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Chapter II
PHYSICAL AND SOCIO-ECONOMIC SETTING OF THE REGION

2.1. Introduction:
In the previous chapter introduction of the subject, meaning and nature of agricultural geography, development of agricultural geography, choice of the region and topic, aims and objectives of the study, database and methodology, significance of the study, review of literature, chapter outline etc. points discussed.

This chapter is mainly concerned with, physical and socio-economic factors which affect on the agricultural landuse in the study region. This chapter is divided into two parts for the sake of study. Part-A is related with physical setting of the study region and part-B is related with socio-economic setting of the study region.

Part-A
Physical Setting of the Region

2.2. Location, Boundaries and Area:
Latur district is situated in the South-East part of the Maharashtra and it lies between 17° 52' North latitude to 18° 50’ North latitudes and 76° 12’East longitudes to 77° 18’ East longitudes (Map No. 2.1).

It is bounded on the North by Beed and Parbhani districts, on the North-East by Nanded districts, on the South-East and South by the Karnataka state and on the North-West, West and South by Osmanabad district. For administrative purpose the district in divided into two revenue divisions i.e. Latur and Udgir division and in 10 talukas Viz.
Latur, Ausa, Renapur, Udgir, Ahmadpur, Chakur, Nilanga, Devani, Jalkot and Shirur Anantpal. Devani, Jalkot and Shirur Anantpal these three talukas are newly created talukas. Due to the non-availability of data newly created talukas are not considered for the present study.

The total geographical area of Latur district is 7157 sq.kms. Out of the total geographical area of Maharashtra it covers 2.39 per cent.

2.3. **Historical Background:**

Latur district has an ancient historical background. The King 'Amoghvarsh' of Rashtrakutas developed the Latur city, originally the native place of the Rashtrakutas. The Rashtrakutas who succeeded the Chalukyas of Badami in 730 A.D called themselves the residents of Lattalut.

Latur has an ancient history. It was home to the Rashtrakutas and was part of Ashok’s empire. It was, over the centuries, variously ruled by the Satavahanas, the Sakas’s, Chalukyas, the Yadavas of Deogiri, the Delhi Sultans, and the Bahamani rulers of South India, Adil Shahi, and the Mughals. Later in the 19th century, it becomes part of the independent princely state of Hyderabad. Earlier know as Naldurg tehsil, in 1905 it was merged with surrounding areas and renamed Latur taluka, and became part of Osmanabad district. After independent and the merger of Hyderabad with the Indian Union, Osmanabad become part of Bombay Province. In 1960, with the creation of Maharashtra, it became one of its districts. On August 15, 1982, Latur was separated from Osmanabad to form a separate Latur district.

2.4. **Territorial Changes:**

The Latur district was carved out as a separate district in the year 1982 as a result of bifurcation of Osmanabad district of Maharashtra State. Five talukas Viz. Latur, Ahmadpur, Udgir, Nilanga and Ausa were separated and formed a new district. At the same time, 53 villages of
Ambejogai taluka of Beed district transferred to Latur taluka of newly formed Latur district. At present, the district is comprises 10 talukas, namely, Latur, Ahmadpur, Udgir, Nilanga, Ausa, Renapur, Chakur, Deoni, Jalkot and Shirur Anantpal etc.

2.5. Physiography:

Physiography is one of the dominant parameter of physical environment and its impact on patterns and density of agriculture is immense. The study of the influence of environment upon the nature and the distribution of crop and livestock is of prime importance in agricultural geography. Nature with its physical characteristics provides a host of possibilities for agriculture in different areas. Physiographically Latur district is divided into two broad divisions. They are as follows.

i) The Balaghat Plateau:

Near about 50% part of the district lies on the Balaghat Plateau. This plateau region is major highland of the district. It is above 600 meters from sea level up to 900 meters. Maximum part of the Balaghat Plateau is flat. But there are some hillocks which is known as local names. There is a one ridge near village Vadwal Janwal this ridge locally know as Vadwal Bet. One conical shaped hillocks near Chakur which is known as Hakani Bet. In Shirur Anantpal taluka Hatti Bet. In Ausa taluka near Hashegaon expanded hill with their which is known as Tembi like these there are several hillocks on Balaghat Plateau in the study region. This Plateau is dissected at many places by water streams and rivers (Map No. 2.2).
ii) **River Basin Region:**

Near about 50% area of the study region, lies in major river basins. This physiographic division knows as River Basin Region. This physiographic division located North-East, central part and in the Southern part of the study region. In North-East part lies in Manar, Tiru and Lendi rivers. Central part is lies in Manjara River in its tributaries. The Southern part of this physiographic division lies in the Basin of Terna River. Expect some hills and hillocks this region is low land region. Its height from sea level is about 300 meters to 600 meters. In this physiographic division Deep black soil is found. (Map No. 2.2)

2.6. **Drainage:**

Drainage is one of the most important components of physical environment, which affects on agriculture directly or indirectly. Surface water is the most important means for providing substantial irrigation, which stabilize and improves agro economic life in an area.

The study region is drained by the Manjra River and its tributaries. The Manjra together with its tributaries the Terna, Tawarja and Gharni drain the Balaghat Plauteu region, while there other tributaries, the Manar, the Tiru and the Lendi drain the North-Eastern region. The following are the important rivers of the Latur district.

1. **Manjra:**

Manjra is the largest river in the district. The Manjra River rises near of Gaurwadi near the Northern edge of the Balaghat Plateau in Beed district and flow South Easterly direction towards the Karnataka State. The Manjra River flows through the talukas of Latur, Nilanga, Shirur Anantpal and Devani.
2. **Tawarja:**

Tawarja River rises near Murud in Latur taluka. Tawarja is the chief right bank tributaries of the Manjra. The Tawarja about 50 kms. Long flows in a general East ward direction and join the Manjra near Seoni Village. It flows through on boundary of Ausa and Latur talukas.

3. **Terna:**

Terna River rises in Washi taluka of Osmanabad district. It flows through Ausa and Nilanga talukas of Latur district. Terna is the chief right bank tributaries of the Manjara. The Terna River has a length of over 150 kms. From its source to its confluence with the Manjra and Terna River flows West to East direction.

4. **Gharni:**

Gharni River rises near Wadval in Chakur taluka. Length of Gharni River is about 40kms. The Gharni is the only river of some size that forms a left bank tributary of Manjra. It flows through Chakur and Shirur Anantpal talukas and joins the Manjra in Nilanga taluka.

5. **Manar:**

The Manar is the Northern most important river of the district, rising on the Balaghat plateau near Dharmapuri in Beed district flows in a North-Easterly course of along 40 kilometers within this district. It continues in this direction into Nanded district as far Kandhar, after which it flows in an Easterly or South-Easterly direction to join Manjra.

6. **Tiru:**

Tiru River rises on the Eastern edge of the plateau near Chakur and has a course of about 56 kilometers within the district generally Eastward to join the Lendi at Kharaka in Nanded district.

7. **Lendi:**

The Lendi River rises similarly on the edge of the plateau near Udgir further East and has only a small course within the district. It is
joined by the Tiru at Kharka in Nanded district and flows past Deglur in Nanded district before it joins the Manjara River.

8. Deoni:

Among the smaller left bank tributaries of the Manjra may be mentioned is the Deoni with a course of about 20 kilometers within the district on the South bank of this river is situated the Deoni village, famous for its breed of cattle bearing its name (Map No 2.3).

2.7. Climate:

Climate is the principal aspects of the physical environment affecting agriculture. Climatic conditions are important in determining distribution and performance of crops. It influences on the choice of farming systems for the good harvesting.

Climate is reflected in the habits and requirements of consumer and thus affects on the prospects of various types of industries of consumer goods. The potential of crop productivity capability of a given area is dependent mainly on the existing climate and soil conditions.

The success or failure of cropping season is determined by the intensity of the climatic factors. The three most important factors of climate from the stand point of plant response are temperature, water supply and light.

Climate of the district is generally dry except during the South-West monsoon season.

Temperature:

Each crop plants needs a certain number of effective heat units for germination, growth, staking, maturity and repining. This is called a thermal constant and varies from crop to crop. The temperature above the minimum is therefore, effective in furthering the growth of plants towards
maturity and is $16^0$ c. at which plant grows. Ideal crop production is between $18.3^0$ c. and $23.9^0$ c.

Table No. 2.1 Monthly Temperature of Latur District: 2001-2002.

| Sr. No. | Months    | Temperature |   |   |
|---------|-----------|-------------|---|--|--|
| 1.      | January   | 33.7        | 17.3 |   |   |
| 2.      | February  | 35.7        | 15.4 |   |   |
| 3.      | March     | 36.1        | 19.0 |   |   |
| 4.      | April     | 37.7        | 21.7 |   |   |
| 5.      | May       | 38.9        | 21.8 |   |   |
| 6.      | June      | 32.0        | 19.5 |   |   |
| 7.      | July      | 30.9        | 18.8 |   |   |
| 8.      | August    | 28.6        | 18.0 |   |   |
| 9.      | September | 31.1        | 18.7 |   |   |
| 10.     | October   | 30.5        | 17.1 |   |   |
| 11.     | November  | 31.9        | 14.7 |   |   |
| 12.     | December  | 31.3        | 11.9 |   |   |


There is no existence of meteorological observatory in the district. The data of temperature had taken from the socio-economic abstract of Latur district. On the basis of temperature data of entire region is divided into four seasons of a year.

i) Hot weather period: (March to May.)

ii) Wet weather period: (June to September)

iii) Post monsoon period: (October to November)

iv) Winter weather period: (November to February.)

Temperature ranging from $20^0$ c. to $30^0$ c. are conductive to Soya beans cultivation and the same temperature is prevalent in the region.
Rainfall:

Of all the weather elements rainfall is dominant single weather parameter influencing the intensity and location of farming system and farmer’s choice of enterprises. It is also becomes a climatic hazards to farming when it is characterized with scantiness, concentration, intensity, variability and unreliability. The quantum of rainfall and the number of rainy days may be quite sufficient to meet the annual requirement of successful crop production, provided they are so naturally spread that rain is received at the time it is required. Variations in rainfall characteristics affect agriculture as a whole, and therefore, there is need to investigate them in detail. They became a more suitable when crops are affected by moisture conditions at sowing, germination, shooting, stalking and heading and at maturing, harvesting and threshing. Moisture is indeed a basic factor in all crop producing areas. It is all the more important in the minimal regions, where average or normal rainfall is generally necessary for successful crop production. In such areas the system of crop production must be correlated more or less to the moisture factor.

Distribution of Rainfall:

A. Spatial Distribution of Rainfall:

The rainfall of the Latur district is erratic in nature. Unevenness in its seasonal and areal distribution posses the problem of dividing the region in suitable zones. However on the basis of rainfall data for the series of years justify the different zone of the regions as follows.

1. Heavy Rainfall Zone: (Above 872.42mm)

This zone comprises the North-East and East part of the region. I.e. Ahmadpur, Chakur and Udgir with the 899.1, 897.04 and 927.72 mm rainfall per annum.
2. Moderate Rainfall Zone: (817.14 to 872.42mm.)

In this zone included only Ausa taluka of the region with the 835.52 mm. rainfall per annum.

3. Low Rainfall Zone: (Below 817.14mm.)

In this zone compares West, North-East and South part of the study region. In this zone included Latur, Renapur and Nilanga talukas of Latur district with the 790.18, 776.54, and 761.86 mm. rainfalls per annum. (Table No.2.2).

Table No. 2.2: Taluka wise Mean Annual rainfall in Latur District (2001-02 to 2005-06)

<table>
<thead>
<tr>
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<th></th>
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<td>1</td>
<td>Latur</td>
<td>714.00</td>
<td>714.03</td>
<td>714.03</td>
<td>714.03</td>
<td>1094.00</td>
<td>790.18</td>
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<td>Renapur</td>
<td>713.07</td>
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<td>714.00</td>
<td>714.00</td>
<td>1027.00</td>
<td>776.54</td>
</tr>
<tr>
<td>3</td>
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<td>846.07</td>
<td>880.08</td>
<td>880.08</td>
<td>880.08</td>
<td>1006.40</td>
<td>899.01</td>
</tr>
<tr>
<td>4</td>
<td>Chakur</td>
<td>780.08</td>
<td>880.08</td>
<td>880.08</td>
<td>880.08</td>
<td>1062.00</td>
<td>897.04</td>
</tr>
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<td>Ausa</td>
<td>813.09</td>
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<td>813.09</td>
<td>813.09</td>
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<td>Nilanga</td>
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<td>711.08</td>
<td>711.07</td>
<td>711.07</td>
<td>962.05</td>
<td>761.86</td>
</tr>
<tr>
<td>7</td>
<td>Udgir</td>
<td>902.08</td>
<td>902.08</td>
<td>902.08</td>
<td>902.08</td>
<td>1027.33</td>
<td>927.71</td>
</tr>
</tbody>
</table>

Source: Socio-Economic Abstract of Latur District 2001-02 to 2005-06
(Computed by Author.)

B. Seasonal Distribution of Rainfall:

About 84 % of the rainfall is intense during rainy season. The quantity of rainfall in the months of June, July, August and September is very important to soya bean. Total span of the soya bean crops is 100-120 days.

The sowing period starts from 20th June to 30 June and from July to second week of August is its growing period, and from 10 August to 10 September is its flowering period and from 10 September its pod
formation period of soya bean crop. So the total quantity of rainfall in the month of June to end of September is very important for soya bean cultivation and region receive maximum rainfall in these months. So, it is ideal climatic condition for the development of soya bean cultivation in this region.

**Rainfall Variability:**

Rainfall variability is calculated here by competing the rainfall data of 5 years from each talukas of the district. Rainfall variability is very important in crop agronomy. It is calculated with the formula of co-efficient of variation.

Co-efficient of variation is the best measurer to compare the variability of two series or sets of observation. A series with less co-efficient of variation is considered more consistent. On the basis of rainfall data for the series of years justify the different zones of the region as following.

1. **Zone of Low Variability Index:** (Below 9c.v.)
   
   The variability index is very low in Ahmadpur (6.00), Ausa (5.00) and Udgir (5.00) talukas in the region.

2. **Zone of Moderate Variability Index:** (9 c.v. to 14c.v.)
   
   Chakur (10.00) and Nilanga (13.00) talukas of the district come under the variability index of 9.00 c.v. to 14.00cv.

3. **Zone of High Variability Index:** (Above 14cv.)
   
   Latur (19.00) and Renapur (16.00) talukas of the district come under the above 14cv. variability index. (Table No.2.3)
Table No. 2.3: Talukawise Co-efficient of Rainfall Variability in Latur District (2001-02 to 2005-06)

<table>
<thead>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Latur</td>
<td>714.0</td>
<td>714.3</td>
<td>714.3</td>
<td>714.3</td>
<td>1094.00</td>
<td>790.18</td>
<td>19.00</td>
</tr>
<tr>
<td>2</td>
<td>Renapur</td>
<td>713.7</td>
<td>714.0</td>
<td>714.0</td>
<td>714.0</td>
<td>1027.00</td>
<td>776.54</td>
<td>16.00</td>
</tr>
<tr>
<td>3</td>
<td>Ahmadpur</td>
<td>846.7</td>
<td>880.8</td>
<td>880.8</td>
<td>880.8</td>
<td>1006.40</td>
<td>899.01</td>
<td>06.00</td>
</tr>
<tr>
<td>4</td>
<td>Chakur</td>
<td>780.8</td>
<td>880.8</td>
<td>880.8</td>
<td>880.8</td>
<td>1062.00</td>
<td>897.04</td>
<td>10.00</td>
</tr>
<tr>
<td>5</td>
<td>Ausa</td>
<td>813.9</td>
<td>813.9</td>
<td>813.9</td>
<td>813.9</td>
<td>922.00</td>
<td>835.52</td>
<td>05.00</td>
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<tr>
<td>6</td>
<td>Nilanga</td>
<td>711.7</td>
<td>711.8</td>
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<td>711.7</td>
<td>962.05</td>
<td>761.86</td>
<td>13.00</td>
</tr>
<tr>
<td>7</td>
<td>Udgir</td>
<td>902.8</td>
<td>902.8</td>
<td>902.8</td>
<td>902.8</td>
<td>1027.33</td>
<td>927.71</td>
<td>05.00</td>
</tr>
</tbody>
</table>

Source: Socio-Economic Abstract of Latur District 2001-02 to 2005-06 (computed by Author.)

Humidity:

Humidity is one of the prominent elements of weather from the farmer’s point of view, and plays a significant role in changing agroclimatic conditions from place to place. Therefore, it is deals with separately from other elements of climate. Humidity in fact is the set of atmosphere with respects to the gaseous from of H₂O i.e. the water vapor it contains. The air is humid during the South-West monsoon season in Latur district. During the rest of the year the air is generally dry.

Cloudiness:

During the South-West monsoon season, the skies are generally heavily clouded to over cast. During the rest of the year the skies are clear or lightly clouded, there is some increase in cloudiness during the afternoons of the summer seasons.

Winds:

Winds are light but increase in force during the latter half of summer and in the monsoon season. Thunderstorms occur in the summer and monsoon seasons while dust storms occur in summer.
2.8 Soil Types:

Soil constitutes the physical basis of agricultural enterprises and plays a very important role in the agricultural economy of the region. Differences in soil texture, drainage, and fertility are of major importance in explaining contrasts in agriculture. Unlike climate, soil should not be regarded as a part of the natural endowment of an area. In fact, it is an agricultural that modifies soils excepting certain virgin soils which can retain their original characteristics. On the whole, soils constitute the physical base, for any agricultural enterprise. Farming is a business and good soil is a part of the farmers stocks in trades. Good soils are good to the extent that man makes judicious use of them. Our standard of living which predominantly depends on agriculture is often determined by a combination of the physical, chemical and biological characteristics of the soils and corps and livestock raised on them. Crop growth is determined to a considerable extent by the amounts of nutrients in the soil. The main factor that has influenced the development of soils in Latur district is the undulating and hilly topography. The soils of varying are to be found through the district. The soils in the district can be classified into three main categories on the basis of depth and structure namely.

Shallow soils (0" - 12"")
Medium soils (12" - 24"")
Deep soils (above - 24"")

Shallow soils are mainly located in the North- Eastern part of the district. They own to dark gray brown in color, loamy to clay loam in texture with granular to sub-angular blocky in structure. These soils tend to be alkaline in reaction. They are different in nitrogen and organic matter and will give better yield on the application of the same with provisions of adequate water (Map No. 2.4).
LATUR DISTRICT

SOIL

INDEX

DEEP SOIL
MEDIUM SOIL

Map No. 2.4

[Map of soil types in LATUR DISTRICT]
Patches of medium soils occur mainly near Nilanga and central portions of the district. They are dark brown to dark gray brown in color, clay loam to clayey in sub-angular blocky to blocky in structure. These soils are alkaline in reaction and have a fair amount of phosphate but need the application of nitrogen and organic matter for better yields. Medium deep soil vary from dark gray brown to very dark brown in color and are found scattered in the Northern parts of the district. They are clay loam to clayey in texture and granular to sub-angular blocky in structure. These soils are alkaline in reaction and are deficient in nitrogen.

Deep soils are generally seen in the South and in the Terna and Manjra River valleys. They are clayey in texture and vary from dark gray brown to very dark gray in color.

The structure of these soils are sub angular blocky to blocky. The lower zones of the profile show compact to massive structure. They are alkaline in reaction and the total soluble salts are fairly high.

2.9 Natural Vegetation:

The land surface of the earth is mainly covered by the natural vegetation. Even the so called deserts have their vegetation though it may be scanty and inconspicuous. Natural vegetation is important from view point of rainfall distribution and the fertility of the soil. It not only checks the soil erosion to the greater extent but also keep the environmental balance. Forest products supports to the forest based industries; therefore the study of forest is essential.

Forest cover of Latur is a very low. Only 0.48 percent 3500 hectare area under forest out of total geographical area during 2003 in Latur districts. In the forest the trees are scattered. Babhul, Khair, Bel, Apta, Dhavde, Bor, Aroni, Hivar, etc. trees and Kektal or Cordage are found in the forest. Similarly Jambhul, Mango, Moh, Neem, Palash etc. are also
found in Chakur taluka of Latur districts is well known for hilly village known as Vadval. It is known as island with innumerable varieties of plants of medical value.

2.10. Minerals:

The geology of the entire district consists of dark colored volcanic lava flows spread out in the form of horizontal sheets or beds. Because of their dominantly basaltic composition and the tendency to form flat topped plateau, the lavas are termed plateau basalts. Since these basaltic lava flows cover an extensive region in the Deccan and frequently presents step like appearance to the hills and ridges they are commonly terms as “Deccan traps”, the word trap meaning ‘step like’.

Trap rocks being hard, dense and durable are most suitable for building purpose but gently lack any economically useful and important minerals.

=*=*=*

Part B

Socio - Economic Setting of the Region

2.11. Introduction:

In the A section has been discussed on the physical setting of the region. However, landuse pattern is a not only product of physical setting of the region but also manmade frame. The analysis of relevant socio-economic factors that influence on the landuse pattern is made. Includes a study of demographic factors, irrigation, animal husbandry, improved seeds, chemical fertilizers, pesticides insecticides and weedicides,
agricultural credit and finance, industries, marketing transportation and communication etc.

Above all these important factors in determining the nature and extension of soya bean cultivation. All these attributes however, influence the entire system of agricultural in general and hence, it is difficult to analyze their influence on each crop separately. As such factors have studied her in the context of agrarian structure in general and Soya bean cultivation in particular.

2.12. Population:

Demographic factors as like growth of population, density of population, land holding size, and literacy etc. are played important role in social, cultural, economic, industrial and agricultural development of the region. It is the people propel social progress, create social wealth, development of science and technology, through their handwork and continuously transform the human environment. Man being powerful geographical factor on the earth surface. He determines the economic pattern of resource utilization. Man himself is a very dynamic and important resource. He plays a crucial role in the entire process of landuse, production and he is also the beneficiary of the whole resource utilization and economic development. The analysis of different elements of population is as follows.

A. Growth of Population:

The growth of population is an index of its economic development, social awaking and many other characters. It is one of the significant factors associated with mans occupations. In other words, it flows in the size from time to time and people migrate temporally both within the administrative boundaries and across them. The growth of population in
any area is determined by these basic factors namely fertility, mortality and mobility. The difference between fertility and mortality is called natural growth of population. The present pattern of population growth is simply the latest phase of census of growth trend.

The growth of population may be approached just by taking into consideration the next year growth of population over the basic year. The following formula used to calculate the growth rate of population.

\[ r = \frac{(P_n - P_0)}{P_0} \times 100 \]

Where, \( r \) = Denotes growth rate of population
\( P_n \) = Denotes current year population
\( P_0 \) = Denotes base year population

The growth rate of population has great significance for the geographers. The growth of population is important because the fast growth put the pressure on agriculture and industry.

The population of district accounted for 2.12% of the states population. It increased from 16.76 lakh in 1991 to 20.78 lakh in 2001 giving a decadal growth of population of 23.94%. Table No. 2.4 shows the population of district and its variation at each census since 1901.

In 1991 out of the total population rural population was 1334773 and urban population was 341868. In 1991 rural urban population decade growth was 28.7% in 2001 total rural population was 1590024 and urban population was 490261 and decade growth was 24.32%.
Table No. 2.4: Decadal growth and variation of population in Latur District (1901-2001)

<table>
<thead>
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<th>Year</th>
<th>Population</th>
<th>Decadal variation</th>
<th>Rate of variation in %</th>
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<td>1901</td>
<td>423609</td>
<td>......</td>
<td>......</td>
</tr>
<tr>
<td>1911</td>
<td>506549</td>
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<tr>
<td>1961</td>
<td>818160</td>
<td>157337</td>
<td>23.81</td>
</tr>
<tr>
<td>1971</td>
<td>1048618</td>
<td>230458</td>
<td>28.17</td>
</tr>
<tr>
<td>1981</td>
<td>1292882</td>
<td>244264</td>
<td>23.29</td>
</tr>
</tbody>
</table>

Source: District Census Hand Book of Latur District, in 1991 & 2001CD.

The year 1921 is known as big divide line because prior to this region’s population decreased by 5.30% in the decade 1911-1921. But since 1921 there has been a drastic change in trend of population growth. The main cause of rapidly growth of population is the rapidly decline in death rate, and slow decrease in birth rate. It is thus, clear that the region’s population is growing at a rapid rate since 1921. But there is a decrease in growth rate of population since 1991.

Regarding the growth rates of taluka, there is also significant difference in various talukas. Most densely populated talukas in the East have shown higher rates of growth. While the Western talukas of Renapur, Chakur do not have an urban areas comparatively smaller growth of population.

B. Density of Population:

For study of the pressure of population on landuse pattern, various types of densities are computed. The term ‘Density of Population’ refers to the number of persons per square kilometer. In other words density of
population shows the man - land ratio. This is calculated by, dividing the number of persons of a country or region, by the total geographical area.

If the density of population is very high, there would be (abnormal pressure on land and if the land area is not sufficiently) productive, over population will result. A country having a higher density man-land ratio at early stage of development will have unemployment.

Generally, a country having a higher density is more prosperous. Higher density of population is the result of advanced industrialization. A higher density of population wills also implies greater economic activities and an obvious urge for an improved standard of living, a grater struggle for existence and continuous competition. Man and land are the ultimate elements in the life of human society. So, that the number of people in proportion to the amount of land is of fundamental consideration in the study of population.

According to 2001 Census, the population of Latur district is 20.80 lakh spread over its area of 7157 sq. k.m. giving the overall density of 282 persons per sq. k.m. and the corresponding figure for Maharashtra state is 314. Leaving cr. Bombay, Latur district is a district among the low-density of Maharashtra. Udgir and Ahmadpur have the highest density of population and the lowest density is Renapur.

C. Literacy:

Literacy is considered as a fairly reliable ended of the socio-economic development of the region. Level of literacy influences to a significant extent the socio-economic development of the region. Literacy also influences fertility, mortality and economics composition to the population of the region. Without an analysis of literacy pattern, a study of the demographic elements of a region will not be complete.

Definition of Literacy varies from region to region. In India, all those persons, who can read as well as write in any language, are
classified as literate. Level of literacy varies enormously from region to region. Even within the same region level of literacy vary between urban to rural areas, among males and females and also among different occupational and social groups. A large number of socio-economic factors, such as nature of economy, level of technological development, etc. influence the literacy pattern.

Out of these literate population 51.63% rural population and 70.87% urban population was literate in Latur district. During 2001, about 71.54% population was literate in Latur district. Out of these literate population 58.90% rural population and 80.05% urban population was literate in Latur district.

During from 1991 to 2001 only 15.97% growth in literate population in Latur district. Only 9.18% growth in literate urban population, while 17.27% growth in literate rural population from 1991 to 2001 in Latur district. It means rural population literacy rate is increasing than urban population literacy rate. It is a positive change for development of agriculture in Latur district.

D. Farm Workers:

The term farm workers included cultivators and agricultural labours. In year 2001, only 36.74% main cultivators and only 33.85% main agricultural labours out of total main working population in Latur district. It means proportion of farm workers very less out of total main working population. In the year 2001 only 29.80% marginal cultivators and 56.76% marginal workers population in Latur district.

E. Land Holding Size:

Land holding size is an important aspect of landuse study. With changes in the size of the holdings, the landuse pattern also changes and the landuse pattern becomes stagnant as soon as the holdings reach to a particular level. The size of farm is a matter of great importance to make
any development in agriculture. It is a pointer to the extent to which the 
time and recourse of the farmer are fully utilized. Land holding is the 
lower level unit of landuse. The decisions are taken on this unit of the 
land therefore it is necessary to analyze the land holding size upon which 
the decision is taken for the use of land for different purposes.

Table No 2.5 shows the maximum size of holding is small in the 
Latur district. In fact near about 89.62% of the total holdings are below 
10 hectare. Only 10.38% of the total holdings are above 10 hectare. 
Therefore, the equipments to be used by farmers is very low scale in the 
maximum fields.

Table No. 2.5. Number and area of operational Holding by size class 
In Latur District

<table>
<thead>
<tr>
<th>Size Class in Hectare</th>
<th>Total Holdings</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Area in Hect.</td>
<td>Percentage</td>
</tr>
<tr>
<td>Below 10.0</td>
<td>226841</td>
<td>579155</td>
<td>89.62</td>
</tr>
<tr>
<td>10.0 - 20.0</td>
<td>4800</td>
<td>60417</td>
<td>9.34</td>
</tr>
<tr>
<td>Above 20.0</td>
<td>266</td>
<td>6691</td>
<td>1.02</td>
</tr>
<tr>
<td>Total all Size Class</td>
<td>231907</td>
<td>646191</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Socio - Economic Abstract of Latur District 2005 – 06.

2.13 Irrigation:

The process of supplying water to the crops by artificial means is 
called irrigation. This is also understood by a different terminology called 
"Irrigated Agriculture or Irriculture". Irrigation is as important to the 
crops as blood supply to the human body. The water supply to the crops 
is a primary need for the healthy growth of the crop as the blood in the 
human body. Irrigation is an agricultural strategy designed to reduce
moisture deficiency i.e. the imbalance between the moisture supplied by rainfall and the evapotranspiratory demand. Moreover, the adverse result of unreliability of rainfall is well countered through irrigation. To be successful and well developed agricultural required supply of water at regular interval and in required quantities. Irrigation is essentially the artificial application of water to overcome deficiencies in rainfall for growing crop. If the rainfall is highly erratic in a region, then, other climatic conditions have to be favourable for the cultivation of variety of crops with the help of irrigation. Development of irrigation depends on the existence of three factors, i.e. 1. The need of irrigation, 2. The facilities and resources and an organization to utilize resources are such as a state or a central authority, 3. As a rule, lower the rainfall grater is its variability and more is the need for irrigation.

The socio-economic need for irrigation has a also been recognized for supporting the growing population, rehabitating the poor section of society and narrowing the gap of regional imbalances. The impact of irrigation is all prevailing as it leads to changes in cropping pattern, increases yield rates and labors utilization and in the ultimate analysis beings prosperity to the area. Hence, it is regarded as catalyst for socio-economic change that set motion the productive forces in the agricultural sector.

Irrigation is the most important and basic ingredient, plays a vital role in the changing agricultural landscape. It provides assurance of agricultural crops, useful for multiple cropping and for adopting agricultural innovation in areas where rainfall is both inadequate and unreliable. It is found that the cultivators having irrigational facilities without irrigation. And, therefore, it is a pivot of modern agricultural growth.
Importance of irrigation as essential in put hardly needs emphasis. Moreover, it is a pre-requisite for the adaptation of new technology in agriculture and for the rapid growth of agriculture sector. The conversion of dry land in to wet land, provides a security against the vagaries of rainfall; preventing crop failure and enabling higher yield per hectored. It also helps to the farmers to take two or more crops from the same field, within a year and it increases the productivity of the land by transforming the agriculture. The impact of irrigation is prevailing as it leads to changes in cropping pattern, increases yield.

According to the 2005-06 figures, it is observed that 10854 hectares land is irrigating, and 29833 hectares of land will come under irrigation after the competition of projects, in their study region.

Modes of irrigation:

Today, land is irrigated by a variety of ways, such as canals, wells, tanks and lifts. The following modes of irrigation are used for irrigations the agricultural land in the study region.

a. Major Irrigation Projects:

An irrigation project which covers more than 10,000 hectares as the cultivated common areas is called major irrigation project. The major irrigation projects are essential for the all round development of the region. Major irrigation projects can change socio-economic structure of the region.

There are two major irrigation projects in Osmanabad district. They are Manjra project in Kalamb taluka and lower Terna project in Omarga taluka in Osmanabad district. It is located in Osmanabad district, but supplying water for the irrigation of agriculture in Latur district. Out of the total cultivable command areas 38203 hectare land in Latur district. According to the 2005-06 figures 10824 hectare land is irrigating. After
the completion of projects near about 29833 hectares, land will come under irrigation.

b. **Medium irrigation projects:**

Medium irrigation projects are those with cultivable command areas between 2000 to 10000 hectares. Out of the total cultivable command areas 28400 hectares land in Latur district. There are 11 medium projects in Latur district. The work of seven projects in completed and four projects are in progress. Sakola, Tipral, and Masalga (Nilanga), Devarjana (Udgir) and Renapur-Kamkheda (Renapur) medium projects are under construction. According to 2005-06 figures it is observed that 1343 hectares land is irrigating. After the competition of projects near about 7755 hectares land will come under irrigation. Gharni, Jogala (Chakur), Tiru Wadhona (Udgir), Tawarjashiur (Latur), Aurad (Sha), (Nilanga), Girakachala (Nilanga) Vhati (Nilanga), and Mogha Brulapa(Udgir) these project are completed and they are providing irrigation to 6519 hectare of land in 2005-06. Raigavhan medium project in Kalamb taluka in Osmanabad district. This project is providing irrigation to 688 hectares of land in Latur district during 2005-06.

Most of the medium irrigation projects become dry in summer season. They provide water for irrigation in rabbi and sometime in summer season. Due to the medium projects yield of crops increased to some extent during recent years.

c. **Well irrigation:**

As the cost of construction of well is low they are suited to poor and marginal farmers. There were 30535 irrigation wells in Latur district during 2005-06. These irrigation wells are providing water to 501 hundred hectare of land during 2005-06.
2.14. Animal Husbandry Resources:

India is a rural oriented and land based country. Animal husbandry resources are the backbone of the Indian agriculture and played important role in rural economy. All the agricultural operations are based on animal husbandry resources. They are the chief sources of power and manure. Most of the farmers are poor with small holding of land which is cultivated with help of bullock and meal buffalo’s. On which they depend for plunging, planking, threshing, harvesting mourning, irrigation and transport of produce etc. Cows provide milk and milk product which are the only one sours of the animal protein in vegetarian diets.

Table No.2.6 shows that near about 536206 animal husbandry are registered in the study region during 2005-06. There were 45962 sheep’s in Latur districts. There is too much variation in talukawise distribution of sheep’s. Out of total district sheep’s, highest sheep’s (30.5%) was found in Udgir taluka whereas lowest sheep’s (2.46%) was experienced in Renapur taluka in year 2005-06. There were 176986 Goats in Latur district and there were to much variation in talukawise distribution of goats. Out of the district total goats, highest goats (21.96%) were recorded in Udgir taluka whereas lowest goats (7.30%) were found in Renapur taluka in 2005-06. There were 67745 cows in Latur district. There is too much variation in talukawise distribution of cows. Out of the district total cows highest (20.52%) was experienced in Udgir taluka whereas lowest cows (6.71%) were found in Renapur taluka in year 2005-06.

There were 887 male buffalos in Latur district. There is too much variation in talukawise distributaries in male buffalos. Out of the district total male buffalos, a highest male buffalo was observed in Ausa (43.06%) taluka whereas lowest male buffalo (1.91%) was found in Udgir taluka in year 2005-06. There were 84262 female buffalos in Latur
district. There is too much variation in talukawise distribution of female buffalos. Out of the district total female buffalos a highest female buffalo (22.53%) was found in Udgir taluka whereas a lowest female buffalo (6.20%) was found in Renapur taluka in year 2005-06. There were 160364 bulks in Latur district. There is too much variation in talukawise distribution of bulks. Out of the district total bulks, a highest bulks (21.52%) was recorded in Nilanga taluka whereas a lowest bulks (6.96%) was observed in Renapur taluka in year 2005-06.

Table No. 2.6: Talukawise Animal Husbandry Resources of Latur District (2005-06)

<table>
<thead>
<tr>
<th>Taluka</th>
<th>Sheep</th>
<th>Goat</th>
<th>Cow</th>
<th>Male Buffalo</th>
<th>Female Buffalo</th>
<th>Bulks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latur</td>
<td>4103</td>
<td>24491</td>
<td>8683</td>
<td>71</td>
<td>13721</td>
<td>23207</td>
</tr>
<tr>
<td></td>
<td>(8.92)</td>
<td>(13.83)</td>
<td>(12.81)</td>
<td>(8.00)</td>
<td>(16.28)</td>
<td>(14.47)</td>
</tr>
<tr>
<td>Renapur</td>
<td>1131</td>
<td>12932</td>
<td>4546</td>
<td>29</td>
<td>5232</td>
<td>11165</td>
</tr>
<tr>
<td></td>
<td>(2.46)</td>
<td>(7.30)</td>
<td>(6.62)</td>
<td>(3.26)</td>
<td>(6.20)</td>
<td>(6.96)</td>
</tr>
<tr>
<td>Ahmadpur</td>
<td>1233</td>
<td>20541</td>
<td>7330</td>
<td>314</td>
<td>8029</td>
<td>17304</td>
</tr>
<tr>
<td></td>
<td>(2.68)</td>
<td>(11.60)</td>
<td>(10.81)</td>
<td>(35.40)</td>
<td>(9.52)</td>
<td>(10.79)</td>
</tr>
<tr>
<td>Chakur</td>
<td>5265</td>
<td>19392</td>
<td>6776</td>
<td>54</td>
<td>8241</td>
<td>13733</td>
</tr>
<tr>
<td></td>
<td>(11.45)</td>
<td>(10.95)</td>
<td>(10.00)</td>
<td>(6.08)</td>
<td>(9.78)</td>
<td>(5.56)</td>
</tr>
<tr>
<td>Ausa</td>
<td>6768</td>
<td>28518</td>
<td>12852</td>
<td>382</td>
<td>12777</td>
<td>29913</td>
</tr>
<tr>
<td></td>
<td>(14.72)</td>
<td>(16.11)</td>
<td>(18.97)</td>
<td>(43.06)</td>
<td>(15.16)</td>
<td>(18.65)</td>
</tr>
<tr>
<td>Nilanga</td>
<td>10892</td>
<td>32244</td>
<td>13650</td>
<td>20</td>
<td>17277</td>
<td>34511</td>
</tr>
<tr>
<td></td>
<td>(23.69)</td>
<td>(18.21)</td>
<td>(20.14)</td>
<td>(2.25)</td>
<td>(20.50)</td>
<td>(21.52)</td>
</tr>
<tr>
<td>Udgir</td>
<td>16570</td>
<td>38868</td>
<td>13908</td>
<td>17</td>
<td>18985</td>
<td>30531</td>
</tr>
<tr>
<td></td>
<td>(30.50)</td>
<td>(21.96)</td>
<td>(20.52)</td>
<td>(1.91)</td>
<td>(22.53)</td>
<td>(19.03)</td>
</tr>
<tr>
<td>Total</td>
<td>45962</td>
<td>176986</td>
<td>67745</td>
<td>887</td>
<td>84262</td>
<td>160364</td>
</tr>
<tr>
<td>District</td>
<td>(100)</td>
<td>(100)</td>
<td>(100)</td>
<td>(100)</td>
<td>(100)</td>
<td>(100)</td>
</tr>
</tbody>
</table>

Source: Socio - Economic Abstract of Latur district - 2005-2006
(figures in the brackets indicates the percentage)
2.15. Improved Seeds:

High yielding variety seeds breeding technology is a revolutionary transition from age-old tradition to innovation. The Green Revaluation sweeping the agricultural economics of the developing countries is essentially the outcome of the use of improved high yielding varieties of different crops. Agricultural investment will be more profitable only after the adaptation of improved seeds, fertilizers and irrigation technology which helps to multiply the productivity of per hectare.

The improved seeds program in the district has changed the tradititional cropping pattern to certain extent and marked the beginning of agricultural development. It is supported by expansion of irrigation and use of chemical fertilizers.

Improved varities of jowar (kharif and rabi) generally used in the region are MBSH-7, CSH-9, CSH-14, (kharif M-35-1, phule yashoda, RAV9-9R(rabi)etc. of bajra shardha, saburi, ICTP 8203, of mung kopergaon, BM- 4 of udid, TAU-1, of maize reasearch, of wheat HD2189, Lok-1, MACS 2496, PBW-343 etc. of gram vijay, annegiri, G-12, Vishal, Virat etc.

Table No. 2.7 Variety wise use of improved seeds in Latur Districts (2006-07)

<table>
<thead>
<tr>
<th>Crop/Variety</th>
<th>Use of H.Y.V Seeds in quintals</th>
<th>Percentage to the Food grain total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jowar</td>
<td>1317</td>
<td>12.90</td>
</tr>
<tr>
<td>Bajra</td>
<td>71</td>
<td>0.69</td>
</tr>
<tr>
<td>Paddy</td>
<td>04</td>
<td>0.03</td>
</tr>
<tr>
<td>Tur</td>
<td>93</td>
<td>0.91</td>
</tr>
<tr>
<td>Mung</td>
<td>447</td>
<td>4.38</td>
</tr>
<tr>
<td>Udid</td>
<td>1604</td>
<td>15.71</td>
</tr>
<tr>
<td>Maize</td>
<td>12</td>
<td>0.11</td>
</tr>
<tr>
<td>Wheat</td>
<td>4960</td>
<td>48.60</td>
</tr>
<tr>
<td>Gram</td>
<td>1797</td>
<td>16.62</td>
</tr>
<tr>
<td><strong>Total Food grain</strong></td>
<td><strong>10205</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

*Source: Agriculture department of zila parishad in Latur.*
Jowar, hybrid bajara, tur, mung, udid, maize, wheat, gram, paddy high yielding seeds are distributed in every taluka.

Near about 10205 quintals high yield variety seeds of food grain were distributed in the study region in during 2006-07. All farmers are using the high yielding variety seeds to increase their agricultural products.

Shows that table No. 2.7 Only 1.74% high yield seeds of paddy, maize, bajara, and tur were used in the study region in year 2005-06. Near about 98.21% high yield variety were seeds of wheat, gram, udid, jowar, and mung were used in Latur district in year 2005-06.

2.16 Chemical Fertilizers:

The natural fertility of land is declining with the passage of time. For the recuperation of fertility, the soils are rested in the form of fallowing or they are enriched by applying manures (compost and green) and chemical fertilizers (NPK).

Use of fertilizers (urea, single super phosphate, ammonium sulphate, and potash, has rapidly increased, with the utilization of improved seeds in area under certain crops as, jowar, bajara, tur, mung, maize, wheat, and gram in the study region. Farmers have learned by experience the effective use of fertilizers.

In during 2005-06 near about 76941 M. tun chemical fertilizers were used in the study region. It is essential to use more chemical fertilizers to raise the food grain crop production in the study region.

2.17. Insecticides, pesticide and weedicides:

The new seeds are very delicate highly susceptible to pests and disease. The irrigation fields enriched with heavy energy input of NPK create a microclimate (hot and humid) in the field which helps in the
luxurious growth of plants. The hot and moist environment of the field also becomes conductive for the fast growth and multiplication of insects and pests. These insects and pests seriously attack on the plants, hamper, their growth and reduce the yield substantially. The danger of pests and insects may be reduced by using plant protection chemicals. The problem may be tackled by developing the disease resistant seeds or by spraying insecticides and pesticides at the prescribed schedules devised for different crops.

The problems of crop disease and infestation by insects may also be overcome by timely application of herbicides, fungicides, insecticides, namaticides, and rodenticides. For the application of plant protection chemicals the farmers must have adequate knowledge of plant diseases and their controlling chemicals. At the outbreak of a disease in the crop the entire area should be sprayed, if the timely spray is not done the crops of the region may vanish. Since the plant protection chemicals are quite expensive, they are generally out of the reach of small and marginal farmers. And if the crop by small farmers is not sprayed, the insects may creep in the neighboring fields and the diseases may adversely affects larger areas.

Monocrotophos, Cholorophrifhos, Endosulphan, Diamethoate, Hexaguinal, Glyphosphate, Gramoxone pesticides and Wedicides are particularly used in the Latur district. In during 2005-06, near about 272200 litre insecticides, pesticides and Wedicides were used in the Latur district.

2.18 Agricultural Credit and Finance:

Capital played a vital role in the Indian agriculture. All agricultural in puts needs capital. All the farmers make their decision based on capital available them. Agricultural credit and finance have remained vital issues in the adoption of modern technology, as it is costly.
There are 104 District Central Co-operative Bank Ltd. in the study region in 2006. There are 6 states Agricultural and Rural Development Bank. There are 586 Primary Agricultural Co-Operative societies in the Latur district in 2006. They are providing loans for development of agriculture. District Central Co-Operative Bank Ltd. is given loan 10594 Lakh Rupees short period Agricultural to the farmers in the study region in 2006. Primary Agriculture Co-Operative Societies are given 43041 thousand Rupees loan to the farmers in Latur district in year 2006.

2.19 Industries:

Industrialization is the base for economic development of any region. The term industry is often used by itself to denote manufacturing. The term ‘manufacturing’ includes those activities by which man changes the form of nature of raw materials converting them into more use full products. These transforming operations are conducted in factories, where raw materials brought from various source regions and from finished products goes to diverse market regions.

Latur district is a very poor in mineral resources and it is less developed agriculturally too. This has resulted in a poor industrial growth based on local resources. The raw materials available in the region are cotton, groundnut, sugarcane, pulses etc. local availability of these raw materials has encouraged establishment of a number of ginning and pressing factories, oil mills, sugar factories, dal mills, handlooms etc.

Lack of adequate transport and communication facilities and absence of any highway passes through the territory are the important reasons that explain the industrial backwardness of Latur district. The industries of Latur district could be discussed under two heads.

i) Small scale industries.

ii) Large scale industries.
i. Small Scale Industries:

Handloom industries are located in Latur, Ausa, Udgir, and Murud. Tanning industries is seen in place like Latur, Udgir and Lamjana. Handmade paper factories are located in Latur and Ausa. In addition to these factories manufacturing vessels of steel and brans are located in Latur. Small industries of colour, manufacturing of iron, nails and other articles of iron are located in Latur and Udgir. Besides pharmaceuticals industries, rope making industries and poultry are seen in the district. Petty industries preparing untrackers and locks are located at Tandulja, Davangaon, Borgaon, Murud and Udgir. Sericulture industry of preparing silk is located at Murud. Oil mills located at Ausa, Murud and Udgir.

ii. Large Scale Industries:

Ginning and pressing factories are found in Latur, Udgir, Ahmadpur, and Chakur, Sugar factories are located at Killari of Ausa taluka, Nalegaon of Chakur taluka, Chincholirao wadi of Latur etc. Milk powder industries are located in Udgir. Dal mills are located in Latur and Udgir.

2.20 Marketing:

Marketing can be defined as the performance of business activities that direct the flow of goods and services from the producer to the consumer, so that they may reach the consumer at the time, place and in form he wishes and at price he is willing to pay. Availability of market facilities is a very important for the agriculture development because after taken the production of one crops are finally brought in to the market for sale, therefore, if the region has several and large market centers, then the regions receives more incentives and has good scope for the development of agriculture. Agriculture produce Market Committee is major market centers for sale of any farm production. There are 10 major agriculture
productions (produce) Market Committee in the study region in the year of 2006. These are also 11 sub-market centers in the study region.

2.21 Transport and Communication:

Transportation plays an important role in the development of modern agriculture. The movements of people and goods from one place to another place it means transport. Transport facilities are the links between the producer and the consumer. In the process of agricultural development, the transport facilities are essential for the supply of certain inputs to the products, to the market and consuming areas. A good network of transport can promote the development of different agricultural products, developments of industries, trade and commerce depends upon the availability of transportation and communication. The modern cultivation depends on the regular and timely supply of seeds, fertilizers, insecticides, pesticides, and weedicidies etc. The dimension of agricultural expansion have increased due to utilization of new inputs and their transport. Transport sector contributes to the success or failure of nearly every investment in the economy.

Almost all the rivers of the regions are unfit for navigation due to their seasonable character, the considerable regional diversity of terrain ranging from level plains and narrow valleys to rugged plateaus, sleep scraps, ridges etc. determine on the distribution of transport media. The variations in the volume of traffic from place to place reflect aerial differentiations in population, settlement size and economic activities. Only 148 km. broad-gauge railway line passes through the study region. About 7206 km. road passes through the Latur district. The length of village roads was 1745 km. whereas the length of major district roads was
1520 k.m. in 2006. Taluka places are well connected by tar roads. It is essential to connect all talukas with rural areas by tar roads.

There were 271 post offices 147 telephone offices and 1 tar office in the study region in during 2005-06. There were 84739 telephone connections in Latur districts (Map No. 2.5).
REFERENCES:

2. Socio- Economic Abstract of Latur district.

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