# Chapter - 2
# Physical features

## 2.1 Geographical disposition

### 2.1.1 Godavari basin

The river Godavari is the second largest river in the country and the largest in Southern India. It rises in the Sahyadri hills at an altitude of about 1067 m near Triambakeswar in the Nasik district of Maharashtra State and flows across the Deccan plateau from the Western Ghats to Eastern Ghats. Rising in the Western Ghats about 80 km from the shore of the Arabian sea, it flows for a total length of about 1465 km in a general South-Eastern direction through the States of Maharashtra and Andhra Pradesh before joining the Bay of Bengal at about 97 km south of Rajahmundry in Andhra Pradesh.

The major tributaries joining the Godavari are the Pravara, the Purna, the Manjra, the Maner, the Pranhita, the Penganga, the Wardha, the Wainganga, the Indravati and the Sabari.

The Godavari basin extends over an area of 312813 $km^2$, which is nearly 10% of the total geographical area of the country. The basin comprises areas in the States of Maharashtra, Madhya Pradesh, Chhattisgarh, Andhra Pradesh, Karnataka and Orissa. The State-wise distribution of the areas is given in Table 2.1.

**Table 2.1**
**State-wise drainage area of Godavari basin**

| Sl.No. | Name of the State | Drainage area ($km^2$) | Percentage of the total basin drainage area |
|---|---|---|---|
| 1. | Maharashtra | 152199 | 48.6 |
| 2. | Madhya Pradesh | 26168 | 8.4 |
| 3. | Chhattisgarh | 39087 | 12.5 |
| 4. | Andhra Pradesh | 73201 | 23.4 |
| 5. | Karnataka | 4406 | 1.4 |
| 6. | Orissa | 17752 | 5.7 |
| | **Total** | **312813** | **100.0** |

The Godavari basin is bounded on the North by the Satmala Hills, the Ajanta Range and the Mahadeo Hills, on the South and East by the Eastern Ghats and on the West by the Western Ghats. It is roughly triangular in shape and the main river itself runs practically along the base of the triangle.

### 2.1.2 Krishna basin

The river Krishna rises in the Western Ghats at an altitude of 1337 m just North of Mahabaleshwar, about 64 km from the Arabian sea and flows from West to East through the States of Maharashtra, Karnataka and Andhra Pradesh to join the Bay of Bengal. The total length of the river from source to its outfall into Bay of Bengal is about 1400 km of which 305 km is in Maharashtra, 483 km is in Karnataka and 612 km is in Andhra Pradesh.

The major tributaries joining the Krishna are the Ghataprabha, the Malaprabha, the Bhima, the Tungabhdra, the Musi, the Palleru and the Muneru.

The Krishna basin extends over an area of 258948 $km^2$, which is nearly 8% of the total geographical area of the country. The basin comprises areas in the States of Maharashtra, Karnataka and Andhra Pradesh. The State-wise distribution of areas is given in Table 2.2.

**Table 2.2**
**State-wise drainage area of Krishna basin**

| Sl.No. | Name of the State | Drainage area ($km^2$) | Percentage to the total basin drainage area |
|---|---|---|---|
| 1. | Maharashtra | 69425 | 26.8 |
| 2. | Karnataka | 113272 | 43.8 |
| 3. | Andhra Pradesh | 76251 | 29.4 |
| | **Total** | **258948** | **100.00** |

The Krishna basin is bounded on North by the common ridge separating it from the Godavari basin, on the South and East by Eastern Ghats and on the West by the Western Ghats. The basin is approximately triangular in

shape with its base along the Western Ghats, the apex at Vijayawada and the river Krishna itself forming the median.

## 2.2 Topography

### 2.2.1 Godavari basin

Except for the hills forming the watershed around the basin, the entire drainage basin of the river Godavari comprises of undulating country, a series of ridges and valleys interspersed with low hill ranges. Large flat areas which are characteristic of the Indo-Gangetic plains are scarce except in the delta. The Sahyadri ranges of Western Ghats form the Western edge of the basin. The interior of the basin is a plateau divided into a series of valleys sloping generally towards East. The Eastern Ghats, which form the Eastern boundary, are not so well defined as the Sahyadri range on the West. The Northern boundary of the basin comprises of tablelands with varying elevation. Large stretches of plains interspersed by hill ranges lie to the South.

### 2.2.2 Krishna basin

The interior of the Krishna basin is a Plateau, the greater part of which is at an elevation of 300-600 m. Its general slope is eastwards. Great undulating plains divided from other by flat topped ranges of hills are the chief characteristics of the plateau. The hill sides are marked by conspicuous wide terraces except in the Southern part of the plateau where the hills are frequently crowned with great 'tors' or rounded hummocks of bare rocks as the result of the constant weathering.

## 2.3 Basin characteristics

### 2.3.1 Godavari Basin

The Godavari basin receives major part of its rainfall during the Southwest monsoon period. The other rainy seasons are not so well defined and well spread as the South-West monsoon season. They contribute about 16% of the total annual rainfall in the Godavari basin. The annual rainfall of Godavari basin varies from 3000 mm to 600 mm.

The Godavari basin has a tropical climate. The mean annual surface temperature in the Western Ghat area is about $24^{o}$ C, and it increases

gradually towards the east and attains a maximum of 29.4° C on the East Coast. During January the mean daily minimum temperature increases from West to East from 15° C on the Western Ghats to about 18° C on the East Coast. The mean maximum daily temperature generally exceeds 30° C in the western part of the Godavari basin and it is only slightly less than 30°C in the Eastern part.

The population of the basin, based on 2001 census was 60.57 million out of which about 75% live in rural and remaining 25% in urban areas. The density of population is around 194 persons per $km^2$. Nearly 40% of work force is engaged in cultivation, 30% as agriculture labour and balance 30% in mining, manufacturing etc.

### 2.3.2 Krishna basin

The Krishna basin receives the major portion of its rainfall during South-West monsoon period. During this period, the basin receives about 80% of its total annual rainfall. The annual rainfall in the Krishna basin varies from 3048 mm to 600 mm.

The Krishna basin has a tropical climate. The mean annual surface temperature in the Western Ghats is about 24° C. It increases gradually towards the East and attains a maximum of 29.4° C on the East Coast. During January the mean daily minimum temperature increases from West to East from 15° C in the Western Ghats to about 18° C in the East Coast; the mean daily maximum temperature generally exceeds 30° C in the Western part of the Krishna basin and is only slightly less than 30° C in the Eastern part.

The population of the basin based on 2001 census was 64.78 millions, out of which 66% live in rural and remaining 34% in urban areas. The density of population is around 250 persons per $km^2$.

## 2.4 Command area

The Godavari (Inchampalli) - Krishna (Pulichintala) link canal runs for a length of about 312.20 km starting from proposed Inchampalli head works in Karimnagar district and terminating into proposed Pulichintala reservoir on Krishna river located in Guntur and Nalgonda districts downstream of

Nagarjunasagar dam. The CCA of the canal is 445299 ha. The terrain of the command enroute is partly rugged and partly plane with numerous streams like Kodipunjula vagu, Peda vagu, Karaka vagu etc. The soils available in the command area are predominantly black cotton, red, red sandy, red loamy, forest and deltaic alluvium.