CHAPTER –III
GEOGRAPHICAL BACKGROUND OF THE STUDY AREA

3.1. Introduction:- The present study intends to discuss the irrigation base and its impact on agriculture in Bellary district which lays in interior part a semi arid region of Karnataka. Hence, it is rather necessary to highlight briefly the salient characteristics of the Semi-arid region of peninsular interior. Further, the arid and semi-arid regions are distinguished by themselves by the degree of aridity but may be located side by side. The main purpose to study is to know the impact of irrigation on the semi arid part of Bellary district’s land use.

Arid and Semi-arid regions

The arid and semi-arid regions in India are often described together as dry farming zones where rain fed agriculture is common, but are characterized by low rainfall, excess of evaporation and low humidity from 8 to 9 moths in a year. These are drought prone and hence agriculture is impossible without the help of irrigation. Further, the ecological balance in the arid and semi-arid eco-system is delicate and gets easily disturbed.

An attempt has been made to delimit the arid and semi-arid regions of India by Krishnan 1971 and Subrahmanyam 1975. The present study is mainly based on the Thornthwaite’s climatic classifications in order to get a clear idea regarding the locations of semi-arid regions in general in peninsular India and particular in the Bellary district. Thornthwaite (1955) used moisture index value of -40 for differentiation of arid zone from that of semi-arid zone while -20 for differentiating semi-arid zone from dry sub-humid zone, which is mentioned in the below table 2.1.

Table. 3.1
Arid and Semi Arid regions in Bellary District

<table>
<thead>
<tr>
<th>Moisture Index</th>
<th>Arid-Climatic Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 20</td>
<td>Dry Sub-humid</td>
</tr>
<tr>
<td>20 to 40</td>
<td>Semi-arid</td>
</tr>
<tr>
<td>40 to 60</td>
<td>Arid</td>
</tr>
</tbody>
</table>
Krishnan (1971) computed aridity index by considering annual moisture deficiency and water needed by using the following formula.

\[
A. I = \frac{\text{Annual moisture deficiency}}{\text{Aridity Index} = \text{Annual water need}} \times 100
\]

**Semi-Arid Zones in Karnataka**

India comprises 104 semi-arid zone districts. In Karnataka state Bellary, Bijapur, Chitradurga, Dharwad, Gulbarga, Kolar, Raichur and Tumkur districts are under semi-arid zones.

Reddy in 1980 attempted to identify performance of agriculture in 72 semi-arid districts of peninsular interior by considering yield level per hectare depending on 11 years 1962-63 to 1973 - 74 and he also taken the annual exponential growth rate of output. Most of the districts of northern Karnataka are under the yield level of less than 700/lb per hectare with differential growth rates. Bellary district indicated least growth rate of less than zero with yield level of less than 700 lbs, per hectare. Hence, Bellary District was selected considered as semi-arid region.

In Bellary district rainfall is low and evaporation exceeds precipitation for more than 8 to 9 months in a year. The rainfall is unequal and erratic. The soil is black to medium black and red. The dependence on monsoon rains is inevitable. Sowing, harvest crop yield are all decided by the Monsoon. Hence for modern agriculture and for using HYV seeds and to get out put irrigation is inevitable.
3.2 Location and Extent of the study area

Map-3.1

Present study deals with irrigated landscapes of Bellary district in Karnataka. Bellary district is one of 27th districts in Karnataka state. Bellary district is spread from South-West to North-East and is situated on the eastern side of Karnataka State. The district is bounded on the north west by district of Gadag, on the north by Koppal
district, on the north east by Raichur district and west by Haveri, on the south by Davangeri, on the south east by Chitradurga district of Karnataka State, on the east are Anantpur and Karnool districts of Andrapradesh state. Covering an area of 8420 sq kms, it lies between (Map2.1) 14º-30' N and 15º-50' N north latitudes and 75-40 E to 77-11 E longitudes and is situated in the central eastern part of Karnataka state. Form north to south and from east to west it is spread over a distance of 186.7 kms and 161 kms respectively. As per 2011 census the population of the district stood at 2532383. The geographical area is 8420 sq kms with an average elevation of 494.14 meters above the sea level. The district is situated in the region generally known as “Deccan Plateau” Popularly called “Northern Maidan” of Karnataka state. Administratively, the district is divided into 7 taluks and spread over two revenue subdivisions viz, Bellary and Hospet. The Bellary revenue subdivision has three taluks viz,Hospet, Hadagli, Hagaribommanahalli and Kudligi The Bellary district has an irrigated area of 198052 hectors in the year 2011-12 and this irrigation impact on land use and cropping pattern is noticeable and studied in this research

Table 3.2
Bellary District

Talukwise distribution of Area, Population, Hoblis, Village, Panchayats

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>NAME OF TALUKS</th>
<th>Geographical Area (Sq. Kms) 2001 Census</th>
<th>Hoblies</th>
<th>No. Of Villages</th>
<th>Village Panchayats</th>
<th>Town Panchayats</th>
<th>population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bellary</td>
<td>1689</td>
<td>5</td>
<td>103</td>
<td>40</td>
<td>--</td>
<td>770929</td>
</tr>
<tr>
<td>2</td>
<td>Hadagalli</td>
<td>948</td>
<td>3</td>
<td>57</td>
<td>21</td>
<td>--</td>
<td>195219</td>
</tr>
<tr>
<td>3</td>
<td>H.B.Halli</td>
<td>974</td>
<td>4</td>
<td>56</td>
<td>26</td>
<td>1</td>
<td>188238</td>
</tr>
<tr>
<td>4</td>
<td>Hospet</td>
<td>904</td>
<td>4</td>
<td>74</td>
<td>23</td>
<td>1</td>
<td>459991</td>
</tr>
<tr>
<td>5</td>
<td>Kudligi</td>
<td>1619</td>
<td>4</td>
<td>91</td>
<td>24</td>
<td>--</td>
<td>308901</td>
</tr>
<tr>
<td>6</td>
<td>Sandur</td>
<td>1152</td>
<td>3</td>
<td>89</td>
<td>22</td>
<td>--</td>
<td>260213</td>
</tr>
<tr>
<td>7</td>
<td>Siraguppa</td>
<td>1036</td>
<td>4</td>
<td>84</td>
<td>33</td>
<td>2</td>
<td>269104</td>
</tr>
<tr>
<td>Dist.total</td>
<td>8450</td>
<td>27</td>
<td>554</td>
<td>189</td>
<td>4</td>
<td>--</td>
<td>452515</td>
</tr>
</tbody>
</table>

Source: Bellary District at glance report – 2011
The study area is in Karnataka state having 3.84 percent of the total population. Bellary is the largest taluk in terms of area, which has 1689 sq. kms, followed by Kudligi (1602 km²). Hospet is the smallest taluk in the study region (Table 2.2). There are 189 village Panchayats and 554 villages. The river Tungabhadra forms an administrative boundary dividing the district on the west.

3.3 Historical Background

There are varied theories with regard to the origin of the name ‘Bellary’ and it is rather difficult to say which term is correct. In one of the lithic inscriptions dating back to 1131 AD found at Byloor, the name of “Bellare” is found. In several other inscriptions found at Kolur, Sindigeri, Kurugodu etc., (all are in Bellary district) the word ‘Ballare’ has been used. In three Hoysal Inscriptions of the years 1161 AD (Belur-193), 1178 AD (Nagamangala 76) and 1183 Ad (Belur-137) Ballare is mentioned as one of the places captured by the Hoysal King ‘Vishnuvardhana’. From these records, it is clear that the place referred to as ‘Bellare’ is Bellary of the present days.

The area of the Bellary district is associated with certain events mentioned in the great epic ‘Ramayana Krishkinds’ where Rama, in the course of his search for seta, met and befriended Sugreeva and Hanuman and is believed to have stayed very close to hampi which became the capital of Vijayanagar Kingdom in the 14th century. Further, this district formed part of territories of various dynasties such as Rashtrakutas, Gangas, Chalukyas of Kalyan, Kalachurys, sevanas and Hoysalas, and there after it came under the sway of Vijayanagara Kings for more than 2 centuries. After the fall of Vijayanagara in 1565, it came under Muslim rulers of Deccan and then Marathas.

In return for stationing subsidiary force in his domain, in the year 1800 Nizam agreed to code to British rulers all the territories acquired by him under the two treaties of 1792 and 1799, and thus, four districts namely Bellary, Anantpur, Cuddapa, and part of Kurnool passed into the hands of the British rulers. The districts were popularly known as coded districts. All these districts were in Madras Presidency till 1953. On October 1, 1953, the Bellary district with its 7 taluks was transferred to the then Mysore state. Mallapuram Taluk was abolished and a new taluk named Hagari Bommanahalli was constituted. On this occasion due to the
transfer of villages from one taluk to another, there were considerable changes in the boundaries of three more Taluks, viz., Kudligi, Hadagali and Hospet. In 1997 Karnataka government transferred Harapanahalli taluka to Davanageri district.

3.4 Physical Setting

Map 3.2
The map 2.2 shows marked contrasts in topography within the district in respect of spatial feature, areal extent, type and quality of resource base. Topographically the district consists of two widely different natural divisions, one to the east of Sandur hills and the other to west. The Sandur hills lie right across the district from North West to southeast, formatting eastern and western divisions. The eastern division is smaller than the western division and is included with Sirguppa and Bellary Taluks of the district. It is a flat treeless landscape covered with black cotton soils. It is rarely diversified by the rocky hills which rise from it. They look like islands out of the sea. The western division though containing scattered patches of black soil is for the most part covered with mixed and red ferruginous soils except in Hadagali Taluk and it is broken up by a constant succession of wild and rugged hills and lie at a higher elevation than the eastern part. Both of them slope gradually northwards towards the river Tungabhadra.

Sandur hills are the most noticeable physical features here. They start from Mallapuram on the bank of the Tungabhadra River and extend south-east ward for about 50 kms, with only one break. The highest peak is where the Kumarswami temple is located at 1000 meters above the sea level. On the other hand, Ramandurga, a little hill station is about 900 meters high.

3.5 Geology

The district consists mainly of Archaen Complex (Map2.3) composed of Crystalline Schists, epidiorites, granitic gneisses and latter granites. Basic and acidic rocks are not uncommon. The crystalline schists and epidiorites of the Dharwad system are the oldest rocks which due to lateral pressure were crumpled into folds with a general north-west to south-east direction. The following are the bands traced from west to east as shown in the map 2.3
Map 3.3

Rocks and Minerals of Bellary District

Legend
Rocks
- Yellow: Granite, Granodiorite, Pegmatite Metamorphic
Major Rock Type - Schists
- Orange: Schists
- Pink: Schists phylite, shale, Limestone/Marble Quartzite
- Blue: Unclassified Crystalline mainly gneisses

Minerals
- Yellow Triangle: Corundum
- Pink Star: Iron Ore
- Yellow Diamond: Manganese Ore
- Green Circle: Sand

0 12.5 25 50 KM
**Dharwad system and equivalent rocks**

This system of geological formations is spread in four bands.

a) **Kunchar – Kallajalligudda Range:**

   This range occupies practically the westernmost part of the district.

b) **Mallappanagudda – Jalikalgudda range:**

   This is an extension of Dambal-Chikkanayakanur hill range and continues in Gadag district, known as Kapatgudda ranges.

c) **Sandur Syncline and the Coppaer Mountain Range:**

   This range occupies the central portion of the district and starts from Mallapur in the north and continues southwards for a distance of 42 kms, which forms the home of economic minerals in the district.

d) **Pennar-Hagari Band:**

   This range runs from Nadivi (on the bank of Tungabhadra river) towards southeast upto the valley of Hagari river.

   The Dharwad system mainly consists of hornblende schists, conglomerates, epidiorites, epidiorite schists, quartz phyllitic schists and banded ferruginous quartzites with frequent concentrations of haematitic iron ore at a number of places. These formations are generally associated with volcanic flows, stills and other minor intrusions.

**Unclassified Granites and Gneisses including Charnokites:**

This system consists of granites and granitic gneisses of gray and light pink colours. They exhibit the same strike as the Dharwad bands and are exposed mostly in the eastern parts of the district. Pink and porphyritic granite occur to the north-east of Bellary town while medium to coarse grained uniformly deep pink granites occur near Dommur and Sirigere in Siraguppa taluk. They consist of seep red feldspars with light blue quartz and negligible proportion of biotic mica. These form attractive decorative building stones, and after polishing and dressing they are exported to foreign markets. A fairly good number of basic dykes occur traversing the district and most of them follow the general strike of the Dharwad bands.
The map 2.4 shows the drainage system of Bellary districts which has profound influence on the irrigation system of the district. The district is drained by the river Tungabhadra and its tributaries Hagari and Chikka Hagari. The rivers enter the district near Hadagli taluk and form the western and northern boundaries of the
district and flows between Koppal and Bellary district for nearly 300 kms covering the taluk of Hadagali, Hagaribommanahalli, Hospet and Siraguppa. At the entry place it flows at a height of 560 meters above the sea level lower down the course its bed deepens. Then it crosses the eastern boundary of Bellary district and enters into karnool district of Andhra Pradesh state. Out of the two tributary rivers of Tungabhadra, river Hagari flows through Siraguppa and Bellary talukas of the district. On the other hand the Chikka-Hagari river (Little Hagari) which lies 96 kms. Away on the western side of the Sandur hills traverses through Hadagali and Kudligi taluks of the district. Like the Tungabhadra, the river Hagari is also formed by two streams called Veda and Avati (they rise near Mallayangiri in Chikkmaglur district and unite at Thangali in Chikkmaglur district). This is not a perennial river. If there are heavy rains the river is flooded, which occasionally does much damage to the wet cultivation along its banks. If flows only for about 92.8 kms, in the Bellary district and joins the mighty Tungabhadra river near Siddaragonde village in Siraguppa taluka. The Chikk-Hagari which is also another tributary of Tungabhadra rises in Chitradurga district of Karnataka state and entered Kudligi taluk. Its course is towards north and after Hadagali taluk joins the back-water of Tungabhadra reservoir, after flowing through 64 kms of area in the district. A dam has been built across this river near Hagaribommanahalli for the purpose of irrigation.

There are a large number of streams which flow from south to north and join the river Tungabhadra. Chief among them are Urahalla, Tippapurhalla, and Hirehalla in Hadagli taluk which are used for lift irrigation. A number of channels were constructed by the Vijayanagara Kings mostly for drawing water from Tungabhadra River at various points and even today they work.
As shown in the map 2.5 the district has two important types of soils viz. Black and Red soils. The black soil is derived variously from trap racks, granites, shales and lime stones of the cuddappa and Karnool series. The soils are either shallow or deep from two to 2.74 meters in depth and are usually under-lain by
decomposed rock material locally called ‘garasu’. They may or may not contain gypsum in the soil profile. The black soils are not only rich in lime content but also contain 65-80 percent of finer materials with low permeability. The red soils are derived from granites and gneisses which are shallow to deep. They have open texture, loamy, intermixed with gravel and quartz pebble Bellary district is covered with red sandy soils, red loamy soils, mixed red and black soils and shallow black soils. All these can be classified into black and red soil groups.

1. **Red Sandy Soils**:

   This soil occurs in Hospet, Kudligi, H.B.Halli, Hadagali and Sandur talukas. The characteristics of sandy soils are Brownish to deep red colour, shallow to deep thickness, sandy in texture, poor water holding capacity and low base status. Rainfed crops like Jowar, Bajra, Groundnut and other oil seeds, Ragi, Millets, other cereals, etc. are raised and sugarcane, Rice, Ragi etc. are grown under irrigation.

2. **Red loamy Soil**:

   Red loamy soil is found in only a small patch in Hadagali taluka. It is red to deep red in colour, shallow to deep in thickness, gravel and pebbles in texture with poor water holding capacity and low base status. Rainfed crops like Jowar, Groundnut and millets are raised. Rice, Sugarcane and Groundnut are the irrigated crops.

**Mixed Red and Black Soil**:

These soils occur in Bellary Sigaruppa and parts of Kudligi taluks. These are brownish in colour, 65 to 80 percent of which are finer materials with low permeability and high base status. They may or may not contain gypsum in the profile and their high water holding capacity surface cracks up in dry summer. Rainfed crops like Jowar, Cotton, other cereals, wheat and pulses are raised. Rice, Sugarcane and cotton are the irrigated crops.

**Shallow Black Soil**:

These soils are found in small patches in Hadagli taluk. They are black in colour, 70 to 80 percent of which are finer materials with medium permeability in small patches and high base status. They may or may not contain gypsum in the
profile but have high water holding capacity. Rainfed crops like Jowar, Wheat, Pulses and oil seeds are raised. Groundnut, Bajra and Cotton are the irrigated crops.

3.8 Climate:

As per Koppen's classification, Bellary district is in the arid zone. And as per the agro-climatic classification of NARP, Bellary district falls under KA-3 Northern Dry Zone. It constitutes basically, semi-arid dry climate. When Agro-ecological zones as considered, Bellary falls in the Karnataka Plateau (Rayalaseema as inclusion). The district is characterized by dryness in the major part of the year; it has a hot summer. The district has a meteorological observatory at Bellary. The period from the later half of November is the coolest part of the year. The temperature begins to rise by the end of the February and by April it is hottest.

The Bellary district falls under semi-arid zone with dry climate. The most important feature of the hilly area as shown in the map 3.6 are around Sandur especially Ramandurga which is a hilly station, is that it is endowed with a very salubrious climate. The recent creation of large artificial lakes by damming the rivers especially the Tungabhadra and the network of the canals have altered the climatic conditions to some extent in certain pockets of the district. Climate is generally characterized by dryness in the major part of the year and hot summer.

Humidity:

The relative humidity remains higher throughout the year particularly in south-west monsoon periods (when they are generally 50 to 70%). In June and July, the highest humidity recorded is 70% then it gradually decreases up to November and rapidly decreases thereafter.

Season:

The year may be divided into four seasons. (1) Summer from March to May- has increasing temperature with the maximum occurring during this period. (2) The south-west Monsoon season from June to September is characterized by over cast skies and high rainfall in the district. (3) October and November constitute the retreating Monsoon and (4) the period from December to February is generally dry, cool, with clear bright skies, low humidity and low temperature.
Temperature:

Bellary district is located in the tropical belt and hence there is no dearth of
temperature. In fact moisture is the factor to be considered seriously in the district
except in its hill stations where temperature is fairly high throughout the year. In the
month of December the mean temperature is the lowest. The mean daily maximum
and minimum temperature are 29.7°C and 16.7°C respectively. By the end February
Temperature begins to rise rapidly and in the month of April mean daily maximum temperature is 39.2°C and the mean daily minimum is 25.2°C. The onset of monsoons in the month of June makes the weather cooler and it continues till the end of the south-west monsoon season. From the beginning of the monsoon season both day and night, temperatures decrease progressively. The month of May is also as hot as April. In these two months the weather is oppressive. The onset of monsoon in the month of June makes the weather cooler and it continues till the end of the south-west monsoon season. From the beginning of October both day and night, temperatures decrease progressively. The highest maximum temperature recorded at Bellary was 43.9°C on 30th April 1909 and on 15th May 1987. The lowest minimum temperature was 10.6°C on 28th December 1926 and 4th January 1891.

The highest maximum temperature recorded at Bellary was 43.9°C on 30th April 1909 and on 15th May 1987. The lowest minimum temperature was 10.6°C on 28th December 1926 and 4th January 1891. Bellary has a hot summer from March to May months where mean maximum temperatures ranges from 23.2°C to 40.4°C. June to September is the southwest monsoon period where the temperature 19.7°C to 35.1°C, October and November is the post monsoon retreating monsoon season with clear bright weather with the mean daily temperature ranges from 14.4°C to 31.1°C. During December to February weather remains dry and comparatively cool season. The skies clouded or overcast during southwest monsoon. During October and November some of the depressions and cyclonic storms originates in Bay of Bengal moving in a westerly to north westerly direction which passes through the district causing wide spread heavy rains and high winds. The mean maximum temperature in the district is 40.4°C. and the mean minimum temperature is 14.3°C. (January month)

Wind: The winds are light to moderate with some strengthening during the south west monsoon. During October to April, the winds blow from directions between north east and south east and are calm in the morning. Winds blow southwest and northwest direction during May to September with an average velocity of 12 kmph. These high winds combined with higher temperature result in high degree of evaporation to the tune of 12.5 mm/day in May against a minimum of 5.4 mm/day in the month of December.
Rainfall:

Bellary district receives rainfall from southwest monsoon from June to September and northeast monsoon from October to December. Overall on an average, there are 43 normal rainy days (1901-1970), where minimum in Bellary taluk with 32.4 rainy days, maximum in Sandur taluk with 56.4 rainy days. Actual rainy days recorded during the year 2005 ranged from 41 to 67 wherein Kudlugi taluk is the minimum with 41 rainy days and maximum is in Sandur taluk again with 67 rainy days. As per the 1951 to 1970 rainfall data analysis, the precipitation during southwest monsoon accounts for 60% of the total amount of rainfall and during northeast monsoon it is 24% the remaining 11.62% is sporadic in summer. September is the wettest month in the year. The analysis of the last ten years rainfall data (1996-2005) shows that the highest rainfall occurred in Sandur taluk with 752.1mm and the lowest at Bellary with 452mm and over all annual normal rain fall in the district is 611mm. Again it is proved that south west monsoon contributes 63% of the total rainfall in the district and north east monsoon with 25.36%. Deficiency in rainfall is observe d in the four taluks for the last ten years in the range of 2.40% (Kudlugi taluk) to 26.02% (Bellary taluk). The excess rainfall in the range of 15.41% (Siruguppa taluk) to 23% (Sandur taluk) was observed. The rainfall in Bellary district is not only a very light, but it is scanty and uncertain. Moreover, very often it will be in the form of light showers instead of down pours. Bellary district receives rainfall from southwest monsoon from June to September and northeast monsoon from October to December. Overall, on an average, there are 43 normal rainy days (1901-1970), where minimum in Bellary taluk with 33 rainy days, maximum in Sandur taluk with 56 rainy days. Actual rainy days recorded during the year 2009 ranged from 41 to 57. Whereas in Bellary taluk it is the minimum with 41 rainy days and the maximum is in Sandur taluk with 57 rainy days. As per 20 years rainfall data analysis, the precipitation during southwest monsoon accounts for 60% of the total rainfall and during northeast monsoon it is 24% and the remaining 11.62% is sporadic during summer season. September is the wettest month in the year. The analysis of the last ten years rainfall data (2001-2011) shows that the highest rainfall occurred in Sandur taluk with 800.60mm and the lowest at Bellary with 529.46mm and over all annual normal rain fall in the district is 630.90mm. On the basis of normal precipitation deficiency of rainfall is observed in the four taluks for the last ten years.
in the range of 7.67% (Kudlugi taluk) to 15.72% (Bellary taluk) and excess rainfall is observed in the range of 9.14% (Hospet taluk) to 23.73% (Sandur taluk). Table 3.3 shows that the rainfall of the Bellary district was decreasing trend, because of the unscientific human activities, like unsustainable mining operation, forest loss, climate change, etc.

The rainfall in Bellary district is not only very light, but it is scanty and uncertain. Moreover, very often it will be in the form of light showers instead of down pours. The average rainfall in the district is 636 mm. The rainfall is mostly confined to the period from May to November. Sixty percent rainfall is received during the period from June to September and about 24 percent during October and November. September is the month which receives the highest rainfall.

3.9 Economic Characteristics

The land resource forms the basis of the economy in addition to forests, minerals, and rivers. Agricultural land is the major economic resource which has been providing sustenance to the people of the District. Although agriculture is the backbone of the economy, it suffers from many drawbacks.

Landuse

As per study done by Indian Council of Forestry Research and Education based on Indian Remote Sensing satellite data, since 2000 the land cover of dense forest, open forest, surface water, and agriculture has decreased. Whereas, area under mining, ore dump, stone quarries, and settlement has increased.

Likewise, minerals, water, etc. cultivable land also forms the backbone of the economy of the district. According to landuse statistics of 2000-01, out of the total geographical area, forest forms 12 percent, land not available for cultivation-15 percent, other uncultivable land-4.6 percent, fallow land-8.94 percent, net cultivated land-60 percent and agricultural land 73 percent. The land use pattern for the year 2009-10 reveals that out of the total land area of the district, forests occupy 11.93%, non-agricultural use (8.44%), barren and wasteland (6.58%), uncultivable wasteland (3.05%), pastures (0.67%), trees and groves (0.44%), and net sown area (53.63%).
Table 3.3: Decadal Rainfall of Bellary District.

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>NAME OF TALUKS</th>
<th>Rainy days</th>
<th>Normal rainfall</th>
<th>Actual annual rainfall from 2000-2011 in mms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bellary</td>
<td>33</td>
<td>502.0</td>
<td>361.4 476.8 386.5 254.2 362.1 586 447.4 551.9 770.2 957.9 776.3 422.9</td>
</tr>
<tr>
<td>2</td>
<td>Hadagalli</td>
<td>43</td>
<td>596.0</td>
<td>849.4 581.9 352.1 336.7 587.5 500.9 605.3 844.3 675.6 742.5 639.4 454.3</td>
</tr>
<tr>
<td>3</td>
<td>H.B.Halli</td>
<td>37</td>
<td>506.0</td>
<td>462.1 588.4 327.9 400.2 516.5 610.3 779.1 665.6 466.3 824.6 665.2 483.6</td>
</tr>
<tr>
<td>4</td>
<td>Hospet</td>
<td>44</td>
<td>578.9</td>
<td>672.4 758.8 398.6 667.1 523.3 1175.3 593.8 618.7 574.9 881.3 997.7 369.6</td>
</tr>
<tr>
<td>5</td>
<td>Kudligi</td>
<td>41</td>
<td>577.0</td>
<td>579.2 584.7 302.5 368.8 780.1 614.2 427.4 489.3 459 1152.9 912.9 329.8</td>
</tr>
<tr>
<td>6</td>
<td>Sandur</td>
<td>56</td>
<td>783.0</td>
<td>812.1 713.3 733.3 443.8 634.8 968.3 668.7 753.3 1009.7 1053.3 1191.4 625.3</td>
</tr>
<tr>
<td>7</td>
<td>Siraguppa</td>
<td>44</td>
<td>657.0</td>
<td>645.4 780.6 307.3 370 738.9 742.1 600.7 908.5 535.5 1291.8 943.9 251.6</td>
</tr>
<tr>
<td></td>
<td>Dist.Avrg</td>
<td>43</td>
<td>626.6</td>
<td>626.0 635.2 401.1 405.8 591.8 772.1 588.9 690.2 641.6 986.3 875.3 356.6</td>
</tr>
</tbody>
</table>

Source: District statistical office Bellary.
Cropping pattern

Cropping pattern – A large area is covered by cereal crops such as jawar, Bajra, Maize, Paddy, etc. ‘Groundnut’ is the important oil seed crop. The other crops are Cotton, Tur, Sugarcane, and gram.

Minerals

Bellarly district is rich in mineral wealth. Iron ore and Manganese ore care the major items of minerals. In addition, other metallic minerals like oxide, gold, copper, lead and non-metallic minerals like andalusite, asbestos, limestone, molding sand, soapstone, granite, etc. are also found in large quantity. The availability of metallic and non metallic minerals has promoted the growth of mining activities and mineral-based industries.

Industries

Though there is enormous resource of iron and manganese ores, their utilization for industrialization is minimum. Much of the iron ore and manganese mined in the district is exported to west and east coast harbor. Though the foundation of one steel plant was laid down as early as 1971 by the late Prime Minister Indira Gandhi, its implementation is delayed due to one or the other reason. The main hurdle in heavy industrialization is cooking coal, which is not available in the Karnataka state.

May attempts have been made to manufacture alloys such as Ferro manganese and Ferro silicon at Torangal. However, recently in 1996 Vijayanagara Steel Ltd., Made an attempt to establish a steel industry in 1993 with capacity of 3 lakh tons, which may be increased to 45 lakhs tones by 2007.
Forests

The total area under forest in the district is about 97017 hectares, which constitute 12% of the geographical area of the district. Forests in the district are of two types: scrub forest which amounts to a large area in the eastern sector of the district and covered by acacia and thorny scrubs. Dry deciduous forests, located
mainly in Sandur block are mainly useful for fuel wood. The forest area more in Kudligi, Sandur and Hospet taluks. The forests of Sandur taluks are providing resources like gum, bee, beedi leaves, grass, etc.

Map 3.8
Fisheries

Bellary district is bestowed with huge scope for inland fisheries i.e. pond fisheries, tank and river fisheries. The district has 145 irrigation tanks with water spread area of 7951 hectares and two reservoirs with a water spread area of 3930 hectares. The length of the river in the district is around 300 kms and there is an irrigation canal which is 340 kilometers long. The Tungabhadra command Area of about 20000 hectares of irrigation land which has become saline and water logged and therefore unfit for agriculture can be converted into fish ponds. The total fish catch during 2000-01 was 11489 tons. There are 40624 fishermen families in the district of which 12044 are engaged in fish farm activities. The important fish reared are Catla, Rahu, Mrigal, Common Carp, Grass Carp and Silver Carp. The major fishing centers are Bellary, Sandur, Hospet, Kudligi taluks.

Market facilities

The rural retail trade is managed by periodic markets, while the whole of cultural produce is managed by regulated markets. There are periodic markets distributed in different taluks (Fig. 2.4), and hence each periodic market serves on an average 43 villages. There are 6 market towns /regulated markets in the district and each market town serves about 86 villages. Sandur taluk has no regulated market but it is served by sub-markets. Hence, there is need to study the market facilities to provide optimum services to the villages.

Transport and Communication

Bellary district is well linked both by Road and by Rail. The district has a road length of 5020 kms. Constituting 181 kms of National Highway, 300 kms of state Highway, 1135 kms major District Roads and 1716 kms of District Roads and 1688 kms of village Roads. At present, road is the vital link between settlement and major urban centre’s of the adjacent areas. The National Highway that links Bellary district to Bombay and Bangalore provides good infrastructure for transportation of goods (Fig.1.6).

As far as railway line is concerned the district has a meter gauge line of 21 kms and broad gauge line of 289 kms. Which connect the Bellary, Sandur, H>B>Halli, Kudlgi, Hospet taluks with a total of 28 stations. The existing railway
line connects Bellary to Madras, Bangalore, Vijaywad, Bombay, Secundarabad and Delhi Via Guntkal Junction. Guntkal is just 52 kms. From Bellary and it connects the Southern Railway and the Northern Railway. The administration of Railway line falls under Hubli division of South Central Railway Zone. Railways are mainly used for transportation of mineral ores to Mangalore and Madras Ports.

At present 391 Post Offices, 318 Telegraph Offices, 96 Telephone Exchanges and 52340 telephones are functioning in the district, The district is connected to 46 KBPS Internet Connectivity with 200 numbers of Internet users. Now all the taluks are connected with STD, FAX facilities and Internet Connection. In Hospet and Bellary the Mobile phone services are doing better. The Mobile Services in Hospet and Bellary are covered by the AIR-TEL and SPICE.

Trade and Commerce

Trade and commerce have their own importance in the economy of the district. The agricultural economy is at subsistence level and hence the harvests are consumed within the district. The chief exporting commodities are minerals like Iron ore, Manganese, Quartz and red oxide.