.V.} \% = \frac{\text{S.D.}}{\bar{X}} \times 100
\]

Where.

C.V. \% = Coefficient of variation

S.D. = Standard deviation

\(\bar{X}\) = Mean
4.11.4 Coefficient of correlation:

It was computed to find out the relationship between each of the independent variable and dependent variable by employing following formula:

\[ r = \frac{\sum xy}{\sqrt{\left( \sum x^2 \cdot \sum y^2 \right)}} \]

Where,

\[ r \] = Coefficient of correlation

\[ \sum xy \] = Correlated sum of products between x and y variables

\[ \sum x^2 \] = Correlated sum of square for x variable

\[ \sum y^2 \] = Correlated sum of square for y variable

4.11.5 Multiple regression analysis

This analysis was done to know the combined effect of the independent variables in explaining the variation in the dependent variable. The prediction equation used was:

\[ \hat{Y} = a + \sum_{i=1}^{k} b_i x_i \]

Where,

\[ \hat{Y} \] = Predicted dependent variable

\[ a \] = Intercept or constant
\[ \sum_{i=1}^{k} b_{i} x_{i} = \text{Sum of partial regression coefficient of } Y \text{ with } X_{i} \ldots X_{k} \text{ variables} \]

\[ x_{i} \ldots x_{k} = \text{Number of independent variables included in multiple regression analysis.} \]

4.11.6 Stepwise multiple regression analysis:

The stepwise multiple regression analysis was carried out to know the important variables with their predictive ability in explaining the variation in the dependent variable.

In the stepwise method, the regression analysis was started with regression of \( y \) with \( x_{i} \ldots x_{k} \) taken singly. The variable giving the greatest reduction in sum of squares of \( Y \) was first selected. Then, the bivariate regression in which \( X_{1} \) appeared was worked out. The variate which gives the greatest additional reduction in sum of square after fitting \( X_{1} \) was selected. All trivariate regressions that include both \( X_{1} \) and \( X_{2} \) were computed. The analysis was continued until the last variate of which additional contribution was the least of all variates. The prediction equation used was

\[ \hat{Y} = a + \sum_{i=1}^{k} b_{i} x_{i} \]

Where,

\[ \hat{Y} = \text{Predicted dependent variable} \]

\[ a = \text{Intercept or constant} \]
\[
\sum_{i=1}^{k} b_{i} x_{i} = \text{Sum of partial regression coefficient of } Y \text{ with } \text{Xi}....Xk \text{ variables}
\]

\( x_{i}...x_{k} \) = Number of independent variables included in multiple regression analysis.

### 4.11.7 Standard partial regression coefficient:

In order to assign the rank to various selected independent variables, the standard partial regression coefficient was used. To calculate the same, the following formula (Snedecor and Cochran, 1967) was used.

\[
b'_{y \cdot x_{i} \cdot j} = b_{y \cdot x_{i} \cdot j} \cdot \left[ \frac{\sum x^{2}}{\sum y^{2}} \right]^{1/2}
\]

Where,

\( b'_{y \cdot x_{i} \cdot j} \) = Standard partial regression coefficient \( y \) with \( x_{i} \)

\( b_{y \cdot x_{i} \cdot j} \) = Partial regression coefficient of \( y \) with \( x_{i} \)

\( \sum x^{2} \) = Corrected sum of square for variable \( x \)

\( \sum y^{2} \) = Corrected sum of square for variable \( y \)

### 4.11.8. Path coefficient analysis

To know the cause and effect relationship between two variables, path coefficient analysis was carried out according to the procedure describe by Dewey and Lu (1959) using the estimates of correlation coefficients. Correlation coefficient of independent variables with managerial ability was used to
estimate the path coefficient for indirect effect of various independent variables on managerial ability.

The path coefficient was obtained by solving a set of simultaneous equations as below.

\[
\begin{align*}
r_{1y} &= p_{1y} + r_{12y} p_{2y} + r_{13y} p_{3y} + \ldots + r_{1iy} p_{iy} + \ldots + r_{1ny} p_{ny} \\
r_{2y} &= p_{2y} + r_{21y} p_{1y} + r_{23y} p_{3y} + \ldots + r_{2iy} p_{iy} + \ldots + r_{2ny} p_{ny} \\
r_{iy} &= p_{iy} + r_{i1y} p_{1y} + r_{i3y} p_{3y} + \ldots + r_{i(i-1)y} p_{iy} + \ldots + r_{iny} p_{ny} \\
r_{ny} &= p_{ny} + r_{n1y} p_{2n} + r_{n3y} p_{3n} + \ldots + r_{n(n-1)y} p_{ny} + \ldots + r_{nny} p_{ny}
\end{align*}
\]

Where,

- \( r_{1y} \) to \( r_{iy} \) = Correlation coefficient between independent variables, 1 to n and dependent variable (y)
- \( r_{i3} \) to \( r_{i (i - 1)} \) = Correlation coefficient among independent variables
- \( p_{iy} + p_{ny} \) = Direct effect of independent variables, 1 to n on dependent variable (path coefficients).

The above equations written in a matrix form are as under:

\[
\begin{bmatrix}
r_{1y} \\
r_{2y} \\
r_{3y} \\
\vdots \\
r_{iy} \\
r_{ny}
\end{bmatrix}
= \begin{bmatrix}
1 & r_{12} & r_{13} & \ldots & r_{1i} \\
r_{21} & 1 & r_{23} & \ldots & r_{2i} \\
r_{31} & r_{32} & 1 & \ldots & r_{3i} \\
\vdots & \vdots & \vdots & \ddots & \vdots \\
r_{i1} & r_{i2} & r_{i3} & \ldots & r_{in} \\
\vdots & \vdots & \vdots & \ddots & \vdots \\
r_{n1} & r_{n2} & r_{n3} & \ldots & r_{ni} \\
1 & 1 & 1 & \ldots & 1
\end{bmatrix}
\begin{bmatrix}
p_{1y} \\
p_{2y} \\
p_{3y} \\
\vdots \\
p_{iy} \\
p_{ny}
\end{bmatrix}
\]
With the help of matrix inversion, the following form of inverted ‘C’ matrix was obtained

\[ B = C^{-1} A \]

Where,

\[
C^{-1} = \begin{bmatrix}
C_{11} & C_{12} & C_{13} & \cdots & C_{1i} & \cdots & C_{1n} \\
C_{21} & C_{22} & C_{23} & \cdots & C_{2i} & \cdots & C_{2n} \\
C_{31} & C_{32} & C_{33} & \cdots & C_{3i} & \cdots & C_{3n} \\
\vdots & \vdots & \vdots & \ddots & \vdots & \ddots & \vdots \\
C_{i1} & C_{i2} & C_{i3} & \cdots & C_{ii} & \cdots & C_{in} \\
\vdots & \vdots & \vdots & \ddots & \vdots & \ddots & \vdots \\
C_{n1} & C_{n2} & C_{n3} & \cdots & C_{ni} & \cdots & C_{nn}
\end{bmatrix}
\]

The direct effect was calculated as under

\[
P_{1y} = \sum_{i=1}^{n} C_{1i} \ast r_{iy}
\]

\[
P_{2y} = \sum_{i=1}^{n} C_{2i} \ast r_{iy}
\]

\[
P_{3y} = \sum_{i=1}^{n} C_{3i} \ast r_{iy}
\]

\[ \vdots \]

\[
P_{iy} = \sum_{i=1}^{n} C_{ii} \ast r_{iy}
\]

\[ \vdots \]

\[
P_{ny} = \sum_{i=1}^{n} C_{ni} \ast r_{in}
\]

The indirect effects was calculated by taking the products of correlation coefficients between corresponding two variables and path coefficient (direct effect) connecting the causal effect with managerial ability.

\[
R = \left[ 1 - (p_{iy} \cdot r_{iy}) \right]^{1/2}
\]

\[ p_{iy} \cdot r_{iy} = p_{1y} \cdot r_{1y} + p_{2y} \cdot r_{2y} + \cdots + p_{ny} \cdot r_{ny} = R^2 \]

\[ R^2 = \text{Coefficient of determination} \]
4.12 RESEARCH HYPOTHESIS (STATED IN NULL FORM)

Based on the literature reviewed and theoretical orientation of the study the following hypotheses pertaining to the specific objectives were developed:

H.1 There is no association between mango growers managerial ability about scientific cultivation of mango orchard and their age.

H.2 There is no association between mango growers managerial ability about scientific cultivation of mango orchard and their education.

H.3 There is no association between mango growers managerial ability about scientific cultivation of mango orchard and their adoption index.

H.4 There is no association between mango growers managerial ability about scientific cultivation of mango orchard and their size of land holding.

H.5 There is no association between mango growers managerial ability about scientific cultivation of mango orchard and their annual income.

H.6 There is no association between mango growers managerial ability about scientific cultivation of mango orchard and their farm mechanization index.

H.7 There is no association between mango growers managerial ability about scientific cultivation of mango orchard and their mango crop intensity.
H.8 There is no association between mango growers’ managerial ability about scientific cultivation of mango orchard and their irrigation potentiality.

H.9 There is no association between mango growers’ managerial ability about scientific cultivation of mango orchard and their mango yield index.

H.10 There is no association between mango growers managerial ability about scientific cultivation of mango orchard and their borrowing of total management credit.

H.11 There is no association between mango growers managerial ability about scientific cultivation of mango orchard and their level of farm wage payment.

H.12 There is no association between mango growers managerial ability about scientific cultivation of mango orchard and their experience as a mango growers.

H.13 There is no association between mango growers managerial ability about scientific cultivation of mango orchard and their social participation.

H.14 There is no association between mango growers managerial ability about scientific cultivation of mango orchard and their personality.

H.15 There is no association between mango growers managerial ability about scientific cultivation of mango orchard and their achievement motivation.
H.16 There is no association between mango growers managerial ability about scientific cultivation of mango orchard and their orientation towards competitions.

H.17 There is no association between mango growers managerial ability about scientific cultivation of mango orchard and their attitude towards modern agriculture.

H.18 There is no association between mango growers managerial ability about scientific cultivation of mango orchard and their level of aspiration.

H.19 There is no association between mango growers managerial ability about scientific cultivation of mango orchard and their risk orientation.

H.20 There is no association between mango growers managerial ability about scientific cultivation of mango orchard and their extension participation.

H.21 There is no association between mango growers managerial ability about scientific cultivation of mango orchard and their training received.

H.22 There is no association between mango growers managerial ability about scientific cultivation of mango orchard and their mass media exposure.

H.23 There is no association between mango growers managerial ability about scientific cultivation of mango orchard and their personal guidance on batter farming.
CHAPTER V

FINDINGS AND DISCUSSION

The main purpose of the present study was to develop and standardize an objective scale to measure managerial ability of mango growers. The findings are therefore, arranged with a major thrust on scale construction. The results are presented under the following sections.

5.1 Development of managerial ability scale
5.2 Relative importance of indicators of the scale
5.3 Measurement of dependent variables (managerial ability of mango growers)
5.4 Measurement of independent variables
5.5 Relational analysis between selected variables
5.6 Constraints and suggestions in adoption of scientific mango cultivation practices.

5.1 DEVELOPMENT OF MANAGERIAL ABILITY SCALE

5.1.1 Identification of the indicators:

In order to identify the basic components of managerial ability, a good number of indicators and sub – indicators pertaining to managerial ability of mango growers were collected through review of literature, correspondence with experts and discussions with extension/management specialists. A total number of 11 main indicators and 105 sub – indicators were selected tentatively as possible indicators and sub-indicators of managerial ability of mango growers.
These main indicators and sub-indicators were mailed to 100 judges, the academicians, administrator and management personnel working in various universities and institutions in India. The judges were requested to indicate whether each of the main indicator and sub indicator sent to them was relevance or not for inclusion in the scale. Simultaneously they were also requested to rank the indicators according to their relative importance in measurement of managerial ability of mango growers. The response was received from 64 judges. Final responses of 60 judges were considered by rejecting four judges’ responses due to incomplete response.

The responses received from the judges supported the relevance of all the ten main indicators and 82 sub-indicators out of 105 sub-indicators. Those indicators that received more than 75 per cent responses were considered as relevance for inclusion in the scale. The details on relevancy are furnished in Table 5.

5.1.2 Obtaining scale values

Based on the rank assigned by the judges to each of the selected main indicators, the scale values of all the main indicators were calculated by using the Normalised Rank Approach as suggested by Guilford (1954). A complete scale comprising of 10 main indicators along with their percent relevancy is given in Table 5.
Table 5: Relevancy of main indicators of the scale

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Item</th>
<th>Relevant Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Knowledge of scientific cultivation</td>
<td>60</td>
<td>100.00</td>
</tr>
<tr>
<td>2</td>
<td>Planning</td>
<td>60</td>
<td>100.00</td>
</tr>
<tr>
<td>3</td>
<td>Organizing the activities</td>
<td>53</td>
<td>88.33</td>
</tr>
<tr>
<td>4</td>
<td>Supervising</td>
<td>54</td>
<td>90.00</td>
</tr>
<tr>
<td>5</td>
<td>Budgeting</td>
<td>56</td>
<td>93.33</td>
</tr>
<tr>
<td>6</td>
<td>Coordinating the activities</td>
<td>52</td>
<td>86.67</td>
</tr>
<tr>
<td>7</td>
<td>Communication</td>
<td>49</td>
<td>81.67</td>
</tr>
<tr>
<td>8</td>
<td>Controlling the activities</td>
<td>50</td>
<td>83.33</td>
</tr>
<tr>
<td>9</td>
<td>Decision making</td>
<td>58</td>
<td>96.67</td>
</tr>
<tr>
<td>10</td>
<td>Human relationship</td>
<td>48</td>
<td>80.00</td>
</tr>
</tbody>
</table>

5.1.3 Validity of the scale

In the present investigation, the validity of the scale was determined by two types of validity tests viz,

5.1.3.1 Content validity:

The content validity was worked out by two ways. Firstly, the indicators selected for inclusion in the scale were based on extensive and exhaustive literature and secondly, the opinions of panel of 60 judges were obtained to know whether the indicators were relevant for inclusion in the scale. More than 75 per cent judges endorsed proposed indicators as relevant, indicating the scale was valid.

5.1.3.2 Criterion validity

It was established by correlating the managerial ability scores obtained from 20 non-sampled respondents with their respective experience as a mango grower. The coefficient of correlation (0.376) between the two variables was found to be significant at 0.01 level of significance indicated that the scale was valid.
5.1.4 Reliability of the scale

The split-half method was used to achieve the reliability of the scale. The scale was administered to 20 non-sampled farmers. The coefficient of correlation was used for the two sets of score. The reliability coefficient of correlation obtained (0.685) was significant at 0.01 level of significance indicated that the scale was reliable.

It can be inferred from the above findings that all the ten indicators and 82 sub-indicators were found relevant for inclusion in the scale. The results of the content and criterion validity tests were indicated that the developed scale was valid. The split-half reliability coefficient stated that the developed scale was reliable.

5.2 RELATIVE IMPORTANCE OF INDICATORS OF THE SCALE

In order to know the relative importance of different main indicators of managerial ability scale, the scale value of each main indicator were compared with the mean score assigned by the respondents. Two methods were adopted for ascertaining the correlation. Firstly between the two sets of score by applying Pearson’s product moment coefficient of correlation and secondly, between the ranks of the two sets of the score by applying Spearman’s rank correlation. The data are presented in Table 6.

The value of the Pearson’s product moment Correlation Coefficient (0.731) and Spearman’s rank correlation coefficient (0.795) were significant at 0.01 level of significance, indicating
positive and significant correlation between the two observations. Thus, it can be inferred that all the indicators were important and hence, none of the main indicators was eliminated. However, their importance was varied as the scale value of each main indicator was different.

Table 6: Scale value of different indicators of the managerial ability scale. 

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Indicator</th>
<th>Scale value</th>
<th>Rank</th>
<th>Means score</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Knowledge of scientific cultivation</td>
<td>8.70</td>
<td>I</td>
<td>82.84</td>
<td>I</td>
</tr>
<tr>
<td>2</td>
<td>Planning</td>
<td>8.35</td>
<td>II</td>
<td>74.75</td>
<td>IX</td>
</tr>
<tr>
<td>3</td>
<td>Organizing the activities</td>
<td>3.75</td>
<td>VI</td>
<td>78.21</td>
<td>VII</td>
</tr>
<tr>
<td>4</td>
<td>Supervising</td>
<td>5.84</td>
<td>V</td>
<td>78.74</td>
<td>V</td>
</tr>
<tr>
<td>5</td>
<td>Budgeting</td>
<td>6.19</td>
<td>IV</td>
<td>76.57</td>
<td>VIII</td>
</tr>
<tr>
<td>6</td>
<td>Co-ordinating the activities</td>
<td>3.24</td>
<td>VII</td>
<td>80.01</td>
<td>III</td>
</tr>
<tr>
<td>7</td>
<td>Communication</td>
<td>0.53</td>
<td>X</td>
<td>78.28</td>
<td>VI</td>
</tr>
<tr>
<td>8</td>
<td>Controlling the activities</td>
<td>3.52</td>
<td>VIII</td>
<td>78.89</td>
<td>IV</td>
</tr>
<tr>
<td>9</td>
<td>Decision making</td>
<td>6.42</td>
<td>III</td>
<td>80.37</td>
<td>II</td>
</tr>
<tr>
<td>10</td>
<td>Human relationship</td>
<td>1.20</td>
<td>IX</td>
<td>72.38</td>
<td>X</td>
</tr>
</tbody>
</table>

It can be observed from Table 6 that the highest scale value was obtained by knowledge of scientific cultivation followed by planning, decision-making and budgeting. The indicators viz. supervising, organizing the activities, coordinating the activities, controlling the activities, human relationship and communication were next in their scale values in descending order.

It can be concluded that the first rank was assigned by the judges to knowledge of scientific cultivation indicator followed by planning, decision making, budgeting and supervising. For the proper management of any mango orchard, adequate knowledge regarding scientific cultivation of mango practices is the prime
requirement. Knowledge about current technology is essential to maximize return from an enterprise. It is a saying that, education is the panacea for the life and knowledge is the determinant factor for the education. Planning helps the farmer in proper allocation of resources and better organization of the farm activities. It enables the farmers to achieve the desired goals. Rationality in decision making helps the farmer to clearly set up the goals in farming. Budgeting involves the allotment of the fund to the various activities and credit is an important input for production, which helps in obtaining full benefits of the technology. These may be the reasons for giving the higher ranking to these indicators by the judges.

Organizing and coordinating were given sixth and seventh rank respectively. Organizing is a process of identifying and grouping the work to be performed. Co-ordination is essential to get the production inputs timely and in adequate quantities. Mango growers used these tools for wise counseling, monitoring, evaluation and promoting teamwork.

The indicators viz; controlling, human relationship and communication were next important ones in descending order. Better communication obtains current and profitable information about modern farm technology keeps the farmer up to date about scientific cultivation. The ability to communicate effectively with other is a management skill. It helps the farmers to receive and disseminate profitable information relating to farm enterprise. Communication skill also enables the farmer to keep good contact with the agricultural support system. Communicating includes an effective and proper selection of ways and means of communication for achieving effective
management ability. At the same time human relationship used for discharging their duties with a consideration of labour morale, treat them as social beings, which positively influence on management ability.

5.3 MEASUREMENT OFDEPENDENT VARIABLE
(MANAGERIAL ABILITY OF MANGO ORCHARD GROWERS)

In order to measure the managerial ability of mango growers about scientific cultivation of mango orchard, the scale that constructed was applied to each mango growers. The complete response was received from each mango grower and the managerial ability index calculated. The final managerial ability index was determined by averaging the index from the respective mango growers. The classification of respondents based on their managerial ability index is presented in Table 7 and diagrammatically in fig 3.

Table 7 : Distribution of respondents by managerial ability

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low MA (below 46.94)</td>
<td>42</td>
<td>21.50</td>
</tr>
<tr>
<td>2</td>
<td>Medium MA (46.94 to 70.12)</td>
<td>120</td>
<td>60.00</td>
</tr>
<tr>
<td>3</td>
<td>High MA (above 70.12)</td>
<td>37</td>
<td>18.50</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

Mean = 58.53  S.D. = 11.58  C.V. = 19.79

It can be seen from the Table 7 and fig 3 that majority of respondents (60.00 per cent) were observed in the medium managerial ability category, while 21.50 per cent respondents fall under the category of low managerial ability. The remaining 18.50 per cent respondents possessed high managerial ability.
Thus, the managerial ability of the respondents was predominantly medium.

It can be concluded from the above finding that the managerial ability of mango growers about scientific cultivation of mango orchard was medium.

This may be due to the medium education level, less training received on management aspects and having medium level of farm inputs with majority of the mango growers. Further, more than two-thirds respondents had medium level of attitude towards modern agriculture resulting into medium level of managerial ability.

The finding was in the conformity with the finding of that Patel and Patel (2000).
FIG 3: DISTRIBUTION OF RESPONDENTS ACCORDING TO THEIR MANAGERIAL ABILITY
5.4 MEASUREMENT OF INDEPENDENT VARIABLES

The managerial ability of the mango growers are mainly influenced as well as governed by the different characteristics of the mango growers. For the sake of easy discussion of the results all the independent variables were grouped as personal, operational management, strategic management and extension communication variable. It was beyond the scope of the present study to include all the characteristics of the mango growers. The results on such characteristics are given below:

5.4.1 Personal Characteristics:

5.4.1.1 Age

The data presented in Table 8 indicated that 41.00 per cent of the respondents were in the middle - age group, while 35.00 per cent were in the old-age group. The remaining 24.00 per cent respondents were from the young – age group.

Table  8 : Distribution of respondents by age  

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Young ( up to 35 years )</td>
<td>48</td>
<td>24.00</td>
</tr>
<tr>
<td>2</td>
<td>Middle ( 36 to 45 years )</td>
<td>82</td>
<td>41.00</td>
</tr>
<tr>
<td>3</td>
<td>Old ( above 45 years )</td>
<td>70</td>
<td>35.00</td>
</tr>
</tbody>
</table>

It can be concluded from the above results that more than two third (76.00 per cent) of the respondents were in middle and old age group.

This might be due to the fact that generally in the rural social system the head of the families who in the majority of the
cases are either middle aged or old aged and take decision for their farming. In addition to this the orchard growers had adopted the diversification of profession and their spouse had started their business at some other place.

This finding was in conformity with the findings of Chavda (1981), Patel (1990), Gorfad (1993) and Chothani (1999).

5.4.1.2 Education

The Table 9 reveals that 39.00 per cent of the mango orchard growers were educated up to primary level, whereas 29.50 per cent of them were educated up to secondary school level, 16.50 per cent were illiterate and 15.00 per cent were educated up to higher secondary and college level.

Table 9: Distribution of respondents by education

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Illiterate (Unable to read or write)</td>
<td>33</td>
<td>16.50</td>
</tr>
<tr>
<td>2</td>
<td>Primary level of education (up to 7th std)</td>
<td>78</td>
<td>39.00</td>
</tr>
<tr>
<td>3</td>
<td>Secondary level of education (5th to 20th std)</td>
<td>59</td>
<td>29.50</td>
</tr>
<tr>
<td>4</td>
<td>Higher level of education (above 10th std)</td>
<td>30</td>
<td>15.00</td>
</tr>
</tbody>
</table>

It can be summarized that above one third (39.00 per cent) of the mango orchard growers were educated up to primary level.

The probable reason for this finding might be that 65.00 per cent of the mango orchard growers were from young and middle age group; they might be benefited with the existing educational facilities prevailing in the area. Hence, majority of the mango orchard growers were educated up to primary level followed by secondary level of education.
Similar findings were reported by Chavda (1981), Satrola (1991) and Chothani (1999)

5.4.2 Operational management

5.4.2.1 Adoption index

For the measurement of adoption, the data were collected and analyzed in two parts (i) practicewise adoption (ii) overall adoption

5.4.2.1.1 Practicewise adoption

To ascertain the practicewise adoption of scientific mango cultivation practices by the mango growers the scientific practices were grouped under 10 major practices (as given in the methodology) and practicewise scores were assigned, making a total of 100 score. On the basis of the practicewise scores obtained by the respondents in adopting a particular practice, the frequency and percentage were worked out for all the practices and on the basis of percentage rank was assigned to each practice. The results are presented in Table 10 and fig 4.

The perusal of data in Table 10 showed that the mango cultivation practice viz; variety (rank first), planting distance (rank second), organic manure (rank third), tillage (rank fourth), and irrigation (rank fifth) were adopted high percent. At the same time with respect to chemical fertilizer (rank sixth), intercropping (rank seventh), insect / pest control (rank eighth), disease control (rank ninth), use of hormones (rank tenth) were less adopted practice by the mango orchard growers.
Table 10: Mango growers’ practicewise adoption of scientific mango cultivation practices.

( n = 200)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the practices</th>
<th>Percentage</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tillage</td>
<td>79.50</td>
<td>IV</td>
</tr>
<tr>
<td>2</td>
<td>Variety</td>
<td>96.00</td>
<td>I</td>
</tr>
<tr>
<td>3</td>
<td>Planting distance</td>
<td>91.50</td>
<td>II</td>
</tr>
<tr>
<td>4</td>
<td>Organic manure</td>
<td>80.50</td>
<td>III</td>
</tr>
<tr>
<td>5</td>
<td>Chemical fertilizer</td>
<td>72.50</td>
<td>VI</td>
</tr>
<tr>
<td>6</td>
<td>Irrigation</td>
<td>76.00</td>
<td>V</td>
</tr>
<tr>
<td>7</td>
<td>Insect/pest control</td>
<td>52.50</td>
<td>VIII</td>
</tr>
<tr>
<td>8</td>
<td>Disease control</td>
<td>40.00</td>
<td>IX</td>
</tr>
<tr>
<td>9</td>
<td>Intercropping</td>
<td>70.50</td>
<td>VII</td>
</tr>
<tr>
<td>10</td>
<td>Use of Hormones</td>
<td>33.00</td>
<td>X</td>
</tr>
</tbody>
</table>

It can be summarized that the practices viz; improved variety, planting distance and organic manure were highly adopted. The area under study is famous for ‘keshar’ mango in India and abroad, show there is no excuse of keshar mango variety. Hence, variety practice occupied first position.

The other two practices planting distance and organic manure were important to produce graded fruits; hence, it stood at second and third position respectively. It is worth to note that insect pest and disease control occupied almost last position in the adoption. The mango growers are well aware about the importance of these practices but the plant protection operations are difficult in mango orachard might be the probable reason of low adoption of the practices.
FIG 4: PRACTICEWISE ADOPTION OF MANGO GROWERS ABOUT SCIENTIFIC CULTIVATION PRACTICES
5.4.2.1.2 Overall adoption

As discussed in the methodology, the adoption quotient (AQ) developed by Chattopadhyay (1974) was used for the calculation of overall adoption. Adoption level for each mango growers was calculated on the basis of maximum score obtained by him. Mango growers were classified into three categories viz, Low adoption (mean – S.D.), Medium adoption (mean ± S.D.) and High adoption (mean + S.D.).

Table 11: Distribution of respondents by overall adoption

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low (below 39.78)</td>
<td>35</td>
<td>17.50</td>
</tr>
<tr>
<td>2</td>
<td>Medium (39.78 to 77.97)</td>
<td>116</td>
<td>58.00</td>
</tr>
<tr>
<td>3</td>
<td>High (above 77.97)</td>
<td>49</td>
<td>24.50</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

Mean = 58.90  
S.D. = 19.10

The data presented in Table 11 and fig 5 revealed that 58.00 per cent of the mango growers were medium adopters. Whereas, 17.50 per cent were low and 24.50 per cent were high adopters of the scientific mango cultivation practices.

It can be concluded that majority of the mango growers were medium adopters of the scientific mango cultivation practices.

This might be due to the fact that the mango growers had medium education, social participation, extension participation, irrigation potentiality and farm mechanization index.
FIG 5: MANGO GROWERS OVERALL ADOPTION OF SCIENTIFIC MANGO CULTIVATION PRACTICES
Moreover, the extension workers might have convinced mango orchard growers and they desired to increase the production of mango by adopting the scientific mango cultivation practices.

This finding was in agreement with the findings of those Chavda (1981), Patel (1990), Gorfad (1993) and Chothani (1999).

5.4.2.2 Size of land holding

It is quite clear from Table 12 that 43.00 per cent respondents were having 2 to 4 ha of land holding and 39.50 per cent having more than 4 ha of land holding while only 17.50 per cent of mango growers having up to 2 ha of land.

Table 12 : Distribution of respondents by size of land holding

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low ( up to 2.0 ha)</td>
<td>35</td>
<td>17.50</td>
</tr>
<tr>
<td>2</td>
<td>Medium ( 2.1 to 4 ha)</td>
<td>86</td>
<td>43.00</td>
</tr>
<tr>
<td>3</td>
<td>High ( above 4.0 ha)</td>
<td>79</td>
<td>39.50</td>
</tr>
<tr>
<td></td>
<td><strong>Mean = 5.06</strong></td>
<td></td>
<td><strong>S.D. =2.87</strong></td>
</tr>
<tr>
<td></td>
<td><strong>C.V.= 56.77</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

It can be concluded that more number of the mango orchard growers had medium size of land holding.

More than 80.00 per cent respondents were from the medium and high size of land holding category. The probable reason might be that in one taluka (Talala) the respondents having large mango orchard while in case of another taluka (Vanthali) the respondents were from the small size of land holding group. Therefore, it is the outcome of the difference.

The finding of Kansagara (1996) and Chothani (1999) were in conformity with present finding while the findings of
Chavda (1981) Patel (1990), Thakur et al. (1991) and Gorfad (1993) were differed from this finding.

5.4.2.3 Annual income

The data presented in Table 13 revealed that 41.00 per cent mango orchard growers were from the medium annual income group, while 33.50 and 25.50 per cent mango orchard growers fall under high and low annual income group respectively.

Table 13: Distribution of respondents by annual income (n = 200)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lower ( up rs.50,000 )</td>
<td>51</td>
<td>25.50</td>
</tr>
<tr>
<td>2</td>
<td>Medium ( 50,001 to 1,000,00 )</td>
<td>82</td>
<td>41.00</td>
</tr>
<tr>
<td>3</td>
<td>High ( above 1,00,000 )</td>
<td>67</td>
<td>33.50</td>
</tr>
</tbody>
</table>

Mean = 109013.10  S.D. = 75081.97  C.V. = 66.87

This might be the fact that majority (80.00 per cent) of the respondents had medium to high size of land holding. In addition to this initial investment and cost of cultivation of mango orchard is high and mango growers get more returns in terms of yield.

The finding was differed from the findings of Kanani (1998) and Chothani (1999),

5.4.2.4 Farm mechanization index

The data presented in Table 14 revealed that higher percentage of the respondents (49.00 per cent) had medium farm mechanization index. It was followed by 29.00 and 22.00 per cent of the respondent who had low and high farm
mechanization index, respectively. It can be inferred that majority of mango growers had medium farm mechanization index.

Table 14: Distribution of respondents by farm mechanization index

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low (below 13.30 score)</td>
<td>58</td>
<td>29.00</td>
</tr>
<tr>
<td>2</td>
<td>Medium (13.30 to 43.89 score)</td>
<td>98</td>
<td>49.00</td>
</tr>
<tr>
<td>3</td>
<td>High (above 43.89 score)</td>
<td>44</td>
<td>22.00</td>
</tr>
</tbody>
</table>

Mean = 28.48  S.D. = 15.35  C.V. = 53.91

The modern farm implements make the different agriculture operation easy in mango orchard which overcome the routine operation might be the reason for medium to high farm mechanization index.

The findings of Khodifad (1993) and Jadav (2001) were in conformity with present finding.

5.4.2.5 Mango crop intensity

The data presented in Table 15 clearly indicate that 55.50 per cent of the mango growers had medium mango crop intensity; whereas 26.50 per cent and 18.00 per cent had low and high mango crop intensity respectively.

Table 15: Distribution of respondents by mango crop intensity

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low (below 63.01 score)</td>
<td>53</td>
<td>26.50</td>
</tr>
<tr>
<td>2</td>
<td>Medium (63.01 to 98.98 score)</td>
<td>111</td>
<td>55.50</td>
</tr>
<tr>
<td>3</td>
<td>High (above 98.98 score)</td>
<td>36</td>
<td>18.00</td>
</tr>
</tbody>
</table>

Mean = 80.92  S.D. = 18.88  C.V. = 23.33
It can be summarized that most of the respondents had medium mango crop intensity. This might be due to the fact that one of the selected taluka viz; Talala is having mango dense monocropping pattern since their ancestors.

This finding was in conformity with the finding of Chothani (1999).

5.4.2.6 Irrigation potentiality

The data pertaining to the irrigation potentiality are given in Table 16 revealed that (67.00 per cent) respondents possessed medium irrigation facility, whereas 16.00 per cent had low irrigation potentiality and 17.00 per cent had high irrigation potentiality.

It is inferred that more than half of the mango growers had medium irrigation potentiality.

Table 16 : Distribution of respondents by irrigation potentiality

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low (below 56.98 score)</td>
<td>32</td>
<td>16.00</td>
</tr>
<tr>
<td>2</td>
<td>Medium (56.98 to 90.14 score)</td>
<td>134</td>
<td>67.00</td>
</tr>
<tr>
<td>3</td>
<td>High (above 90.14 score)</td>
<td>34</td>
<td>17.00</td>
</tr>
</tbody>
</table>

Mean = 73.56  S.D. = 16.58  C.V.= 22.54

Majority of the mango growers possessed medium to large size of farm holding and might have medium irrigation potentiality proportionate to their farm.

Similar findings were reported by Gorfad (1993) and Dangar (1996).
5.4.2.7 Mango yield index

The data presented in Table 17 clearly indicates that 59.00 per cent of the mango growers had medium mango yield index, whereas equal number (20.50 per cent) of respondents had low and high mango yield index.

Table 17: Distribution of respondents by mango yield index (n = 200)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low (below 84.82 score)</td>
<td>41</td>
<td>20.50</td>
</tr>
<tr>
<td>2</td>
<td>Medium (84.82 to 115.38 score)</td>
<td>118</td>
<td>59.00</td>
</tr>
<tr>
<td>3</td>
<td>High (above 115.38 score)</td>
<td>41</td>
<td>20.50</td>
</tr>
</tbody>
</table>

Mean = 100.32  S.D. = 15.28  C.V. = 15.22

It can be concluded that majority of the mango growers had medium mango yield index.

The adoption of planting distance practice (91.50 per cent) which helped mango growers to increase and maintain number of mango tree per acre, might be the reason for high mango yield index.

Similar findings were reported by Gorfad (1993) and Chothani (1999).

5.4.2.8 Borrowing of total credit

It is apparent from the Table 18 that about 75.50 per cent of mango orchard growers were found to have medium borrowing of total management credit followed by 14.00 and 10.50 per cent respondents had high and low borrowing of total management credit, respectively.
Table 18: Distribution of respondents by borrowing of total management credit

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low (below 0.14 score)</td>
<td>21</td>
<td>10.50</td>
</tr>
<tr>
<td>2</td>
<td>Medium (0.14 to 0.34 score)</td>
<td>151</td>
<td>75.50</td>
</tr>
<tr>
<td>3</td>
<td>High (above 0.34 score)</td>
<td>28</td>
<td>14.00</td>
</tr>
</tbody>
</table>

Mean = 0.24  S.D. = 0.10  C.V. = 41.57

It can be concluded that more than two third of the mango orchard growers had borrowed total management credit from the different source.

In fact, 82.50 per cent mango orchard growers had medium and large size of land holding and 74.00 mango orchard growers had medium and high annual income. Thus, mango orchard growers have to borrow credits for managing critical financial crisis from their relative, friends and cooperative bank.

5.4.2.9 Level of farm wage payment

The data presented in Table 19 revealed that 64.50 per cent of the mango orchard growers had medium level of farm wage payment whereas 17.50 mango orchard growers had low and 18.00 mango orchard growers had high level of farm wage payment.

Table 19: Distribution of respondents by level of farm wage payment

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low (below 4669.48 score)</td>
<td>35</td>
<td>17.50</td>
</tr>
<tr>
<td>2</td>
<td>Medium (4669.48 to 5779 score)</td>
<td>129</td>
<td>64.50</td>
</tr>
<tr>
<td>3</td>
<td>High (above 5779 score)</td>
<td>36</td>
<td>18.00</td>
</tr>
</tbody>
</table>

Mean = 5224.48  S.D. = 554.99  C.V. = 10.62
It can be inferred that majority of the mango growers were from the medium level of farm wage payment group.

Generally, medium and large size of land holding require more labour particularly at the harvesting period. Harvesting is the pick period of mango ripening which require time bound transportation, grading etc. for getting remunerative price in market. Some times natural hazard force them to pay high wages.

5.4.3 Strategic management

5.4.3.1 Experience as a mango growers

It is cleared from the Table 20 that more than one half (56.00 per cent) of the mango orchard growers had medium experience as a mango growers, where as 27.00 per cent and 17.00 per cent of them had low and high experience as a mango grower respectively.

Table 20 : Distribution of respondents by experience as a mango growers

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low (below 6.45 score)</td>
<td>54</td>
<td>27.00</td>
</tr>
<tr>
<td>2</td>
<td>Medium (6.45 to 13.20 score)</td>
<td>112</td>
<td>56.00</td>
</tr>
<tr>
<td>3</td>
<td>High (above 13.20)</td>
<td>34</td>
<td>17.00</td>
</tr>
</tbody>
</table>

Mean = 9.89     S.D. = 3.37     C.V. = 34.28

It can be concluded that majority of the mango orchard growers had a medium experience as a mango growers. This might be due to the fact that 76.00 per cent mango grower were medium and old age group.

This finding was in agreement with the finding of Bora (1986).
5.4.3.2 Social participation

The data presented in Table 21 revealed that more than one half (56.50 per cent) of the respondents had medium social participation followed by low (23.50 per cent) and high (20.00 per cent) social participation.

Table 21: Distribution of respondents by social participation

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low (below 2.02 score)</td>
<td>47</td>
<td>23.50</td>
</tr>
<tr>
<td>2</td>
<td>Medium (2.02 to 9.07 score)</td>
<td>113</td>
<td>56.50</td>
</tr>
<tr>
<td>3</td>
<td>High (above 9.07)</td>
<td>40</td>
<td>20.00</td>
</tr>
</tbody>
</table>

Mean = 5.96  S.D. = 2.84  C.V. = 47.63

It can be summarized that majority of the mango orchard growers had medium social participation.

The mango orchard growers were the members of the village co-operative society and milk producers’ co-operative society irrespective of their farm size. The mango growers might be aware about the participation in social and co-operative organization.

The similar findings were observed by Chavda (1981), Gorfad (1993) and Chothani (1999).

5.4.3.3 Personality

The data in Table 22 indicate that more than one half (55.50 per cent) of the respondents exhibited extrovert personality, whereas, 44.50 per cent respondents exhibited introvert personality.

It can be inferred that majority of the mango growers were from extrovert personality group.
Table 22: Distribution of respondents by personality

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introvert (Up to 16.04 score)</td>
<td>89</td>
<td>44.50</td>
</tr>
<tr>
<td>2</td>
<td>Extrovert (above 16.04 score)</td>
<td>111</td>
<td>55.50</td>
</tr>
<tr>
<td></td>
<td>Mean = 16.04 S.D. = 1.95</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.4.3.4 Achievement motivation

So far as achievement motivation is concerned, the Table 23 reveals that nearly 68.00 per cent respondents had medium level of achievement motivation followed by high (17.50 per cent) and low level (14.50 per cent) of achievement motivation.

Table 23: Distribution of respondents by achievement motivation

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low (below 18.93 score)</td>
<td>29</td>
<td>14.50</td>
</tr>
<tr>
<td>2</td>
<td>Medium (18.93 to 23.38 score)</td>
<td>136</td>
<td>68.00</td>
</tr>
<tr>
<td>3</td>
<td>High (above 23.38 score)</td>
<td>35</td>
<td>17.50</td>
</tr>
<tr>
<td></td>
<td>Mean = 21.16 S.D. = 2.22</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From the above data, it can be concluded that majority respondents were having medium achievement motivation.

The ignorance of cultivators regarding the competition of mango crop, recognition, awards, prizes etc. for outstanding work for mango crop cultivation might be the probable reason for same.

The findings of Thakor (1993) and Vyas (1995) were in conformity with this finding.
5.4.3.5 Orientation towards competition

It can be seen from Table 24 that majority (65.00 per cent) of the mango orchard growers had medium level of orientation towards the competitions followed by low (15.00 per cent) and high (20.00 per cent) level of orientation towards the competitions.

Table 24: Distribution of respondents by orientation towards the competitions

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low (below 15.14 score)</td>
<td>30</td>
<td>15.00</td>
</tr>
<tr>
<td>2</td>
<td>Medium (15.14 to 23.45 score)</td>
<td>130</td>
<td>65.00</td>
</tr>
<tr>
<td>3</td>
<td>High (above 23.45 score)</td>
<td>40</td>
<td>20.00</td>
</tr>
</tbody>
</table>

Mean = 19.27   S.D. = 4.17   C.V. = 21.66

It can be inferred that majority of the respondents had medium level of orientation towards the competitions.

This might be because of lack of concerted efforts regarding the recognition of orchard growers for their excellence in farming, which led the above said results.

This finding was in conformity with the finding of Vyas (1995).

5.4.3.6 Attitude towards modern agriculture

With regard to attitude towards the modern agriculture, the data are presented in Table 25 reveal that little less than two-thirds (64.00 per cent) of the respondents had favourable attitude towards the modern agriculture. The 17.50 and 18.50 per cent respondents observed the less favourable and highly favourable attitude towards modern agriculture respectively.
Table 25: Distribution of respondents by attitude towards the modern agriculture (n = 200)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Less favourable (below 9.98 score)</td>
<td>35</td>
<td>17.50</td>
</tr>
<tr>
<td>2</td>
<td>Favourable (9.98 to 28.12 score)</td>
<td>128</td>
<td>64.00</td>
</tr>
<tr>
<td>3</td>
<td>Highly favourable (above 28.12 score)</td>
<td>37</td>
<td>18.50</td>
</tr>
</tbody>
</table>

Mean = 19.27  S.D. = 4.17  C.V. = 21.6

It can be concluded from the above information that about two-thirds respondents had possessed favourable attitude towards modern agriculture.

This might be due to the reason that most of the respondents possess medium education, experience as a mango grower and medium mass media exposure and extrovert personality which encourage them to expose with different categories of people and media which shape favorable to high favorable attitude towards modern agriculture.

5.4.3.7 Level of aspiration

It is apparent from the Table 26 that 75.00 per cent mango orchard growers had medium level of aspiration followed by 15.00 per cent of mango grower had low and only 10.00 per cent of the mango orchard growers had a high level of aspiration.

Table 26: Distribution of respondents by level of aspiration (n = 200)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low (below 15.26 score)</td>
<td>30</td>
<td>15.00</td>
</tr>
<tr>
<td>2</td>
<td>Medium (15.26 to 33.22 score)</td>
<td>150</td>
<td>75.00</td>
</tr>
<tr>
<td>3</td>
<td>High (above 33.22 score)</td>
<td>20</td>
<td>10.00</td>
</tr>
</tbody>
</table>

Mean = 24.29  S.D. = 8.94  C.V. = 36.81
It can be summarized that two third of the respondents had medium level of aspiration.

The probable reason might be due to the facts that the orchard growing profession is carried out since generations. The orchard growers are maintaining this heritage and no such aspiration attributes might have affected for gear up the social status.

This finding was in agreement with the findings of Patel and Patel (1985) and Vyas (1995).

5.4.3.8 Risk orientation

The data presented in Table 27 indicated that more than two thirds (69.50 per cent) of the respondents were from medium risk orientation group, whereas, 16.00 and 14.50 per cent of them had low and high level of risk orientation, respectively.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low (below 13.17 score)</td>
<td>32</td>
<td>16.00</td>
</tr>
<tr>
<td>2</td>
<td>Medium (13.17 to 18.72 score)</td>
<td>139</td>
<td>69.50</td>
</tr>
<tr>
<td>3</td>
<td>High (above 18.72 score)</td>
<td>29</td>
<td>14.50</td>
</tr>
</tbody>
</table>

Mean = 15.93  S.D. = 2.81  C.V. = 17.61

It can be concluded that most of the orchard growers had to prefer medium to low risk in cultivation of mango orchard.

The probable reason may be that crop is grown where there is an assured irrigation and they had medium education, adoption index, social participation may have to developed medium risk preference ability.

This finding was in agreement with the findings of Chavada (1981), Khodifad (1993) and Kanani (1998).
5.4.4 Extension – communication

5.4.4.1 Extension participation

The data regarding extension participation are presented in Table 28 revealed that 72.50 per cent of the mango growers had medium extension participation, whereas 20.00 per cent and 7.50 per cent of them had low and high extension participation, respectively.

Table 28: Distribution of respondents by extension participation (n = 200)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low (below 4.25 score)</td>
<td>40</td>
<td>20.00</td>
</tr>
<tr>
<td>2</td>
<td>Medium (4.25 to 23.29 score)</td>
<td>145</td>
<td>72.50</td>
</tr>
<tr>
<td>3</td>
<td>High (above 23.29)</td>
<td>15</td>
<td>7.50</td>
</tr>
</tbody>
</table>

Mean = 13.78  S.D. = 9.52  C.V. = 69.08

It can be inferred that majority of the mango orchard growers had medium level of extension participation.

The probable reason for this finding might be that the frequent contacts of mango orchard growers with extension functionaries encouraged them to participate more in extension activities.

This finding was in conformity with the findings of Chothani (1999) and Patel (1996).

5.4.4.2 Training received

It is apparent from the Table 29 that 47.00 per cent mango orchard growers were less trained followed by 29.50 per cent of mango grower were untrained. The slight less than one fourth (23.50 per cent) of the mango orchard growers had more training regarding the management of mango orchard.
Table 29: Distribution of respondents by training received (n = 200)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Untrained (0 score)</td>
<td>59</td>
<td>29.50</td>
</tr>
<tr>
<td>2</td>
<td>Less trained (below 1.20 score)</td>
<td>94</td>
<td>47.00</td>
</tr>
<tr>
<td>3</td>
<td>More trained (above 1.2 score)</td>
<td>47</td>
<td>23.50</td>
</tr>
</tbody>
</table>

It can be concluded that 76.50 per cent mango orchard growers were either less trained or untrained.

This might be due to lack of awareness regarding new technological know-how and there is no any mango orchard problem oriented training course conducted by any institute.

This finding was in conformity with the finding of Chothani (1999).

5.4.4.3 Mass media exposure

From perusal of the data presented in Table 30, it is clear that 60.50 per cent of the mango orchard growers had medium level of mass media exposure, whereas 24.00 and 15.50 per cent of them had low and high level of mass media exposure, respectively.

Table 30: Distribution of respondents by mass media exposure (n = 200)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low (below 8.15 score)</td>
<td>48</td>
<td>24.00</td>
</tr>
<tr>
<td>2</td>
<td>Medium (8.15 to 14.45 score)</td>
<td>121</td>
<td>60.50</td>
</tr>
<tr>
<td>3</td>
<td>High (above 14.45 score)</td>
<td>31</td>
<td>15.50</td>
</tr>
</tbody>
</table>

Mean = 11.31  S.D. = 3.15  C.V. = 27.89
It can be concluded that majority of the respondents had medium level of mass media exposure.

This might be due to the fact that higher exposure to various sources of information facilitated them to get detailed information, experience and conviction about scientific cultivation of mango orchard. Though, the education might have played vital role as the mango grower vary in terms of their level of education led them to select an appropriate media as a source of information regarding mango orchard.

This finding was in concurrence with the findings of Bhople and Ingle (1990), Solanki et al (1991) and Kalsariya (1993).

5.4.4.4 Personal guidance on better farming

The examination of data presented in Table 31 indicate that 67.00 per cent of the respondents were in the medium level of personal guidance for better farming, while 18.50 per cent were in the low level group. The remaining 14.50 per cent respondents were found in the high level of personal guidance for better farming.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low (below 18.06 score)</td>
<td>37</td>
<td>18.50</td>
</tr>
<tr>
<td>2</td>
<td>Medium (18.06 to 31.46 score)</td>
<td>134</td>
<td>67.00</td>
</tr>
<tr>
<td>3</td>
<td>High (above 31.46)</td>
<td>29</td>
<td>14.50</td>
</tr>
</tbody>
</table>

Mean = 24.77  S.D. = 6.70  C.V. = 27.06

It can be concluded that majority of the respondents had medium level of personal guidance for better farming.
This might be due to the fact that among the personal locality and cosmopolite source of information like friends, neighbors, relative and extension personnel may not be frequently used by the cultivars. On the other hand, there may not be such organization/ institution situated of the area under study which facilitated to personal guidance to mango orchard growers.

5.4 RELATIONAL ANALYSIS BETWEEN SELECTED VARIABLES

5.5.1 Correlation analysis:

To ascertain the association between managerial ability of mango orchard growers (dependent variables) and their selected characteristics (independent variables). On the basis of operational measure developed for the variable null hypothesis were stated for testing the relationship and their significance on zero order correlation. The zero order correlation are given in Table 32.

5.5.1.1 Age and managerial ability

The data presented in Table 32 (1) were used for testing the null hypothesis (H.1), that there is no association between managerial ability of mango orchard growers and their age was tested.

The calculated correlation co-efficient value $r = -0.25699$ was found significant at 0.01 level. Thus, the null hypothesis was rejected.
Table 32: Zero order correlation coefficient of independent variables with managerial ability of mango growers.

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Independent variables</th>
<th>‘r’ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>PERSONAL</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>$X_1$ Age</td>
<td>-0.25699**</td>
</tr>
<tr>
<td>2</td>
<td>$X_2$ Education</td>
<td>0.52564**</td>
</tr>
<tr>
<td>II</td>
<td>OPERATIONAL MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>$X_3$ Adoption Index</td>
<td>0.58392**</td>
</tr>
<tr>
<td>4</td>
<td>$X_4$ Size of land holding</td>
<td>0.11279 ns</td>
</tr>
<tr>
<td>5</td>
<td>$X_5$ Annual income</td>
<td>0.15768*</td>
</tr>
<tr>
<td>6</td>
<td>$X_6$ Farm mechanization index</td>
<td>0.27693**</td>
</tr>
<tr>
<td>7</td>
<td>$X_7$ Mango crop intensity</td>
<td>0.06648 ns</td>
</tr>
<tr>
<td>8</td>
<td>$X_8$ Irrigation potentiality</td>
<td>0.04587 ns</td>
</tr>
<tr>
<td>9</td>
<td>$X_9$ Mango yield index</td>
<td>0.19406**</td>
</tr>
<tr>
<td>10</td>
<td>$X_{10}$ Borrowing of total credit</td>
<td>0.07263 ns</td>
</tr>
<tr>
<td>11</td>
<td>$X_{11}$ Level of farm wage</td>
<td>0.10268 ns</td>
</tr>
<tr>
<td>III</td>
<td>STRATEGIC MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>$X_{12}$ Experience as a mango growers</td>
<td>0.34711**</td>
</tr>
<tr>
<td>13</td>
<td>$X_{13}$ Social participation</td>
<td>0.12288 ns</td>
</tr>
<tr>
<td>14</td>
<td>$X_{14}$ Personality</td>
<td>0.06587 ns</td>
</tr>
<tr>
<td>15</td>
<td>$X_{15}$ Achievement motivation</td>
<td>-0.06154 ns</td>
</tr>
<tr>
<td>16</td>
<td>$X_{16}$ Orientation towards the competition</td>
<td>0.09234 ns</td>
</tr>
<tr>
<td>17</td>
<td>$X_{17}$ Attitude towards modern agriculture</td>
<td>0.25488**</td>
</tr>
<tr>
<td>18</td>
<td>$X_{18}$ Level of aspiration</td>
<td>0.11565 ns</td>
</tr>
<tr>
<td>19</td>
<td>$X_{19}$ Risk orientation</td>
<td>0.30592**</td>
</tr>
<tr>
<td>IV</td>
<td>EXTENSION - COMMUNICATION</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>$X_{20}$ Extension participation</td>
<td>0.04616 ns</td>
</tr>
<tr>
<td>21</td>
<td>$X_{21}$ Training received</td>
<td>0.22302**</td>
</tr>
<tr>
<td>22</td>
<td>$X_{22}$ Mass media exposure</td>
<td>0.24046**</td>
</tr>
<tr>
<td>23</td>
<td>$X_{23}$ Personal guidance on better farming</td>
<td>0.1191 ns</td>
</tr>
</tbody>
</table>

* = significance at 0.05 level (0.138)
** = Significance at 0.01 level (0.181)
ns = Non significance
It can be concluded that there was negative and significant association between managerial ability of mango orchard growers and their age.

This might have happened because young farmers having higher level of managerial ability as compare to old age farmers. Young aged farmers due to their positivism in planning, organizing activities, supervising labours, budgeting, more knowledge, coordinating and maintaining human relationship are better than the old aged farmers. Thus, the managerial ability of young aged farmer is better than old aged farmer.

Similar finding was observed by Patel and Patel (2000).

5.5.1.2 Education and managerial ability

The data in Table 32 (2) were used to test the null hypothesis (H.2) that there is no association between mango growers managerial ability about scientific cultivation of mango orchard and their education.

The calculated correlation coefficient value of $r = 0.52564$ was positive and highly significant at 0.01 level of probability. Hence, the null hypothesis was rejected.

It can be concluded from the above result that the education had positive and significant relationship with managerial ability. It means farmers having higher level of education had higher level of managerial ability.

The probable reason might be that education exposes mango growers to more communication media and source of information led them to better perception and comprehension.
Further, the education of mango orchard grower helps them to collect information and pragmatic decision making. Thus, education provides a persistent reorientation to the mango orchard growers where in they gradually subsume science and innovation changing on a better entrepreneur and ultimately reflecting on better management of the enterprise. Therefore, the findings seemed to be logical.

This finding was in conformity with the findings of Rao (1995), Sumathi (1987) and Nagarajan (1989).

5.5.1.3 Adoption index and managerial ability

The data in Table 32 (3) were used to test the null hypothesis (H.3) that there is no association between mango growers managerial ability about scientific cultivation of mango orchard and their adoption index.

The calculated correlation coefficient value of $r = 0.58392$ was positive and highly significant at 0.01 level of probability. Hence, the null hypothesis was rejected.

It is obvious that there was significant correlation existing between the level (degree) of managerial ability of mango orchard growers and their level of adoption. It implied that increase in mango orchard growers level of adoption resulted in increase of positive managerial ability about scientific cultivation of mango orchard.

This might be due to the fact that farmers with better level of adoption index are more active as compared to average farmers. This kind of behaviour motivate an individual to do something new for getting desired level of results. Indirectly we can also say
that these farmers got all those qualities leading towards better managerial ability. Hence, naturally the farmers with higher level of adoption index will have higher level of managerial ability.

5.5.1.4 Size of land holding and managerial ability

The data in Table 32 (4) were used to test the null hypothesis (H.4) that there is no association between mango growers managerial ability about scientific cultivation of mango orchard and their size of land holding.

The calculated correlation coefficient value of $r = 0.11279$ was non significant at 0.01 level of probability. Hence, the null hypothesis was accepted.

It can be inferred that the association was positive and non significant which indicated that both the variable are independent from each other.

This might be due to the fact that land holding of the mango orchardist is a major mean of their livelihood. Hence, irrespective of their land holding they tried to get more economic return.

The finding of Patel and Patel (2000) was in conformity with present findings while the findings of Colin (2000) was differed from this finding.

5.5.1.5 Annual income and managerial ability

The data in Table 32 (5) were used to test the null hypothesis (H.5) that there is no association between mango
growers managerial ability about scientific cultivation of mango orchard and their annual income.

The calculated correlation coefficient $r = 0.15768$ was found positive and significant at 0.05 level hence, the null hypothesis was rejected.

It is concluded that there is association between managerial ability of mango growers and their annual income. The positive relationship indicated that with increase in annual income the managerial ability also increased.

The probable reason might be that farmers with higher level of annual income will have more chances of exposure of communication mass media, controlling various agricultural activities; manage different activities and taking right decision leading to higher production. Thus, higher level of managerial ability was observed among those farmers who had higher level of annual income.

5.5.1.6 Farm mechanization index and managerial ability

The data in Table 32 (6) were used to test null hypothesis (H.6) that there is no association between the mango growers’ managerial ability and their farm mechanization index.

The computed correlation co-efficient value of $r = 0.27693$ was positive and significant at 0.01 level. Hence, null hypothesis was rejected.

It can be concluded that there is association between managerial ability and farm mechanization index. It can be said
that with increase in farm mechanization index the managerial ability also increased.

The probable reason for this might be that farm implements are useful to reduce drudgery lode and gear up the working capacity of mango orchard operations. Implements are useful in increasing managerial capacity of the farmers. Thus, managerial ability among those farmers was observed who had higher level of farm mechanization index. Hence, a significance result was observed between farm mechanization index and managerial ability.

5.5.1.7 Mango crop intensity and managerial ability

The data in Table 32 (7) were used to test the null hypothesis (H.7) that there is no association between the managerial ability of the respondents and their mango crop intensity.

The calculated correlation coefficient $r = 0.06648$ was found non significant at 0.05 per cent level of significance. Hence, the hypothesis was accepted.

This indicated that the managerial ability and mango crop intensity are independent from each other.

This might be due to the fact that mango crop intensity shows higher level of interest of an individual to adopt mango corps within their available land holding. It is natural that farmers with higher level of area under mango orchard will have always try to have all those qualities through which they can get maximum returns from it. However, it was not observed up to the level of significance.
5.5.1.8 Irrigation potentiality and managerial ability

The data in Table 32 (8) were used to test the null hypothesis (H.8) that there is no association between the managerial ability of the mango growers and their irrigation potentiality.

The calculated correlation coefficient $r = 0.04587$ was found non significant at 0.05 per cent level of significance. Hence, the hypothesis was accepted.

This indicated that the managerial ability and irrigation potentiality are independent from each other. It means that similar level of managerial ability was observed among farmers having irrigation facility as well as farmers without irrigation facility.

5.5.1.9 Mango yield index and managerial ability

The data presented in Table 32 (9) were used to test the null hypothesis (H.9) that there is no association between managerial ability and mango yield index was tested.

The calculated correlation coefficient value of $r = 0.19406$ was found positive and significant at 0.05 level of probability indicating the null hypothesis was rejected.

It can be inferred that the managerial ability of the respondents was positive and significantly associated with mango yield index. It showed that mango yield increased with increase in managerial ability of mango growers.
The probable reason could be that the farmers had higher mango yield index will have more annual income / ha., which led to more exposure to mass media and suitable purchasing of suitable farm inputs resulted in improving managerial ability of mango orchard.

5.5.1.10 Borrowing of total credit and managerial ability

The data in Table 32 (10) were used to test the null hypothesis (H.10) that there is no association between mango growers managerial ability about scientific cultivation of mango orchard and their borrowing of total credit.

The calculated correlation coefficient value of \( r = 0.07263 \) was non significant at 0.05 level of probability. Hence, the null hypothesis accepted.

This indicated that the managerial ability and borrowing of total credit for management are independent from each other.

Results show that there is not significant relation between borrowing of total credit and managerial ability. It means, even after taking credit farmers did not utilized it to manage their crop effectively. Thus, non significance relationship observed between borrowing of total credit and managerial ability.

5.5.1.11 Level of farm wage and managerial ability

The data in Table 32 (11) were used to test the null hypothesis (H.11) that there is no association between the managerial ability and level of farm wage was tested.

It can be inferred that the calculated value of \( r = 0.10268 \) was non significant. Hence, the null hypothesis was accepted.
This indicated that the managerial ability and level of farm wage are independent from each other.

Result shows that there was homogeneity in managerial ability among those orchard growers who hired more no. of labour and mango growers who hired less no of labours.

5.5.1.12 Experience as a mango growers and managerial ability

The data in Table 32 (12) were used to test the null hypothesis (H.12) that there is no association between mango growers managerial ability about scientific cultivation of mango orchard and their experience as a mango growers.

The calculated correlation coefficient value of $r = 0.34711$ was positive and highly significant at 0.01 level of probability. Hence, the null hypothesis was rejected.

Resulted data show that experience increases the managerial ability of mango growers. It is because of rich experience help them the take right decision regarding the budgeting, planning, organizing and controlling activities. Thus, a significance result was observed between experience as a mango grower and managerial ability.

Similar finding was reported by Bora (1986).

5.5.1.13 Social participation and managerial ability

The data furnished in Table 32 (13) Indicated that the calculated value of correlation coefficient $r = 0.12228$ was non significant at 0.05 level of probability. Hence, null hypothesis (H.13) was accepted.
It can be concluded that there was non significant association between social participation and managerial ability of mango growers.

The probable reason might be that generally, it is considered that social organization are helping farmers in various ways but all activities of social organization did not play any pivotal role in improving managerial ability of mango growers.

5.5.1.14 Personality and managerial ability

The data in Table 32 (14) were used to test the null hypothesis (H.14) that there is no association between mango growers managerial ability about scientific cultivation of mango orchard and their personality.

The calculated correlation coefficient value of $r = 0.06587$ was non significant at 0.01 level of probability. Hence, the null hypothesis accepted.

It can be inferred from the above result that managerial ability and personality are independent from each other.

5.5.1.15 Achievement motivation and managerial ability

The data in Table 32 (15) were used to test the null hypothesis (H.15) that there is no association between mango growers managerial ability about scientific cultivation of mango orchard and their achievement motivation.
The computed correlation coefficient \( r = -0.06154 \) was negative and non-significant. Hence, null hypothesis was accepted.

This indicated that the managerial ability and achievement motivation are independent from each other.

The findings of Badachikar (1985) and Rao (1995) differed with this finding.

5.5.1.16 Orientation towards competition and managerial ability

The data in Table 32 (16) were used to test the null hypothesis (H.16) that there is no association between mango growers managerial ability about scientific cultivation of mango orchard and their orientation towards the competition.

The calculated correlation coefficient value of \( r = 0.09234 \) was positive and non-significant at 0.05 level of probability. Hence, null hypothesis was accepted.

It can be concluded that the managerial ability of mango growers was positively and non-significantly associated with their orientation towards the competition.

The probable reason might be that mango orchard growers compete themselves to climb up from lower order physiological needs to self-acqualification needs. This urge to move upward earlier than others, which acts as instrument to acquire and adopt managerial components related to orchard enterprise. Thus, orientation towards competitions might have raised the managerial ability, but not rise up to the level of significance.
5.5.1.17 Attitude towards modern agriculture and managerial ability

The data in Table 32 (17) were used to test the null hypothesis (H.17) that there is no association between mango growers managerial ability about scientific cultivation of mango orchard and their attitude towards modern agriculture.

The calculated correlation coefficient value of $r = 0.25488$ was positive and significant at 0.01 level of probability. Hence, the null hypothesis was rejected.

It can be inferred that attitude towards modern agriculture had positive and significant relationship with managerial ability of mango orchard grower about scientific cultivation of mango orchard. It means, as favorable attitude towards modern agriculture the managerial ability is more.

It is because of high favorable attitude towards modern technology led them to high adoption ultimately resulted in better managerial ability.

The finding of Vyas (1995) was supported this finding.

5.5.1.18 Level of aspiration and managerial ability

The data presented in the Table 32 (18) was used to test the null hypothesis (H.18) that there is no association between managerial ability and their level of aspiration.

The calculated correlation coefficient $r = 0.11565$ was positive and non significance at 0.05 level. Hence, the null hypothesis was accepted.
This indicated that increase in level of aspiration led high managerial ability but not at the level of significant.

The probable reason might be that mango orchard growers have stated the future level of performance to be reached in the enterprise after knowing their past performance and present experience. This might have led them to acquisition of effective efficiency.

The findings of Bora (1986) and Nagarajan (1989) differed with this investigation.

5.5.1.19 Risk orientation and managerial ability

The data depicted in Table 32 (19) was used for testing the null hypothesis (H.19) that there is no association between managerial ability and their risk orientation.

The computed coefficient of correlation $r = 0.30592$ was positive and significant at 0.01 level. Hence, null hypothesis was rejected.

It can be concluded form above results that managerial ability and risk orientation was significantly correlated. The positive direction of relationship indicated that the managerial ability increased with increase in risk orientation.

This might be due to the fact that farmers with higher level of risk orientation means a person having better quality to take risk to get better economic end. Person with such kind of qualities, which always try to get all those qualities to fight against to uncertainties in mango orchard enterprise. This might have became them efficient manager.
The findings of Rao (1995), Sumathi (1987) and Nagrajan (1989) were in conformity with the present finding.

5.5.1.20 Extension participation and managerial ability

The data presented in the Table 32 (20) were used to test the null hypothesis (H.20) that there is no association between managerial ability and extension participation of the respondents.

The calculated correlation coefficient $r = 0.0416$ was non significant at 0.05 level of probability. Hence, the null hypothesis was accepted.

It can be concluded that there was no relationship exist between extension participation and managerial ability of the respondents about scientific cultivation of mango orchard.

Results show that extension participation did not play any significance role in improving managerial ability of mango growers.

5.5.1.21 Training received and managerial ability

The data presented in the Table 32 (21) was used to test the null hypothesis (H.21) that there is no association between managerial ability and their training received.

The calculated correlation coefficient $r = 0.22302$ was positive and significance at 0.01 level. Hence, the null hypothesis was rejected.
It can be concluded that training improves the managerial ability of mango orchard growers about scientific cultivation of mango orchard.

This finding was in conformity with the findings of Rao (1995) and Nagrajan (1989).

5.5.1.22 Mass media exposure and managerial ability

The data in Table 32 (22) were used to test the null hypothesis (H.22) that there is no association between managerial ability of mango orchard growers and their mass media exposure.

The calculated correlation coefficient value $r = 0.24046$ was highly significant at 0.01 level. Hence, the null hypothesis was rejected.

It can be concluded that there was positive and highly significant relationship between mango orchard growers’ managerial ability and their mass media exposure. It implies that an increase in mass media exposure was responsible for the increase in managerial ability.

This might be due to the fact that the farmers with high exposure of mass media will always have more chances to collect useful information about the scientific cultivation practices, well organise activities, timely budgeting, co-ordinating activities, controlling activities and decision making in any crops. Therefore, a significance relationship was observed between mass media exposure and managerial ability of mango orchard growers.
This findings was in conformity with the findings of Nagrajan (1989).

5.5.1.23 Personal guidance on better farming and managerial ability

The data in Table 32 (23) were used to test the null hypothesis (H.23) that there is no association between mango growers managerial ability about scientific cultivation of mango orchard and their personal guidance on better farming.

The calculated correlation coefficient value of \( r = 0.1191 \) was non significant at 0.01 level of probability. Hence, the null hypothesis was accepted.

This indicated that the managerial ability and personal guidance on better farming are independent from each other.

The probable reason might be that more intensive, personal approach coupled with timely guidance extended to the mango orchard growers after careful analysis of problems at various stage of the enterprise by the extension workers might have led to acquisition of managerial effectiveness factors by mango orchard.

Based on the above results of correlation analysis, it can be concluded that the variables viz; adoption index, age, education, annual income, experience as a mango growers, farm mechanization index, mango yield index, training received, attitude towards modern agriculture, mass media exposure and risk orientation had significant relationship with managerial ability of mango orchard growers about scientific cultivation of mango orchard which are shown in fig 6.
FIG 6: SIGNIFICATLY CORRELATED VARIABLES WITH MANAGERIAL ABILITY OF MANGO GROWERS

5.5.2 Extent of variation:
5.5.2.1 Multiple regression analysis:

Pearson’s correlation analysis merely portrays coexistence of relation between any two variables. This procedure does not capture the interaction effect among variables. One variable is associated with or is simultaneously dependent on several others. Managerial ability was postulated as a linear function of various variables. It is not influenced solely by any of these factors taken in isolation but as a part of complex and interacting system. Based on this approach, the multiple regression analysis using linear model was carried out to know the combined effect of the independent variables in explaining the total variation in the dependent variable.

In multiple regression analysis, all the 23 independent variables were fitted to explain the variation in managerial ability. The results are presented in Table 33.

All the independent variables mentioned in Table 33 explained as much as 63.70 per cent of total variation in the managerial ability. The unexplained variation was of 36.30 per cent may be due to the factors outside the scope of the study.

It can also be revealed that the ‘t’ values of six variables viz; adoption index, age, education, experience as a mango growers, mass media exposure and risk orientation were significant at 0.01 level of significance and the ‘t’ value of one variable i.e. level of aspiration was significant at 0.05 level of significance. These seven variables significantly contributed in explaining the variation in managerial ability.

Table 33 : Multiple regression analysis of managerial ability
( \( n = 200 \) )

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Variables</th>
<th>Regression coefficient (bi)</th>
<th>S.E. of bi</th>
<th>‘t’ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Age (X₁)</td>
<td>-0.2483</td>
<td>0.0665</td>
<td>-3.7338**</td>
</tr>
<tr>
<td>2</td>
<td>Education (X₂)</td>
<td>0.9760</td>
<td>0.1833</td>
<td>5.3246**</td>
</tr>
<tr>
<td>3</td>
<td>Adoption Index (X₃)</td>
<td>0.1702</td>
<td>0.0339</td>
<td>5.0206**</td>
</tr>
<tr>
<td>4</td>
<td>Size of land holding (X₄)</td>
<td>-0.3358</td>
<td>0.2951</td>
<td>-1.1379</td>
</tr>
<tr>
<td>5</td>
<td>Annual income (X₅)</td>
<td>0.00061</td>
<td>0.0019</td>
<td>0.6027</td>
</tr>
<tr>
<td>6</td>
<td>Farm mechanization index (X₆)</td>
<td>0.0841</td>
<td>0.0461</td>
<td>1.8243</td>
</tr>
<tr>
<td>7</td>
<td>Mango crop intensity (X₇)</td>
<td>0.0041</td>
<td>0.0318</td>
<td>0.1289</td>
</tr>
<tr>
<td>8</td>
<td>Irrigation potentiality (X₈)</td>
<td>0.0429</td>
<td>0.0339</td>
<td>1.2655</td>
</tr>
<tr>
<td>9</td>
<td>Mango yield index (X₉)</td>
<td>0.0033</td>
<td>0.0397</td>
<td>0.0831</td>
</tr>
<tr>
<td>10</td>
<td>Borrowing of total credit (X₁₀)</td>
<td>2.8939</td>
<td>6.3808</td>
<td>0.4535</td>
</tr>
<tr>
<td>11</td>
<td>Level of farm wage (X₁₁)</td>
<td>0.00769</td>
<td>0.1100</td>
<td>0.0700</td>
</tr>
<tr>
<td>12</td>
<td>Experience as a mango growers (X₁₂)</td>
<td>0.8233</td>
<td>0.1996</td>
<td>4.1247**</td>
</tr>
<tr>
<td>13</td>
<td>Social participation (X₁₃)</td>
<td>0.2918</td>
<td>0.2126</td>
<td>1.3725</td>
</tr>
<tr>
<td>14</td>
<td>Personality (X₁₄)</td>
<td>0.2418</td>
<td>0.2867</td>
<td>0.8434</td>
</tr>
<tr>
<td>15</td>
<td>Achievement motivation (X₁₅)</td>
<td>-0.4718</td>
<td>0.2580</td>
<td>-1.8287</td>
</tr>
<tr>
<td>16</td>
<td>Orientation towards the competition (X₁₆)</td>
<td>-0.0807</td>
<td>0.1418</td>
<td>-0.5691</td>
</tr>
<tr>
<td>17</td>
<td>Attitude towards modern agriculture (X₁₇)</td>
<td>0.0933</td>
<td>0.0716</td>
<td>1.3031</td>
</tr>
<tr>
<td>18</td>
<td>Level of aspiration (X₁₈)</td>
<td>0.1790</td>
<td>0.0714</td>
<td>2.5070*</td>
</tr>
<tr>
<td>19</td>
<td>Risk orientation (X₁₉)</td>
<td>0.6976</td>
<td>0.2435</td>
<td>2.8649**</td>
</tr>
<tr>
<td>20</td>
<td>Extension participation (X₂₀)</td>
<td>-0.0084</td>
<td>0.0613</td>
<td>-0.1370</td>
</tr>
<tr>
<td>21</td>
<td>Training received (X₂₁)</td>
<td>-0.3176</td>
<td>0.7676</td>
<td>-0.4138</td>
</tr>
<tr>
<td>22</td>
<td>Mass media exposure (X₂₂)</td>
<td>0.4864</td>
<td>0.1843</td>
<td>2.6392**</td>
</tr>
<tr>
<td>23</td>
<td>Personal guidance on better farming (X₂₃)</td>
<td>-0.0696</td>
<td>0.0935</td>
<td>-0.7444</td>
</tr>
</tbody>
</table>

* = Significance at 0.05 level (1.960)

** = Significance at 0.01 level (2.576)

\( R^2 = 0.6370 \)
FIG 7: TOTAL VARIATION ACCOUNTED IN MULTIPLE REGRESSION ANALYSIS
Remaining variables have failed to contribute significantly in managerial ability of mango growers about scientific cultivation of mango orchard.

It can be concluded that 63.70 per cent total variation in managerial ability was explained by set of 23 independent variables together. It can also be concluded that out of 23 variables, seven variables viz; adoption index, age, education, experience as a mango growers, mass media exposure, level of aspiration and risk orientation had significant contribution in managerial ability. This result provides evidence about the overwhelmingly important role of seven significant variables in achieving managerial ability, which presented in fig 7.

5.5.2.2 Stepwise multiple regression analysis:

Efroymsons (1962) stated that stepwise regression is one such method, which has been widely adopted in multiple regression analysis nowadays. It has the added advantage that at each stage of analysis, every variable is subjected to an examination for its predictive value. Based on this approach, the stepwise multiple regression analysis was carried out to know the important variables with their predictive ability in explaining the variation in the dependent variable.

In stepwise regression analysis, all the 23 independent variables were considered and the results are presented in Table 34.

It is clear from Table 34 that the seven variables viz. adoption index, age, education, experience as a mango growers, mass media exposure, level of aspiration and risk orientation put
together explained as much as 60.67 per cent of total variation in the managerial ability. The unexplained variation was 39.33 per cent may be due to factors other than above mentioned seven factors.

It can also be seen from the Table 34 that the ‘t’ values and ‘f’ values for all the above seven variables were found significant at 0.01 level of significance indicating significant contribution of these seven variables on managerial ability. The partial regression coefficients indicated that one unit change in adoption index, age, education, experience as a mango growers, mass media exposure, level of aspiration and risk orientation would change 0.1813 unit, -0.2042 units, 1.0789 units, 0.9220 units, 0.5142 units, 0.2060 units and 0.6393 units in the managerial ability, respectively.
Table 34: Stepwise multiple regression analysis of managerial ability

(\ n = 200)

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Independent variables</th>
<th>Partial regression</th>
<th>S.E. of bi</th>
<th>‘t’ value</th>
<th>‘r’ value</th>
<th>Standard partial regression</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Age (X_1)</td>
<td>-0.2042</td>
<td>0.0590</td>
<td>3.4610**</td>
<td>3.4610**</td>
<td>0.20973</td>
<td>IV</td>
</tr>
<tr>
<td>2</td>
<td>Education (X_2)</td>
<td>1.0789</td>
<td>0.1734</td>
<td>6.2220**</td>
<td>6.2220**</td>
<td>0.35525</td>
<td>I</td>
</tr>
<tr>
<td>3</td>
<td>Adoption Index (X_3)</td>
<td>0.1813</td>
<td>0.0320</td>
<td>5.6656**</td>
<td>5.6656**</td>
<td>0.29735</td>
<td>II</td>
</tr>
<tr>
<td>4</td>
<td>Experience as a mango growers (X_{12})</td>
<td>0.9220</td>
<td>0.1664</td>
<td>5.5409**</td>
<td>5.5409**</td>
<td>0.26813</td>
<td>III</td>
</tr>
<tr>
<td>5</td>
<td>Level of aspiration (X_{18})</td>
<td>0.2060</td>
<td>0.0668</td>
<td>3.0838**</td>
<td>3.0838**</td>
<td>0.15892</td>
<td>V</td>
</tr>
<tr>
<td>6</td>
<td>Risk orientation (X_{19})</td>
<td>0.6393</td>
<td>0.2085</td>
<td>3.0662**</td>
<td>3.0662**</td>
<td>0.15480</td>
<td>VI</td>
</tr>
<tr>
<td>7</td>
<td>Mass media exposure (X_{22})</td>
<td>0.5142</td>
<td>0.1710</td>
<td>3.0070**</td>
<td>3.0070**</td>
<td>0.13990</td>
<td>VII</td>
</tr>
</tbody>
</table>

CONSTANT = 18.04
\[ R^2 = 0.6067 \]

Multiple R = 0.7789

* = significant at 0.01 level significance
As a result of stepwise regression analysis, following regression model was obtained.

\[ \hat{Y} = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_{12} X_{12} + b_{18} X_{18} + b_{19} X_{19} + b_{22} X_{22} \]

Where,

- \( Y \) = Predicted dependent variable
- \( a \) = The intercept i.e. 18.04
- \( b_1 \) = Partial regression coefficient of \( Y \) on \( X_1 \) (age)
- \( b_2 \) = Partial regression coefficient of \( Y \) on \( X_2 \) (education)
- \( b_3 \) = Partial regression coefficient of \( Y \) on \( X_3 \) (adoption index)
- \( b_{12} \) = Partial regression coefficient of \( Y \) on \( X_{12} \) (experience as a mango growers)
- \( b_{18} \) = Partial regression coefficient of \( Y \) on \( X_{18} \) (level of aspiration)
- \( b_{19} \) = Partial regression coefficient of \( Y \) on \( X_{19} \) (risk orientation)
- \( b_{22} \) = Partial regression coefficient of \( Y \) on \( X_{22} \) (mass media exposure)

Therefore, the fitted equation is as under

\[ Y = (18.04) + (-0.2042) X_1 + (1.0789) X_2 + (0.1813) X_3 + \\
(0.9220) X_{12} + (0.2060) X_{18} + (0.6393) X_{19} + (0.5142) X_{22} \]
The various independent variables had their own units of measurement, which did not permit a comparison of the partial regression coefficient values. To facilitate comparison, the partial values were converted into standard partial values which were free from the units of measurements. The independent variables were then ranked based on standard partial regression coefficient values \((b_i\)\), which are presented earlier in Table 34. The order of these seven variables from highest to lowest was as (i) Education (0.35525) (ii) Adoption index (0.29735) (iii) Experience as a mango growers (0.26813) (iv) age (0.20973) (v) level of aspiration (0.15892) (vi) risk orientation (0.15480) and (vii) mass media exposure (0.13990).

The stepwise variations accounted by different independent variables are presented in Table 35 and fig 8.

It is clear from Table 35 and Fig. 8 that the variable, adoption index alone account 34.10 per cent variation in managerial ability followed by adoption index + education (46.22 per cent), adoption index + education + experience as a mango growers (53.64 per cent), above three + mass media exposure (55.66 per cent), above four + risk orientation (57.41 per cent), above five + age (58.72 per cent), above six + level of aspiration (60.67 per cent)
Table 35: Stepwise variation accounted by different independent variables in managerial ability

<table>
<thead>
<tr>
<th>Step No.</th>
<th>Variables included</th>
<th>Multiple 'R'</th>
<th>Total variation accounted ($R^2$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Adoption Index ($X_3$)</td>
<td>0.5839</td>
<td>0.3410 (34.10 %)</td>
</tr>
<tr>
<td>II</td>
<td>Education ($X_2$) + ($X_3$)</td>
<td>0.6799</td>
<td>0.4622 (46.22 %)</td>
</tr>
<tr>
<td>III</td>
<td>Experience as a mango growers ($X_{12}$) + ($X_2$) + ($X_3$)</td>
<td>0.7324</td>
<td>0.5364 (53.64 %)</td>
</tr>
<tr>
<td>IV</td>
<td>Mass media exposure ($X_{22}$) + ($X_{12}$) + ($X_2$) + ($X_3$)</td>
<td>0.7460</td>
<td>0.5566 (55.66 %)</td>
</tr>
<tr>
<td>V</td>
<td>Risk orientation ($X_{19}$) + ($X_{22}$) + ($X_{12}$) + ($X_2$) + ($X_3$)</td>
<td>0.7577</td>
<td>0.5741 (57.41 %)</td>
</tr>
<tr>
<td>VI</td>
<td>Age ($X_1$) + ($X_{19}$) + ($X_{22}$) + ($X_{12}$) + ($X_2$) + ($X_3$)</td>
<td>0.7663</td>
<td>0.5872 (58.72 %)</td>
</tr>
<tr>
<td>VII</td>
<td>Level of aspiration ($X_{18}$) + ($X_1$) + ($X_{19}$) + ($X_{22}$) + ($X_{12}$) + ($X_2$) + ($X_3$)</td>
<td>0.7789</td>
<td>0.6067 (60.67 %)</td>
</tr>
</tbody>
</table>

(n = 200)
FIG. 8: EXTENT OF VARIATION ACCOUNTED IN STEPWISE MULTIPLE REGRESSION ANALYSIS
It can be concluded from the above results of stepwise regression analysis that 60.67 per cent variation was accounted by a set of seven independent variables viz, adoption index, education, experience as a mango grower, mass media exposure, risk orientation, age and level of aspiration put together in managerial ability. Adoption index by mango orchard alone was accounted 34.10 per cent variation. The standard partial values also indicated that the education (35.52) and adoption index (29.73) were in highest order of magnitude, which reflected its importance.

5.5.3 Path analysis:

The correlation analysis reported earlier indicated relationship between dependent and independent variables in presence of all other variables which normally operate in a life situation. The relationships revealed by correlation study may undergo change in different situations where some of the independent variables may not exist or may be latent.

The correlation coefficients of eleven variables, the multiple regression coefficients of seven variables, and the stepwise multiple regression coefficients of seven variables were significant with managerial ability. The data thus indicated that the observed relationship of independent variables with dependent variable was only partially absolute and partially relative and a portion of observed relationships was the contribution made by other independent variables through which the independent variables exercise their influence jointly.

Therefore, to study the influence of the independent variables on dependent variable both directly as well as through
other variables present in the study, the path analysis was applied. Hence, all the 23 independent variables were subjected to path analysis. The path analysis results are presented in Table 36.

5.5.3.1 Direct effect

The data given in Table 36 reveal that the variable, education had exerted the highest direct positive effect on managerial ability as the path coefficient being 0.3214 followed by adoption index (0.2792), experience as a mango growers (0.2394), risk orientation (0.1689) and mass media exposure (0.1323). Remaining variables did not exhibit considerable direct effect on managerial ability of mango growers.

5.5.3.2 Total indirect effect:

The data in Table 36 indicate that education possessed highest total indirect positive effect (0.5523) on managerial ability followed by risk orientation (0.3428), experience as a mango growers (0.3349), adoption index (0.3048), farm mechanization index (0.2553), attitude towards modern agriculture (0.2335) and mass media exposure (0.2225), while age had exerted highest total indirect negative effect (-0.3168) on managerial ability followed by achievement motivation (-0.0761) and level of aspiration (-0.0226). Remaining variables did not exhibit considerable total indirect effect on managerial ability.
Table 36: Path coefficients showing the effect on managerial ability

\( n = 200 \)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Independent variables</th>
<th>Direct effect</th>
<th>Total indirect effect</th>
<th>Substantial indirect effect (First)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Age ((X_1))</td>
<td>-0.255</td>
<td>-0.3168</td>
<td>-0.1724 ((X_2))</td>
</tr>
<tr>
<td>2</td>
<td>Education ((X_2))</td>
<td>0.3214</td>
<td>0.5523</td>
<td>0.1368 ((X_1))</td>
</tr>
<tr>
<td>3</td>
<td>Adoption index ((X_3))</td>
<td>0.2792</td>
<td>0.3048</td>
<td>0.109 ((X_2))</td>
</tr>
<tr>
<td>4</td>
<td>Size of land holding ((X_4))</td>
<td>-0.0832</td>
<td>0.1218</td>
<td>0.0562 ((X_2))</td>
</tr>
<tr>
<td>5</td>
<td>Annual income ((X_5))</td>
<td>0.0395</td>
<td>0.1469</td>
<td>0.0376 ((X_2))</td>
</tr>
<tr>
<td>6</td>
<td>Farm mechanization index ((X_6))</td>
<td>0.1114</td>
<td>0.2553</td>
<td>0.0528 (X)</td>
</tr>
<tr>
<td>7</td>
<td>Mango crop intensity ((X_7))</td>
<td>0.0066</td>
<td>0.0449</td>
<td>0.0477 ((X_3))</td>
</tr>
<tr>
<td>8</td>
<td>Irrigation potentiality ((X_8))</td>
<td>0.0614</td>
<td>0.0465</td>
<td>0.0072 ((X_9))</td>
</tr>
<tr>
<td>9</td>
<td>Mango yield index ((X_9))</td>
<td>0.0043</td>
<td>0.1749</td>
<td>0.0648 (X)</td>
</tr>
<tr>
<td>10</td>
<td>Borrowing of total credit ((X_{10}))</td>
<td>0.0253</td>
<td>0.0792</td>
<td>0.0825 ((X_1))</td>
</tr>
<tr>
<td>11</td>
<td>Level of farm wage ((X_{11}))</td>
<td>0.0037</td>
<td>0.0961</td>
<td>0.0231 (X)</td>
</tr>
<tr>
<td>12</td>
<td>Experience as a mango growers ((X_{12}))</td>
<td>0.2394</td>
<td>0.3349</td>
<td>0.0597 (X)</td>
</tr>
<tr>
<td>13</td>
<td>Social participation ((X_{13}))</td>
<td>0.0715</td>
<td>0.0953</td>
<td>0.0318 ((X_9))</td>
</tr>
<tr>
<td>14</td>
<td>Personality ((X_{14}))</td>
<td>0.0407</td>
<td>0.0555</td>
<td>0.021 ((X_2))</td>
</tr>
<tr>
<td>15</td>
<td>Achievement motivation ((X_{15}))</td>
<td>-0.0906</td>
<td>-0.0761</td>
<td>-0.0234 ((X_2))</td>
</tr>
<tr>
<td>16</td>
<td>Orientation towards the competition ((X_{16}))</td>
<td>-0.0291</td>
<td>0.0857</td>
<td>0.0411 ((X_9))</td>
</tr>
<tr>
<td>17</td>
<td>Attitude towards modern agriculture ((X_{17}))</td>
<td>0.0731</td>
<td>0.2335</td>
<td>0.0722 (X)</td>
</tr>
<tr>
<td>18</td>
<td>Level of aspiration ((X_{18}))</td>
<td>0.1381</td>
<td>-0.0226</td>
<td>0.041 ((X_2))</td>
</tr>
<tr>
<td>19</td>
<td>Risk orientation ((X_{19}))</td>
<td>0.1689</td>
<td>0.3428</td>
<td>0.0779 (X)</td>
</tr>
<tr>
<td>20</td>
<td>Extension participation ((X_{20}))</td>
<td>-0.0069</td>
<td>0.0407</td>
<td>0.0161 ((X_2))</td>
</tr>
<tr>
<td>21</td>
<td>Training received ((X_{21}))</td>
<td>-0.0219</td>
<td>0.2049</td>
<td>0.0902 ((X_2))</td>
</tr>
<tr>
<td>22</td>
<td>Mass media exposure ((X_{22}))</td>
<td>0.1323</td>
<td>0.2225</td>
<td>0.0505 (X)</td>
</tr>
<tr>
<td>23</td>
<td>Personal guidance on better farming ((X_{23}))</td>
<td>-0.0403</td>
<td>0.1031</td>
<td>0.061 (X)</td>
</tr>
</tbody>
</table>

Residual = 0.3973
5.5.3.3 Substantial indirect effect (first):

Table 36 also shows that education was seen to have the highest positive first substantial indirect effect (0.1368) on managerial ability through the variable, adoption and age. The second important variable exerting first substantial positive indirect effect was adoption index (0.1090) on managerial ability through the variable, education. The third important variable exerting first substantial positive indirect effect was training received (0.0902) on managerial ability through the variable, education.

While, age was seen to have highest negative first substantial indirect effect (-0.1724) on managerial ability through the variable, education. The next important variables exerting first substantial negative indirect effect was achievement motivation (-0.0234) on managerial ability through variable, education. Remaining variables did not exhibit considerable first substantial indirect effect on managerial ability.
FIG 9: IMPORTANT VARIABLES IN PATH ANALYSIS

X_3 = Adoption Index
X_1 = Age
X_2 = Education
X_{12} = Experience as a mango growers
X_{21} = Training received
X_{15} = Achievement motivation
X_{19} = Risk orientation

FIG 9: IMPORTANT VARIABLES IN PATH ANALYSIS
It can be concluded from the above path results that the education and adoption index were the most important variables affecting directly and positively on managerial ability. In respect to total indirect effect on managerial ability, the key variables were education, adoption index and training received for positive effect, while age and achievement motivation for negative effect and these also important in respect to first substantial indirect effect through the variable education. The important variables in this regards are shown in Fig 9.

The path analysis further shows that the residual effect from the path was low in magnitude (0.3973) suggesting that the characteristics studied were sufficient to express their contribution towards managerial ability.

Based on the above discussion on relational analysis, the results lead to the conclusion that the important characteristics of mango orchard growers managerial ability in relation to scientific mango orchard cultivation were: adoption index, age, education, annual income, experience as a mango growers, farm mechanization index, training received, achievement motivation, attitude towards modern agriculture, mass media exposure, level of aspiration and risk orientation.
5.6 CONSTRAINTS AND SUGGESTIONS IN ADOPTION OF SICENTIFIC MANGO CULTIVAITON PRATICES.

5.6.1 Constraints faced in adoption of improved mango production technology by the mango orchard growers.

The constraints were kept open ended. The responses were recorded in the schedule itself. The frequency for each constraint was worked out and converted in to percentage. A rank was assigned to each constraint based on percentage. The data are given in Table 37.

It is obvious from the Table 37 majority of the mango growers expressed irregular and insufficient electric power supply (85.00 %), lack of modern spraying equipment (79.17%), lack of awareness about recommendations (75.00 %), high price of fertilizer (72.50 %), high price and ineffectiveness of fungicides (70.00%), Lack of improved agricultural implements (66.67 %), irregular rainfall (63.33%) and high price of insecticides and pesticides (61.67 %).

Other general constraints faced by the mango growers were: afraid of flower and fruit drooping due to natural calamity (60.33 %), lack of technical know how (57.50%), high price and unavailability of organic manure (55.00%), unavailability of certified graft plants (52.50 %), lack of credit facility (49.17%), Lack of assured irrigation facility through out the year (48.33 %), High labour wages (45.83%), lack of skilled labours (35.00 %), Unavailability of fertilizer in time (34.17 %), shedding effect on inter crop (29.17 %) and intercropping increase weed problem (29.17 %).
Table: Constraints faced by the mango orchard growers in adoption of improved mango production technology.

(N = 200)

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Constraints</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lack of improved agricultural implements</td>
<td>80</td>
<td>66.67</td>
<td>VI</td>
</tr>
<tr>
<td>2</td>
<td>Lack of skilled labours</td>
<td>42</td>
<td>35.00</td>
<td>XVI</td>
</tr>
<tr>
<td>3</td>
<td>High labour wages</td>
<td>55</td>
<td>45.83</td>
<td>XV</td>
</tr>
<tr>
<td>4</td>
<td>Unavailability of certified graft plants</td>
<td>63</td>
<td>52.50</td>
<td>XII</td>
</tr>
<tr>
<td>5</td>
<td>Lack of credit facility</td>
<td>59</td>
<td>49.17</td>
<td>XIII</td>
</tr>
<tr>
<td>6</td>
<td>Lack of awareness about recommendations</td>
<td>90</td>
<td>75.00</td>
<td>III</td>
</tr>
<tr>
<td>7</td>
<td>Lack of technical skill</td>
<td>58</td>
<td>48.33</td>
<td>IVX</td>
</tr>
<tr>
<td>8</td>
<td>High price and unavailability of organic manure</td>
<td>66</td>
<td>55.00</td>
<td>XI</td>
</tr>
<tr>
<td>9</td>
<td>Lack of technical know how</td>
<td>69</td>
<td>57.50</td>
<td>X</td>
</tr>
<tr>
<td>10</td>
<td>High price of fertilizers</td>
<td>87</td>
<td>72.50</td>
<td>IV</td>
</tr>
<tr>
<td>11</td>
<td>Unavailability of fertilizer in time</td>
<td>41</td>
<td>34.17</td>
<td>XVII</td>
</tr>
<tr>
<td>12</td>
<td>Irregular and insufficient electric power supply</td>
<td>102</td>
<td>85.00</td>
<td>I</td>
</tr>
<tr>
<td>13</td>
<td>Afraid of flowers and fruits drooping due to natural calamity</td>
<td>73</td>
<td>60.33</td>
<td>IX</td>
</tr>
<tr>
<td>14</td>
<td>Lack of assured irrigation through out the year</td>
<td>58</td>
<td>48.33</td>
<td>IVX</td>
</tr>
<tr>
<td>15</td>
<td>High price of insecticides and pesticides</td>
<td>74</td>
<td>61.67</td>
<td>VIII</td>
</tr>
<tr>
<td>16</td>
<td>Lack of modern spraying equipment</td>
<td>95</td>
<td>79.17</td>
<td>II</td>
</tr>
<tr>
<td>17</td>
<td>High price and ineffectiveness of fungicides</td>
<td>84</td>
<td>70.00</td>
<td>V</td>
</tr>
<tr>
<td>18</td>
<td>Shedding effect on inter crop</td>
<td>35</td>
<td>29.17</td>
<td>XVIII</td>
</tr>
<tr>
<td>19</td>
<td>Intercropping increase weed problem</td>
<td>33</td>
<td>27.50</td>
<td>IXX</td>
</tr>
<tr>
<td>20</td>
<td>Irregular rainfall</td>
<td>76</td>
<td>63.33</td>
<td>VII</td>
</tr>
</tbody>
</table>
From above discussion, it could be concluded that more number of mango orchard growers faced the constraints of irregular and insufficient electric power supply (rank first), lack of modern spraying equipment (rank second) and lack of awareness about recommendations (rank third). While least number of mango orchard growers were faced the constraints of unavailability of fertilizer in time (seventeenth rank), shading effect on intercrop (eighteenth rank) and intercopping increase weed problem (nineteenth rank).

5.6.2 Suggestions to overcome the constraints in adoption of improved mango cultivation technology.

For ascertaining the suggestions to overcome the constraints in adoption of improved mango cultivation practices, the suggestions were invited openly from the mango growers. The frequency was calculated for each suggestion and converted into percentage. The suggestions along with their percentage are presented in Table 38.

The most important suggestions offered by the mango orchard growers to overcome the constraints in adoption of recommended improved mango production technology were: regular electric power supply should be made available (84.16 %), crop insurance scheme should be introduced in mango crop (81.66 %), effective control measures of pests and diseases should be evolved (75.00 %), price of pesticides and fertilizers should be low
Table 38: Suggestions to overcome the constraints faced in adoption of improved mango production technology.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Suggestions</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Crop insurance scheme should be introduced for mango crop</td>
<td>98</td>
<td>81.66</td>
<td>II</td>
</tr>
<tr>
<td>2</td>
<td>Agricultural inputs should be subsidized</td>
<td>74</td>
<td>61.66</td>
<td>VIII</td>
</tr>
<tr>
<td>3</td>
<td>Training should be given to the fruit growers in relation to the best orchard management</td>
<td>82</td>
<td>68.33</td>
<td>VI</td>
</tr>
<tr>
<td>4</td>
<td>Cooperative society for mango should be started</td>
<td>85</td>
<td>70.83</td>
<td>V</td>
</tr>
<tr>
<td>5</td>
<td>Supply and transport facilities should be easily available</td>
<td>68</td>
<td>56.66</td>
<td>X</td>
</tr>
<tr>
<td>6</td>
<td>Extension workers should regularly contact the farmers to disseminate latest mango production technology</td>
<td>71</td>
<td>59.16</td>
<td>IX</td>
</tr>
<tr>
<td>7</td>
<td>Effective control measures of pests and diseases should be evolved</td>
<td>90</td>
<td>75.00</td>
<td>III</td>
</tr>
<tr>
<td>8</td>
<td>Regular electric power supply should be made available</td>
<td>101</td>
<td>84.16</td>
<td>I</td>
</tr>
<tr>
<td>9</td>
<td>Remunerative minimum prices should be fixed by the Government</td>
<td>77</td>
<td>64.16</td>
<td>VII</td>
</tr>
<tr>
<td>10</td>
<td>Government should provide certified mango grafts of improved variety to the farmers</td>
<td>55</td>
<td>45.83</td>
<td>XII</td>
</tr>
<tr>
<td>11</td>
<td>Required pesticides and fertilizers should be made available in time</td>
<td>48</td>
<td>40.00</td>
<td>XIII</td>
</tr>
<tr>
<td>12</td>
<td>Price of pesticides and fertilizers should be low</td>
<td>87</td>
<td>72.50</td>
<td>IV</td>
</tr>
<tr>
<td>13</td>
<td>Training must be arranged regarding post harvest management</td>
<td>62</td>
<td>51.66</td>
<td>XI</td>
</tr>
</tbody>
</table>
(72.50 %), cooperative society for mango should be constituted (70.83 %), training should be given to the fruit growers in relation to the best orchard management (68.33 %), remunerative minimum prices should be fixed by the Government (64.16 %) and agricultural inputs should be subsidized (61.66 %). The comparatively less important suggestion as expressed by mango growers were: extension workers should regularly contact the farmers to disseminate latest mango production technology (59.16 %), supply and transport facilities should be easily available (56.66 %), training regarding post harvest management should be arranged (51.66 %), government should provide certified mango grafts of improved variety to the farmers (45.83 %) and required pesticides and fertilizers should be made available in time (40.00 %).

It can be concluded that important suggestions offered by majority of the mango orchard growers were: regular electric power supply should be made available (rank first), crop insurance scheme should be introduce in mango (rank second), effective control measures of pests and diseases should be evolved (rank third). At the same time the least important suggestions offered by the more number of mango orchard growers were: required pesticides and fertilizers should be made available (rank thirteen), government should provide certified mango grafts of improved variety to the farmers (rank twelfth) and training regarding post harvest management (rank eleventh).
PERSONAL VARIABLES

\( X_1 \) Age \( \blacklozenge \) ▲ ● ■
\( X_2 \) Education \( \blacklozenge \) ▲ ● ■

OPERATIONAL MANAGEMENT VARIABLES

\( X_3 \) Adoption index \( \blacklozenge \) ▲ ● ■
\( X_5 \) Annual income \( \blacklozenge \)
\( X_6 \) Farm mechanization index \( \blacklozenge \)
\( X_9 \) Mango yield index \( \blacklozenge \)

STRATEGIC MANAGEMENT VARIABLES

\( X_{12} \) Experience as a growers \( \blacklozenge \) ▲ ● ■
\( X_{15} \) Achievement motivation ■
\( X_{17} \) Attitude towards modern agril. \( \blacklozenge \)
\( X_{18} \) Level of aspiration ▲ ●
\( X_{19} \) Risk orientation \( \blacklozenge \) ▲ ● ■

EXTENSION - COMMUNICATION VARIABLES

\( X_{15} \) Training received \( \blacklozenge \) ■
\( X_{19} \) Mass media exposure \( \blacklozenge \) ● ■
\( X_{20} \) Personal guidance on better farming ▲

LEGEND :

\( \blacklozenge \) = Significant correlationship
▲ = Significant contribution in total variation
● = Highest contribution in total variation
■ = Highest effect in path analysis

FIG 10 : THE EMPIRICAL MODEL
CHAPTER VI

SUMMARY AND CONCLUSIONS

This chapter includes in a nutshell the description of summary, conclusions, implications and suggestions for further research. This chapter has been divided into the following major heads:

6.1 Summary
6.2 Major funding and conclusions
6.3 Implications of the study
6.4 Suggestions for the further research

6.1 SUMMARY

6.1.1 Introduction:

Farmers all over the world are working as managers of their farms. Irrespective of the economic, social, cultural, physical and technological environment, the farmer manages a production system to get a return from it. Consciously or unconsciously, management is farmers’ primary concern.

Return from the farm which may be in the form of produce or money is crucial for the farmers, as they depend through which the farmer can meet the goals of the family. In highly competitive world, the challenges before the farmer are how well he can manage the farm to enhance the return on a sustained basis. To meet these challenges effectively, it is imperative to develop the managerial ability of the farmers.
Management, for the purpose of the present study, has been defined as the process by which the farmer is able to enhance maximum return from the farm on a sustained basis from available resources for the attainment of family goals.

Mango is a very important fruit crop in India. It accounts for 38 per cent of the area and 23 per cent of the output of all fruits in the country. It is generally observed that the mango orchard growers are semi educated and medium knowledgeable. Similarly, they have experience of mango growing but not of scientific management of mango orchard. Thus, neither they have higher knowledge nor they have an experience of scientific management of mango orchard, even though they carry out good production. India being the largest producer of mango fruit occupies a very prestigious position in the world. Therefore, good management of mango orchard is the most essential for the development of Indian horticulture. The cultivation of mango enterprise mainly depends on the managerial role played by the mango growers.

Moreover, the mango growers perform many functions in carrying out the better production such as: preparing a plan of work, giving clear instructions, integrating the work, taking proper decision at right time, implementing the decision etc. in carrying out the management activity in mango orchard. All the above functions involve in one or the other way many management components viz. planning, organizing, directing, controlling, human relation, leading, coordinating and decision making.
In view of these facts, it was highly considered necessary to carry out the study entitled “managerial ability of mango growers’ about scientific cultivation of mango orchard” with following specific objectives:

1) To develop and standardize managerial ability scale of mango growers about scientific cultivation of mango orchard.
2) To measure the managerial ability of the mango growers about scientific cultivation of mango orchard.
3) To study the selected characteristics of mango orchard growers.
4) To explore the relational analysis of selected variables of mango growers.
5) To study the constraints faced by mango growers in adoption of scientific cultivation of mango orchard.
6) To elicit the suggestions in overcoming the existing constraint in adoption of scientific cultivation of mango orchard.

Based on the objectives of the study and theoretical framework, the statistical hypotheses (null form: Ho) were formulated.

6.1.2 Methodology:

Mango orchard growers, of two talukas, Vanthali and Talala respondents were considered for the study. A sample of 200 respondents, representing 20 villages of two taluka of Junagadh district was drawn by using proportionate random sampling technique. In order to measure the managerial ability of mango orchard, the standardized scale developed for the purpose was used. Selected independent variables were
measured either with help of developed scales or by developing schedules and indices.

An interview schedule was prepared containing three major parts. The first part contains information regarding independent variables, second part contains detail of managerial ability scale and third part contains information of constraints faced by mango growers in adoption of scientific mango cultivation practices and suggestions to overcome the constraints. The data were collected by personal interview when mango orchardists were fully engaged in the cultivation operation. The data so collected were coded, classified, tabulated and analysed in order to make the findings meaningful. The findings of the study and conclusions are summarized as below.

6.2 MAJOR FINDINGS AND CONCLUSIONS:

6.2.1 Development of scale to measure managerial ability:

A large number of indicators and sub-indicators pertaining to managerial ability were collected through relevant literature by correspondence and discussed with management experts and specialists of extension. The indicators so collected were then sent to judges to know the relevancy of indicators as well as to obtain the rank. Those indicators that received more than 75.00 percent ‘relevant’ responses were included in the scale. The scale value of finally selected indicators and sub-indicators were worked out by using the Normalised Rank Approach as suggested by Guilford (1954). Ten main indicators and 82 sub-indicators emerged from the study, which were used for measurement of managerial ability of mango orchard growers. The indicators were; knowledge about scientific cultivation with
thirty five sub indicators, planning with eight sub-indicators, organizing with three sub-indicators, supervision with eleven sub-indicators, budgeting with three sub-indicators, co-ordination with four sub-indicators, communication with three sub-indicators, controlling with four sub-indicators, decision making with five sub-indicators and human relationship with six sub-indicators.

The content validity was determined by using review of literature and opinion of a panel of 60 judges and the criterion validity was measured by correlating managerial ability score of non-sampled respondents and their respective experience as a mango growers. The coefficient of correlation between the two variables was found to be significant. The split-half reliability coefficient of correlation obtained was significant, indicating the developed scale was reliable.

6.2.2 Relative importance of the indicators of scale:

The scale value of each indicator was compared with the mean score assigned by the respondents and then Pearson’s product moment correlation coefficient was worked out. Spearson’s product moment correlation coefficient was also worked out for their ranks. Both coefficients were found significant. Finally, it was concluded that out of eleven indicators, ten indicators were important and hence one indicator leadership was eliminated. However, their importance was varied, as the scale value of each indicator was different. The first rank was assigned to knowledge about scientific cultivation of mango orchard indicator followed by planning, decision making, budgeting and supervising. Organizing the activities and co-coordinating the activities were given sixth and
seventh rank respectively. The next important indicators in descending ordered were controlling, human relationship and communication.

6.2.3 Managerial ability of mango orchard growers

About two-thirds (60.00 per cent) of the mango orchard growers were from the medium managerial ability category, while 21.50 per cent mango orchard growers were from low and 18.50 per cent mango orchard growers were from high managerial ability category about scientific cultivation of mango orchard.

6.2.4 Characteristics of mango orchard growers

In respect of the personal characteristics, more numbers (41.00 per cent) of respondents were from the middle age group and more than two-third (68.50 per cent) respondents possessed primary and secondary level of education.

As regarding operational management characteristics, majority (58.00 per cent) of the mango growers were medium adopters, more number (43.00 per cent) of respondents having size of land holding of 2 to 4 ha, about half (49.00 per cent) of the respondents had medium farm mechanization index, more than half (55.50 per cent) of the respondents had medium mango crop intensity, more than two-third (67.00 per cent) of the respondents had medium irrigation facility, majority (41.00 per cent) of the respondents had medium annual income, majority (75.00 per cent) of the respondents had medium borrowing of total management credit and 64.50 per cent respondents were from medium level of farm wage group.

The respondents with related to the strategic management variable, majority (65.00 per cent) of the respondents had
medium experience as mango growers, more than two third (68.00 per cent) of the respondents were from medium achievement motivation group, 65.00 per cent of the respondents had medium orientation towards the competition, 64.00 per cent respondents had favourable attitude towards modern agriculture, more than 75.00 per cent respondents were from medium level of aspiration group, 69.50 per cent respondents had medium risk orientation, 56.50 per cent respondents had medium social participation and more than half (55.50 per cent) of the respondents possessed extrovert personality.

Looking to the extension communication variable, majority (64.00 per cent) of the respondents had medium exposure towards mass media, 67.50 per cent respondents were from medium personal guidance to better farming group, 72.50 per cent respondents had medium extension participation and more number 47.00 per cent respondents were less trained.

**6.2.5. Relational analysis:**

6.2.6.1 Correlation analysis:

Based on the coefficient of correlations, ten independent variables viz, adoption index, education, annual income, experience as a mango growers, farm mechanization index, mango yield index, training received, attitude towards modern agriculture, mass media exposure and risk orientation were found having significant and positive relationships with managerial ability at 0.01 level of significance. While age had significant but negative relationship with managerial ability at 0.01 level of significant.
6.2.6.2 Multiple regression analysis:

The seven variables viz, adoption index, age, education, experience as a mango growers, mass media exposure, level of aspiration and risk orientation were found significantly contributing to managerial ability. All the 23 independent variables together explained total variation in managerial ability to the extent of 63.70 per cent.

6.2.6.3 Stepwise multiple regression analysis:

On the basis of the results of stepwise multiple regression analysis, adoption index alone accounted 34.14 per cent of variation in managerial ability followed by 46.22 per cent by adoption index + education, 53.64 per cent by adoption index + education + experience as a mango growers, 55.66 per cent by adoption index + education + experience as a mango growers + mass media exposure, 57.41 per cent by adoption index + education + experience as a mango growers + mass media exposure + risk orientation, 58.72 per cent by adoption index + education + experience as a mango growers + mass media exposure + risk orientation + age, 60.67 per cent by adoption index + education + experience as a mango growers + mass media exposure + risk orientation + age + level of aspiration.

6.2.6.4. Path analysis:

The highest positive direct effect on managerial ability was exerted by education followed by adoption index. In respect to total indirect effect, the highest positive effect was exhibited by education followed by risk orientation, while the highest negative effect was exercised by age followed by achievement motivation. The first substantial positive indirect effect was found highest by
education, while negative effect was found highest by age through the variable, education. The variable, education emerged as channel for indirect effect for most of the variables.

Based on the above relational analysis, the result leads to the conclusion that the important characteristics of mango orchard growers for selection criteria in relation to managerial ability were; adoption index, education, age, annual income, farm mechanization index, mango yield index, experience as a mango growers, achievement motivation, attitude towards modern agriculture, level of aspiration, risk orientation, training received, mass media exposure and personal guidance on better farming. Therefore, due weightage should be given to the above characteristics of mango orchard growers to achieve higher managerial ability resulting in to effective management of scientific cultivation of mango orchard.

**6.2.7 Constraints and suggestion**

**6.2.7.1 Constraints in adoption of improved mango production technology.**

The important constraints faced by more than 60.00 per cent of mango growers were:

1. Irregular and insufficient electric power supply.
2. Lack of modern spraying equipment.
3. Lack of awareness about recommendations.
4. High price of fertilizer.
5. High price and ineffectiveness of fungicides.
7. Irregular rainfall.
8. High price of insecticides pesticides.
6.2.7.2 Suggestions to overcome the constraints in adoption of improved mango production technology.

Out of 13 suggestions given by the respondents to overcome the constraints in adoption of improved mango production technology the eight most important suggestions expressed by more than 60.00 per cent respondents were:

1. Regular electric power supply should be made available.
2. Crop insurance scheme should be introduce in mango crop.
3. Effective control measures of pests and diseases should be evolved.
4. Price of pesticides and fertilizers should be low.
5. Cooperative society for mango should be constituted.
6. Training should be given to the fruit growers in relation to the best orchard management.
7. Remunerative minimum prices should be fixed by the Government.
8. Agricultural inputs should be subsidized.

6.3 IMPLICATIONS OF THE STUDY:

The findings of the study lead to the following implication:

[1] Effective management is crucial for obtaining high return from a production system on a sustained basis. It is essential that the farmers and extension workers are made aware of the need for developing the managerial ability of the farmers.

[2] The developed scale may be administered to any orchard growers with due modification to measure managerial ability about scientific cultivation of orchard.
[3] To maximize overall profit of any orchard, the orchard growers should have managerial skills particularly in planning, decision-making, organizing, communicating, coordinating, directing and human relationship.

[4] The study suggested that due weightage should be given to such characteristics of the mango orchard growers viz, adoption index, education, annual income, experience as a mango growers, farm mechanization index, mango yield index, training received, attitude towards modern agriculture, mass media exposure and risk orientation to achieve higher managerial ability resulting into effective management of mango orchard.

[5] For developing managerial ability, it is essential to organize management training for the farmers. Management training may emphasise both operational and strategic management aspects. This shall help the farmers to move from traditional to modern management of their farms and enable them to cope with new demands, new problems, and new challenges in the field of horticulture.

[6] The education and adoption level of mango orchard growers emerged with highest direct effect and became main channel for indirect effect of variables in managerial ability of mango orchard growers. Hence, it is worth to train and educate the mango orchard grower by different training and extension approaches through which their knowledge regarding mango cultivation practice may updated which lead them to better management efficiency in managing their mango orchard.
The use of mango cultivation practices as per recommendation help the mango orchard grower in better management. Hence, extension functionaries should concentrate their efforts to educate and convince the mango orchard growers by imparting effective training through latest communication technology in adopting the recommended technology.

The important constraints faced by most of mango orchard growers in adoption of mango cultivation should be take in to account while ascertainig their managerial ability.

### 6.4 SUGGESTIONS FOR FURTHER RESEARCH

This study leads to the following areas for further research.

[1] The study was limited to mango grower of Talala and Vanthali taluka only but to strengthen the findings of this study, similar study may be carried out to the other area of the state.

[2] This study was limited to only mango crop. The further study may have to be taken for the orchardist of other major fruit crops of the state.

[3] Some other aspects of management of mango orchard like, marketing, budgeting and value addition etc, may be studied.

[4] Same study can be undertaken after five years of this study to know the change in managerial ability of mango orchard growers about scientific cultivation of mango orchard.
REFERENCES:


From: 
Dr. M. N. Popat 
Professor & Head 
Department of Extension Education 
College of Agriculture 
Junagadh, (Gujarat) 

Dear sir,

This is in connection with the research study undertaken by one of my Ph.D. students Mr. N. B. Jadav. He is interested in developing a scale to measure the managerial ability of mango growers about scientific cultivation of mango orchard.

Considering your vast experience in this field, you are nominated to act as one of the judges.

In part A the main components specifying the Managerial ability of mango growers. You are requested to indicate whether each of these main components are relevant or not for inclusion in the scale and then to rank the main components according to their importance.

Further, you may suggest any other components if you feel it appropriate for its inclusion in the scale.

I believe that you might be busy with your own schedule. But, I am sure that you will spare your valuable time to complete this exercise.

Lastly, I would like to request you to return duly filled in questionnaire to Shri N. B. Jadav in attached self-addressed stamped envelope at your earliest convenience preferably within week’s time.

Thanking you very much.

Encl: App I

To, 

Your sincerely

(M. N. Popat)
A SCALE TO MEASURE THE MANAGERIAL ABILITY OF MANGO GROWERS

Please indicate whether each of the main components are relevant or not for inclusion in the scale by putting tick mark (     ) against appropriate column and then to rank and give scale value of main components according to their importance in measuring Managerial ability of mango growers about scientific cultivation of mango orchard.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Main indicator</th>
<th>Relevancy</th>
<th>Rank order</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Relevant</td>
<td>Not Relevant</td>
</tr>
<tr>
<td>1.</td>
<td>Knowledge of scientific practices</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Organizing the activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Supervising</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Budgeting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Coordinating the activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Communication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Controlling the activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Decision making</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Human relationship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Leadership</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Any other</td>
<td></td>
<td></td>
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</table>
## Scale Value Main Indicator of Managerial Ability of Mango Growers

### APPENDIX – II

<table>
<thead>
<tr>
<th>Rank (ri)</th>
<th>Ri</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>Total</th>
<th>P</th>
<th>C</th>
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<td>3</td>
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<td>60</td>
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<td>18</td>
<td>10</td>
<td>8</td>
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<td>27</td>
<td>1</td>
<td>27</td>
<td>60</td>
<td>5</td>
<td>2</td>
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</table>

\[ \sum f_{ii} = 60 \times 60 \times 60 \times 60 \times 60 \times 60 \times 60 \times 60 \times 60 \times 60 = 600 \]

\[ \sum f_{iic} = 400 \times 391 \times 274 \times 327 \times 336 \times 261 \times 192 \times 268 \times 342 \times 209 = 3000 = 5Nn \]

\[ M_c = R_j = \frac{f_{iic}}{f_{ii}} \]

\[ R_c = (\text{Scale value}) = 2.357 R_j - 7.01 \]

\[ P = \frac{(R_j - 0.5) \times 100}{n} = \frac{(10 - 0.5) \times 100}{10} = 95 \]

Where,

- **A** = Knowledge of scientific practices
- **B** = Planning
- **C** = Organizing
- **D** = Supervising
- **E** = Budgeting
- **F** = Co-coordinating
- **G** = Communication
- **H** = Controlling
- **I** = Decision making
- **J** = Human relationship

\[ ri = \text{Ranks given by judges to fifteen components} \]

\[ Ri = \text{Rank values (in the reverse order of rank i.e., rank one getting ten, rank two getting nine and rank ten getting one)} \]

\[ P = \text{Centile value} \]

\[ n = \text{Number of variables ranked} \]

\[ C = \text{Values determined to each centile value (P)} \]

\[ f_{ii} = \text{Total number of judges who have ranked ten components} \]

\[ f_{iic} = \text{Ca or CE} \]

\[ MC = R_j = f_{iic}/f_{ii} \]

\[ Rc = (\text{Scale value}) = 2.357 R_j - 7.01 \]

\[ P = (R_j - 0.5) \times 100/n \]

## APPENDIX – III

### PART – I
MANAGERIAL ABILITY OF MANGO GROWERS ABOUT SCIENTIFIC CULTIVATION OF MANGO ORCHARD

(Questionnaire to be filled up by MANGO ORCHARD GROWERS)

Name: 

Village:

Taluka:

1) Age of mango growers:

2) Education:

3) How many hectares of land do you possess?
   i) Irrigated...........ha
   ii) Unirrigated.......ha
   iii) Total..............ha

4) How many hectare land under mango orchard?...........................ha

5) Experience as mango orchard growers......................year

6) Total Training received..............................no.

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Topic of training</th>
<th>Duration</th>
<th>Place</th>
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<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7) What is your annual income
   i) From mango orchard Rs.................
   ii) Other field crops Rs...................
   iii) Business income Rs...................
   iv) Employment Rs.........................
   v) Other income Rs....................... 
   vi) Total income Rs......................

8) Extension participation
   Have you participated in any of the following extension activities during the last year? Yes / no

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Activities</th>
<th>Weightage</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Conducted demonstration on my farm</td>
<td>9.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Had discussion with extension</td>
<td>6.84</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9) **Social participation**

Are you a member and / or holding any position in any organization?

Yes/no

If yes, give the details

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Organization</th>
<th>Weightage</th>
<th>Member</th>
<th>Position</th>
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<tr>
<td>1.</td>
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<td>Taluka panchayat</td>
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<tr>
<td>3.</td>
<td>District panchayat</td>
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<td>4.</td>
<td>Primary Agril. Credit society</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Milk producer co-operative society</td>
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<td></td>
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<tr>
<td>6.</td>
<td>Farmers mandal</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Yuvak mandal</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Other (specify)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10) **Adoption Index**

10.1) How many times have you followed following tillage operations?

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Tillage operations</th>
<th>Number</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Deep ploughing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Harrowing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Weeding</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10.2) Which variety of mango have you grown on your orchard? Give details.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Variety</th>
<th>Area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
10.3) What planting distance have you kept between two mango tree?......

10.4) Have you applied organic manure in mango orchard? Yes / no
   If yes, Quantity................. kg/ha
   Time of application..............

10.5) Have you applied chemical fertilizers in mango orchard? yes / no
   If yes, give details

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Name of fertilizer</th>
<th>Quantity kg / tree</th>
<th>Time of application</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Deep ploughing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Harrowing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Weeding</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10.6) Give the details about irrigation

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>No. of irrigation</th>
<th>Interval between two irrigation</th>
<th>Method of application</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Winter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Summer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Monsoon</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10.7) Have you taken control measures in your mango crop against insect / pest? Yes / no. If yes, Give the details

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Name of insect / pest</th>
<th>Name of insecticide</th>
<th>Quantity kg or lit/ha</th>
<th>Time of application</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10.8) Have you sprayed the fungicides for controlling the disease in mango orchard? Yes / No. If yes, give details

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Name of disease</th>
<th>Name of fungicides</th>
<th>Quantity kg or lit/ha</th>
<th>Time of application</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
10.9) Have you grown intercrop with your mango crop? Yes / No
If yes, give the details

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Name of the intercrop</th>
<th>Sowing time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10.10) Have you applied hormones? Yes / No. If yes, give details

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Name of hormones</th>
<th>Quantity</th>
<th>Time of application</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. Personality

Please give your response by putting a tick (✓) for the following statements relating to your personality

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Statement</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Do you like to talk before a group of people?</td>
<td>Yes (2) No (1)</td>
</tr>
<tr>
<td>2</td>
<td>Are you somewhat suspicious of other motive?</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Do you always try to make others happy?</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Do you suffer from a feeling of inferiority?</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Do you make friends easily?</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Are you feeling easily hurt?</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Are you at home among strangers?</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Do you worry over what think of you?</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Do you like to take the lead in social gathering?</td>
<td></td>
</tr>
</tbody>
</table>

Note: score for negative statements will be reversed

12. Achievement motivation

Please indicate your response for following statements related to your achievement motivation by putting a tick against each statement.

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Statements</th>
<th>A (3)</th>
<th>UD (2)</th>
<th>DA (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>One should work like a slave until he is satisfied with result</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>One should have determination and driving ambition to achieve certain things in his life</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
even if these qualities make one unpopular

3. Work should come first, even if one can’t get rest in order to achieve ones goal

4. Even when ones’ own interest is in danger he should concentrate on his job and forget his obligations to other

5. One should set difficult goals for one self and try to reach them

6. It is better to be satisfied with whatever little. One has than to be always struggling for more

7. The things are happening nowadays that one is discouraged to work hard

8. When working in groups, one should be try to be better than others in similar tasks.

A= Agree, UD= Undecided, DA= Disagree

13. Farm Mechanization Index

Do you possess the following assets?

If yes, give the details.

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Assets</th>
<th>Weightage</th>
<th>Number</th>
<th>Since (When) Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Tractor</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Oil engine / electric motor</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Thresher</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Sheller</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Sprayer / Duster</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Sprinkler / Drip irrigation sets</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Bullock cart</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Local seed drill</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Harrow</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Hoe</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Plough</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Other, if any</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
14. Risk orientation:

Following are the statements indicating the willingness to take risk. It varies with individual to individual. Kindly tick mark as against each statement in any response category to which you agree.

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Statement</th>
<th>SA</th>
<th>A</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>A farmer who is willing to take greater risk than the average farmers usually does better financially. (+ve)</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2.</td>
<td>A farmer should take more of a chance in making a big profit than to be content with a smaller, but less risky profit. (+ve)</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3.</td>
<td>A farmer should grow large number of crops to avoid greater risk involved in growing one or two crops. (-ve)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4.</td>
<td>It is good for a farmer to take risk when he knows his chance of success if fairly high. (+ve)</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>5.</td>
<td>Trying entirely a new practice in farming by a farmer involves risk but it is worthy. (+ve)</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>6.</td>
<td>It is better for a farmer not to try new farming method unless most of other farmers have used. (-ve)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

SA= strongly agree
A= Agree
D= Disagree
SD= strongly disagree

15. Mass media exposure

How frequently do you use the following mass media exposure for management of mango orchard?

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Mass media exposure</th>
<th>Regularly</th>
<th>Frequently</th>
<th>Once in a week</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Radio</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Television</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Newspaper</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Printed literature</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Agril. Exhibition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Demonstration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Any other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

16. Mango crop intensity

What are the areas under different crops during last kharif season?

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Name of the crop</th>
<th>Area</th>
</tr>
</thead>
</table>
17. **Mango yield index**
   a) What is the yield of mango on your farm during normal year............q/ha  
   b) What was the maximum yield of mango on your farm......................q/ha

18. **Level of farm wage payment**
   Total hired labour....................in one year.
   Wages of labour......................Rs.
   Total gross cropped area.............ha

19. **Borrowing of total management credit.**
   i) Total amount borrowed for management of orchard............Rs  
   ii) Total annual cash requirement for management of orchard...Rs.

20. **Attitude towards modern agriculture.**
    The scale to measure the attitude of the farmers towards modern agriculture had 8 items. Each statement was provided with 5 point response categories ranging from strongly agree to strongly disagree. Each statement were given scores for strongly agree-5, agree-4, undecided- 3, disagree-2 and strongly disagree-1. Scoring was reversed for the unfavourable statement.
The faced problems of farmers can be solved through the use of modern agricultural practices.

It is better to use aid practices then to take risk in modern agricultural practices.

It is good to use modern agricultural practices for higher crop yield.

Though the use of modern agricultural practices is good but economic situation of most of the farmers do not permit to use of it.

Use of modern agricultural practices enhances the socio-economic status of the farmers.

Modern agricultural practices are more complex and technical in nature.

Profit is more than the cost involved in the use of modern agricultural practices.

Use of modern agricultural practices, enhances the infestation of insects, pests and disease in crop.

21. Orientation towards the competition.

The scale consist 6 items. The statements with serial number (i), (ii), (iv), and (v) indicated positive orientation, while remaining statements indicated negative orientation. Each statement was provided with 4 point response categories ranging from strongly agree to strongly disagree. The favourable statements were given scores for strongly agree-4, agree-3, disagree-2 and strongly disagree-1. Scoring was reversed for the unfavourable statement.

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Statement</th>
<th>SA</th>
<th>A</th>
<th>DA</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>i)</td>
<td>The key points of success in farming should not be divulged to other farmers.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii)</td>
<td>A better yield in comparison to the neighbors brings more prestige.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii)</td>
<td>It is of no use to keep in formation as what other farmers are doing.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iv)</td>
<td>Crop competitions should be organized for all-important crops.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>v)</td>
<td>Better farming provides opportunity for recognition by the extension officers.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>vi)</td>
<td>It is not good for a farmer to become too ambitious in life</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

22. Personal guidance on better farming
The scale had 12 items. Each statement was provided with 4 point response categories ranging from strongly agree to strongly disagree. The statements were given scores for very much-4, much-3, not so much-2 and very little-1.

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Statement</th>
<th>VM</th>
<th>M</th>
<th>N so M</th>
<th>VL</th>
</tr>
</thead>
<tbody>
<tr>
<td>i)</td>
<td>The extent to which you discussed your farming problems with the extension personnel in the last two years.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii)</td>
<td>The extent to which the extension personnel visited your crop in the last two years.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii)</td>
<td>The assistance you received in testing your farm soil</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iv)</td>
<td>The help you have received in preparation of your farm plan.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>v)</td>
<td>The help you have received in determining the most suitable cropping pattern for your farm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>vi)</td>
<td>The advice you have received for proper use of fertilizer to different crops of your farm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>vii)</td>
<td>The advice you have received for efficient water use in your farm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>viii)</td>
<td>The advice you have received in using farm machinery in your farm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ix)</td>
<td>The assistance you have received in identifying the insect pests of your crop plants and prescribing control measures for them</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>x)</td>
<td>The assistance you have received in identifying the diseases of your crops plants and prescribing control measures for them</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>xi)</td>
<td>The advice you have got about proper storage of your farm produce.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>xii)</td>
<td>The advice you have received in understanding the additional cost and additional return in the use of new inputs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
23. **Level of aspiration**

The scale consists of 13 items (two statements under educational) were provided with 5-point response categories, indicating low to high levels of aspiration. 5-Point response categories from 0 to 4 were pre-tested. The range of scores was from 0 to 52.

<table>
<thead>
<tr>
<th>a) Educational Aspiration</th>
<th>No educ (0)</th>
<th>Primary (1)</th>
<th>Middle (2)</th>
<th>High school (3)</th>
<th>College or more (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>What level you expect your sons to reach in their education?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What level you expect your daughters to reach in their education?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Occupational Aspiration</td>
<td>Labour</td>
<td>Caste occupation</td>
<td>Independent</td>
<td>Improved cultivation</td>
<td>Govt. Service</td>
</tr>
<tr>
<td>What level you expect your sons to reach in their occupation?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Aspiration for land</td>
<td>None</td>
<td>Less than 25 per cent</td>
<td>25 to 50 per cent</td>
<td>50 to 75 per cent</td>
<td>More than 75 per cent</td>
</tr>
<tr>
<td>What is your aspiration in respect to increasing your land in the next three years?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Aspiration for farm produce</td>
<td>None</td>
<td>Less than 25 per cent</td>
<td>25 to 50 per cent</td>
<td>50 to 75 per cent</td>
<td>More than 75 per cent</td>
</tr>
<tr>
<td>What level you expect to increase your crop production in the next three years?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) Aspiration for purchase of Agricultural implements</td>
<td>None</td>
<td>Wheel hoe</td>
<td>Mould board/Seed drill</td>
<td>Power tiller/thresher/sprayer</td>
<td>Tractor/pump set</td>
</tr>
<tr>
<td>What is your expectation in respect to purchase of agricultural implements/machines in the next three years?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f) Aspiration for increasing livestock</td>
<td>None</td>
<td>Poultry</td>
<td>Goat/sheep</td>
<td>Cows/Bufferaloes</td>
<td>Draught cattle (Bullock)</td>
</tr>
<tr>
<td>What is your aspiration in respect to increase of farm animals in the next three years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aspiration for providing shelter for farm animals</td>
<td>None</td>
<td>Shed thatched</td>
<td>Mud walled and thatched</td>
<td>Fullmud walled and tiled</td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------------------------</td>
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<td>g)</td>
<td>What is your expectation to provide shelter for farm animals in the next three years?</td>
<td></td>
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<tr>
<td>h)</td>
<td>Aspiration for increasing Annual income</td>
<td>None</td>
<td>Less than 25 per cent</td>
<td>25 to 50 per cent</td>
<td>50 to 75 per cent</td>
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<td>What is your aspiration in respect to increasing your income in the next three years?</td>
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<tr>
<td>i)</td>
<td>Aspiration for house alteration or construction</td>
<td>None</td>
<td>Minor repairs in the existing house</td>
<td>Construction of one kachcha house</td>
<td>Construction of one pucca house</td>
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<td>What is your aspiration in respect to house alteration or construction in the next three years?</td>
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<td>j)</td>
<td>Aspiration for purchase of furniture</td>
<td>None</td>
<td>Bench/stool</td>
<td>Easy chair</td>
<td>Chair/Table</td>
</tr>
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<td></td>
<td>What is your aspiration in respect of purchase of furniture in the next three years?</td>
<td></td>
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<td>k)</td>
<td>Aspiration for material possession</td>
<td>None</td>
<td>Silk/wollen clothing</td>
<td>Radio/Transistor/Cycle</td>
<td>Brass/Stainless steel vessels</td>
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<td>What is your expectation to have more material possession in the next three years?</td>
<td></td>
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<tr>
<td>l)</td>
<td>Aspiration for general contentment in life</td>
<td>None</td>
<td>Some what better</td>
<td>Better</td>
<td>Mostly better</td>
</tr>
<tr>
<td></td>
<td>What level you expect your general contentment (satisfaction) to reach in the next three years?</td>
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</table>
PART – II

MANAGERIAL ABILITY SCALE

1. Knowledge of scientific practices

A number of ‘statements’ pertaining to various aspects of scientific cultivation of mango enterprise are given below. Please tell whether do you know it or do not know? But items are not scored but used to confirm the answer given by the respondents. (Yes=1, True=1, while No=0, False=0)

[Maximum score = 35] and [Scale value = 8.7].

1) When organic manure is mixed with soil and filled in the pit? (Before monsoon, winter, after monsoon)

2) How much planting distance is kept for medium spreading mango variety in less fertile soil? (10 X 10 m, 12 X 12 m, 15 X 15 m)

3) If there is no rain after sowing of mango, what is the recommendation for irrigation? (Immediately, after week, after fortnight)

4) What is the recommendation for keeping graft union above the ground level? (15 to 20, 21 to 25, 26 to 30 cm)

5) How many intercultural operations are recommended in mango orchard in one year? (3, 4, 5)

6) When newly planted graft plants should be irrigated in winter and summer? (Winter 7 to 10, 10 to 13, 13 to 17; summer 4 to 7, 7 to 9, 9 to 12)

7) In which type of atmosphere fruits should not be harvested? (Hot, cool, medium)

8) Green manuring improves physical condition and soil fertility of mango orchard. (Yes / no)

9) Pre-monsoon ploughing reduces soil erosion and maximizes water percolation. (Yes / no)

10) During which stage the fruit dropping causes maximum reduction in mango production? (Sorghum sized fruits, pepper sized fruits, Areca nut sized fruits)

11) Which variety of mango is recommended for the Saurashtra region?
12) Which type of graft of mango is recommended for the Gujarat state? (Inarching, Nutan grafting)

13) What should be the size of pit for mango planting? (60 X 60 X 60, 50 X 50 X 50, 70 X 70 X 70)

14) Which pest cause severe attack at the time of sprouting? (mealy bug, mango malformation, fruit fly)

15) When soil should be ploughed to control mealy bug? (Nov-dec, Jan-Feb, March-April)

16) To get maximum production in the next year, in which month the manure and fertilizer should be applied? (June, July, August)

17) What is the recommended irrigation interval for fruiting mango tree? (20 to 25, 25 to 30, 30 to 35)

18) How many irrigations should be given to fruiting mango tree in one month? (4, 6, 8)

19) For how many years intercropping is possible in new orchard? (4 to 5, 5 to 6, 6 to 7)

20) Which point should be taken into consideration while intercropping? ...........................................

21) In which month mango hopper attack in mango orchard? (Oct to May, May to June, June to July)

22) Flowers of mango are wrinkled and dropped due to attack of mango hopper. (True / false)

23) Which pesticide should be recommended to control mango hopper? (carbaryl, endosulfan, monocrotophos)

24) For controlling which pest, the affected, dropped and spoiled fruits are collected and buried into soil. (Fruit fly, mealy bug, mango hopper)

25) Which pest caused fruit dropping? (Fruit fly, mealy bug, mango hopper)

26) Which pest caused drying of stem? (Mango stem borer, mealy bug, fruit fly)

27) Which pesticide is recommended to control mango stem borer? (DDVP, mono, cyper)

28) Which pesticide is recommended to control mealy bug? (Aldrin, fenval, mono)

29) At which stage mango tree is affected by powdery mildew. (While fruiting, flowering, small)

30) To reduce dropping of fruits, application of 20 NAA + 2 % Urea should be sprayed for two times. (True / false)

31) Apiculture with mango orchard helps in pollination in mango tree. (True / false)

32) Which variety shows more spongy tissues? (alpasho, Jamadar, Keshar)
33) More number of big flowers having less pollen resembles to bunch, are the symptoms of .................
   (Mango malformation, vegetative malformation)
34) How mango malformation can be controlled? ..........  
35) What is the average production of mango from one tree?  
   (80 to 100, 100 to 150, 150 to 200)

2. Planning in mango orchard

A mango grower has synchronized systematically perform the various factors of scientific cultivation of mango orchard. The following 'statements' are the related to these aspects.

[Maximum score = 25] and [Scale value = 8.3].

(a) What are the objectives in planning for management of mango orchard?
   i) To get more income per year  
      (3)
   ii) To maximize overall production of orchard  
      (2)
   iii) To minimize the total cost  
      (1)

(b) Which types of forecast are made in relation to mango orchard?
   i) About rainfall  
      (3)
   ii) About the natural calamity i.e. wind, storm, frost  
      (2)
   iii) About outbreak of disease and pest  
      (1)

c) On which basis you decide the future plan for mango orchard?
   i) Based on commodities prices /market  
      (3)
   ii) Based on number of bearing mango tree  
      (2)
   iii) Based on resources available  
      (1)

d) Which points do you consider while planning for management of mango orchard?
   i) Recommendation of mango production technology (GAU)  
      (4)
   ii) Past experience  
      (3)
   iii) Availability of capital  
      (2)
   iv) Availability of resources  
      (1)
e) What are the main strategies while planning for the management of mango orchard?
   i) Adopting /including new recommended mango practices (4)
   ii) To adopt new variety (3)
   iii) Value addition (2)
   iv) Marketing (1)
   v) As usual (0)

f) Do you planning about the amount of seed, fertilizer and plant protection chemicals needed for cultivation of mango orchard.
   i) Always (2)
   ii) Rarely (1)
   iii) Never (0)

g) To whom you consult while planning?
   i) Agricultural expert (4)
   ii) Gram Sevdek (3)
   iii) Progressive mango orchard growers (2)
   iv) Family member (1)
   v) Not any one (0)

h) Do you think that planning in mango orchard increase the yield.
   i) Always (2)
   ii) Rarely (1)
   iii) Never (0)

3. Organizing the activities

A mango grower performs various role in organizing the activities in scientific cultivation of mango production. The following ‘statements’ are related to these aspects.

[Maximum score = 8] and [Scale value = 3.7].

a) How do you carry out the activities in mango orchard?
   i) Based on the imp of work (3)
   ii) Based on information given by different people (2)
   iii) Based on past experience (1)

b) Do you always group the various farming operations to achieve the goal?
   i) Always (2)
   ii) Rarely (1)
   iii) Never (0)

c) Do you delegate the authority for his responsibility to perform a job?
   i) Always (2)
   ii) Rarely (1)
   iv) Never (0)
4. Supervision in mango orchard

A mango grower performs various role in supervising various activities in mango orchard. The following 'statements' are the related to these aspects [Maximum score = 24] and [Scale value = 5.8].

a) How do you supervise the activities in your orchard?
   i) With personal interest (2)
   ii) Indirect supervision (1)
   iii) No interest at all (0)

b) What are the new innovations to incorporate in your mango orchard?
   i) Recommendation regarding the new cultural practices (4)
   ii) Use of growth regulators (3)
   iii) Recommendation of new pesticides (2)
   iv) Recommendation about intercropping (1)

c) Do you supervise your orchard with right intensity?
   i) Always (2)
   ii) Rarely (1)
   iii) Never (0)

d) To whom do you consult while taking the decision?
   i) Consult other in the family (2)
   ii) Consult the progressive mango orchard grower (1)
   iii) Discussion with labour (0)

e) Do you assess the information regarding orchard?
   i) Always (2)
   ii) rarely (1)
   iii) never (0)

f) Do you appraise the performance and bring short comings for effective management of mango orchard?
   i) Always appraises (2)
   ii) Sometimes (1)
   iii) Not at all (0)

g) Do you think that year wise is necessary in management of mango orchard?
   i) Always (2)
   ii) Rarely (1)
   iii) never (0)

h) Do you always supervise the irrigation of your mango orchard?
   i) Always (2)
   ii) Rarely (1)
   iii) Never (0)

i) Do you keep watch for nutrient deficiency in your mango orchard?
   i) Always (2)
5. Budgeting

A mango grower performs various roles in Budgeting in mango orchard. The following 'statements' are related to these aspects.

[Maximum score = 10] and [Scale value = 6.19].

a) What provision have you made for budget?
   i) By own sources (4)
   ii) Relative and friends (3)
   iii) Loan from bank/co-operative society (2)
   iv) Money Lander (1)
   v) Not decided anything (0)

b) While planning the budget, which of the following items do you give priority?
   i) Priority to inputs i.e. chemical fertilizers, pesticides, insecticides, fungicides (3)
   ii) Priority to irrigation (2)
   iii) Priority to post harvest management (1)

c) Which criteria will you choose for budget?
   i) Minimize the budget (3)
   ii) As per the past budget (2)
   iii) Budget is more than previous year (1)

6. Coordination the activities

A mango grower performs various role to coordinate the activities in mango orchard. The following 'statements' are related to these aspects.

[Maximum score = 9] and [Scale value = 3.2].

a) Do you give equal weightage to all activities?
   i) Always (2)
   ii) Rarely (1)
   iii) Never (0)

b) Which activities do you perform well in advance?
   i) Application manure and fertilizer (3)
   ii) Cleaning the orchard (2)
   iii) Irrigation (1)
c) Are you able to get all diversified interest for effective management of mango orchard?
   i) Always (2)
   ii) Rarely (1)
   iii) Never (0)

d) Do you set a calendar for various operations?
   i) Always (2)
   ii) Sometimes (1)
   iii) Never (0)

7. Communication

A mango grower performs various role in communicating the activities of mango orchard. The following ‘statements’ are in related to these aspects.

[Maximum score = 6] and [Scale value = 0.5].

a) Do you give clear cut instructions to the labour regarding the care of mango tree: i.e. timely irrigation, digging of pits etc

   i) Always (2)
   ii) Sometimes (1)
   iii) never (0)

b) Do you consult to other the problems which are faced by you in management of mango orchard?

   i) Always (2)
   ii) Sometimes (1)
   iii) never (0)

c) Do you hear the suggestion from other i.e. family member, labour, and other orchard growers?

   i) Always (2)
   ii) Sometimes (1)
   iii) never (0)

8. Controlling

A mango grower has performed various role in controlling the activities of mango orchard. The following ‘statements’ are the related to these aspects.

[Maximum score = 7] and [Scale value = 3.5].

a) What type of labour do you prefer?

   i) Skilled (2)
   ii) Semi skilled (1)
   iii) Unskilled (0)
b) Do you maintain various records pertaining to mango orchard operations?
   If yes, what types of records? (1)
   If No (0)

c) How do you pay the wages to labour working under you
   i) As per the govt. Approved rates (2)
   ii) As per the rate commonly followed in village (1)
   iii) Minimum (0)

d) Do you have equipment /implement on hire?
   i) Always (2)
   ii) Rarely (1)
   iii) Never (0)

9. Decision making

A mango grower has performed various role in decision making procedure of mango orchard. The following ‘statements’ are the related to these aspects. [Maximum score = 10] and [Scale value = 6.4].

a) Do you always take decision at proper time?
   i) Always (2)
   ii) Rarely (1)
   iii) Never (0)

b) Do you always apply technical competency in making decision?
   i) Always (2)
   ii) Rarely (1)
   iii) Never (0)

c) To whom will you discuss, while taking important decision?
   i) Family member (2)
   ii) Other orchard growers (1)
   iii) Labour (0)

d) Do you always implementing the decision?
   i) Always (2)
   ii) Rarely (1)
   iii) Never (0)

e) Do you take decision always free from bias?
   i) Always (2)
   ii) Rarely (1)
   iii) Never (0)
10. Human relationship

A mango grower performs various role in human relationship in mango orchard. The following ‘statements’ are the related to these aspects.

[Maximum score = 12] and [Scale value = 1.2].

a) Do you prefer contacting people personally?
   i) Always (2)
   ii) Rarely (1)
   iii) Never (0)

b) Do you recognize and appreciate the work done by people working under you?
   i) Always (2)
   ii) Rarely (1)
   iii) Never (0)

c) Do you try to know the habit of the people working under you?
   i) Always (2)
   ii) Rarely (1)
   iii) Never (0)

d) Do you listen the suggestions given by people working under you?
   i) Always (2)
   ii) Rarely (1)
   iii) Never (0)

e) During the act of listening, do you avoid undesirable arguments?
   i) Always (2)
   ii) Rarely (1)
   iii) Never (0)

f) Do you cooperate the person working under you?
   i) Always (2)
   ii) Rarely (1)
   iii) Never (0)
PART – III

1. CONSTRAINTS FACED BY MANGO GROWERS' IN ADOPTION OF MANGO ORCHARD PRACTICES.
   1.
   2.
   3.
   4.

2. SUGGESTIONS TO OVERCOME THE CONSTRAINTS IN ADOPTION OF SCIENTIFIC MANGO ORCHARD PRACTICES.
   1
   2
   3
   4
   .
   .
   .