CHAPTER II

LOCATIONAL AND SPATIAL ASPECTS OF
THE STUDY REGION

Location and Extent:
Chittoor district, the present study area lies in the southern most part of Andhra Pradesh State. It forms a part of the semi-arid as well as backward Rayalaseema region. Geomatically, it is located between the northern latitudes of 12° 37' and 14° 08' and between the eastern longitudes of 78° 3' and 79° 55'. It is bounded on the west by Karnataka State; on the east by Nellore district of Andhra Pradesh; on the north by Cuddapah, Anantapur and Nellore districts of Andhra Pradesh and on the south by Tamilnadu State. The district derives its name from Chittoor its headquarters town. The total geographical area of Chittoor district is 15,152 sq.kms. It is the sixth
largest district both in terms of area (5.51%) and population (4.91%) in Andhra Pradesh State. Administratively, the district is divided into three revenue divisions and 66 mandals.

Relief:

The district has a diversified topographical conditions consisting of plains, valleys, hills and plateaus which combine to make the district as one of the most typical physiographic units in the State. Morphologically, the district lies in transitional zone between the interior Deccan Plateau and the Coastal plain. Roughly the district can be divided into two natural divisions, namely (1) the hills and uplands and (ii) the plains.

The hills and uplands are found on the Western part of the district comprising of 31 mandals of Madanapalle division. The Eastern Ghats are the most extensive range of hills in the western and central parts of the district and which serves as water divide for many small streams. The Eastern Ghats enters the district in Kuppam area in the south-west corner. They pass northward through Palamaner and Punganur areas and are bending towards the east as far as the hills of Tirupati called, Mamandur valley. Near Tirupati, the range is intersected by a long valley which passes into Cuddapah district. East of this valley, the Ghats once more rise and follow a north-easterly direction until they enter Nellore district near Srikalahasti area. The general elevation of the Ghats which pass through the district is about 762 mts. The prominent hills of the ranges are Nagari hills, Seshachalam hills and Horsley hills.
The plains are found on the eastern part of the district comprising 20 mandals belonging to Srikalahasti, Satyavedu, Nagari and Puttur areas. In between the two natural divisions, there lies a transitional terrain zone consisting of number of valleys. This region is comprising of Chittoor, Bangarupalem and Chandragiri areas.

**Drainage System:**

There are no perennial rivers in the district. The non-perennial minor rivers and seasonal streams constitute the chief drainage system of the district. These minor rivers and streams remain dry for a major part of the year due to seasonal rainfall conditions. Some of the important minor rivers flowing in the district are the Papaghni, Ponnai, Pincha, Palar, Koundinya, Kalyani, Kusasthali, Swarnamukhi, Arani and Bahuda. Besides these, there are number of small hilly streams flowing in the district. It is significant to state that the drainage network of these minor river and stream valleys functions as a source of groundwater development which largely influence the agricultural development.

**Geology:**

Most of the area in the district has been covered by Pre-Cambrian granites which are highly magmatised. More than three-fourths of the area in the district has been occupied by Archaeans which are the oldest rocks belonging to Dharwarian system with basic intrusives. These granites are highly magmatised and are useful only as building material.
The Cuddapah system of formations and Upper Gondwanas have been noticed in northern and north-eastern portions of the district as outliers. They are mostly quartzites and shales of Nallamalai series. Upper Gondwanas and Cuddapahs are also noticed in the southern most part of the district near Satyavedu. Along the river courses recent and sub-recent formations like old and new alluvium are also noticed in the district.

**Soils:**

The soils of the district are broadly divided into red, black and mixed. A major portion of the district is covered by red soils. According to an assessment made on the basis of village records, the predominant red loamy soil is accounted for 57 per cent, red sandy 34 per cent and the remaining 9 per cent is covered by black clay (3%), black loamy (2%), black sandy (1%) and red clay (3%).

The red soils in the district are generally shallow to moderately deep with appreciable distribution of gravel. These soils are generally poor in organic matter and phosphorous content but usually rich in potash. The moisture holding capacity is very low and protective irrigation and fertilization are necessary to raise good crops and higher yield levels.

**Climate:**

Climatically, the district comes under semi-arid climate. As per the Koppen's climatic classification, it comes under 'Aw' type of climate denoting the distinct dry season in winter and marked seasonal rhythm of rainfall.
Temperature:

This district may generally be described as having hot summer and pleasant winter. The summer period from March to June is fairly hot throughout the district, and May being the hottest month. However, the upland portion of western parts of the district is comparatively cooler than the eastern parts whereas the transitional zone enjoys the moderate temperature conditions. It is evident from the fact that the mean maximum and minimum temperatures at Arogyavaram in the western region accounted 31.1°C and 19.9°C respectively which are comparatively lower than the temperatures of 33.4°C and 21.5°C at Tirupati in the eastern region of the district. On the whole, the distribution of temperatures in the district is congenial for the development of different cropping cycles throughout the year.

Rainfall:

Chittoor district receives rainfall from both the monsoons, namely south-west and north-east monsoons. The average annual rainfall of the district is 827.5 mm, but it varies from a maximum of 1187.8 mm. in Satyavedu in the eastern part to a minimum of 555.7 mm. in Pedda Thippasamudram in the western part of the district. In general the rainfall trend decreases from east as it moves towards to west and north-west direction.

Out of the total rainfall, the district receives more rainfall from south-west monsoon which accounted for 44 percent (364 mm.) and it followed by north-east monsoon with 41 percent (339 mm.); hot weather period with 11.7 per cent (96.9 mm.) and winter period with 3.3 per cent (27.6 mm.). The rainfall received from south-west
monsoon is more copious compared to north-east monsoon in the western and central parts of the district where as the rainfall received from north-east monsoon is comparatively very high in the eastern parts of the district than the other areas of the district. The district also experiences striking variations in the occurrence and distribution of rainfall and as a result of it, occurrences of drought and prolonged dry spells are not uncommon and which have had a debilitating effect on agricultural economy of the district.

Forests:

Forests accounted for 30.1 per cent of the total geographical area of the district. The floristic composition in the forests vary from dry mixed deciduous to thorny scrub jungles with occasional patches of dry evergreen growth. The hill forests in all over the district are considered important from the commercial point of view, since they are the sources for the supply of valuable products like red sanders, bamboo, sandalwood and good quality timber. Other forest products available in the district are soapnut, myrobalan, honey, custard apple and etc.

It is needless to emphasize that the present forest cover of the district is optimally sufficient to meet the proper ecological balance, but, the need of the hour is the careful management and protection from deforestation activities, soil erosion, overgrazing, extension of agriculture into reserve forest areas etc.

Landuse:
As per the nine-fold land use classification of the district, the forest cover accounted for 30.1 per cent; barren and uncultivable land 11.2 per cent; land put to non-agricultural uses 9.3 per cent; permanent pastures and grazing lands 2.7 per cent; miscellaneous tree crops 1.8 per cent; cultivable waste 3.4 per cent; other fallow lands 6.9 per cent; current fallows 2.9 per cent and net sown area 31.7 per cent.

Irrigation:

About 41 per cent of the total cropped land is irrigated in the district. Out of the total irrigation made by different sources, well irrigation is predominant which accounted for 58.9 per cent and followed by tank irrigation 37.9 per cent, cannel irrigation 2.4 per cent and other sources 0.8 per cent. There are eight medium and minor irrigation projects in the district. The total registered ayacut area under these projects is 16,773 hectares but actually irrigating only 3,255 hectares. The rainfall is more important for well distribution of tank and well irrigation.

Socio-Economic Setting:

Population

As per the 1991 census, the total population of Chittoor district is 32,56,247 accounting for 4.91 per cent of the total population of Andhra Pradesh State. The density of population in the district is 215 persons per sq.km. as against to 241 persons in the state as a whole. The district occupied sixth rank in terms of total population and 14 rank in terms of density of population in the State. The rural population accounted for 80.18 per cent of the total population of the district as against
to 73.16 per cent in the State which reveals the strong hold for the primary economic activity in the district.

**TABLE - 2.1**

**POPULATION GROWTH IN CHITTOOR DISTRICT**

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>No. of persons</th>
<th>Percentage</th>
<th>Density per Sq. km.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1901</td>
<td>11,24,261</td>
<td>-</td>
<td>-</td>
<td>71</td>
</tr>
<tr>
<td>1911</td>
<td>11,77,489</td>
<td>+ 52,228</td>
<td>+ 4.73</td>
<td>75</td>
</tr>
<tr>
<td>1921</td>
<td>12,09,752</td>
<td>+ 32,283</td>
<td>+ 2.74</td>
<td>77</td>
</tr>
<tr>
<td>1931</td>
<td>13,31,517</td>
<td>+1,21,765</td>
<td>+10.27</td>
<td>84</td>
</tr>
<tr>
<td>1941</td>
<td>14,97,778</td>
<td>+1,66,261</td>
<td>+12.49</td>
<td>97</td>
</tr>
<tr>
<td>1951</td>
<td>16,66,266</td>
<td>+1,68,488</td>
<td>+11.25</td>
<td>106</td>
</tr>
<tr>
<td>1961</td>
<td>19,14,639</td>
<td>+2,48,373</td>
<td>+14.91</td>
<td>127</td>
</tr>
<tr>
<td>1971</td>
<td>22,85,536</td>
<td>+3,70,897</td>
<td>+19.37</td>
<td>145</td>
</tr>
<tr>
<td>1981</td>
<td>27,37,316</td>
<td>+4,51,780</td>
<td>+19.77</td>
<td>181</td>
</tr>
<tr>
<td>1991</td>
<td>32,56,247</td>
<td>+5,18,931</td>
<td>+18.96</td>
<td>215</td>
</tr>
</tbody>
</table>

The sex ratio of the district is 968 per 1000 males as against to 973 in the State. The rural sex ratio in the district is 972 while the urban sex ratio is 954. Concerning to the growth of population, there has been a continuous growth rate from 1901 to 1991. But the high growth rate is recorded between 1961 to 1991. During 1981-91 the population growth rate in the district is 18.96 per cent as against to 23.91 per cent.
in the State, and thus, revealing a low rate of population in the district when compared with the State's average.

**Literacy:**

As per the 1991 census, the literacy rate of the district is 43.04 per cent which is significantly higher than the average literacy rate of 37.59 per cent in the State. The district has occupied 4th rank in the literacy rate among the 23 districts of the State. There is a striking difference in the literacy between male and female as well as rural and urban. It is evident from the fact that among the total literates, the male literacy accounted for 63.71 per cent while female 36.29 per cent. Among the rural, the literacy rate in the district is 38.14 per cent where as in urban population it is very high accounted for 62.88 per cent.

**Occupational Pattern:**

Out of the total working population of the district 73 per cent is engaged in agriculture which is slightly higher than the State's average of 69.8 per cent. It shows that the agriculture is the chief source of livelihood of the people of this region as well as economic development of the district next to agriculture, the trade and transport sector is important which accounted for 8.6 per cent and it followed by manufacturing sector with 6.4 per cent and construction sector 1.4 per cent.

**Size and Distribution of Land Holdings:**

There are about 440 thousand land holdings operating an area of 603 thousand hectares of agricultural land in the district. Out of which, 356 thousand land holdings
were small and marginal (size of land holding with 2 hectares) accounting for 80.8 per cent of the total holdings, but they were operating only 43.6 per cent of the total agricultural land. Contrasting to this, the moderate size of land holdings (size of land holding with 2-5 hectares) were less significant in terms of number of holdings accounting only 13.4 per cent of the total number of holdings, but they were significant in terms of operating area which accounting 33 per cent of the total agricultural land of the district. Equally the higher size of land holdings (size of land holding with 5-10 & 10 hectares) were lesser in number consisting 5.8 per cent of the total number of holdings but higher in the operation of agriculture land accounting 23.4 per cent of the total agricultural land of the district. It indicates that a small section of people (higher-size land holdings) owns nearly one-fourth of the total agricultural land. In the other way it can be said that the real development of agriculture in the district is heavily based upon the interest and efforts of small, marginal and middle size of land holdings who were accounting 94.2 per cent of the total number of land holdings and they own 76.6 per cent of the total agricultural land. During the period of drought occurrences and crop failures, the small and middle size of land holdings will be affected greatly.
TABLE 2.2

Distribution of Land Holdings in Chittoor District 1986-87

<table>
<thead>
<tr>
<th>Land holding size (in ha.)</th>
<th>No. of land holdings (in '000)</th>
<th>Percent to total holdings</th>
<th>Area operated (in '000 ha.)</th>
<th>percent to total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1</td>
<td>254.8</td>
<td>57.8</td>
<td>116.5</td>
<td>19.3</td>
</tr>
<tr>
<td>1 - 2</td>
<td>101.5</td>
<td>23.0</td>
<td>146.0</td>
<td>24.3</td>
</tr>
<tr>
<td>2 - 5</td>
<td>68.5</td>
<td>13.4</td>
<td>199.3</td>
<td>33.0</td>
</tr>
<tr>
<td>5 - 10</td>
<td>12.3</td>
<td>5.0</td>
<td>83.4</td>
<td>13.8</td>
</tr>
<tr>
<td>&gt;10</td>
<td>3.5</td>
<td>0.8</td>
<td>58.1</td>
<td>9.6</td>
</tr>
<tr>
<td></td>
<td><strong>440.6</strong></td>
<td><strong>100.0</strong></td>
<td><strong>603.3</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Mineral Wealth:

The district is not rich in mineral wealth and its exploitation has been on a small scale. Mineral resources play a very insignificant role in the economy of the district. The different minerals available in the district are steatite near Chittoor area; barytes near Srikalahasti; gold in Kuppam area; china-clay near Karakamadi, low grade iron near Srikalahasti and Renigunta areas and granites in different parts of the district. The granites of different colours like black, pink and gray are used in stone polishing industry.

Industry:

The industrial development is low in the district. The total number of industrial units operating in the district are 976, out of which, 27 units are large and medium
scale units, and remaining 949 are in small scale category. But these two (large and small) categories have been sharing almost equal proportion of workers and capital investment. The total number of workers engaged in industries are 13,841 and the total capital is 804.4 million rupees. Out of the 27 large and medium industries, 16 are located in Tirupati - Renigunta region and 5 at Chittoor. The important large scale industries are cotton spinning, sugar industry, confectionery, distilleries, dairy, fruit canning and processing, leather tanning, oil and flour mills, chemicals and metallic industries. There are 13 different types of small scale industries concentrated heavily in the close proximity of urban settlements. In the small scale sector, the engineering based, agro-based and beverages are more significant.

**Transport and Communication:**

Chittoor district has a well developed and well connected transportation and communication system served by roadways, railways and air transport. An airport located near Tirupati operates regular services to important cities like Madras, Hyderabad, Bangalore and Vijayawada.

Pertaining to railway network, Renigunta and Pakala are two important railway junctions in the district. The Renigunta junction connects many important places in the country from Kanyakumari to Kashmir. The Pakala junction connects many places within the district in the western region. The total length of railway line in the district is 511 kms.

The total length of all types of roads in the district is 9,337 kms. The Madras-Bangalore National High Way passes through the district for a distance of
about 81 kms. The towns of the district are well connected by roads with each other as well as with other district headquarters. By road also the district is well connected with the metropolitan cities like Madras, Bangalore and Hyderabad.

The district has fairly well developed network of post and telegraph offices. There are 1,178 post offices, 152 telegraph offices, one radio station and TV relay station catering to the needs of the people in the district.