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INTRODUCTION:

The measurements of production and inputs required for the yield and output is known as agricultural productivity. The study of the spatial variations in agricultural productivity is useful for identifying, the different areas of agriculture. In developing countries like India, land is limited for making expansion into cultivated area. Further, increasing pressure of population on land compels the scientists to think for the improvement of agricultural productivity. Thus, to solve the food problem a suitable way is, to increase the production per unit area and per unit of time, Hence, a measurement of the existing agricultural productivity becomes necessary before any remedial steps can be taken.

Agricultural productivity is the interplay of a multitude of many factors, such as environmental, socio-economic and technological factors. The agricultural productivity is closely related to the per hectare yields, where as the agricultural efficiency is much more than agricultural productivity and conveys a more comprehensive meaning. Agricultural productivity is the actual performance of the land in terms of per hectare yield, where as agricultural efficiency is a ratio between the achievement in terms of agricultural production and the actual potential of the land productivity is a physical rather than a value concept and describes the changing relation between out put and one of the major inputs like land, labor, and capital.

7.1 PRODUCTIVITY OF PRINCIPAL CROPS:

Wheat, Jawar, Bajra, Maiz, Tur, Gram, Sugarcane, Cotton and Groundnuts are the important crops of the Solapur District. Sugarcane and Jawar is accounting for more than 50 percent of the total cultivated area of the region. Jawar can be grown both a Rabi and Kharif crops in
Solapur district. Wheat is more common in dry areas. Sugarcane is the principal crop of the region. It is a late arrival in the field of cash crops. Its cultivation is confined to the areas receiving adequate and timely irrigation.

The crop productivity changes have occurred in response to many technological developments during the last few decades. The adoption of seeds, fertilizers and irrigation has resulted into increase of farm production and diversifying the production pattern. The soil conservation has been an addition, for increasing the productivity. Thus, all these factors interact the changes in agricultural production.

7.1.1 LEVELS OF JAWAR PRODUCTIVITY:

There are wide variations in the yield of Jawar in the region under study. The average productivity of the region as a whole is 449 Kg per hectare in 2000-01. The tahsil wise yield ranges from 225.4 Kg. per hectare to 812.8 Kg per hectare. In the region, the three tahsils have recorded a yield level of greater than 725 Kg. per hectare. The very high productivity is observed in Mangalvedha tahsil with an average productivity of 812.8 Kg per hectare. The improved dry farming techniques assured supply of water, use of new strains of seeds, proper also of fertilizers, and modern methods in Jawar husbandry, all of them are responsible for higher production. The moderate level of productivity is noted in Karmala, Pandharpur, Mohol and South Solapur. At the other extreme, remaining all tahsils has low productivity with output per hectare of less than 425 Kg per hectare. (Fig. 7.1)

7.1.2 LEVELS OF BAJRA PRODUCTIVITY:

There are wide variations in the average level of productivity of bajra. The average productivity of bajra, in the region is 415 Kg per hectare during 2000-01 periods. In the region understudy the four tahsils have
SOLAPUR DISTRICT

Yield Level of Jawar (2000-01)

Productivity Kg./hectare
- High: More than 725
- Moderate: 425 to 725
- Low: Less than 425

Yield Level of Bajra (2000-01)

Productivity Kg./hectare
- High: More than 400
- Moderate: 200 to 400
- Low: Less than 200

Figure 7.1
productivity above district average and seven tahsils have below average. The major parts of Solapur district i.e. Mohol and North Solapur have high level of bajra productivity. The moderate productivity is recorded in Barshi, Karmala, Malshiras, Sangola and Mangavedha tahsiles. In Madha, Pandharpur, South Solapur and Akkalkot, the productivity is low. Recently new strains and the improvement in dry farming techniques have improved the productivity of bajra.

The highest yields of 415 Kg per hectare are recorded in 2001. And production is recorded of 22100 metric tones region as a whole.

7.1.3 LEVELS OF WHEAT PRODUCTIVITY:

The distribution pattern of wheat productivity is given in Fig 7.2. The average productivity of wheat in the region is 1100 Kg. per hectare. There are only four tahsils which have a yield above 1500 Kg per hectare. These four tahsils are namely Karmala, Malshiras, Pandharpur and North Solapur; all together make a major contribution to wheat output in the region. The moderate production of wheat is observed in Madha, Mohol, and south Solapur tahsils and low production in Barshi, Akkalkot, Mangalvedha and Sangola tahsils with an average productivity of 1000 Kg per hectare, during the period 2000-01. The yield and production of wheat are the highest in the region, but slowly declined 1991 onwards.

7.1.4 LEVELS OF TUR PRODUCTIVITY:

Tur is a more important food grain of the region. The average productivity of the region is 387 Kg per hectare. There are three tahsils namely, North Solapur, Sourth Solapur, and Akkalkot, which have recorded productivity level higher than 500 Kg per hectare. At the extreme, the four tahsils namely Barshi, Karmala, Malshiras, and Mangalvedha which have productivity levels less than 250 Kg per
hectare. Sangola, Pandharpur, Madha, Mohol tahsils have productivity ranging between 250 to 500 Kg. per hectare. The levels of tur productivity are very high in those parts of the district where tur concentration is significant. Tur is used by the people in daily diet as a pulse and hence, it is grown by the people in sizable area of the Solapur District.

The highest yield and production in 2000-01 recorded 387 Kg per hectare and total production of 12500 metric tones, where as the yield per hectare and production was relatively low in 1980-81.

7.1.5 LEVELS OF GRAM PRODUCTIVITY:

Gram is known as (HARBARA) in rural areas. The average productivity of region is 564 Kg per hectare. There are four tahsils namely Barshi, Karmala, Malshiras and South Solapur which have productivity, levels higher than 500 Kg per hectare. There are three tahsils which have productivity levels, less than 250 Kg per hectare. Low productivity occurs in North Solapur, Mangalvedha and Mohol, where local factors such as poor soils, relief and low intensity of irrigation directly affect the level of gram production. Elsewhere, the level of gram production ranges from 250 to 500 Kg per hectare. (Fig. 7.3)

The yield of gram in 1980-81 was 355 Kg per hectare and total production was 11300 metric tones. The highest yield and production have been recorded during 2000-01.

7.1.6 LEVEL OF GROUNDNUT PRODUCTIVITY:

Groundnut is the important oilseed crop of the region and its area of concentration is in southern part of South Solapur tahsil. The average productivity of region is 932 Kg per hectare during 2000-01. It recorded high productivity with an average productivity of 653 Kg per hectare
while low productivity is in Akkalkot tahsil with an average productivity of 269 kilogram per hectare. Elsewhere, the levels of production are moderate due to agronomic limitation and the competition with grain crop.

In 1980-81 the total production was 61200 metric tones for region as a whole, and yield per hectare was 915 Kg. After that the production and yield were increased in 1991. Then, there has been a decline in the production and yield per hectare during the 2000-01 periods.

The productivity level of individual crop do not give an average picture of agricultural productivity, hence, the overall level of agriculture productivity is attempted by applying standard quantitative method as below.

Table: 7.1

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Crops</th>
<th>Yield per hectare in Kg.</th>
<th>Production in ‘00’ tones.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Jawar</td>
<td>349</td>
<td>443</td>
</tr>
<tr>
<td>2.</td>
<td>Bajra</td>
<td>282</td>
<td>383</td>
</tr>
<tr>
<td>3.</td>
<td>Wheat</td>
<td>942</td>
<td>1035</td>
</tr>
<tr>
<td>4.</td>
<td>Tur</td>
<td>199</td>
<td>243</td>
</tr>
<tr>
<td>5.</td>
<td>Gram</td>
<td>355</td>
<td>497</td>
</tr>
<tr>
<td>6.</td>
<td>Groundnut</td>
<td>915</td>
<td>1688</td>
</tr>
</tbody>
</table>

Source: Socio-economic Abstract of Solapur district (1980-2001)

7.2 MEASUREMENT OF AGRICULTURAL PRODUCTIVITY:

Identification and delineation of various areas of agricultural productivity have been attempted by many scholars by using many
techniques. In the present investigation, three methods such as Kendal’s, ranking co-efficient methods, yield index method and Bhatia’s method have been used for the measurement of agricultural productivity. The weakness of Kendal’s ranking co-efficient method namely; neglect of the aerial strength of crops was removed by Sapre and Deshpande, (1964). After that, further, modification has been attempt by Bhatia (1967).

7.2.1 Measurement of Productivity by Kendal’s Ranking Co-efficient method:

Here, the Kendal’s ranking co-efficient method (1968) is used while applying this technique; seven major crops grown in all the tashils of the district are selected. The crops have ranked in order to their yield per unit area. Then the arithmetic mean of these ranks is obtained which Kendal’s called as ranking co-efficient and the same is represented cartographically. Lower the co-efficient value, higher is the productivity level of agriculture.

Results and discussion:

Three areas of agricultural productivity have been identified as shown in (Fig. 7.4)

I. Areas of high productivity.

II. Areas of moderate productivity

III. Areas of low productivity.

I. Areas of high productivity -

This category is confined largely to northern and eastern part of Solapur district comprising the tashils of South Solapur, North Solapur, Mohol, Barshi, and Karmala. The rivers in this area provide water for irrigation in Rabi Season. The river basins have fertile soils and many farmers in this area are adopting new inputs in agriculture by using. Fertilizers, machinery, improved seeds etc. All the favorable factors and
SOLAPUR DISTRICT
Agricultural Productivity Kendal's Method

Co-Efficient Value

- **High**: Below 5.5
- **Moderate**: 5.5 to 6.5
- **Low**: Above 6.5

Fig. No.7.4
human efforts have resulted into the high agricultural productivity in the region of Solapur district.

II. Areas of Moderate productivity -

This category of productivity covers four tahsils. The co-efficient value in this area ranges from 5.5 to 6.5. Akkalkot tahsil is quite famous for pulses cultivation. Other tahsils like Akkalkot, Sangola, Pandharapur, Malshiras have fertile soil but paucity of water for irrigation and high variability of rainfall have resulted into moderate agricultural productivity.

III. Areas of low productivity -

The low productivity areas cover two tahsils where the co-efficient value is above 6.5. The high variability of rainfall and low intensity of irrigation have led to low agricultural productivity in dry areas of the district.

7.2.2 Measurement of Productivity by Yield Index Method:

The regional imbalance in agricultural productivity of Solapur district is measured by using index method. While applying this method, the seven crops grown in most of the tahsils are selected. The yield index of each crop is calculated by the equation given below:

\[
\text{Yield of crop: } \frac{\text{Yield of crop} \text{ ‘a’ in the areal unit}}{\text{Yield of crop ‘a’ in the region}} \times 100
\]

Then the composite yield index was obtained for each tahsil and the same is represented cartographically on the map of Solapur district. (Fig.7.5)

Results and discussions:

Three categories such as: (1) Areas of high productivity. (2) Areas of moderate productivity and (3) Areas of low productivity have been identified as below:
SOLAPUR DISTRICT
Agricultural Productivity Yield Index Method

Co-Efficient Value

- High: Below 115
- Moderate: 90 to 115
- Low: Above 90

Fig. No.7.5
Areas of high productivity:

It is mainly confined to the central and eastern part of district excluding south Solapur tahsil. Thus the tahsils of Mohol, Karmala and North Solapur recorded high productivity.

I. Areas of moderate productivity -

This category of productivity is mainly observed in western part of Solapur district except Karmala. The rainfall is low in Sangola tahsil. Irrigation facilities are not more developed. The average yield of crop is low. Kharif crops are dependent on monsoon and Rabi crops are grown only where water is available for irrigation.

III. Areas of low productivity -

In the central part of Solapur district low production is recorded. This part consists of Madha, Pandharpur, Malgalvedha and Akkalkot tahsils. Hence, the yield of crops is very low. The irrigation facilities are not developed. Agricultural implements are old and traditional. Rainfall is uncertain, thus, the combined effect of all these factors leads to the low agricultural productivity.

7.2.3 Measurement of Productivity by Bhatia’s Method:

The levels of agricultural productivity are the result of natural environment and partly of human activities. It is a dynamic concept and any change in above factors may affect agricultural production. Thus, to reckon the regional differences in levels of agricultural productivity here, Bhatia’s weighted average yield index is also used. Seven crops are selected for this purpose and weights are given by taking, crop land devoted to each crop. This has been represented as given under,: 

i) \( \text{Iya} = \frac{yc \times 100}{yr} \)

\( \text{Iya} = \text{yield index of crop ‘a’} \)
yc = yield of crop ‘a’ in the areal unit.
Yr = yield of crop ‘a’ in the region.

ii) \[ Ap = \frac{Iya \times Ca + Iyb \times cb}{Ca + cb} \times Iyn \times cn. \]

Ap = Agricultural productivity.

Iya, Iyb = Yield index of various crops.
Ca, Cb = percent of cropland under different crops.

On this basis, the agricultural productivity of each tahsil of Solapur district has been computed and mapped. (7.6)

**Result and discussions:**

Fig. 7.6 brings out the general pattern of regional imbalances in the levels of agricultural productivity. For discussion, the region is grouped into three categories namely: i) Areas of high productivity. (ii) Areas of moderate productivity and. (iii) Area of low productivity.

**I. Areas of high productivity:**

The area of this category includes only three tahsils of the district, namely, south Solapur, Mohol and Madha. This area coincides with the area of laterite to deep black soils and high intensity, of irrigation. This has been reflected in high agricultural productivity. The highest productivity is recorded in Madha tahsil of Solapur district.

**II. Areas of moderate productivity:**

The tahsils of Barshi, Karmala, Malshiras, and Akkalkot have moderate agricultural productivity with the development of irrigation facilities, these tahsils may be improved even in the higher productivity in future.
SOLAPUR DISTRICT
Agricultural Productivity Bhatia's Method

Co-Efficient Value

- High: Below 135
- Moderate: 100 to 135
- Low: Above 100

Fig. No.7.6

260
III. Areas of low productivity:

The areas of low level of agricultural productivity occur in all the remaining tahsils of Solapur district. Here, local factors such as poor soils and very low intensity of irrigation affect the level of agricultural productivity. In this part of the district, the level of crop production per unit area can also be raised by using improved seeds and increasing irrigation facilities.

7.3 AGRICULTURE AND MARKETING:

There is a close relationship between agricultural productions on the one hand, and availability of enough food grain on the other. In subsistence type of agriculture, a small portion of agriculture production is also sent to market for earning cash. Therefore, in the following paragraph an account of agriculture market centers and pattern of agricultural marketing is also attempted.

Agricultural marketing is one of the manifold problems which have a direct bearing upon the prosperity of the cultivator. The problem of marketing is greater in agriculture than industries, as the agricultural products are bulky and perishable. The producers of agricultural goods are scattered over large rural areas and the entire surplus is not consumed by the people locally and it is sent to a distant urban centers, hence, the cost of transport is also high.

Marketing system in the region is of three types namely regulated, retail, wholesale, and periodical. As far as the farmers and agriculture of the region are concerned, regulated, wholesale and periodical marketing are more important.

Regulated and wholesale market centers are located at the tahsil headquarters and other urban centers. The regulated markets in the district are the wholesale trade centers which are mainly the export
centers of surplus commodities. All the regulated markets are established under the new Act of 1963 which was actually implemented in this district since 1967. All the tahsils in the district are served by regulated markets.

The objectives of this establishment of market centers are (i) To bring about equity in bargaining power among the agriculturists and traders (ii) To prevent malpractices and iii) To promote mutual confidence.

Hence, an attempt is made to analyze the role of agricultural market centers in respect of agriculture of the region under study. The marketing activity of major centers is given below. There are number of market centers in the solapur district. Every tahsils centre has a market to purchase the agricultural produce. (Fig.7.7)

**MARKET CENTERS:**

**7.3.1 BARSHI:**

The agricultural produce market committee at Barshi was established on 11th June 1948. It is the biggest and the most important market in the district. This market is commonly called as ‘Gateway of Marathwada’ in the field of agricultural trade. A large amount of agricultural produce is brought for sale at this market. It is served by convenient means of transport and communications which attract agriculturists and traders from Marathwada region. The Latur-Miraj railway line of south central railway as well as many state high ways serves the centre. The important regulated commodities are groundnut, mug, green, yellow, monglai, udid, sanflower, jawar, bajari, wheat, gram turmeric, chillis, gur, tamarind etc. Besides, the market committee has along regulated cattle trade consisting of cows, bullocks, male and female buffaloes, sheep and goats since 1964.
The Barshi market is an assembling as well as distributing center of all agricultural commodities. Of the total assembled produce, 20 percent retained for local consumption and 80 percent is exported to distant market centers. The following commodities are exported to the destinations mentioned against them. (Fig. 7.7)

Table 7.2
Commodity and its destination

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Commodity</th>
<th>Destination</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Groundnut</td>
<td>Bombay</td>
</tr>
<tr>
<td>2.</td>
<td>Mug</td>
<td>Goa, Bombay, Gujrat, Bihar, Madras,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mysore, Kerala, Andra Pradesh</td>
</tr>
<tr>
<td>3.</td>
<td>Udid</td>
<td>Goa, Madras, Kerala, Bihar, Andra</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pradesh.</td>
</tr>
<tr>
<td>5.</td>
<td>Tur and Turdal</td>
<td>Bombay, Pune, Gujrat, Madras, Mysore,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kerala.</td>
</tr>
<tr>
<td>6.</td>
<td>Tamarind</td>
<td>Madras, Mysore, Bombay and Andra</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pradesh.</td>
</tr>
</tbody>
</table>

7.3.2 SOLAPUR:

The Solapur market is one of the biggest wholesale markets in Maharashtra State. It is served by railway and road transport facilities. The Mumbai-Chennai railway line as well as the National and State highways have brought the city into close contact with distant trade centers in Maharashtra, Andra Pradesh, Tamilnadu and Karnataka states. Also a considerable produce from Osmanabad district is brought to
SOLAPUR DISTRICT
MARKETING CENTERS

Supply of Tur-Dal and Jawar

- Solapur → Jawar
- Barshi → Tur-Dal

Figure 7.7
Solapur for sale. The area of operation of the market committee extends over two tahsils namely south and north solapur. In this market, the commodities as under are marketed. They are groundnut (shelled and unshelld), linseed, tur, mug, jawar, gram, wheat, chillies, rice, gur, onions and live stocks such as goats and sheep, and buffaloes, cows, bullocks and horses. The market is famous for groundnut jawar, karadi and it is exported to other markets. The market committee has introduced the commercial grading system since 1963 and has a unit of five graders. The Maharashtra state warehousing corporation has build four godowns on the market yard, the storage capacity of each of these being 72,000 bags.

7.3.3 AKLUJ:

The agricultural produce market committee at Akluj, was established in 1950. It is one of the big markets in the district. It is however, handicapped by the lack of convenient means of rail transport.

The market has regulated the commodities such as gur, cotton (Laxmi, Javilla and nimkar) groundnut, sunflower, tur gram, jawar, wheat. The cattle trade consisting of sheep, goats, and buffaloes and horses are also regulated, since, independence of India. Gur is important commodity in this market. In the cattle market, the sheep and goats are very popular to sale and purchase.

7.3.4 KARMALA:

The Agricultural produce, market committee at karmala was established on 1\textsuperscript{st} January 1943. The market has jurisdiction over 96 villages which are frequented by recurring conditions of scarcity. Some villages from Karjat and Jamkhed tahsils of Ahmadnagar, district and some villages from Paranda and Ashti tahsils of Osmanabad and Beed
districts get the benefit of this market. Though, Karmala is in the chronic drought area, yet there is a considerable turn over of trade.

Though the market is situated in the drought stricken area, about 70 percent of the assembled produce is exported outside of the Karmala tahsil after meeting the local demand.

The direction of export trade is as under. (Crop Destination)

<table>
<thead>
<tr>
<th>Crop</th>
<th>Destination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bajari</td>
<td>Nasik, Thane, pune and Bombay.</td>
</tr>
<tr>
<td>Wheat</td>
<td>Bangalore, Andra Pradesh, Solapur Satara and pune.</td>
</tr>
<tr>
<td>Groundnut</td>
<td>Pune, Bombay and Solapur.</td>
</tr>
<tr>
<td>Sesamum</td>
<td>Baroda and Bombay.</td>
</tr>
<tr>
<td>Gur</td>
<td>Barshi, Kolhapur, Ahmandnagar, Pune and Gadag.</td>
</tr>
<tr>
<td>Chills</td>
<td>Bombay and pune.</td>
</tr>
<tr>
<td>Mug</td>
<td>Madras, Gujarat, Mysore, Bombay and Andhra Pradesh.</td>
</tr>
</tbody>
</table>

7.3.5 PANDHARPUR:

Pandharpur market committee was started in 1949 and has developed into a very big market of agricultural produce. The market yard of Pandharpur is conveniently located as regard to easy means of transport and communications. It is served by the Latur-Miraj now board gauge line of the south central railway and many important state highways. In this market all agriculture commodities such as groundnut, sunflower, tur (red, white and mix, gram, jawar) (Maldandi 35-1, and hybrid) wheat (bansi N 156), onion (white and red) are marketed. Besides, the market committee has also regulated the trade of cows, bullocks, horses, sheep and goats and buffaloes.
About 30 percent of the total produce is retained by the agriculturists, and about 70 percent is brought for sale. The import and export of agricultural produce is done by motor transport as well as by railway. The transport charges per quintal from Pandharpur to Mumbai are rupees 80, for Kolhapur rupees 50 for Satara and Sangli are Rs. 40. The Co-operative marketing societies have played an important role in the regulation of trade in this market.

7.3.6 MOHOL:

This market was started in 1956. The area of operation of the market committee is whole Mohol tahsil. This market has not much scope for its development as a large quantity of agricultural produce is diverted to other markets. Jawar, Bajari, wheat, maize, gram, tur, mug, gur, onions, chillis and groundnut are the important commodities of this market.

7.3.7 KURDUWADI:

This market committee was established on 1st May 1950. The market is served by convenient means of transport and communication. The Mumbai Pune Chennai railwayline and Latur-Miraj Railway line of the South Central Railway as well as the Bombay-Hyderabad national highway are the important trade routes passing through Kurduwadi. The area of operation of the market extends over the entire Madha Tahsil. Groundnut, wheat jawar, chillis, gram, tur, mug, gur, maize bajari are the regulated commodities. Cattle market is famous center in this region.

About 80 percent of the total agricultural produce is brought for sale in the market and 20 percent is consumed locally. Jawar is the main commodity of this market. The agriculturally, Jawar is the main commodity of this market. The agricultural produce is exported to
Mumbai-Chennai, Aurangabad, Pune and Gujarat State. The daily attendance of the agriculturists at kurduwadi market ranges from 400 to 500.

7.3.8 SANGOLA:

Sangola is situated within the chronic drought belt. This factor has reduced its importance as a centre of trade in agricultural commodities. It is very famous for the trading of live stocks such as bullocks of the Khilar breed and also for sheep and goats. The regulated commodities are groundnut, tur, Jawar, Bajari, wheat, chillis, gur, and mataki. About 70 percent of the total produce is retained by the agriculture while only 30 percent is handled at the market yard.

7.3.9 AKKALKOT:

Akkalkot market committee was established in 1952, the convenient transport facilities have helped for development of the market. The area of operation of the market committee extends over the entire Akkalkot tahsil. The regulated commodities are groundnut, tur, mug, udid, Karadi, gur, chillis, jawar, wheat, bajari, gram, onions, ambadi, and cattle market. The Akkalkot tahsil Kharedi Vikri Sangh limited play an important role in marketing activities.

7.3.10 MANGALWEDHA:

The Mangalvedha market committee was established in 1961 at Mangalvedha. Till that date there was a sub-market yard at Mangalvedha under the change of the Pandharpur market committee since its establishment, the committee has maintained steady development in regard to the regulation of agricultural commodities. Groundnut Sunflower, tur, gram, jawar, bajari, wheat, hulga, mataki, gur are the
market commodities in this market. There is a cattle market also in Mangalvedha famous in the region under study.

The agricultural productivity is not accidental or stagnant. It can be transformed into different grades, such as desert soils can be made productive, by application of fertilizers and irrigation and vice versa and the good fertile soils can be classified as poor agricultural productivity, if market facilities and other inputs are not available cheaply. In view of the preceding discussion it may be concluded about the agricultural productivity regarding the region under study.

The physical conditions of the region play an important role in determining the agricultural productivity. So the agricultural productivity is the outcome of agricultural inputs and local physical conditions.

There are remarkable disparities in the level of agricultural productivity in the region. The high productivity zone is continued in the middle part of the region. Other areas may be regarded as weaker zone in respect of agricultural productivity. In solapur district, there is a considerable scope to increase the agricultural productivity. If the farmers are provided with modern implements, adequate amount of fertilizers, better seeds and the necessary irrigation facilities, than agricultural productivity may be increased.

In solapur district all the tahsils are served by regulated markets. Barshi and solapur market are the biggest market centers in the district and are famous for tur dal and Jawar. They are assembling as well as distributing centers of the agricultural commodities. Many market centers are served by convenient means of transport and communication, hence, different commodities are sent to distant trade centers from other states. Every market centers besides, agricultural commodities, also regulate the cattle trade.
IRRIGATION AND TECHNOLOGICAL DETERMINANTS OF AGRICULTURE

Means of Irrigation and various technological determinants are the most crucial factors determining the pattern and pace of agricultural growth in any region. It includes all the available means, which improve the efficiency of converting scarce resources into products which satisfy human wants. It manifests itself in the use of new inputs and Knowledge leading to an upward shift of the production, function in the long run.

The changes in agricultural production are the results of the whims of nature that have played in our agriculture. But technological factors have a great influence upon agriculture, as the agricultural production has increased since last three decades. The food grain production is increasing day by day, and now the country is self sufficient in the food grain production due to the technological development.

The first five year plan, particularly from 1955, the traditional face of agriculture is steadily changing. These changes are reflected in both, expansion and intensification of cropping. The growth of sugar factories, have played an important role in the agricultural changes of the region. Therefore, the modern agriculture is a sector of economy, which stands to develop farming and industries. Thus, the technological factors have played a dominant role in the transformation of Indian agriculture. Agriculture is the chief source of raw materials for various industries in urban and rural areas.

7.4 TECHNOLOGICAL FACTORS:

There are number of factors influencing agricultural development in a region like Solapur District. Very recently introduced technological factors of the region include irrigation, agricultural implements and machinery, adoption to improved seeds, use of chemical fertilizers,
agricultural credit etc. In the following lines, an attempt is made to analyze the regional pattern of these technological factors and changes therein in the region under study.

7.5 IRRIGATION:

In a monsoonal region like India the rainfall is most erroneous and unpredictable. In such conditions, the irrigation becomes the most important factor for agriculture in the district, because, the rainfall is very less and irregular. It is observed that the cultivators having irrigational facilities tend to adopt improved form practices more than those of cultivators who practices agriculture without irrigation. Therefore, irrigation is a pivot of modern agricultural growth.

Irrigation is the artificial application of water to overcome the deficiencies in rainfall for the growing of crops. It is essential for the better yield and for assurance of the crops. Irrigation development in Solapur district has to be viewed, in the context of the climatic conditions, especially rainfall with a wide difference in rainfall from one part to other part of the district and from year to year. The area which is affected by the variations in rainfall is mainly located in the district. Agriculture is highly speculative venture under such harsh conditions which affect the agricultural production and efficiency. Therefore, irrigation is vital for the success of agriculture in these parts. Moreover, rainfall of the district is seasonal and it is handicapped by lack of water from November onwards, hence the Rabi crops usually fail. In order to sustain Rabi crops in Solapur district, the artificial supply of water becomes most essential and necessary.
7.5.1 Sources of Irrigation:

Taking in to consideration the major sources of irrigation, such as, river, lake, canal, tanks and tube-well as parameters, responsible for the changes in the agricultural pattern in different parts of the region understudy. Broadly, these sources in the study region are classified into two categories namely; surface irrigation and underground water into the total net irrigated area.

7.5.2 Net Irrigated Area:

The total net irrigated area in the region was about 9 percent in 1970-71, which increased to 31.1 percent in 1980-81 to total cultivable area and there after remarkable decline was noticed in the year 1990-91, which became 10.8 percent. This decline in proportion of irrigated land to total cultivable land may be due to the scarcity of rainfall. During the last few decades the source of irrigation was only the rainfall, which fills the tanks, lakes and dams as well as underground water. Surprisingly the net irrigated area during the recent decades of 2001 was very high. The proportion of irrigated land to total cultivable land due to the improvement in irrigated land was very impressive (25.7 percent). Implementation of the modern technologies and facilities provided to farmers by the government in the district of Solapur is quite satisfactory. (Fig. 7.8)

7.5.3 Surface Irrigation:

Surface irrigation includes rivers, tanks, lakes, canal and small dams. The total surface irrigation area in the region was about 24.2 percent in 1970-71 which slightly decreased to 23.5 percent in 1980-81. Thereafter, it increased to 40.8 percent in the year 1990-91. This is clearly indicated by the proportion of surface irrigation which increased


SOLAPUR DISTRICT

Net Irrigated Area (2000-01)

Area in Percentage
- More than 30
- 15.0 to 30
- Less than 15

Change in Net Irrigated Area (1981-2001)

Percentage Increase
- More than 20
- 10.0 to 20
- Less than 10

Figure 7.8
due to Government of Maharashtra and Zilla Parishad. Solapur have constructed number of percolation tanks and canals in this region under the employment Guarantee scheme. During the recent decade of 2000-01 surface irrigation has tremendously decreased due to improvement of underground water irrigation like tube wells, hence, the area under surface irrigation was 24.1 percent in 2000-01 (Table 7.3)

Table 7.3
Sources of irrigation and its changes in Solapur district (1970-2001)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface irrigation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>24.2</td>
<td>23.5</td>
<td>40.8</td>
<td>24.1</td>
<td>-0.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+17.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-16.7</td>
</tr>
<tr>
<td>Underground water irrigation</td>
<td>75.8</td>
<td>76.5</td>
<td>59.2</td>
<td>75.9</td>
<td>+0.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-17.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+16.7</td>
</tr>
<tr>
<td>Net irrigated area</td>
<td>9</td>
<td>13.1</td>
<td>10.8</td>
<td>25.7</td>
<td>+4.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-2.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+14.9</td>
</tr>
</tbody>
</table>


Note: Figures indicate percentage.

Fig. 7.9 shows the proportion of surface irrigation as the average for 2000-01 years. It reveals that overall intensity of irrigation varies remarkably in different parts of the district. The highest intensity of surface irrigated area were found in south eastern Solapur tahsils consisting of Pandharpur, Sangola and Mangalvedha. The proportion ranges between 20 percent to 30 percent in Karmala, Barshi, Madha and
Akkalkot tahsils. The intensity is low in rainfed areas of central and eastern part of the district.

There are many tanks such as Ekruk (North Solapur), Buddehal (Sangola), Gheradi (Sangola), Tawale (Sangola), which are the main source of surface irrigation in the region under study.

Besides, there are many other tanks in other parts of the district such as Pathri, Barshi, Hotagi in South Solapur, Wadshivane, Karamala and Saptane in Madha which provide irrigation in the concerned region. Canal irrigation plays important role in the overall irrigation of the district. The area under canal irrigation increased by the major Ujani irrigation project on river Bhima, near Ujani village in Madha tahsil of Solapur district.

Both, positive and negative changes in surface irrigation were found in the study regions, during 1980 to 2001. Karmala, Malashiras, Pandharpur and Madha tahsils recorded less than ten percent increased, while North Solapur, Sangola and Mangalwedha tahsils recorded more than twenty percent increase in surface irrigation in the district.

**7.5.4 Underground Water Irrigation:**

Tube wells are the major source of underground water irrigation in the Solapur district. The total under ground water irrigation in the region was about 75.8 percent of the total net irrigated area in 1970-71 and it was 76.5 percent in 1980-81. Thereafter, it considerably decreased to 59.2 Percent in 1990-91. During the recent decade, it has increased by 75.9 percent due to improvement of tube wells in the region understudy.

Wells are the principal source of underground irrigation. Table 7.5 shows, the distribution of wells in each talukas classified as useful for irrigation and other which are not useful for irrigation. There are about 65364 tube wells in the district out of them 6841 are not useful for
Table 7.4

<table>
<thead>
<tr>
<th>Tahasil s</th>
<th>Surface irrigation</th>
<th>Under ground water irrigation</th>
<th>Net irrigated area</th>
</tr>
</thead>
<tbody>
<tr>
<td>N. Solapur</td>
<td>9.2</td>
<td>29.8</td>
<td>+20.6</td>
</tr>
<tr>
<td>Barshi</td>
<td>4.1</td>
<td>22.1</td>
<td>+18</td>
</tr>
<tr>
<td>Akalkot</td>
<td>N.A</td>
<td>23.2</td>
<td>--</td>
</tr>
<tr>
<td>S. Solapur</td>
<td>1.8</td>
<td>17.6</td>
<td>+15.8</td>
</tr>
<tr>
<td>Mohol</td>
<td>1</td>
<td>17.1</td>
<td>+16.1</td>
</tr>
<tr>
<td>Mangalvedha</td>
<td>11.4</td>
<td>37.5</td>
<td>+26.1</td>
</tr>
<tr>
<td>Pandharpur</td>
<td>53.9</td>
<td>32.9</td>
<td>-21</td>
</tr>
<tr>
<td>Sangola</td>
<td>8.8</td>
<td>31.6</td>
<td>+22.8</td>
</tr>
<tr>
<td>Malshiras</td>
<td>45.8</td>
<td>15.7</td>
<td>-30.1</td>
</tr>
<tr>
<td>Karmala</td>
<td>20.7</td>
<td>26.6</td>
<td>+5.7</td>
</tr>
<tr>
<td>Madha</td>
<td>22.8</td>
<td>20.4</td>
<td>-2.4</td>
</tr>
<tr>
<td>District Total</td>
<td>23.5</td>
<td>24.1</td>
<td>+0.6</td>
</tr>
</tbody>
</table>

**Source:** Socio-economic review and District statistical Abstract Solapur 1980-81 to 2000-01.

Irrigation. The density of wells is high in the low leveled to moderate undulating terrain of the district than the hilly terrain. The largest number of irrigation tube wells is found in Pandharpur tahsil (11217) while number of tube wells not useful for irrigation is more in south Solapur tahsil.

Fig. 7.10 shows, the proportion of underground water irrigation in the Solapur district in 2000-01. It clearly reveals that overall intensity of irrigation varies remarkably in different parts of the district. The highest
intensity of underground water was found in Malshiraras, Mohol and south Solapur tahsils. The less than 10 percent intensity was observed in Sangola and Pandharpur tahsils.

Both positive and negative changes in underground water irrigation were found in the region during 1980 to 2001. Malshiras tahsils recorded more than 30 percent positive change while Pandharpur tahsil recorded 15 to 30 percent increased. Rest all tahsils having less than 15 percent increased in the district (Fig. 7.10)

Solapur district is found in rain shadow area so that, there is a more need of irrigation Firstly, the major and medium irrigation project like the Nira right bank canal is not utilized sufficiently. Wells become dry in summer period and also increase the problem of drinking water in the study region.

**7.6 FARM IMPLEMENTS MACHINERY:**

Farm implements are closely adjusted to their environment. There is little possibility of change in the application of agricultural implements. The agricultural implements in the region are few in number, small in size and light in weight. Tilling, cultivation and many agricultural operations are dependent on the various types of implements and machinery. The implements and machinery used in the region are ploughs for ploughing. Harrows for crushing the clods, seeds driller for sowing, hoes for inter culture, most, oil engines and electric pumps for water lifting, carts for transport and tractor for many agricultural operations. Out of these, iron and wooden ploughs, electric pumps, tractors and other machinery are wide spread implements in the Solapur district. In the following lines, an attempt is made to analyze the regional distribution pattern of plough, carts, oil engine, electric pumps and many other modern implements in the district of Solapur.
7.6.1 Ploughs:

Locally, these are called as ‘Nangar’. These are of two types namely Wooden and iron. Both are widely used all over the region, but there are regional variations in the distribution. (Fig. 7.11). Iron ploughs are dominant in the region particularly in Akkalkot, South Solapur, Pandharpur, Malshiras and North Solapur, where per hundred hectare of cultivated area its density is high. The regions average number is 532 ploughs per 100 hectare of cultivated area. In the central part, there are less than 400 ploughs per 100 hectare of cultivated area. In some talukas like Karmala and Pandharpur, above 400 to 500 the numbers of ploughs per 100 hectare of cultivated area are noted.

During 1981-2001, the total numbers of wooden ploughs have slightly increased from 14844 to 15037 and on the contrary iron plough have decreased. The wooden ploughs are generally used by poor farmers and iron ploughs are used by rich formers in the region of Solapur district.

Table No. 7.5

Density of well irrigation in Solapur District (2001)

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Talukas</th>
<th>Total well</th>
<th>Not Useful for irrigation</th>
<th>Useful for irrigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>N. Solapur</td>
<td>1722</td>
<td>297</td>
<td>1215</td>
</tr>
<tr>
<td>2.</td>
<td>Barshi</td>
<td>4994</td>
<td>776</td>
<td>4189</td>
</tr>
<tr>
<td>3.</td>
<td>Akkalkot</td>
<td>9170</td>
<td>254</td>
<td>8823</td>
</tr>
<tr>
<td>4.</td>
<td>S. Solapur</td>
<td>5871</td>
<td>1827</td>
<td>4007</td>
</tr>
<tr>
<td>5.</td>
<td>Mohol</td>
<td>3817</td>
<td>224</td>
<td>3524</td>
</tr>
<tr>
<td>6.</td>
<td>Mangalvedha</td>
<td>6390</td>
<td>409</td>
<td>5877</td>
</tr>
<tr>
<td>7.</td>
<td>Pandharpur</td>
<td>11217</td>
<td>1280</td>
<td>9911</td>
</tr>
<tr>
<td>8.</td>
<td>Sangola</td>
<td>8506</td>
<td>545</td>
<td>7863</td>
</tr>
<tr>
<td>9.</td>
<td>Malshiras</td>
<td>3220</td>
<td>104</td>
<td>3009</td>
</tr>
<tr>
<td>10.</td>
<td>Karmala</td>
<td>3895</td>
<td>860</td>
<td>2998</td>
</tr>
<tr>
<td>11.</td>
<td>Madha</td>
<td>6562</td>
<td>265</td>
<td>6150</td>
</tr>
</tbody>
</table>

**District Total** | **65364** | **6841** | **57566**

**Source:** Socio economic review and district statistical abstract of Solapur 2000-01.
SOLAPUR DISTRICT

Plough per 100 hectare of Cultivated Area (1981)

Area in Percentage
- More than 400
- 350 to 400
- 300 to 350
- Less than 300

Plough per 100 hectare of Cultivated Area (2000-01)

Percentage Increase
- More than 500
- 400 to 500
- 300 to 400
- Less than 300

Figure 7.11
7.6.2 Carts:

The carts are generally used for many purposes; therefore, carts have a significant variation in the distribution pattern in the region. (Fig. 7.12). Region’s average density is 362 per 100 hectares of cultivated area. Carts are relatively more in Malshiras and Akkalkot tahsil which comes to above 500 carts per 100 hectare of cultivated area. There is tremendous decrease in number of carts from 51049 in 1981 to 35485 in 2001. This decline may be due to increase in the number of tractors to solve this purpose.

7.6.3 Agricultural Machinery:

The application of mechanical power to agriculture is one of the major technical developments of the post independence period. The mechanization of agriculture in India simply means the use of tractors and power-operated pumps sets. It is labor and time saving and gives more time to look other farm work.

Spatial difference in the use of modern agricultural machinery is closely related to irrigation, size of holdings and poverty which mainly controls the use of modern machinery, change in the implements is more significant in the areas of commercial farming. The modern agricultural machinery used in the region under study are oil engine, sugarcane, crushers, electric pumps, tractors and others. In the following lines, an attempt has been made to show the distribution pattern of oil engines, electric pumps, sugarcane crushers and tractors etc.
Table No. 7.6
Growth of agricultural implements and machinery in Solapur district
(1980-2001)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>i.</td>
<td>Plough</td>
<td>54645</td>
<td>76431</td>
<td>52217</td>
</tr>
<tr>
<td></td>
<td>A) Wooden.</td>
<td>14844</td>
<td>25744</td>
<td>15037</td>
</tr>
<tr>
<td></td>
<td>B) Iron</td>
<td>39801</td>
<td>50687</td>
<td>37180</td>
</tr>
<tr>
<td>ii.</td>
<td>Carts</td>
<td>51049</td>
<td>27866</td>
<td>35485</td>
</tr>
<tr>
<td>iii.</td>
<td>Oil engine pump for irrigation purpose.</td>
<td>19681</td>
<td>10784</td>
<td>7464</td>
</tr>
<tr>
<td>iv.</td>
<td>Electric pumps for irrigation purpose.</td>
<td>23022</td>
<td>41188</td>
<td>5236</td>
</tr>
<tr>
<td>v.</td>
<td>Sugarcane crushers</td>
<td>1123</td>
<td>824</td>
<td>1781</td>
</tr>
<tr>
<td></td>
<td>C) Worked by power.</td>
<td>1064</td>
<td>646</td>
<td>996</td>
</tr>
<tr>
<td></td>
<td>D) Worked by bullocks.</td>
<td>59</td>
<td>187</td>
<td>785</td>
</tr>
<tr>
<td>vi.</td>
<td>Tractors</td>
<td>429</td>
<td>1060</td>
<td>3747</td>
</tr>
</tbody>
</table>


7.6.4 Oil Engine:

It is used to lift the water from rivers and wells. Their number is decreased due to increase in electric pumps from 19681 to 7464 during the period 1981-2001. In Solapur district, Karmala and Pandharpur tahsils have more number of oil engines used. While on the other hand, Mohol and Mangalwedha tahsils have less number of oil engine used in the region under study.

7.6.5 Electric Pumps:

Electric power is available for irrigation purposes with the increasing rural electrification, so the number of; electric pump in the district has increased from 20322 in 1981 to 52366 in 2001. This shows
that electric pumps are more in Malshiras and Pandharpur tahsils. Changes in the number of electric pumps during the period of 1980-2001 have been observed specially in north and north eastern tahsils of Solapur district. In recent decade, more than 2500 electric pumps have increased. (Fig. 7.13)

7.6.6 Sugarcane Crushers:

Gur making is a rural traditional industry in the district. Previously, the sugarcane crushers were bullocks driven, but now they are operated with the help of oil engines or by electricity. In 1980-81, there were 1123 crushers and out of them 1064 worked by power and 59 worked by bullocks. In 2000-01 the numbers of crushers driven by bullocks have decreased and there has been slight increase in the number of crushers worked by power. But the total numbers of sugar cane crushers have increased from 1123 to 1781 during the 1980-2001. This increase may be attributed to increase in the area under sugarcane as a result of increase in the irrigational facilities in the district.

7.6.7 Tractors:

With the use of tractors, many farm implements driven by bullocks were improved while other was replaced by better and more efficient implements. In the regions, the number of tractors was only 429 in 1980-81 but it increased to 3747 tractors in 1981. The concentration of tractors in certain irrigated areas in South Solapur is more while low in Barshi talukas on the other, while, the number of tractors is moderate in Madha, Mohol Mangalvedha and Karmala tahsil of Solapur district.
### 7.7 IMPROVED SEEDS:

Generally, the big as well as small cultivators preserve seeds from their previous harvest. Only the poor cultivators, who can not afford to do so, depend on the outside supply for meeting their seed requirements. Besides, those cultivators who want do replace their old seed for new promising varieties and those who want to undertake cultivation a fresh, also depend upon the outside of seed supply. Now days the cultivator is very careful about the selection of good quality seeds for his field to grow crops. He takes care that the gains preserved by him are bold and healthy and are lustrous in colour.

The improved verities of food grain crops evolved by the department of agriculture, give about 10 to 15 percent increased yield over the local varieties of seeds of improved variety and strains for the use in the district of Solapur. (Table 7.7)

#### Table 7.7

**Varieties of seeds of improved variety**

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Name of the Grain</th>
<th>Variety name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Jawar</td>
<td>M-35-1</td>
</tr>
<tr>
<td>2.</td>
<td>Wheat</td>
<td>N-917, N-747-19, N-59, HY-65</td>
</tr>
<tr>
<td>5.</td>
<td>Cotton</td>
<td>Laxmi.</td>
</tr>
<tr>
<td>7.</td>
<td>Groundnuts</td>
<td>K-4-11, K-3</td>
</tr>
<tr>
<td>8.</td>
<td>Tur</td>
<td>N-84</td>
</tr>
<tr>
<td>9.</td>
<td>Safflower</td>
<td>N-62-8</td>
</tr>
<tr>
<td>10.</td>
<td>Mug.</td>
<td>Jalgaon</td>
</tr>
</tbody>
</table>
There are ten talukas in the district where seed multiplication farms have been established. The foundation seeds of various improved grains are produced on these farms. The foundation seeds are further distributed to the seed villages through zilla parishad.

The hybrid seeds such as Jawar-CSH-1, CSH-2, Bajra-HB-1, Maiz Deccan double hybrid are also produced on the cultivator's field under the supervision of seed certification authorities and the same are purchased by the marketing federation unfortunately. The taluka level data about improved seeds is not available. Hence, the distribution pattern of seed use is not tried. It gives an idea of improved seed only on district level.

7.8 CHEMICAL FERTILIZERS:

The most essential requirement in stepping up agricultural production is the use of adequate manures and fertilizers. Fertilizers along with better seeds are the Key to the expected per acre production achievements. Thus, the importance of increase in the use of fertilizers was known from the beginning of planning. The major break through the consumption of fertilizers came into existence with the introduction of new farm of technology. The application of fertilizers and manures has become essential to make agronomy more profitable and to meet the increasing demand for food grains. The farmyard manure which is prepared out of dung, urine of cattle, ash and other refuse is not enough to meet the local, requirements of farmers. The cultivators, therefore, have started applying the chemical fertilizers extensively to enhance the crop production in the district. The use of chemical fertilizers in the district is shown as under:

Use of chemical fertilizers

a) Ammonium sulphate
b) Super Phosphate
c) Super Nitrogen Phosphate  

d) Fertilizer Mixture  

e) Urea and  

f) Others  

The chemical fertilizers require abundant supply of water. Heavy doses of fertilizers are applied wherever enough irrigation facilities are available. They are used both for food crops and non food crops and also for commercial crops. The cultivators have realized the value of chemical fertilizers due to the fact that they have obtained higher yield of the crops through their application.

**7.9 AGRICULTURAL CREDIT:**

Credit societies provide loan for cultivators in order to help and enhance the inputs per unit of area. Majority of the villages in Solapur district have co-operative credit societies. The following table shows the position of agricultural credit societies in the district for the years 1980-81, 1990-91 and 2006. (Table 7.8)

**Table No. 7.8**
Agricultural co-operative credit societies in Solapur district (2001)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Items</th>
<th>Credit Facilities (Rs in ‘000’)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1980-81</td>
</tr>
<tr>
<td>1.</td>
<td>Number of Agricultural Societies</td>
<td>849</td>
</tr>
<tr>
<td>2.</td>
<td>Number of Membership</td>
<td>227187</td>
</tr>
<tr>
<td>3.</td>
<td>Share Capital</td>
<td>48852</td>
</tr>
<tr>
<td>4.</td>
<td>Working Capital</td>
<td>238955</td>
</tr>
<tr>
<td>5.</td>
<td>Loan Advanced</td>
<td>96286</td>
</tr>
<tr>
<td>6.</td>
<td>Loan Recovered</td>
<td>82520</td>
</tr>
<tr>
<td>7.</td>
<td>Loan Outstanding</td>
<td>196499</td>
</tr>
<tr>
<td>8.</td>
<td>Loan Overdue</td>
<td>106915</td>
</tr>
</tbody>
</table>

**Source:** Socio-economic review and District statistical Abstract of Solapur 1980-2001.
It is observed that numbers of agricultural credit societies are increasing gradually in recent time. However, there is increasing trend in respect of their memberships. It is however, discouraging to note that with an increased advances over 1980-81, the amount of overdue are also increasing year by year for farmers.

Tahsil wise variations are not uniform in the district. Numbers of agricultural credit societies are more in Madha, Barshi and Pandharpur tahsils. However their memberships are more in Barshi and Pandharpur tahsils.

7.10 ROADS:

Roads are the life line of a region, since; these provide door to door service within short period of time. Roads play an important role in agricultural development as these contribute in the mobilization of resources and reduce the gap between rural and urban communities. The use of new inputs has added new dimensions to agricultural expansion and the input factors can be moved easily by roads. In this way, the roads have played an important role in economic life of man in the Solapur district during 1980-2001 periods. The length of roads have increased more and connected many small villages to each others. Accessibility is the main key factor for the economic development of a region.
REFERENCES