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3. RESEARCH DESIGN

The research design is a plan or blueprint of research. A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to research purpose with economy in procedure.

3.1. NEED OF THE RESEARCH:
Agro-processing industry refers to the subset of manufacturing that processes raw materials and intermediate products derived from the agricultural sector. The agricultural sector includes agricultural farm, livestock, forestry and fisheries. Agro-processing industry has multidimensional effect on upliftment of agricultural and rural sector. Agro-processing on one hand can act as panacea for the agricultural problems and on the other stimulates industrial development. It can act as a symbiotic link between agriculture and industry. Agro-processing can play a role of catalyst in the overall development of the economy. Therefore agro-processing industry occupies a significant position in the development of Indian economy.

The state of agro-processing industry in the India is poor. The contribution of the agro-processing industry in GDP of the economy is less. Its contribution in employment is less. The level of processing in the sector is less and post harvest losses are more. Further, there is vast untapped domestic and export potential.

Ahmednagar is largest district in Maharashtra in terms of geographical area and predominantly rural in nature. The majority of the population depends on the agriculture. The industrial development in the district is lead by agro-processing industry. It is known as birth place for agro-processing co-operatives like sugar, milk. It has highest number of livestock and therefore ranked number one in milk production in Maharashtra. Shevgaon, Pathardi tehsils in the district are given a status of ‘Cotton Zone’ by the government. Therefore, it is one of the leading districts in Maharashtra in Cotton production. Thus, agro-processing industry especially small scale becomes assumes paramount significance in the Ahmednagar district as it can play major role in its economic development.

In a view of its role in the economic development of a country, research studies have been conducted on various aspects of the agro-processing industry. Many research
studies are related to role and significance of agro-processing industry in agricultural, rural and economic development. The research studies are sector specific and are related more to the food sector than to non food sector. The research studies are product category specific and are related to specific product categories like fruit and vegetable processing etc. The research studies conducted in Maharashtra are comparatively less. The research studies are related to large scale enterprises especially related to sugar industry. The research studies related to analysis of performance of agro-processing industry are scanty. The research studies are related to economic, technical aspects of agro-processing industry.

On this backdrop, a need was felt to study agro-processing industry especially small scale in operation in the Ahmednagar district with a focus on the marketing and financial functions of the management.

3.2. PURPOSE OF THE RESEARCH:
The purpose of the research is to outline the status and point out the prospects of the small scale agro-processing industry in Ahmednagar district. This would help in forming the generalized view of the agro-processing industry especially with respect to their performance and problems. Since, marketing and finance are two key areas for survival and growth of the enterprise the focus of the study is kept on these two areas. The purpose of research is also to study the sickness and closure in the industry and the causes behind the same so as to throw more light on the problems of the industry.

3.3. RESEARCH PROBLEMS:
The research is undertaken to study small scale agro-processing industry in Ahmednagar district. The research questions are as follows.

- **How is the marketing and financial performance of the small-scale agro-processing industry in the Ahmednagar district?**
- **What are the marketing and financial problems faced by the small scale agro-processing industry in the Ahmednagar district?**
3.4. SIGNIFICANCE OF THE RESEARCH:
Agro-processing industry with its strong backward and forward linkages can play catalytic role in agricultural, rural and economic development. The significance of research can be seen in view of the significance of the industry. The study of agro-processing industry in Ahmednagar district has been undertaken outline its status and point out the prospects. The significance of the research is as follows.

- **Interdisciplinary Nature:**
  This research is interdisciplinary in nature since it is related to various facets of following areas - marketing, finance and other functional areas of management, International Business Management, Commerce, Economics, Entrepreneurship and Agriculture.

- **Benefit to Existing Entrepreneurs:**
  This research will throw light on the performance and will pinpoint the problems of agro-processing industry. This will help existing entrepreneurs in understanding their problems and arriving at appropriate solutions so as to improve their performance.

- **Benefit to Prospective Entrepreneurs:**
  The research will serve as guiding light for existing and aspiring entrepreneurs as it will identify the prospects of the small scale agro-processing industry in the district. This will help prospective entrepreneurs to identify new business opportunities.

- **Benefit to the Government:**
  This research will portray the status and prospects of the small scale agro-processing industry. This will be beneficial to the Government for drawing the policy imperatives for the support and strengthening of small scale agro-processing industry.

- **Benefit to Academicians and Researchers:**
  The research will encourage the academicians and researchers to conduct such studies all over the country to bring out the status of the industry on a national basis. This will not only open new avenues of research but also help to understand the small scale agro-processing industry and arrive at solutions to strengthen it.
3.5. OBJECTIVES OF THE RESEARCH:
The objectives of the research are as follows.

1) To portray the demographic profile of the Small Scale Agro-Processing Industry in the Ahmednagar district.
2) To study the marketing & financial management practices used by the Small Scale Agro-Processing Industry in the Ahmednagar district.
3) To assess the marketing & financial performance of the Small Scale Agro-Processing Industry in the Ahmednagar district.
4) To identify the marketing & financial problems of enterprises of the Small Scale Agro-Processing Industry in the Ahmednagar district.
5) To estimate the extent of sickness in the Small Scale Agro-Processing Industry in the Ahmednagar district and the causes behind the same.
6) To bring out the extent of closure in the Small Scale Agro-Processing Industry in the Ahmednagar district and the causes behind the same.
7) To ascertain the role and impact of various government organizations on the Small Scale Agro-Processing Industry in the Ahmednagar district.
8) To point out the prospects of the Small Scale Agro-Processing Industry in the Ahmednagar district.

3.6. SCOPE OF THE RESEARCH:
The scope of the research is as follows.

1) The scope of the research covers all the fourteen tehsils in the Ahmednagar district.
2) The scope of the research covers agro-processing enterprises which are small scale in operation. The definition of the small scale enterprises as per the ‘Micro, Small and Medium Enterprises Development Act (MSMED)’ 2006 is considered.
3) The scope of research covers ‘Permanently Registered’ enterprises with District Industries Centre (DIC), Ahmednagar.
4) The scope of the research covers the manufacturing enterprises. The manufacturing enterprises are those enterprises which purchases raw materials, processes it and converts it into the finished product to sell it in the market.
5) The scope of the research includes primary, secondary and tertiary processing enterprises in the agro-processing industry.

6) The scope of the research covers the marketing and financial functions of management.

7) The time period of the study is from the financial year 2003-04 to 2007-08.

3.7. HYPOTHESES:

In order to formulate hypothesis ‘Exploratory Research’ is conducted. An ‘Experience Survey’ was conducted of experts especially top government officials of ‘District Industries Centre (DIC)’, ‘Khadi Village Industries Board (KVIB)’ and Maharashtra Centre for Entrepreneurship Development (MCED’), Ahmednagar. The seven hypotheses are formulated and are given below.

1) The marketing performance of the Small Scale Agro-Processing Industry in the Ahmednagar district is satisfactory.

2) The food sector dominates in the sales of the Small Scale Agro-Processing Industry in the Ahmednagar district.

3) There are significant differences in the mean annual sales of the product categories of the Small Scale Agro-Processing Industry in the Ahmednagar district.

4) The proportion of closure in the Small Scale Agro-Processing Industry is less than that in the Small Scale Sector in the Ahmednagar district.

5) The proportion of closure in the women enterprises is more than that in the enterprises owned by men in the Small Scale Agro-Processing Industry in the Ahmednagar district.

6) The proportion of closure in the food sector is less than that in the non food sector of the Small Scale Agro-Processing Industry in the Ahmednagar district.

7) The assistance provided by government organizations has been effective in checking the extent of closure in the Small Scale Agro-Processing Industry in the Ahmednagar district.
3.8. RESEARCH DESIGN:
The research design is as follows.

3.8.1. Type of Data:
A combination of primary & secondary data is used in this research. Primary data is the data which is collected afresh and for the first time by the researcher. The secondary data is the data which already exist in some or the other form and is collected already by someone else.

The secondary data is collected in this research to fulfill the information requirements of few objectives - to portray the demographic profile, to ascertain the role of various government organizations in the development and to identify the prospects of the small scale agro-processing industry in the Ahmednagar district.

The primary data is collected in this research in order to fulfill the information requirements of certain objectives - to portray the demographic profile, to ascertain the impact of various government organizations on the development, to study the marketing and financial management practices, to assess the marketing and financial performance, to identify the marketing and financial problems, to estimate the extent of sickness and closure and the causes behind the same and to identify the prospects of the small scale agro-processing industry in the Ahmednagar district.

3.8.2. Sources of Data:
The data is collected from following sources.

- **Secondary Data Source:** Secondary data is collected from sources like – Reports and Database of Government Departments/Organizations, Newspapers, Magazines, Books, Research Journals, Internet etc.

- **Primary Data Source:** Primary data is collected from management of the small scale agro-processing enterprises in the Ahmednagar district. The primary data is
collected from entrepreneurs of the enterprises but in case the entrepreneur is not available the data is collected from the manager.

3.8.3. Method of Data Collection:
A survey of small scale agro-processing enterprises in the Ahmednagar district is carried out to collect primary data. The ‘Schedule Method’ is used to collect data. A schedule is similar to questionnaire and consists of set of questions related to the research topic. The researcher has personally met respondents along with the schedule and asked questions as per the schedule and recorded the responses.

3.8.4. Research Instrument:
A ‘Schedule’ is used as a research instrument to collect the primary data. A preliminary schedule was drafted keeping in mind the objectives of research. A pilot survey of 20 respondents was carried out to test the schedule. The errors identified in the pilot survey were removed and the final schedule was drafted.

The schedule drafted for the research consists of 75 questions. The schedule consists of a combination of open and close end questions. There are 57 close end questions and 18 open end questions. The schedule is divided into nine sections as follows.

- Section A: Identification Details
- Section B: General Information
- Section C: Starting Problems Faced
- Section D: Government Assistance
- Section E: Closure and the Causes behind it
- Section F: Marketing Information
- Section G: Financial Information
- Section H: Information related to Other Functional Areas of Management
- Section I: Prospect of the Business

3.8.5. Sampling Design:
Sampling design is prepared so as to draw a representative sample from the population and reach reliable conclusions.
• **Population/Universe:**
The population/ universe is considered as: ‘Manufacturing Small Scale Agro-Processing Enterprises in Ahmednagar district permanently registered till 31\textsuperscript{st} March 2008’. The population is ‘finite population’ and the population size is 702.

• **Sampling Unit:**
The sampling unit is considered as a ‘manufacturing small scale agro-processing enterprise’.

• **Sampling Frame:**
The sampling frame consists of list of all the sampling units in the population. The sampling frame is collected from District Industries Centre (DIC), Ahmednagar.

• **Sample Size:**
The sample size is decided using statistical technique so as to arrive at the results which are fairly accurate. The statistical technique to determine sample size in this research is based on precision rate and the confidence level. Since most of the analysis in this research is based on proportion the sample size estimation is based on following formula.

\[
n = \frac{z^2 \times p \times q \times N}{e^2 (N-1) + z^2 \times p \times q} \]

\[\text{……………………………………… (1)}\]

Here,

\[n = \text{Sample Size}\]
\[p = \text{Sample Proportion}\]
\[q = 1 - p\]
\[z = \text{Value of Standard Variate at a given Confidence Level}\]
\[e = \text{Precision Rate or the Acceptable Error}\]
\[N = \text{Size of Population}\]
A pilot survey was conducted for 20 small scale agro-processing enterprises. It was found that 6 enterprises i.e. 30% of the enterprises out of 20 are closed. Therefore, sample proportion, p is taken as 0.3, p = 0.3, q = 1 – p = 1 - 0.3 = 0.7.

The confidence level decided was 95%. That means results are estimated with 95% confidence. The value of z Standard Variate for 95% confidence level is found from the z-table and it is 1.96. z = 1.96

The precision rate decided was 5%. The precision rate determines the precision with which results are estimated. That means the estimated results vary ±5% from the actual estimate. Therefore, e becomes 5%. e = .05

The size of the population is 702. N= 702

After putting all these values in the formula (1) the sample size was estimated as follows.

\[ n = \frac{(1.96)^2 \times 0.3 \times 0.7 \times 702}{(0.05)^2 (702-1) + (1.96)^2 \times 0.03 \times 0.07} \]

\[ n = 221.13 \]

Since the sample size estimated was 221.13 it was rounded off to 225 units. The sample size is 225 which is 32.05% of the population. Thus the sample size is 225 and it was estimated on the basis of precision rate of ±5% and 95% confidence level.

**Sampling Method:**

A ‘Proportionate Stratified Random Sampling Method’ is used in order to draw a representative sample from population. It is one of the types of the ‘Probability Sampling Method’. The following steps are carried out in order to draw a representative sample.

1) The population is divided into homogeneous groups. Each such group is called as ‘Stratum’. In order to have better representation of the population, in this research ‘Cross Stratification’ is done on two parameters viz. product category and tehsil. This cross-stratification is represented using two-way table (Table 3.1) by taking product category as row and tehsil as column. Each ‘Cell’ (intersection of row and
column) of the two-way table represents the number of enterprises of that particular product category located in the particular tehsil.

2) Thereafter, the total number of enterprises in each product category (row total) and tehsil (column total) are found out. (Table 3.1).
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<td>6</td>
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<td>170</td>
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</tbody>
</table>

(Note: A’nagar. – Ahmednagar, Rahu. – Rahuri, Shri. – Shrirampur, Raha. – Rahata, Ako. – Akole, Sang. – Sangamner, Path. – Pathardi, Shev. - Shevgaon, Par. – Parner, Shrig. – Shrigonda, Kar. – Karjat, Jam. – Jamkhed, New. – Newasa, Kopar. – Kopargaon)

(Source: District Industries Centre, Ahmednagar)
3) The proportion of each stratum of product category and tehsil in the population is found out and shown in Table 3.2 and 3.3.

4) The stratum sample size for each product category and tehsil is calculated. This sample size for each stratum is kept directly proportional to the size of the respective stratum in the population. Thus, the number of enterprises selected as sample from each product category and tehsil is proportional to the size of the respective product category and tehsil in the population. This means each product category and tehsil has representation in the sample in the same proportion as that of it in the population. The calculation of the stratum sample size for each product category is shown in Table 3.2 and for each tehsil in Table 3.3.

Table 3.2: Sample Sizes for Strata on the basis of Product Category

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Product Category</th>
<th>Number of Enterprises (N_i)</th>
<th>Proportion in Population P_i (%)</th>
<th>Sample Size (n_i = n*P_i)</th>
<th>Sample Size (Round Off) (n_i)</th>
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<td>3</td>
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<td>n= 225</td>
<td>n=225</td>
</tr>
</tbody>
</table>
Table 3.3: Sample Sizes for Strata on the basis of Tehsil

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Tehsil</th>
<th>Number of Enterprises (Ni)</th>
<th>Proportion in Population P_i (%)</th>
<th>Sample Size (n_i=n*Pi)</th>
<th>Sample Size (Round Off) (n_i)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ahmednagar</td>
<td>226</td>
<td>32.19</td>
<td>72.43</td>
<td>72</td>
</tr>
<tr>
<td>2</td>
<td>Rahuri</td>
<td>37</td>
<td>5.27</td>
<td>11.86</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>Shrirampur</td>
<td>56</td>
<td>7.98</td>
<td>17.95</td>
<td>18</td>
</tr>
<tr>
<td>4</td>
<td>Rahata</td>
<td>28</td>
<td>3.99</td>
<td>8.98</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>Akole</td>
<td>21</td>
<td>2.99</td>
<td>6.73</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>Sangamner</td>
<td>86</td>
<td>12.26</td>
<td>27.59</td>
<td>28</td>
</tr>
<tr>
<td>7</td>
<td>Pathardi</td>
<td>29</td>
<td>4.13</td>
<td>9.29</td>
<td>9</td>
</tr>
<tr>
<td>8</td>
<td>Shevgaon</td>
<td>21</td>
<td>2.99</td>
<td>6.73</td>
<td>7</td>
</tr>
<tr>
<td>9</td>
<td>Parner</td>
<td>54</td>
<td>7.69</td>
<td>17.30</td>
<td>17</td>
</tr>
<tr>
<td>10</td>
<td>Shrigonda</td>
<td>44</td>
<td>6.27</td>
<td>14.11</td>
<td>14</td>
</tr>
<tr>
<td>11</td>
<td>Karjat</td>
<td>13</td>
<td>1.85</td>
<td>4.16</td>
<td>4</td>
</tr>
<tr>
<td>12</td>
<td>Jamkhed</td>
<td>12</td>
<td>1.71</td>
<td>3.85</td>
<td>4</td>
</tr>
<tr>
<td>13</td>
<td>Newasa</td>
<td>38</td>
<td>5.41</td>
<td>12.17</td>
<td>12</td>
</tr>
<tr>
<td>14</td>
<td>Kopargaon</td>
<td>37</td>
<td>5.27</td>
<td>11.86</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>N=702</strong></td>
<td><strong>100.00</strong></td>
<td><strong>n=225</strong></td>
<td><strong>n=225</strong></td>
</tr>
</tbody>
</table>

5) Then the proportion of each cell (intersection of row and column) of the two way table (Table 3.1) of population in the respective stratum of the product category is found out. Thereafter, the number of the enterprises to be selected as sample from each cell is worked out (Table 3.4). The number of the enterprises to be selected as sample from each cell is kept directly proportional to the size of the cell in the stratum.

For example,

The first cell, which is an intersection of row one i.e. product category – ‘Processing of Fruits & Vegetables’, and column one i.e. tehsil – ‘Ahmednagar’, contains 15 enterprises. This means 15 enterprises of product category – ‘Processing of Fruits & Vegetables’ are located in tehsil – ‘Ahmednagar’. The proportion of this first cell in the product category – ‘Processing of Fruits and Vegetables’ is calculated as follows.
Proportion of Cell = \frac{\text{No. of Enterprises in Cell} \times 100}{\text{No. of Enterprises in respective Product Category}}

Proportion of Cell 1 = \frac{15 \times 100}{38} = 39.47\%

In order to keep the same proportion of number of enterprises of cell 1 in the sample of product category – ‘Processing of Fruits and Vegetables’ the sample size for cell 1 is calculated as follows.

Sample Size of Cell = \text{Stratum Sample Size for Product Category} \times \frac{\text{Proportion of Cell}}{\text{Proportion of Cell}}

Sample Size of Cell 1 = 12 \times \frac{39.47}{100} = 4.74 \approx 5

The sample sizes are rounded off to the nearest digit. Thus, the sample size for cell 1 becomes 5. That means 5 enterprises are to be selected from the number of enterprises from ‘Processing of Fruits and Vegetables’ in ‘Ahmednagar’ tehsil. Thus the sample sizes for all cells are calculated. (Table 3.4)

The total of the sample sizes for the cells of the respective product category should be equal to stratum sample size for that product category. In case, it is less, the sample is chosen randomly from the remaining cells which have enterprises of that product category. For example, in case of ‘Bakery Products’ after calculating the sample sizes for all the cells and rounding off the figures, the total number of samples was coming out as 15, whereas the stratum sample size for bakery products was 16. Therefore, one sample from the remaining cells i.e. enterprises of bakery products in Jamkhed and Rahuri tehsil, is selected randomly. In this case it was enterprise in Jamkhed.

6) Finally the samples are chosen from each cell and stratum on random selection basis. For random selection of the samples from cell and stratum, lottery method is used.
Table 3.4: Sample Design for the Small Scale Agro-Processing Industry in the Ahmednagar District

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Processing of Fruits &amp; Veg.</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>Vegetable Oil</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>3</td>
<td>Milk &amp; Milk Products</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>6</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>37</td>
</tr>
<tr>
<td>4</td>
<td>Grain Mill Products</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>Animal Feed</td>
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<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>6</td>
<td>Bakery Products</td>
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<td>1</td>
<td>1</td>
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<td>1</td>
<td>1</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>7</td>
<td>Confectionary</td>
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<td>0</td>
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<td>0</td>
<td>1</td>
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<tr>
<td>8</td>
<td>Spices</td>
<td>4</td>
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<td>1</td>
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<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>9</td>
<td>Tobacco related Products</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>Other Food Products</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
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<td>Textiles</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>12</td>
<td>Wood &amp; Wood Products</td>
<td>19</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>7</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>54</td>
</tr>
<tr>
<td>13</td>
<td>Paper &amp; Paper Products</td>
<td>6</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>21</td>
</tr>
<tr>
<td>14</td>
<td>Ayurvedic Products</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>15</td>
<td>Essence Sticks</td>
<td>3</td>
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<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>
| **Total** |                                     | **72**  | **12** | **18** | **9** | **7** | **28** | **9** | **7** | **17** | **14** | **4** | **12** | **12** | **225** |}
3.8.6. Tools for Data Analysis:
Both Statistical and Financial tools are used for data analysis. The computer software is used for data analysis. The tools used for data analysis are given below.

- **Analysis of Marketing Performance:**
Marketing function has an important role in an enterprise to satisfy the need and want of the customer and excel competition in order to achieve sales and profits. Since the marketing function is the major determinant of the sales and profits, the assessment of the marketing performance is significant in the performance assessment of an enterprise. The marketing performance is assessed on the basis of ‘Sales’ of the enterprise. The ‘Sales Growth Rate’ is used as an indicator of the marketing performance of an enterprise. The average annual sales growth rate of the enterprise is found for the study period ranging from 2003-04 to 2007-08. The marketing performance is analysed product category wise, sector wise, tehsil wise, area wise, scale of operation wise, form of organization wise, ownership wise and for industry as a whole. Further statistical tools like mean, standard deviation, simple correlation are used to analyze the nature of the sales of the industry.

- **Analysis of Financial Performance:**
Financial Performance of an enterprise is analysed to know its financial health. Financial analysis is the process of selection, relation and evaluation. The analysis of financial statements is the process of evaluating the relationship between component parts of financial statements, to obtain a better understanding of the firm’s position and performance.

In this research ‘Ratio Analysis’ is used as a tool for analyzing the financial performance of the enterprises. Ratio analysis is defined as the systematic use of ratios to interpret the financial statements so that the strengths & weaknesses of a firm as well as its historical performance & current financial condition can be determined. The rationale of ratio analysis is the fact that it makes related information comparable. The term ratio refers to the numerical or quantitative relationship between two items or variables. This relationship can be expressed as, Percentages or Fraction or Proportion of numbers. These alternative methods of expressing items which are related to each other are, for purposes of financial analysis, referred to as ratio analysis.
Ratios are relative figures reflecting the relationship between variables. The use of ratios, as a tool of financial analysis, involves their comparison. Comparison with related facts is, therefore, the basis of ratio analysis. The financial performance is analysed product category wise, sector wise and for industry as a whole. The focus of the financial analysis is not on individual analysis of the firm but a group of firms, so as to draw conclusions for the industry as whole. Therefore, in this research the basis for comparison used are comparison with standards or industry average and trend analysis. Further, inter-product category comparison i.e. the comparison between ratios of various product categories and with the industry as a whole is made. In addition to that, inter-sector comparison i.e. the comparison between ratios of various sectors and with the industry as a whole is made.

The following ratios are used to analyse the financial performance of the enterprises.

- **Liquidity Ratios:**
  - Current Ratio
  - Quick Ratio

- **Leverage Ratios:**
  - Debt/Equity Ratio
  - Interest Coverage Ratio

- **Profitability Ratios:**
  - Gross Profit Ratio
  - Operating Profit Ratio
  - Return on Investment

- **Efficiency Ratios:**
  - Capital Turnover Ratio
  - Inventory Holding Period
  - Debtors’ Collection Period
• **Analysis of Sickness:**

The prevalence of sickness in small scale industries has been a cause of concern for quite some time. The definition of ‘Sickness’ in small scale sector has been undergoing changes from time to time. The Reserve Bank of India (RBI) was instrumental in appointing committees from time to time to look into the issue of ‘Sickness’ affecting the small scale sector. The latest definition of ‘Sickness’ given by the Working Group on Rehabilitation of Sick Units set up by the RBI (Kohli Committee) is used in this research to measure sickness is given below.

“A small scale industrial unit is considered as sick when,

i. If any of the borrowal accounts of the unit remains substandard for more than six months, i.e., principal or interest, in respect of any of its borrowal accounts has remained overdue for a period exceeding one year will remain unchanged even if the present period for classification of an account as substandard is reduced in due course;

   OR

ii. There is erosion in the net worth due to accumulated losses to the extent of 50% of its net worth during the previous accounting year;

   AND

iii. The unit has been in commercial production for at least two years.”

As per the Third Census of Small Scale Industries, Government of India, 2001-02, in order to measure incipient sickness a continuous decline in the gross output in the three consecutive years is considered as suitable indicator. Therefore, this indicator is used as basis for identifying the incipient sick units in this research.

Thus, the following criteria are adopted to identify sick/incipient sick units in this research.

i. Continuous decline in the gross output compared to the previous two financial years;

ii. Delay in repayment of institutional loan, for more than 12 months; and

iii. Erosion in the net worth to the extent of 50% of the net worth during the previous accounting year.
• **Analysis of Problems Faced by the Enterprises:**

The problems faced by the enterprises are grouped as starting problems, current problems, reasons behind sickness and reasons behind closure. As mentioned in the scope of research, even though the focus is kept on marketing and finance functional areas, some of the interrelated problems of other functional areas are also covered.

The current problems and the causes behind sickness in the industry are identified and pointed out. In the case of the starting problems and the causes behind closure in the industry, the degree of intensity of the problem is also assessed. Here, the level of intensity of various problems is measured using the 3-point continuum rating scale – high, medium and low. Thereafter, weights of 3, 2 and 1 are assigned to these three levels of intensities respectively. Based on the responses obtained from entrepreneurs for each problem, weighted mean score is calculated. Finally, 'Z' score was worked out to assess degree of intensity of these problems and rank orders are given based on the 'Z' values. A problem is considered as high in terms of intensity with 'Z' score values of more than 1, medium in terms of intensity with 'Z' score values 1 to -1 and low in terms of intensity with 'Z' score values less than -1. The ‘Z’ values are calculated using following formula.

\[
Z = \frac{X_i - \bar{X}}{\sigma}
\]

Where, 
- \(Z\) = Standard Variate for a normal distribution,
- \(X_i\) = Weighted Mean of each problem, where \(i = 1\) to \(k\), \(k=\) number of problems
- \(\bar{X}\) = Weighted Mean of all the problems
- \(\sigma\) = Standard Deviation

• **Hypothesis Testing:**

The following statistical tests are used for hypothesis testing.

- \(z\)- test for mean and proportion
- F-test for difference in means
- \(\chi^2\) test for independence of variables
3.8.7. Charts for Data Presentation:
The charts used for visual data presentation are given below.

- Pie Chart
- Bar Chart
- Divided Bar Chart
- Multiple Bar Chart
- Line Chart

3.9. LIMITATIONS OF THE STUDY:
The limitations of the study are as follows.

- The study is limited to only permanently registered enterprises with the District Industries Centre (DIC), Ahmednagar. Therefore, the study does not reflect unregistered sector of the industry.
- The study is limited to manufacturing enterprises only. Therefore, the study does not reflect the service enterprises in the industry.
- The schedule is drafted in English which is not a regional language.
- The sample size is 225 enterprises. Sample size is decided on the basis of the $\pm 5\%$ precision and 95% confidence level.
- The performance analysis is based on the information of the working enterprises only.
- The marketing performance is analysed on the basis of one parameter i.e. ‘sales growth rate’ only.
- The financial performance analysis is based on the financial information of the enterprises which maintain books of accounts and use mercantile system. Therefore, the financial performance does not reflect the performance of the enterprises which does not maintain books of accounts and which maintain it but use cash system.
- The financial information i.e. Balance Sheet, Trading and Profit and Loss Account is not reorganized and taken as it is as given by the enterprise. Further, financial statements have their own limitations.
- The financial performance is analysed on the basis of ten financial ratios which are relevant to the study.
- The period of study is limited to five years from financial year 2003-04 to 2007-08.