CHAPTER II

STUDY REGION
STUDY REGION

The region was once considered only a mental construct; now it has become a well known and very popular concept which is accepted widely. Despite being elusive for long, it is used as a prime concept and as a method of classification not merely in geography but also in all cognate disciplines.

The concept of region occupies an important position in geographic research and the problem of dividing the earth's surface into smaller study areas has received attention in the history of development of geographic thought. (Whittlesey 1954) The idea of region is an intellectual construct used to facilitate study. (Yeats and Garner 1974) Though the concept of region is controversial, it is commonly accepted that the study of regional geography is essential for systematic description and to understand fully the areal differences and characteristics of the regions.

North Karnataka includes eight districts of the Karnataka State in the northern portion. The region is situated in between 13° 55' and 18° 25' north latitudes and 74° 9' and 77° 39' east longitudes. It covers an area of 100087 sq. kms. and is bordered by Goa and
Fig. 2.1
Maharashtra in the north-west and by Andhra Pradesh in the east. Chitradurga, Shimoga and Dakshin Kannada districts of the Karnataka State in the south and the Arabian sea in the west.

**GEOLOGY**

Geological structure has bearing not only on the physical setting and geomorphology of a region but also on the distribution of rocks, minerals and soils. It provides the background for a proper understanding of the resources and economy of a region on which the progress of urbanization depends to a considerable extent.

North Karnataka forms a part of peninsular India which itself is a part of the most stable and ancient (3000 million years old) landmass of the world which is called Gondwana land. The Archaean complex consisting of granitic gneisses and Dharwar system of rocks were the first to be formed between 1500 and 3000 million years ago. Subsequently, about 1000 years were formed ago, the Kaladgi and Bheema a series of sediments, presently found in metamorphic forms. The Deccan traps of region belong to the Eocene (125 million years), Cretaceous (60 million years). Periods and laterites to the Pleistocene (1 million years) period. The geological features are shown in figure 2.2.
NORTH KARNATAKA
GEOLOGY

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1. The Dharwad schists are found in packed bands running in north-west to south-east directions and contain almost all minerals like gold, iron, manganese, chromium, copper, lead etc. Granitoid gneissic rocks belonging to Archaean period are younger than Dharwar schists. They contain different types of granitic rocks like peninsular gneisses, charnockites, are hard crystalline and slightly metamorphosed rocks.

2. Precambrians:

The rocks of marine origin of the Precambrian period are the Kaladgi series of Cyddalore system and Bhima series of the Karnool system. These are younger than the Archaeans and lie between the Archaeans in the south and the Deccan traps in the north in Belgaum, Bijapur and Gulbarga districts. They include shale, limestone, marble, schists, sandstone, quartzites and conglomerates.

3. Deccan traps:

Located in the northern part of the region, these are younger than the above mentioned formations and belong to the period from the cretaceous to the tertiary. They have been formed by the lava eruption at the time of Himalayan orogeny in Belgaum, Bijapur, Gulbarga and Bidar districts.
4. Recent deposit:

These are mainly laterites of the Pliocene period and are found on the marine platform of coastal belt. Another system of this is the very recent deposits of the true coastal plain which includes blown sands, alluvium, silt and mud. They are the youngest formations belonging to the period from the Pleistocene to the present.

Relief

Physiographically the study area can be subdivided into three regions, each of which has its own distinctive physical characteristics.

1. The coastal region:

The coastal region is a narrow stretch of 144 kms. along the Arabian sea and 16-48 kms. wide. In some places the crest of the adjoining Western ghats reach the sea as close as 13 kms. This low land region of the western coast is traversed by several ridges and spurs of western ghats. The average height of the plain is generally 75 metres above the sea level, but at some places the height is about 145 metres. The rivers of the coastal plain created valleys and deep gorges at several places. The most spectacular water falls with a straight leap of 220 metres is on Sharavati river. The alluvial fans of tributaries, marshy banks and esturine islands are the typical features of the low lands which are the results of the sand bar.
NORTH KARNATAKA
RELIEF AND DRAINAGE

ALTITUDE IN METERS:
- 900 & above.
- 600-900
- 300-600
- 150-300
- Less than 150

SCALE:
50 0 50 100 150 Kms.

Fig. 2.3
2. The Malnad region:

The hilly region of the western ghat is referred to as malnad. The abrupt rise at the eastern flanks forms the western ghat section. This region is mainly forested hilly country. It is a landlocked area with a height of more than 152 metres from the mean sea level in the west and gradually rises towards the east. Culminating in a series of ranges of hills with an average height about 900 metres. The height extends upto 1000 meters near Supa and Sadashivgad of Uttara Kannada districts. Towards east its height gradually decreases and merges with the maidan region.

3. Maidan region:

The maidan lies to the east of malnad and stretches to the northern and eastern parts of North Karnataka. This region is characterised by an undulating landscape with broadbased valleys. The maidan is a relatively flat surface. It is a plateau rising between 450 and 760 metres. It is a mountainous, treeless, expansive landscape.

The river plains of the Krishna, the Bhima and the Tungabhadra with the intervening watersheds, the steep like landscape, lateritic escarpments, hills and ridges break the monotony of the northern maidan.
The extreme north-eastern part is drained by the Krishna and its tributaries. The south-east of this tract, outcrops of quartzites, limestones and shales, takes the form of the residual hills of the Malaprabha and the Ghataprabha rivers. The significant denudational features are the continuous chain of flat-topped hills with an escarpment in the south-west and a gradual slope towards the north.

To the south-east of these residual hills is a plain with an undulating surface drained by the river Malaprabha and its tributaries. The south of this is also drained by the river Tungabhadra in Bellary and Raichur districts.

**Drainage pattern**

The study area is blessed with water wealth in its numerous rivers and its streams. The rivers and the river systems conform to the physiographic divisions, the principal water divide being the western ghats stretching north to south giving rise to a west-flowing and east-flowing river system.

The drainage of the study area is seasonal in character, as it is fed by monsoon rains only and many of them dry up thereafter.
The streams of the maidan are generally dry but flow in flashy floods occasionally.

The drainage system of the region can be broadly divided into:

i) east-flowing rivers and ii) west-flowing rivers, which have been separated by the Western ghats.

i) West-flowing river system:

The important west-flowing rivers are the Kali, the Gangavali (Bedti), the Aganashini or Tadri and the Sharavati, which rise on the western slopes of the ghat and drains into the Arabian sea through the coastal plain of Uttar Kannada district.

ii) East-flowing river system:

The important east-flowing rivers of the region are the Krishna, the Ghataprabha, the Malaprabha, the Bhima and the Tungabhadra. All the rivers of the study area join the river Krishna at different places after draining the region. The river Tungabhadra is the most important tributary. Nearly 60 per cent of the area of North Karnataka lies in the Krishna basin and it covers Bellary, Bijapur, Gulburga and Raichur districts fully and Belgaum, Dharwad, Bidar and Uttar Kannada districts partially.
The drainage pattern of North Karnataka can be further divided into three drainage basins. They are:

i) Basin of the Krishna,

ii) Basin of the tributaries of the Godavary, and

iii) Basin of the west-flowing rivers

i) **The Krishna river basin:** It covers nearly 60 per cent of North Karnataka. It rises in the Western ghats near Mahabaleshwar in Maharastra state. It flows across the entire width of the peninsula through Maharastra, Karnataka and Andra Pradesh to empty itself into the Bay of Bengal. 483 kms. of the course of the Krishna lie in North Karnataka. The high rainfall zone along the Western ghats forms the western boundary of the Krishna basin.

ii) **The basin of the tributaries of Godavari:** The important tributaries of the river Godavari in the study region are the Manjra and the Kanjra rivers. These rivers together cover only 2000 sq. kms. of area in the Bidar district.

iii) **The basin of west flowing rivers:** The important rivers of the basin are the Kali, the Gangavali, the Aganashini and the Sharavati which rise in the western slopes of the Western ghats. They have
got a very small basin in Belgaum, Dharwad and Uttar Kannada districts. The basins of these rivers are under the direct influence of the south-west monsoon and receive heavy and assured rainfall between June and August.

**Climate:**

**Rainfall:** The distribution of the annual rainfall is shown in The region receives its rainfall from south-west monsoon winds. A major portion of its precipitation comes from the south-west monsoon winds which set in about the end of May or in early June and stretch with some intervals till the end of September. The retreating monsoon starts in October and usually ceases by the end of December. The most important features emerging from the rainfall map are the striking variation in the distribution of normal annual rainfall in the state. The highest normal annual rainfall, 3129.8 mm, is recorded at Karwar in the coastal area, while the lowest rainfall, 518 mm, is experienced in the Bellary region in the eastern part of the study area. The coastal region and areas on the windward side of Western ghats receive more than 2000 mm, because the moisture-laden south-west monsoon wind is forced to rise here steeply by the Western ghats resulting in very heavy precipitation in this belt. From this belt of high rainfall, it declines towards the eastern and north-eastern parts.
Temperature:

The study region experiences very low temperature in the months of December and January and it rises thereafter slowly up to May. It reaches its highest temperature in the maidan and coastal areas in May. In January the mean daily minimum temperature is 16-18° C in the coastal area and ghats except the Bidar districts where it is 12-14° C. In April the mean daily maximum temperature is about 32° C in the coastal region and increases as we go north-east in the northern maidan area up to 39° C in Gulbarga and Raichur region and it falls to about 37° C in Bidar district. The highest temperature is recorded in May, which is the warmest month over major parts of the region. In Gulbarga and Raichur the temperature reaches 43° C.

The average relative humidity is the highest in the region in July-August and lowest in March-April.

Soils:

Soils play a significant role in determining agricultural production. Since there is wide variation in the geology, climate, vegetation and physiography in North Karnataka, it has influenced soil formation over the ages and has given rise to several soil types. Therefore different soils have distinct morphological and physio-chemical properties that
have a bearing on plant growth.

According to the conventional Indian classification of soils, North Karnataka can be divided into the following soil regions:

1. **Shallow black soils.**

   The shallow black soils are found on undulating ridges of the Deccan trap region of North Karnataka, occupying areas in the north and north-western parts of Belgaum and Bijapur districts. The area falls under northern dry agro-climatic region. There are shallow dark greenish to dark reddish brown soils, usually culcarious with gravelly clay loam. They have moderate to high water-holding capacity and severely susceptible to erosion. The common crops of these soils are jowar, bajra and other millets, horsegram and other pulses.

2. **Medium black soils.**

   Medium black soils occur in the Deccan trap, schist, limestone regions of North Karnataka in parts of Bidar, Gulbarga, Bijapur, Raichur, Dharwad and Belgaum districts. The major area falls under dry agro-climatic region. These soils are moderately deep and dark greyish brown. They are usually calcareous with heavy clay content. This soil cracks in dry weather. These soils are generally fertile producing
NORTH KARNATAKA
SOILS

Fig. 2.4

TYPES OF SOILS

- COSTAL ALUVIUM
- DEEP BLACK
- LATERITE
- MEDIUM BLACK
- MIXED RED & BLACK
- RED LOAMY
- RED SANDY
- SHALLOW BLACK

SCALE: 20 0 20 40 60 80 Kms
good yield when moisture is a limiting factor. The major crops of these soil are jowar, wheat and other millets, cotton, safflower, groundnut, maize, chillies, tur, gram and other pulses.


The soils occur in deep black Deccan trap and limestone region in parts of Gulbarga, Bijapur, Raichur and Bijapur. These soils are found on different types of parent material like gneisises, schists, sedimentary rocks and mixed origin including transported soils occurring in the basins of major river valleys and depressions, and occupy considerable areas in parts of Raichur, Bellary and Dharwad districts. But major areas lie under northern dry agro-climatic region. These soils are very dark black, dark brown, greyish brown to very dark grey. The texture is usually clayey throughout the profile. These soils are slightly to moderately susceptible to erosion. The major crops of these soil are same as those grown under medium black soils.

4. Red sandy soils.

The red sandy soils occur in an undulating landscape on acidic rocks like granites and granule gneisses occupying areas in parts of Dharwad and Bellary districts. The major crops grown in this soil are jowar, rice, millets, pulses and groundnut.
5. **Mixed red and black soils.**

The mixed red and black soils occur generally on gently undulating plains or complex geological material comprising gneisses, Dharwar schists and sedimentary rocks formations. These soils occupy areas in parts of Bijapur, Belgaum, Dharwad, Raichur and Bellary districts. The major crops grown in these soil are jowar, cotton, groundnut, chillies, wheat and pulses. Under irrigation paddy and sugar cane are also grown.

6. **Red loamy soils.**

These soils are found on the hilly to undulating landscape on granites. Granite gneisses and Dharwar schists occupying areas along the Western ghats in the transition tract. It occupies parts of Belgaum and Uttar Kannada districts of North Karnataka. Once these soil grow crops like ragi, wheat, jowar, millets and pulses under rainfed conditions in dry agro-climate regions. In transition and in ghat region crops like paddy, coconut, arecanut and vegetables are grown.

7. **Laterite soils.**

The laterite soils are mainly found on gently undulating rocky plains to hilly topography of peninsular gneisses and Dharwar schists region. They occupy areas along the western coast in coastal high
rainfall and transition zone. These soil can be seen in Uttar Kannada 
district and south-eastern parts of Bidar and north-eastern part of 
Gulbarga district. Laterite soils are found under heavy rainfall and 
high temperature conditions resulting in intensive weathering and 
leaching. The laterite of malnad and coastal areas are of recent 
origin whereas the laterite occupying Bidar and Gulbarga districts 
appear to be found in the older period when the climate of the 
region was conducive to laterization. These soils are deep to very 
deep and yellowish red to dark red, reddish brown or brown in colour. 
Crops like paddy, sugarcane, coconut, banana, arecanut, cardamom, 
cashew etc. are grown in these soil of malnad and coastal tracts. In 
Bidar and Gulbarga crops like jowar, groundnut, pulses, safflower, 
linseed etc. are grown under dry cultivation.

8. Coastal alluvium.

The coastal alluvium soils are found on gently sloping to nearly 
level plains on a narrow strip in, the Uttar Kannada district. These 
are deposited soils consisting of washed down materials from the 
western ghats and by the action of the Arabian sea. This alluvium is 
deep to very deep, light grey, sandy brown in colour. Crops like 
paddy, pulses, sugarcane and cashew are grown on these soil.
Vegetation

The vegetation of North Karnataka varies from evergreen forest to thorn and scrub forests on account of its varied topography, climate, soils and underground water supply. The natural vegetation is classified as i) Evergreen forest ii) Semi-evergreen forest iii) Deciduous forest and iv) Thorn and scrub forests.

The evergreen forests are found in the places where the rainfall is more than 2500 mm. on a narrow strip of the western slope of the Western ghats in Uttar Kannada. These dense forests have almost impenetrable vegetation. Balagi, ebony, hebbalasu are typical economically important plants grown in these forest.

The semi-evergreen forests are found in the places where the rainfall varies from 1500-2500 mm. on the eastern part of the evergreen forests in Uttar Kannada, south-western parts of Belgaum and the Western part of Dharwad districts. These forest are the homeland of soft woods, which are being used for plywood, match stick and packing case manufacturing.

Deciduous forests are situated in the places where rain fall is varying from 750-1500 mm. These forests are found in the districts
of Belgaum, Dharwad and eastern part of Uttar Kannada. The commercially important trees grown in this forests are rosewood, teakwood, honne, matti, nandi etc. This deciduous forest is very important for timber and fire-wood production.

Thorn and scrub forests are found in the places where rainfall is meagre i.e. average rainfall in a year is less than 600 mm. This forest forms a large percentage of the forest area in the North Karnataka and found in the districts of Bijapur, Bidar, Gulbarga, Raichur and Bellary. In these forests fire-wood and timber species are grown. Unfortunately these forest are subjected to heavy pressure from fire wood requirements.
Table I/1: District-wise forest area vis-a-vis geographical area

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<th>Districts</th>
<th>Geographical area in sq. kms.</th>
<th>Forest area in sq. kms. 1981</th>
<th>% of forest to total area</th>
<th>Forest area in sq. kms. 1991</th>
<th>% forest to the total area</th>
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