CHAPTER- VI

CONCENTRATION AND DIVERSIFICATION OF
AGRO-BASED INDUSTRIES
CHAPTER-VI

CONCENTRATION AND DIVERSIFICATION OF
AGRO-BASED INDUSTRIES

6.1 INTRODUCTION

6.2 SPATIO-TEMPORAL GROWTH OF SUGAR INDUSTRIES

6.2.1 SPATIO-TEMPORAL GROWTH OF SPINNING MILLS

6.2.2 SPATIO-TEMPORAL GROWTH OF EDIBLE OIL MILLS

6.2.3 SPATIO-TEMPORAL GROWTH OF RICE MILLS

6.2.4 EMPLOYMENT IN AGRO-BASED INDUSTRIES

6.3 CONCENTRATION AND DIVERSIFICATION OF
AGRO-BASED INDUSTRIES

6.3.1 CONCENTRATION OF AGRO-BASED INDUSTRIES

6.3.1.1 CONCENTRATION OF SUGAR INDUSTRY

6.3.1.2 CONCENTRATION OF SPINNING MILLS

6.3.1.3 CONCENTRATION OF OIL MILLS

6.3.1.4 CONCENTRATION OF RICE MILLS

6.4 INDUSTRIAL DIVERSIFICATION OF AGRO-BASED INDUSTRIES

6.5 SUMMARY
CHAPTER VI

CONCENTRATION AND DIVERSIFICATION OF

AGRO-BASED INDUSTRIES

6.1 INTRODUCTION

Agriculturally Kolhapur district is one of the leading districts in the state of Maharashtra. There were number of crops has been grown in the district. Majority of the agro-based industries in the district were relied on raw material come from agriculture. Therefore a sound position was found in the district from time immemorial. The number of considerable agro-based industries was established in the district. From the year 2001-2002 to 2011-2012 there was a considerable change in the growth agro-based industries in the district was noted by 1.32 times. A considerable growth was recorded in the rice mills with 1.70 times within the period of ten years from 2001-02 to 2011-12 fallowed by sugar industries (1.31times), spinning mills( 1.26 times) and oil mills (1.23) in the district. The table no 5.1 Shows that the spatial-temporal changes in the growth of the agro-based industries in the Kolhapur district from the period 2001-02 to 2011-12.

6.2 SPATIO-TEMPORAL GROWTH OF SUGAR INDUSTRIES

Sugar industry is one of the most important agro based industry in the district. There were 16 sugar factories existed in the district in 2001-2002. This was possible due to the sugarcane cultivation. Sugarcane was grown in good quantities since old day in Kolhapur district. Well irrigation facilities are developed in the district; well drained soils of Kolhapur district are best suited to this tropical crop. Farmers of the district taking efforts to provide high yielding varieties of sugarcane therefore the raw material was available for the sugar factories in the district. The Hatkangale and Shirol tahsils have three sugar factories. Kagal and Phanala tahsils have two sugar factories. The Shahuwadi, Shirol, Gagenbavada, Ajara, Gadhinglaj and Changad tahsils of the district has one sugar in 2001-2002 (Table No 6.1).

There were 21 sugar factories came into existence in the year 2011-2012 in the district. Hatkangale, Kagal and Changad are the leading tahsil of the district and each has three sugar factories. The marked growth in the sugar factories
noted in the Changad and Kagal tahsils of the district. These tahsils have enough raw materials for the existence of sugar factories in the district. All the infrastructural facilities were available in these tahsils. Gagenbavada tahsil has started new sugar factory in the recent year. Shirol district has two sugar factories. The increase in the sugarcane cultivation has motivated to the development of sugar factories in the district. Sugar industries are the main important agro-based industry in the study region. Sugar factories are offer good employment opportunities in the rural areas. In the year 2001-2002 there 17,389 workers engaged in the sugar factories. The number of workers grown and it has provides employment to 20,313 workers in the year 2011-2012 in the district.

Table No. 6.1
Kolhapur District: No of Agro-based Industries.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sug. ind.</td>
<td>Spin. mills</td>
</tr>
<tr>
<td>1</td>
<td>S.wadi</td>
<td>1</td>
<td>----</td>
</tr>
<tr>
<td>2</td>
<td>Panhala</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>H. gale</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>4</td>
<td>Shirol</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>Karveer</td>
<td>3</td>
<td>----</td>
</tr>
<tr>
<td>6</td>
<td>G.bavda</td>
<td>1</td>
<td>----</td>
</tr>
<tr>
<td>7</td>
<td>R.gari</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>8</td>
<td>Kagal</td>
<td>2</td>
<td>----</td>
</tr>
<tr>
<td>9</td>
<td>B.gad</td>
<td>----</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>Ajara</td>
<td>1</td>
<td>----</td>
</tr>
<tr>
<td>11</td>
<td>G.laj</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>C.gad</td>
<td>1</td>
<td>----</td>
</tr>
<tr>
<td>13</td>
<td>District</td>
<td>16</td>
<td>23</td>
</tr>
</tbody>
</table>

Source: Socio-economic abstract of the Kolhapur district 2001-02 to 2011-12.
Kolhapur District
Tahsilwise Distribution of Sugar Industries
2011-2012
(B)

Legend:
Sugar Industry

Map No.6.1 (B)
6.2.1 SPATIO-TEMPORAL GROWTH OF SPINNING MILLS

Cotton spinning mills is one of the main agro-based industries in the district. It plays important role in the cotton textile industry in the district. It provides yarn (soot) for the weaving mills in the district. Ichalkaranji is the known as the Manchester’s of cotton textile of the Maharashtra. Cotton textile industry is mainly concentrated in and around the Ichalkaranji town. All the required infrastructural facilities are well developed in this area of the district. The textile clusters is particularly made at Ichalkarnaji. Though, the locational aspects play an important role in the development of cotton textile industry.

In the year 2001-2002, there were 23 spinning mills are existed in the district. The spinning mills were mainly concentrated in the Hatkanangale tahsil particularly at Ichalkaranji, followed by Shirol tahsil of the district. There are 14 spinning mills were existed in Hatkangale tahsil. Six spinning mills were found in Shirol tahsil. The remaining tahsils e.g. Panhala, Bhandarged and Gadhinglaj has one spinning mill respectively (Map No. 6.2 A). There were 60.87 percent spinning mills were concentrated in Hatkangale tahsil followed by Shirol 26.08 percent and 4.35 percent in each in the Panhala, Baudargad and Gadhinglaj tahsils of the district.

There is a notable increase in the number of spinning mills in the district from 2001-2002 to 2011-2012. There were 29 spinning mills were existed in the year 2011-2012 (Map No.6.2 B). The growth index of spinning was 126.08 percent as compare to 2001-2002. Particularly the growth in the number spinning was recorded in the Hatkangale and Shirol tahsils of the district. In the year 2011-2012 there were 16 spinning mills were found in Hatkangale tahsils the district. Shirol tahsil has 8 spinning mills in the year 2011-2012. The Pahnala, Ajara, Karveer, Budhargad, Gadchinglaj tahsils have one spinning mills respectively in 2011-2012(Table No.6.1 B).

The notable change in the growth of the spinning mills were observed in the Hatkangale and Shirol tahsils of the district from 2001-2002 to 2011-2012. There were 55.17 percent spinning mills were located in the Hatkangale and 27.58 percent in the Shirol. The Pahnala, Karveer, Budargad, Ajara, and Gadchinglaj tahsils has 3.45 percent share in the spinning mills respectively in the Kolhapur district.
Kolhapur District
Tahsilwise Distribution of Soot (Yarn) Girni
2001-2002
(A)

Legend:

Seot Girni

Map No.6.2 (A)
Kolhapur District
Tahsilwise Distribution of Soot (Yarn) Girni
2011-2012
(B)

Map No.6.2 (B)
6.2.2 SPATIO-TEMPORAL GROWTH OF EDIBLE OIL MILLS

The edible oil is one of the important small scale agro-based industries in the district. It is mainly concentrated at Karveer, Gadhinglaj, Htkanangale tahsils of the district. The entrepreneurial efforts are being important for the beginning of the oil mills at Kolhapur. The availability of raw material, transportation and market facilities are also play an important role in the beginning of the oil mills at Kolhapur and Gadchinglaj cities in the Kolhapur. A considerable increase in the number of oil mills was notable in the Karveer tahsils of the district.

In 2001-2002 there were 21 oil mills were existed in the district. The oil mills increases up to 26 in 2011-2012. The index of growth is 123.81 in the period of investigation. There were (66.66 percent) 14 oil mills were concentrated in Karveer tahsil of the district in 2001-2002 (Map No.6.3 A). There are three (14.28 percent) oil mills were existed in each in the Hatkangale and Gadhinglaj tahsils during 2001-2002 (Table no.6.1). The Shahuwadi tahsil has one unit (4.76 percent) of oil mills in 2001-2002.

The number of oil mills increases in the Karveer, Hatkangale, Gadhinglaj and Changad tahsils of the district in 2011-2012. The Karveer (16), Hatkangale (4), Gadhinglaj (4), Changad (1), Shahuwadi (1) are the main tahsils having oil mills in the year 2011-2012. (Map No.6.3B) The share of the oil mills in Karveer tahsil (61.53 percent) was shown decreases as compare to year 2001-2002.

There is increase in the share of oil mills (15.38 percent) in the Hatkangale and Gadhinglaj tahsils of the district respectively. Changad tahsil has one oil mill in 2011-2012. The Shahuwadi and Changad has 3.85 percent share in the oil mills respectively during the year 2011-2012. (Map No. 6.3 B)

There is a considerable change was observed in the increase of oil mills particularly in the Karveer, Hatkangale, and Gadchinglaj tahsils of the district (Map No.6.3 B).

The oil seeds made available in the district was inadequate because the farmers become replace the ground by the sugarcane. Therefore the mills have facing acute shortage of groundnut.
Kolhapur District
Tahsilwise Distribution of Edible Oil Mills
2001-2002
(A)

Map No.6.3 (A)
6.2.3 SPATIO-TEMPORAL GROWTH OF RICE MILLS

There were 10 rice mills existed in the year 2001-2002 in the district. (Map No.6.4 A) out of ten rice mills 4 rice mills were found in Karveer, 2 in Hatkangale and one each in Radhanagari, Kagal, Bhudargad and Ajara tahsils in the district in 2001-2002(Map No.6.4 A).

Rice mills are increased by 1.7 times from 2001-2002 to 2011-2012. During 2011-2012 there 17 rice mills were existed in the district out of them 5 each in Hatkangale and Karveer, 2 each in Ajara and Radhanagari, 1 each in Panhala, Kagal, Bhudarged tahsils of the district. (Map No. 6.4 B)

There is a considerable increase in the number of rice mills in the Hatkangale, Karveer, Radhanagari and Ajara tahsils of the district from 2001-2002 to 2011-2012.(Map No. 6. 4 B). Still there is a potential for the new begins of rice mills in the tahsils of the western part of the district.
Kolhapur District
Tahsilwise Distribution of Rice Mills
2001-2002
(A)

Legend:
Rice Mill

Map No.6.4 (A)
6.2.4 EMPLOYMENT IN AGRO-BASED INDUSTRIES

Agro-based industries play an important role in the generation of employment in the rural areas of any region. Thus the labour or worker is one of the major location factors of the agro-based industries. Majority of the peoples in the Kolhapur district are cultivators, agricultural labourers and other workers. But the different types of agro-based industries in the district provide a huge opportunity of employment to the rural peoples. The workers are available at comparatively much cheaper rates in this region. Many large and small scale agro based industries provided employment to the local labours. There were 46.92 percent peoples are engaged as labourers to the total population of the district in different category of the economic activities in the year 2001. Thus the skilled and unskilled, both types of workers are easily available in this region.

During 2001-2002 there were 24,209 workers working in the different types of agro-based industries in the district. The growth index of industrial workers was increased by 1.24 times during 2001-2002 to 2011-2012 in the study region. There were 30,114 workers working in the different types of agro-based industries e.g. Sugar factory, spinning mills, Edible oil mills and Rice mills in the year 2010-2011 (Table No.6.2).

Table No. 6.2
Kolhapur District: Employment in Agro-based Industries.

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Tahsil</th>
<th>2001-2002</th>
<th>2010-2011</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sug. ind.</td>
<td>Spin. mills</td>
</tr>
<tr>
<td>1</td>
<td>S.wadi</td>
<td>788</td>
<td>----</td>
</tr>
<tr>
<td>2</td>
<td>Panhala</td>
<td>2100</td>
<td>630</td>
</tr>
<tr>
<td>3</td>
<td>H. gale</td>
<td>3087</td>
<td>3065</td>
</tr>
<tr>
<td>4</td>
<td>Shirol</td>
<td>2114</td>
<td>2898</td>
</tr>
<tr>
<td>5</td>
<td>Karveer</td>
<td>2743</td>
<td>----</td>
</tr>
<tr>
<td>6</td>
<td>G.bavda</td>
<td>660</td>
<td>----</td>
</tr>
<tr>
<td>7</td>
<td>R.gari</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>8</td>
<td>Kagal</td>
<td>2471</td>
<td>----</td>
</tr>
<tr>
<td>9</td>
<td>B.gad</td>
<td>404</td>
<td>135</td>
</tr>
<tr>
<td>10</td>
<td>Ajara</td>
<td>692</td>
<td>----</td>
</tr>
<tr>
<td>11</td>
<td>G.laj</td>
<td>790</td>
<td>----</td>
</tr>
<tr>
<td>12</td>
<td>C.gad</td>
<td>1540</td>
<td>----</td>
</tr>
<tr>
<td>13</td>
<td>District</td>
<td>17389</td>
<td>6728</td>
</tr>
</tbody>
</table>

Source: Socio-economic abstract of the Kolhapur district 2001-02 to 2011-12.
During 2010-2011 there were 20,313 workers working in the sugar industry. It is increased by 1.16 times in the study region during the period 2001-2002 to 2010-2012. Sugar factory is one of the important agro-based industries of the study region which one provides a huge quantity of employment to the local level labourers in the study region.

The leading tahsils in the field of cooperative sugar factories has made an important role in the generation of employment to the local peoples. The Hatkanangale, Kagal, Karveer, Shirol and Changad are the main tahsils where the sugar industries being existed and provides employment to workers of the study region.

There were 9579 workers working in the spinning (yarn) mills during 2010-2011 in the study region. It increased by 1.42 times over the year of 2001-2002. There 4275 workers out of 9579 workers working in the spinning mills in the Hatkanangale tahsil of the district and the percentage 44.62 followed by Shirol (37.26 percent) 3570 workers out of total workers engaged in spinning mills in the district. The spinning mills a sector has provide a large quantity of employment to the workers in the study region. All the spinning mills are concentrated in the Hatkanangale and Shirol tahsils of the district during the period 2001-2002 to 2010-2011 (Table No.6.2).

During 2010-2011 there were 112 workers working in the edible oil mills in the study region. A very small quantity of labour engaged in this agro-based industry as compare to the other agro-industries E.g. Sugar and Spinning mills. Majority of the edible oil mills are concentrated in Karveer and Hatkanangale tahsils of the district. The workers are available at local level in the district. The Kolhapur is the main centre of this enterprise. Where the oil mills particularly located near the market place at Kolhapur.

Rice mills are another agro-based industry which provides a little quantity of employment to the workers. Though, it requires trained workers. There were 110 workers working in the rice mills of the district. The extent of its growth is 1.77 times from the year 2001-2002. It is clear from the table no.6.2 that there is 28.18 percent workers (31 workers) were engaged in this enterprise in the Hatkanangale tahsil. Shirol tahsil has five rice mills and ranks second (21.81 percent)
in employment. Radhanagari and Ajara tahsils which have two rice mills were existed in the study region. The Panhala and Radhanagari tahsils has well suitable for the rice mills where 18.18 percent workers working in the rice mills.

As compare to other agro-based industry of the district, there were majority labour force was working in the sugar industry, spinning mills, edible oil mills and rice mills they may become the potential source of labour in the rural sector of the study region.

During the period of investigation from 2001-2002 to 2010-2011 a remarkable growth was noted in number of the employment in the study region. A remarkable growth was recorded in the large scale agro-based industry e.g. Sugar and Spinning mills both the co-operative and private sector of the Kolhapur district.

6.3 CONCENTRATION AND DIVERSIFICATION OF AGRO-BASED INDUSTRIES

Kolhapur district lies in the extreme south of the state of Maharashtra. It is fortune that the district has been availed with the all the natural elements to its all round development. Geographically district has different characteristics. It influences on the socio economic development of the district. The farmers of the district grow different types of crops relied on the extremely geographical condition. There were different types of crops grown in the district e.g. cereals, fruits and vegetables and cash crops. It is the base of the development of agro-based industries. Different types agro-based industries exist in the district from long time.

The Kolhapur district is famous for the sugar industries, Cotton textile industries and different types of food processing industries. Particularly sugar industries are flourished in the middle and eastern part of the district. Cotton textile industry is the eastern part of the district. The region is having good fertile soil, sufficient drainage net work, irrigation facilities and other infrastructural facilities so it is all favorable for the existences and development of the different food processing industries in the district.

There is potential for new coming agro-based industries in the district. Still the district is enjoying the development of such types of agro-based industries
thoroughly. The development of these industries maintains adequate growth and creates sample opportunities of employment in the district.

6.3.1 CONCENTRATION OF AGRO-BASED INDUSTRIES

Industrial concentration means the variation in the density of any industrial area at a given point of time. The concentration of these agro-based industries depends on terrain, agricultural production, availability raw material, water, transportation system, market place and pedological conditions. It is a tendency to have high concentration in area of ideal infrastructure condition place, perfect knowledge of industrial concentration and diversification pattern in a region which has been considered to be most useful in the judicious industrial planning. The general concentration of an enterprise can be quantified with help of location quotient or by co-efficient of localization.

In order to determine the regional concentration of selected agro-based industries Bhatia’s method of crop concentration (1965) is used with modification for calculation quotients. The following formula is used for the concentrations of selected agro-based industries:

\[
\text{Indx. of Concent.} = \frac{\text{No. of ind.} \, ‘a’ \, \text{in the comp. area unit}}{\text{No. of all sectd. agro ind. in the comp area unit}} \times \frac{\text{No. of agro. ind.} \, ‘a’ \, \text{in the entr. area}}{\text{No. of all sectd. agro ind. unit in the entr. study region}}
\]

Table no. 6.3 reveals that the index values of concentration of agro-based industries for the year 2001-02 and 2011-12.

6.3.1.1 CONCENTRATION OF SUGAR INDUSTRY

From the table 6.3 it is noted that the low concentration of sugar industries was recorded in Gadhinglaj, Karveer, Hatkanangle and Shirol tahsils of the Kolhapur district in the year 2001-2002. Whereas moderate concentration of sugar industries was recorded in Ajra, Kagal, Panhala and Shahuwadi tahsils in 2001-2002. High concentration was recorded in Chandgud, Gaganbavada tahsils in 2001-2002. None of
the industrial concentration of agro-based industries was recorded in the tahsils of Radhanagari and Bhudarged in the year 2001-2002 (Map 6.5 A).

Table no. 6.3

Kolhapur District: location quotient of industrial concentration

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sugar ind.</td>
<td>Spin mills</td>
<td>Edi.oil mills</td>
<td>Rice mills</td>
<td>Sugar ind.</td>
<td>Spin. Mills</td>
</tr>
<tr>
<td>1</td>
<td>Shahuwadi</td>
<td>2.27</td>
<td>0.00</td>
<td>1.67</td>
<td>0.00</td>
<td>2.27</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td>Panala</td>
<td>3.00</td>
<td>1.00</td>
<td>0.00</td>
<td>0.00</td>
<td>2.27</td>
<td>0.81</td>
</tr>
<tr>
<td>3</td>
<td>Hatkangale</td>
<td>0.62</td>
<td>1.97</td>
<td>0.45</td>
<td>0.64</td>
<td>0.50</td>
<td>1.84</td>
</tr>
<tr>
<td>4</td>
<td>Shiro</td>
<td>0.64</td>
<td>2.66</td>
<td>0.00</td>
<td>0.00</td>
<td>0.91</td>
<td>2.58</td>
</tr>
<tr>
<td>5</td>
<td>Karveer</td>
<td>0.64</td>
<td>0.00</td>
<td>2.20</td>
<td>1.36</td>
<td>0.54</td>
<td>0.13</td>
</tr>
<tr>
<td>6</td>
<td>G.bavada</td>
<td>4.54</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>4.54</td>
<td>0.00</td>
</tr>
<tr>
<td>7</td>
<td>R.nagari</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>7.14</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>8</td>
<td>Kagal</td>
<td>3.00</td>
<td>0.00</td>
<td>0.00</td>
<td>2.36</td>
<td>3.40</td>
<td>0.00</td>
</tr>
<tr>
<td>9</td>
<td>B.gad</td>
<td>0.00</td>
<td>1.57</td>
<td>0.00</td>
<td>3.57</td>
<td>1.50</td>
<td>1.06</td>
</tr>
<tr>
<td>10</td>
<td>Ajara</td>
<td>2.27</td>
<td>0.00</td>
<td>0.00</td>
<td>3.57</td>
<td>1.14</td>
<td>0.81</td>
</tr>
<tr>
<td>11</td>
<td>G.laj</td>
<td>0.91</td>
<td>0.62</td>
<td>2.00</td>
<td>0.00</td>
<td>0.73</td>
<td>0.52</td>
</tr>
<tr>
<td>12</td>
<td>Cha.gad</td>
<td>4.54</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>3.40</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Source: Computed by Author.

The notable changes in the concentration of sugar industry in the year 2011-2012 were shown in Table No. 6.3 in the study region. There is low concentration of sugar industries was recorded in the tahsils of Gadtinglaj, Karveer, Hatkanagle, Shiro. The moderate concentration of sugar industry was recorded in the tahsils of Shahuwadi, Panhala, Bhudarged, Ajara tahsils of the district in the year 2011-2012. The high concentration of sugar industries was recorded in the Chandgad, Gaganbavada tahsils of the district in 2011-2012. None of sugar industry was concentrated in the Radhanagri tahsils of the district (Map 6.5 B). Notable change was observed in the concentration of sugar industries in the Kagal and Bhudarged tahsils of the study region.
Map No.6.5 (B)
6.3.1.2 CONCENTRATION OF SPINNING MILLS

Low concentration of spinning mills (0 to 1) was recorded in Gadhinglaj and Panhala tahsils and moderate concentration (1 to 2) of cotton spinning was observed in Bhudargad and Hatkangale tahsils of the district in 2001-2002. (Map 6.2 A) High concentration (> 2) of spinning mills was recorded in Shirol tahsils. None of the concentration of spinning mills was recorded in the Radhanagari, Gaganbavada, Kagal, Karveer and Shahuwadi tahsils of the district in 2001-2002 (Map 6.6 A).

Low concentration was observed in spinning mills (0 to 1) in Ajara, Gadhinglaj and Karveer and Panhala in 2011-2012 (Map 6.6 B). Moderate concentration was recorded in (1 to 2) the Bhudargad and Hatkanangale in 2011-2012. The high (> 2) concentration was observed in the Shirol tahsils in the year 2011-2012. There is none of concentration is observed in the Chandgad, Radhanagari and Shahuwadi tahsils of the Kolhapur district (Map 6.6.B). There is change in the concentration of spinning mills was noticed from 2001-2002 in the tahsils Ajara and Karveer tahsils of the Kolhapur district. (Map.no.6.6 A and B)

6.3.1.3 CONCENTRATION OF OIL MILLS

Low concentration (0 to 1) of oil mills was found in the Karveer tahsils and moderate concentration (1 to 2) was recorded in Gadhinglaj and Shahuwadi tahsils in the district in 2001-2002 (Map 6.7 A). High concentration (>2) of oil mills was observed in Karveer tahsils of the district in 2001-2002. None of the concentration in oil mills was observed in the Chandgad, Ajara, Bhudarged, Radhanagari, Gaganbavad, Panhala and Shirol tahsils of the district in 2001-2002 (Map 6.7 A).

The low concentration (0 to 1) of oil mills was noted in the year 2011-2012 in Chandgad and Hatkananagale tahsils of the district (Map 6.7 B). The moderate concentration (1 to 2) was observed in the tahsil Shahuwadi in the Kolhapur district. The high concentration of oil mills in 2011-2012 was observed in the Gadhinglaj and Karveer tahsils of the district. None of the concentration in 2011-2012 was recorded in the Ajara, Bhudarged, Radhanagari, Gaganbavada, Panhala and Shirol tahsils of the district (Map no.6.7 B).

The change in the concentration of oil mills was recorded in the tahsils of Chandgad and Gadhinglaj in the Kolhapur district (Map 6.7 A and B).
Map No.6.6 (A)

Kolhapur District
Concentration of Soot (Yarn) Girni
2001-2002
(A)
Kolhapur District
Concentration of Soot (Yarn) Girni
2011-2012
(B)

Legend:
Location Quotient
- > 2
- 1 to 2
- 0 to 1
- None

Map No.6.6 (B)
Kolhapur District
Concentration of Oil Mills
2001-2002

(A)

Legend:
Location Quotient
> 2
1 to 2
0 to 1
None

Map No.6.7 (A)
Kolhapur District
Concentration of Oil Mills
2011-2012
(B)

Map No.6.7 (B)
6.3.1.4 CONCENTRATION OF RICE MILLS

Low concentration of rice mills (0 to 1) was noticed in Karveer and Hatkanagale tahsils of the district in 2001-2002 (Map 6.8 A). The moderate concentration of rice mills was (2 to 3) recorded in Kagal tahsils of the district in 2001-2002 and high concentration of rice mills (>3) was observed in Ajara, Bhudargad and Radhanagari tahsils of the district in 2001-2002. (Map no. 6.8 A). No concentration in rice mills was recorded in the Chandgad, Gaganbavada, Panhala and Shahuwadi tahsils in the Kolhapur district in 2001-2002 (Map no. 6.8 A).

The low concentration in rice mills (2 <) was recorded in the Bhudargad, Kagal, Karveer, Panhala and Hatkanagale tahsils of the district in 2011-2012. (Map no.6.8 B) The moderate concentration in rice mills (2 to 3) was observed in the tahsils of Ajara and high concentration was noted in the tahsils (>3) of Radhanagari in the district. (Map no. 6.8 B) None of the concentration of rice mills was noted in the tahsils of Chandgad, Gudhinglaj, Gaganbavada, Shahuwadi and Shirol tahsils of the district in 2011-2012. (Map no.6.8 B)

The change in rice mills was recorded in the tahsils of Bhudargad, Ajara, Kagal, Panhala tahsils in the district during 2001-2002 to 2011-2012 (Map no. 6.8 A B).
Kolhapur District
Concentration of Rice Mills
2011-2012
(B)

Map No.6.8 (B)
6.4 INDUSTRIAL DIVERSIFICATION

Industrial diversification is a concept which is opposite to industrial specialization. Diversification in industrial pattern means a variety of industries involving intensity of competition amongst a regional industry for arable land. The diversification in structural forms of industry such as industrial pattern, cropping pattern explain why it is possible or necessary to start a variety of agro-based industries which possess nearly an even proportion. Industrial activities which have obviously involve intense competition among various activities for space. The keener the competition the higher the magnitude of diversification and lesser the competition greater will be the trend towards specialization or monoculture, where emphasis is on one or two industries.

The Gibbs-Martin index of Diversification is a useful alternative index for testing the diversification of employment in industry. It was developed by Gibbs and Martin in 1962. If the labour force in a region is concentrated wholly in one industry, the index is zero; if it is distributed throughout every industry (i.e. Maximum diversification) the index approaches 1. For computing index of diversification the following formula was accepted and used for the calculation of index of diversification. The formula is employed in the form of following formula.

\[
\text{Index of diversification} = 1 - \frac{\sum x^2}{(\sum x)^2}
\]

Where, \(x\) is the number of employees in each industrial category. The range of the Gibbs-Martin index of diversification run from 0 (absolute concentration) to 0.9 (completely diversification) Gibbs-Martin index is called as an index of diversification.

The indices of industrial diversification are calculated for the period i.e. 2001-2002 and 2010-2011 (Table No. 6.4) and shown in (Map 6.9 A and 6.9 B) respectively. It shows the regional distribution of pattern of Agro-based industrial diversification grouped in to four categories viz:

1. Perfect concentration (0.00)
2. Areas of low diversification (0.20 <)
3. Areas of moderate diversification (0.21 to 0.40)
4. Areas of high diversification (> 0.40)
Table No. 6.4
Kolhapur District: Index of Diversification of Agro-based Industries

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Tahsils</th>
<th>Index of Diversification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2001-2002</td>
</tr>
<tr>
<td>1</td>
<td>Shahuwadi</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td>Panhala</td>
<td>0.35</td>
</tr>
<tr>
<td>3</td>
<td>Hatkananagle</td>
<td>0.49</td>
</tr>
<tr>
<td>4</td>
<td>Shirol</td>
<td>0.49</td>
</tr>
<tr>
<td>5</td>
<td>Karveer</td>
<td>0.03</td>
</tr>
<tr>
<td>6</td>
<td>Gaganbavada</td>
<td>0.00</td>
</tr>
<tr>
<td>7</td>
<td>Radhanagari</td>
<td>0.00</td>
</tr>
<tr>
<td>8</td>
<td>Kagal</td>
<td>0.00</td>
</tr>
<tr>
<td>9</td>
<td>Bhudargad</td>
<td>0.37</td>
</tr>
<tr>
<td>10</td>
<td>Ajara</td>
<td>0.03</td>
</tr>
<tr>
<td>11</td>
<td>Gadhighalaj</td>
<td>0.02</td>
</tr>
<tr>
<td>12</td>
<td>Chandged</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Source: Computed by Author.

The perfect concentration (0.00 indices) of agro-based industries was found in Shahuwadi, Gaganbavada, Radhanagari, Kagal and Chandgad tahsils of the district in 2001-2002 (Map No.6.9 A). Low diversification of agro-based industries (below 0.20) was found in Karveer, Ajara and Gadhinglaj tahsils of Kolhapur district. Moderate concentration (0.21 to 0.40) of agro-based industries was found in the Bhudargad and Panhala tahsils of the district in year 2001-2002 (Map No.6.9 A). High industrial diversification (more than 0.40) was recorded in the Hatkanagale and Shirol tahsils of the district in 2010-2011 (Map No.6.9 A and Table No. 6.4).

In the year 2010-2011 the perfect concentration of agro-based industries was observed in the Gaganbavada, Radhanagari and Chandgad tahsils of the district (Map No.6.9 B and Table No.6.4). Low industrial diversification (below 0.20) of agro-based industries was noted in the Shahuwadi and Kagal tahsils of the district. Moderate diversification (0.21 to 0.40) of agro-based industries was observed in the Gadhighalaj, Karveer, Panhala and Bhudargad tahsils of the district in the year.
2010-2011 (Map No.6.9 B and Table No.6.4). High diversification (more than 0.40) was recorded in the Ajara, Shirol and Hatkangale tahsils of the district in during the year 2010-2011 (Map No.6.9 B).

Some changes have been noted in the diversification of agro-based industries from 2001-2002 to 2010-2011 in the district. The major changes in the diversification of agro-based industries were noted in the Kagal and Shahuwadi tahsils from perfect concentration to low concentration. Low to high diversification is noted in the tahsil Ajara. The Shirol and Hatkanangale tahsils has remained highly diversified in the agro-based industries during this period.

The Kagal tahsil had only two sugar industries in 2001-2002 now it has three sugar industries, Shahuwadi tahsils has one sugar industry in 2001 to 2012 prior to this period there was nothing any industry in the tahsil. The Gadhinglaj tahsils had five agro-based industries in 2001-2002 now in 2010-2012 it has six agro-based industries. Therefore changes have been noted from 2001-2012. Kareer tahsils has recorded low to moderate diversification due to the increase of agro-based industries from number 21 to 25 and particularly the no. of industries grown e.g. oil mills, rice mills and spinning mills.

There Shirol and Hatkangale tahsils have remain diversified in agro-based industries during the period 2001-2012. Particularly the change has been noted in sugar industries, spinning mills, oil mills and rice mills. Karveer tahsils has noted changes in the number of sugar industries and spinning mills in the district.

The number of employment has grown from 24204 to 30114 from 2001 to 2011 in the district.

6.5 SUMMARY

The number of considerable agro-based industries was established in the district from the year 2001-2002 to 2011-2012. Sugar industry, spinning mills, oil mills, rice mills and other food processing units are the most important agro based industry in the district.

Sugar industries were increased by 1.31 times in the study region during 2001-02 to 2011-12. Hatkanangale, Kagal and Chandgad are the leading tahsils of the district in
the number of sugar factory. All essential factors are available for sugar industry in these tahsils. Except the Radhanagri each tahsil has a sugar factory. The Gaganbavada tahsil has newly emerged tahsil in this field of sugar factorirs.

Cotton textile industry of the district is particularly concentrated at Ichalkaranji. The spinning mills were increased by 1.26 times during 2001-02 to 2011-12. The numbers of spinning mills were increased from 23 to 29 during the period of investigation. A notable increase in the number of spinning was recorded in the Hatkanangale and Shirol tahsils of the district.

Edible oil industry of the district is mainly located in Karveer, Gadhingalj and Hatkanangale tahsils of the district. The index of growth of edible oil is 1.23 times from 2001-02 to 2011-12. The share of oil mills was decreased in the Karveer tahsil as compare to total number of oil mills in the district during this period. The notable increase in numbers of oil mills was recorded in the karveer, Hatkanangale and Gadhingalaj tahsils.

The rice milling was one of the important agro-based industries in the district. The growth index of the rice mill was 1.7. Majority of the rice mills were located at Kolahapur, Ichalkaranji. Particularly, the rice mills closely located to the industrial estates of the district. A considerable increase in the number of rice mills was noted in the Hatkaangale, Karveer, Radhanagari and Ajara tahsils of the district.

The different type of agro-based industries provides employment opportunity to the people of the study region. The employment in agro-based industries of the district is increased by 1.24 times from 2001-02 to 2011-12. There were 67.45 per cent of employment was provided by the sugar factories. Spinning mills have next to provide the employment to the peoples of the region it would provide 31.81 per cent employment to the peoples as compare to total employment of the Agro-based industries in the district. Very little opportunity was made by the oil and rice mills in this connection.

The table 6.3 reveals that the concentration of the agro-based industries in the study region. Low concentration of sugar industries was recorded in the Gadhinglaj, Karveer, Hatkanangale and Shirol tahsils of the study region. The moderate concentration was noted in the Shahuwadi, Panahala, Bhudargasd and Ajara
were as high concentration of sugar industries was recorded in the Chandgad and Gaganbavada tahsils of the district during 2011-2012.

From the analysis of the table 6.3 it is said that, the low concentration of spinning mills recorded in the Ajara, Gadlingalaj and Karveer and Panhala. Moderate concentration was observed in the Bhudargad and Hatkanangale where as high concentration of spinning mills were observed in the Shirol tahsils of the district during 2011-12.

Table 6.3 revels that the concentration index of agro-based industries in the study region. The low concentration of oil mills was noted in the Chandgad and Hatkanangale where as moderate concentration of oil mills were noted in the Shahuwadi. High concentration of oil mills was observed in the Gadlingalaj and Karveer tahsils of the district in 2011-12.

There were 17 rice mills was recorded in the district during 2011-12. The low concentration of the rice mills was recorded in the Bhudarga, Kagal, Karveer, Pqanhala and Hatkanangale. Moderate concentration of rice mills was observed in Ajara whereas high concentration of rice mills was observed in the Radhanagari tahsils of the district in 2011-12.

Perfect concentration of agro-based industries was observed in the Gaganbavada, Radhanagari and Chandgad tahsils of the district. Low diversification of agro-based industries was recorded in the Shahuwadi and Kagal tahsils of the study region. Moderate diversification of agro-based industries was observed in the Gadlingalaj, Panhala and Bhudargad. High diversification was recorded in the Ajara, Shirol and Hatkanagale tahsils of the district 2011-2012.

The major changes in the diversification of the agro-based industries were noted in the Kagal and Shahuwadi tahsils from perfect concentration to low diversification, low to high diversification is noted in the Ajara. Shirol and Hatkanangale tahsils has remain highly diversification from 2001-02 to 2010-11.
REFERENCES


12. http://kolhapur.gov.in
15. http://www.kolhapurdistrict.org.in
17. http://www.maharashtra.gov.in