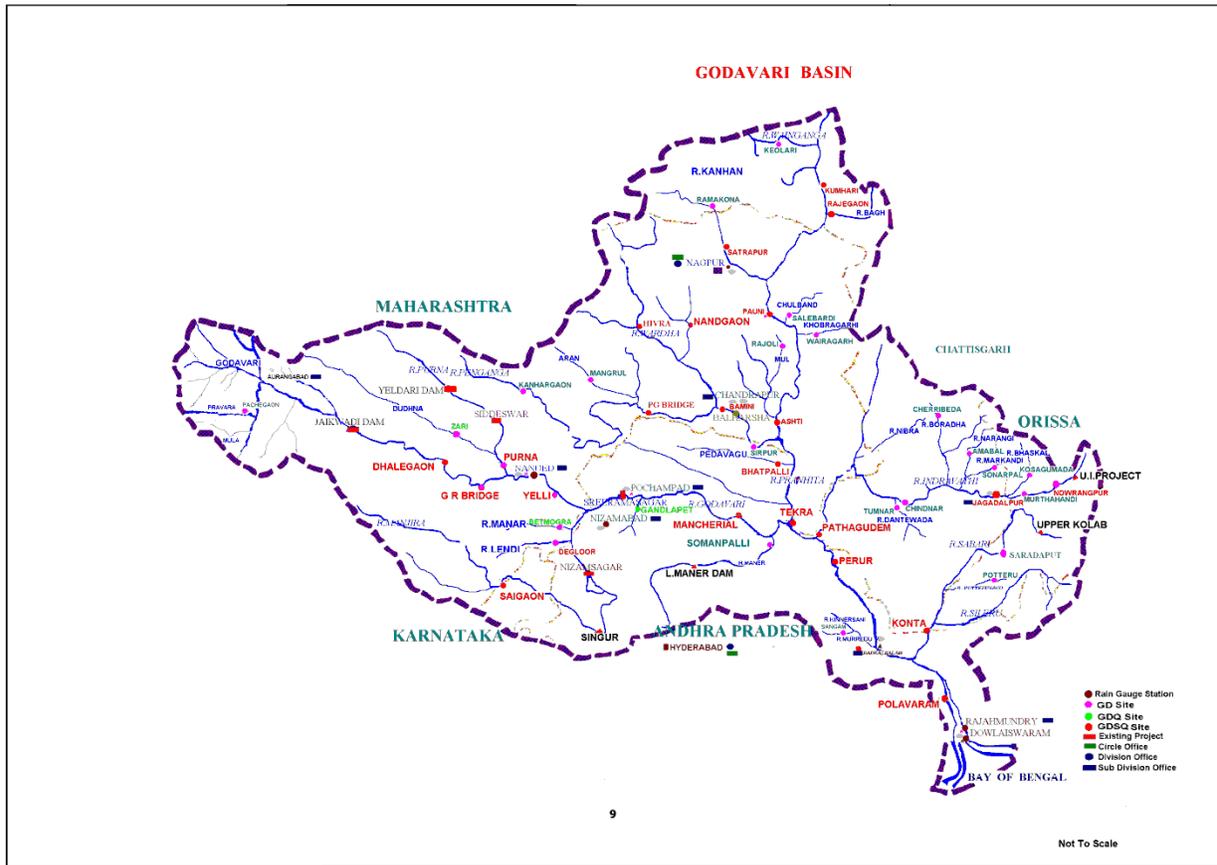


## The Godavari River System



The river Godavari, the largest of the peninsular rivers, and third largest in India, drains about 10% of India's total geographical area. The catchment area of the river is 3,12,812 sq.km. and is spread in the states of Maharashtra (48.6%), Andhra Pradesh (23.4%), Madhya Pradesh (10.0%), Chattisgarh (10.9%), Orissa (5.7%) and Karnataka (1.4%). The basin lies in the Deccan plateau and is situated between latitude  $16^{\circ} 16' 00''$  North and  $22^{\circ} 36' 00''$  North and longitude  $73^{\circ} 26' 00''$  East and  $83^{\circ} 07' 00''$  East.

The river Godavari rises at an elevation of 1,067 m in the Western Ghats near Thriambak Hills in the Nasik district of Maharashtra. After flowing for about 1,465 km., in a generally south-east direction, it falls into the Bay of Bengal.

About 64 km. from its source, the Godavari receives the waters from Dharna, on its right bank and a short distance down stream the Kadana joins it from the left. The combined waters of the Pravara and Mula which rise in the hills of Akola join the river from left about 217 km. from its source. About 338 km. from its source, the river receives the combined waters from the Purna and Dudhna rivers and after a further 138 km. at the border of Maharashtra and Andhra Pradesh, the waters of the Manjira river joins it from the South. At this point, Godavari flows at an elevation of about 329 m.

The river Pranhita, conveying the combined waters of Penganga, the Wardha and Wainganga, which drain Nagpur and southern slopes of the Satpura ranges, falls into Godavari about 306 km. below its confluence with the Manjira. The waters of the Indravathi join the river Godavari 48 Km downstream. The last major tributary is the Sabari from Orissa, which joins the Godavari, 100 km. up-stream of Rajahmundry.

The largest tributary of the Godavari is the Pranhita with about 34.87% coverage of drainage area. The Pravara, Manjira and Maner are right bank tributaries covering about 16.14%, the Purna, Pranhita, Indravathi and Sabari are important left bank tributaries, covering nearly 59.7% of the total catchment area of the basin. The Godavari in the upper, middle, and lower reaches make up for the balance 24.16%. The particulars of the catchment area, length, elevation of the source points of the river and its tributaries in the order of their occurrence along the length of the main river are indicated in the table below.

#### Important Tributaries of Godavari

Sl.No	Name of the River	Elevation of Source	Length of Tributary (km)	Catchment area (sq.km.)	Average annual rainfall (mm)
1	Upper Godavari (source to Manjira confluence)	1,067	675	33502	770
2	Pravara	1,050	208	6537	606
3	Purna	838	373	15579	797
4	Manjira	823	724	30844	846
5	Middle Godavari (between confluence points Manjira and Pranhita)	323	328	17205	955
6	Maner	533	225	13106	932
7	Penganga	686	676	23898	960
8	Wardha	777	483	24087	1055
9	Pranhita	640	721	61093	1363
10	Lower Godavari (Pranhita confluence to sea)	107	462	24869	1208
11	Indravati	914	535	41665	1588
12	Sabari	1,372	418	20427	1433

## **Rainfall pattern in the basin.**

The Godavari basin receives its maximum rainfall during the Southwest monsoon. The monsoon currents strike the West Coast of the peninsula from West and South-West, meet the Western Ghats or Sahyadri Range which present almost an uninterrupted barrier ranging from 600 m. to 2100 m. in height. Before surmounting this barrier the currents deposit most of their moisture on its windward side, and then sweep across the interior of the peninsula on the Easterly course. Rainfall is governed largely by the orography of the area, which leads to variation in the amount of precipitation. In crossing the Ghats, the monsoon wind loses a large part of their moisture. The monsoon currents follow the Eastward slope of the country from the crest of the Ghats, which form the watershed. Conditions in the interior are, therefore, somewhat unfavorable for heavy precipitation except in association with the depression from the Bay of Bengal. The north-east part of the Godavari basin also receives some rain in association with monsoon depressions, which move west-north-west across the Orissa coast.

The Godavari receives the drainage from a length of about 129 km. of the high rainfall zone in the Western Ghats. The annual rainfall varies from 1,000 to 3,000 mm in this reach. East of the western ghats, the rainfall decreases rapidly to less than 600 mm. There is a belt some distance East of the Western Ghats and in width varying from about 80 km. in the South to about 97 km. in the North with less than 600 mm, of normal annual rainfall. The belt which is about 10,360 sq.km. in area, includes portions of Aurangabad and Ahmednagar districts of Maharashtra. After this area the rainfall again gradually increases to about 900 mm towards the East coast.

January and February are almost entirely dry in the Godavari basin, the rainfall during these two months being less than 15 mm. During the next three months, up to end of May, it varies from 20 mm to about 50 mm, in most parts of the basin. All parts of the basin receive the maximum rainfall in the period from June to September. The Godavari basin as a whole receives 84% of the annual rainfall on an average, during the Southwest monsoon, which sets in mid June and ends by mid October. The Indravati and Pranhita sub-basins receive upto 86% and 88% of the annual rainfall during the same period due to influence of the cyclonic storms which predominantly pass through these sub-basins.

## **Water Resources Development in the Basin**

The water resources potential in Godavari basin has been assessed to be 110.54 km<sup>3</sup>. The utilisable surface water is about 76.3 km<sup>3</sup>, the replenishable ground water is about 45 km<sup>3</sup>. There is a vast potential for irrigation development and hydropower generation in the basin.

Prior to Independence only a few irrigation projects were constructed in Godavari basin. Important among these are Godavari delta system (with Dowlaiswaram weir as head works). Nizamsagar reservoir, Kadana dam and Pravara dam. After independence, under various five-year plans a large number of multi-purpose and irrigation projects have been taken up. The most important among them are the Jaikwadi, Sriramsagar, Kadam, Upper Indravati, Singur and Godavari Barrage (by modernising the existing gated weir at Dowlaiswaram).

Since the mid-1960's, the Central Water Commission is conducting hydrological observations in Godavari basin. Hydrological observation stations have been established on main Godavari River as well as on all the important tributaries. During the year 2008-09, hydrological observations at 48 stations have been under operation. Out of these, 7 stations are on the main Godavari and the remaining 41 are on its tributaries. In addition to gauge and discharge observations, sediment load at 16 stations and water quality monitoring at 18 stations are also being done. The location of the hydrological observation sites is shown in the basin map.