CHAPTER 2

2.1 Background of the Study of Area

Physiographically Karnataka is highly diversified with Very High to Very Low in rainfall, temperature and elevation conditions. The low land of North East Karnataka with Very Low Rainfall and High Temperature, have agriculturally backward condition apart from irrigated tracts. The North central lowland experiences High temperature with low rainfall with low agricultural development. Towards the North West an undulating upland terrain with moderate rainfall has created moderately developed region with respect to agricultural activity. Southern part of the Karnataka has been occupied by undulating upland terrain with moderate rainfall and High temperature except the irrigated tracts. Development through Agriculture is not up to the potential level of development. The semi Malnad region which lie adjacent to Malnad region extending north to south is a transitional belt with moderate to good Rainfall and High temperature possessing hill ranges of semi hillock have better agriculture productivity and infrastructure. Towards the western part of the semi Malnad region, lies the Malnad region formed due to the folds occurred by the captivated heat and reacted pressure, this region possesses, High Rainfall with High Temperature varying in elevation between 300 – 1200 meters. This section of the region is agriculturally productivity, with more land under plantation and horticulture crops. The major portion of the gang laid covered by forest in their region. Adjoining to the Malnad towards west is the coastal Karnataka with High Rainfall and High Temperature having a flat level land varying between 200 mtrs to 10 mtrs. Towards to the sea, the western district, which is wet land condition of this region also, has less disparity in the Economic Development of the region (Map No 2.1 and 2.2)

The physiographic classification of Karnataka was found most essential to meet the above said objective; the existing Physiographic Karnataka classification has been done and followed in the gazetteer of Karnataka, is which found to be ambiguous. To classify the physiographic condition of Karnataka based on existing technology online with the scientific method such as ASTER DEM data (30 meter resolution) was generated keeping elevation and angle of the slope. This Western Ghat or Malnad was delineated. The true delianation of Malnad was not existing proper record it is on their
Karnataka State
Distribution of Mean Rainfall (1971 - 2001)

LEGEND
Distribution of Rainfall (1971-2010)
- < 970
- 971 - 3508
- 3,509 - 6,045
- 6,046 - 8,583
- 8,583-11,120

Karnataka State Boundary

Map. 2.3
account the reclassification of physiographic region has been done and categorized into six classes such as

1. 0 – 200 Coastal and piedmont Coastal plains
2. 201 – 450 North East Territorial plains
4. 601 – 1000 North West, Southern and South eastern undulating upland region.
5. 1001 above Mountain peaks

2.2 Rainfall Distribution in Karnataka

Karnataka located as one of the southern states of peninsular India possess five types of rainfall regions from highest to lowest such as the Coastal rainfall region, Malnad rainfall region, Transitional rainfall regions of foot hills, the Semi Malnad low rainfall region of the southern Karnataka, the Low Rainfall regions of Central, Semi low rainfall of north western Karnataka and Low of north eastern Karnataka. The seasonal movement of wind in southern peninsular region of India has produced a land of no rainfall regions both during South west monsoon and North east monsoons. Regions that fall under this category of low rainfall places are the central continental location track of southern peninsular. This includes the patches of Tamilnadu such as Mettur, Selam, Dharmapuri and patches of Karnataka such as Kollegal, Tumkur, Chitradurga, Bellary, Raichur, Gulbarga, Bidar, Bijapur, Bagalkot Sollapur. These places are far from marine influence (Map No: 2.3)

2.2.1 The Coastal Rainfall Regions

A narrow coastal region starting from Goa coast to the Malabar coast of Kerala experience rainfall during the south west monsoon period. The annual average rainfall of coastal Karnataka varies between 200 to 250 cm. These regions also experience inter mitten rainfall caused by the fronts developed by land and sea breeze and the convectional rainfall during the pre-monsoon period. During the North east monsoon west coast of Karnataka experiences scanty rainfall and it’s only during the cyclonic effect some parts of coast line experience rainfall.
2.2.2 Rainfalls of Western Ghats

The nature of rainfall on Western Ghats of Karnataka can be categoried as orographic produced due to aloft of rain bearing monsoon winds. Western mountains stretching from north to south act as obstacles for the inbound south west monsoon winds. The result of hitting the western mountain chain lifts the wind up, placing a congenial situation for the condensation process to begin. As a result, heavy downpour of rainfall occurs on the entire mountain chains of this region, which varies between 200 to 250 cm per annum. It is also to be noted that the second largest rainfall receiving station located in this mountain called Agumbe towards the eastern direction mountains dip gradually and also the rainfall decreases gradually.

2.2.3 The Transitional rainfall Foot Hills Regions

The foot hills of Western Ghats neither possess higher rainfall or lower rainfall, it varies between 150 to 200 cm per annum. There is a sharp decrease in rainfall in this region compared to coastal and Western Ghats due to its rain shadow region location although the proximity to receive from region is less than 150 km the mountain chains causes abstraction and the most of rainfall produces in the hilltop very less in the foot hills.

2.2.4 Southern Semi Low Rainfall Region

Bounded by three Sides Mountain such as Western Ghats in the west, the Nilgiri hills in south, Eastern Ghats in the east this region experiences scanty rainfall from south west monsoon period in the form of passing clouds. There is wide dismay in the distribution of rainfall over place and time most of this places experiences 100 to 150 cm and many patches experience less than 100 cm. As stated in the above paragraph, the central location of this region is one of the major causes and inter locked mountain situation.

2.2.5 Central Low Rainfall Patch

Proximity to Bay Of Bengal Sea to this region is one of the major causes for much drier condition where the rainfall is less than 50 to 75 cm. Added to the proximity the undulating terrain with outcrop rocky structure has aggravated the temperature in this region giving scope for the condensation process or for evapotranspiration due to lack
of vegetative growth. The central dry region includes districts like Bangalore north rural regions, Tumkur, Chitradurga and Bellary.

2.2.6 North Western Low Rainfall Regions

Further north of Karnataka the apex region as a broad stretch increases the proximity to the Arabian Sea. The distance factor along with the rain shadow cover of in this region as greatly reduced the amount of rainfall between 75 to 100 cm, which includes Belgaum, Bagalkot, and Bijapur.

2.2.7 North Eastern Low Rainfall Region

North eastern marginal region of Karnataka located at the northern tip of elongated Karnataka. Because of a typical continental location abstracted by the mountains on western and eastern side has resulted in very low rainfall region less than 50 to 60 cm. This region covers Bidar, Gulbarga, Yadgir and Raichur districts of Karnataka.

2.3 Rainfall Region categorized on the basis of North East Monsoon

Since Karnataka experiences rainfall by seasonal winds such as South west monsoon and North eastern monsoon it is essential to understand the rainfall distribution during north east monsoon period according to the distribution of rainfall from north east monsoons the distribution of rainfall region of Karnataka can be broadly categorized as the intercontinental low rainfall region which stretches exactly from the central parts of peninsular India. This region has already stated Chamarajanagara, Bangalore rural, Tumkur, Chitradurga, Bellary, Raichur, Yadgir, Gulbarga, Bidar and stretches further comprising of the border districts of Maharashtra and Andhra Pradesh.

2.4 Southern Marginal North East Rainfall Regions of Karnataka

The Plains of Tamilnadu have paved way for the North east monsoon rain bearing winds to reach interior parts of Cauvery river basin of Karnataka. And it is during this period Mysore, Mandya, Chamarajanagara experience considerable amount of rainfall which is an increasing trend indicator of climate change. In the past twenty years there has been steady increase in rainfall from north east monsoon rainfall compared to south west monsoon rainfall in this region. It can be quantified as 40:60 ratio, 40 from south west monsoon and 60 from north east monsoon rainfall. Apart from this particular section, the rest of the regions of Karnataka can be categorized for reach no
north east rainfall regions of Karnataka, which includes the transitional foot hill mountain regions, Western Ghats, coastal, north, north eastern Karnataka. It is on the basis of the distribution of rainfall, the agriculture pattern of Karnataka is determined and it can be understood how the cropping pattern and the distribution of rainfall is having inter relationship apart from the irrigated tracks.

2.5 Drainage network

The topographical pattern of a region determines the drainage system. Karnataka state is located in three major category of topography such as Costal Plains, the Western Mountain chains (Western Ghats) and the plateau region. The granitic geological structures have produced a matured drainage network. The western mountain chains act as a rain catchment area, thus providing a major source of all rivers. The general south east dip of Deccan plateau has developed elongated river basins from the Western Ghats, Bay of Bengal in the east. Only few swift flowing rivers flow towards west and join at Arabian Sea completing not more than 100 km of journey. (Map No: 2.4)

2.5.1 Major Rivers of Karnataka

Karnataka state has been bestowed with a few major rivers from north to south such as Bheema, Krishna, Tungabhadra, and Cauvery.

2.5.2 Bheema drainage network

Bheem river takes its origin in western mountain chins of Maharashtra states Bhimashankar Place. Bheema flow towards eastern direction cutting across northern dry section of Karnataka state, climatologically, the region receive low rainfall which is less than 60 cm per annum. With the help of canal irrigated farming has been developed. The rugged terrain with dry summer condition has put the agricultural activity in a dismal state. Acute shortage of rainfall in this basin has lead to dryness during summer season.

2.5.3 Krishna

Krishna river flows through the districts such as Belgaum, Jamkandi, Bijapur, Gulbarga, Yadgir. This river also takes origin from Western Ghats of Maharashtra and flows towards eastern direction in a highly dissected undulating terrain. As such canal
irrigation could not be extended. Recently the height of the barrier has been increased under the scheme of upper Krishna project. Low to very low rainfall condition of this region has kept the river seasonal and no water in the channel during the summer season.

2.5.6 Tungabhadra

Tungabhadra is the largest river basin of Karnataka. Both Tunga and Bhadra take a northward direction and flow towards east and north eastern direction. Finally it enters into Andhra Pradesh State and flows towards north western direction to end up in the Bay of Bengal.

The dissected elevated terrain of this region has forced the river to flow in north central direction from the western and then towards the eastern direction. The highly dissected terrain led to first, second, Third and fourth order channel path. The important districts which come under Tungabhadra river basin Shimoga, parts of Chitradurga, Haveri, Bellery and Raichur. Most of the river water has been utilized for industrial and agricultural development. At present it is one of the high quality rice producing basin of Karnataka.

2.5.7 Cauvery river basin

River Cauvery which is considered as life line of the farmers of this region takes its origin in Bagamandala near Madikeri town, one of the hills stations of Karnataka. It flows towards the south west direction. At Kushalanagar the river flows in the eastern direction over undulating terrain producing many geomorphic and historical sites such as Sriranagapatna and Shivanasamudra Island. The dam constructed across Cauvery and its tributaries has brought a ray of hope among the semi rainfall regions of southern Karnataka. The command area of Cauvery River is bounded by Western Ghats, Malai Mahadeshwara hills and Nilgiri Hills. River Cauvery has cut across in the eastward direction carving the hard rock terrain. The fault zone at Shivanasamudra and Hogenkal produces magnificent horse shoe waterfalls and enters Tamil Nadu farming a huge basin developed by distributaries. The low rainfall experienced in this region makes the river channel with bleak flow of water during the summer season. The undulating dissected terrain has produced 5 to 6 stream orders.