

## GEOGRAPHY – MODULE 3.1

### Peninsular River – Mahanadi, Godavari, Krishna.

- Peninsular rivers are much older than Himalayan rivers (Discordant).
- The peninsular rivers are Concordant except for few rivers in the upper peninsula region.
- They are non-perennial rivers with maximum discharge in the rainy season.
- Broad and shallow valleys - Peninsular rivers reached mature stage – fluvial landforms and have almost reached their base – Vertical down cutting is negligible.
- River banks have gentle slopes except for a limited tract where faulting forms steep sides.
- The main water in Peninsular rivers is formed by western ghats, which run from north to south to the western coast.
- The velocity in the rivers and the load carrying capacity of the streams is low due to low gradient.

Major Peninsular rivers such as - Mahanadi, Godavari, Krishna and the Cauvery flow eastwards and drain into the Bay of Bengal. Make deltas at their mouth.

Narmada and Tapi, those origin from the western ghats and falling in the Arabian Sea estuaries in the place of deltas.

BASIS FOR COMPARISON	HIMALAYAN RIVERS	PENINSULAR RIVERS
MEANING	rivers that originate from Himalayan ranges. Flows out every year	Rivers that arise from western ghats. Receive water only during particular period.
NATURE	Perennial	Non perennial
FORM	Delta	Some form delta and others Estuary.
SHAPE	Meandering	Straight

<b>ROCKS</b>	Bed rocks are soft, sedimentary and easily erodible.	Bed rocks are hard, resistant, not easily erodible.
<b>FED BY</b>	Snow and rain	Rain
<b>DRAINAGE BASIN</b>	large	Small
<b>IRRIGATE</b>	Northern plain	Deccan plateau
<b>VALLEY</b>	V shaped valley is formed	U shaped valley is formed.

EAST FLOWING PENINSULAR RIVERS
Mahanadi River
Godavari River
Krishna River
Kaveri River
Pennar River
Subarnarekha River
Brahmani River
Sarada River
Ponnaiyar River
Vaigai River

## MAHANDI RIVER

- Extend - Chhattisgarh and Odisha.
- Smaller portion on Jharkhand, Maharashtra and Madhya Pradesh.
- Bounded by central India hills on the north; eastern ghats on the south and east by the Maikala range on the west.
- **Mahanadi – the great river** – total course of 560 miles.
- Source on the northern foothills of Dandakaranya in Raipur district of Chhattisgarh.
- One of the major peninsular rivers with water potential and flood flowing or producing capacity.

## **E ▶ ENTRI**

- Other streams between the Mahanadi and the Rushikulya draining directly into the Chilka Lake also form basin.
- **Major part of the basin covered with agricultural land.** 54.27% of the total area.
- **Active silt** depositing streams in Indian subcontinent.
- After receiving Srinath River – it turns into Sea and enter the Odisha.
- At Sambalpur- the Hirakud Dam – river manmade lake 55 km long.
- Enters Odisha – then joins Bay of Bengal with various false channel.
- One of its mouths – **Puri – famous pilgrimage site.**

### Tributaries:

- Chhattisgarh plain – upper course lies in saucer shape basin – west south east covered with hills.
- 

The left bank tributaries	▪ the Seonath, the Has, the Mand and the Ib.
The right bank tributaries	▪ the Ong, the Tell, the Jonk.

### Projects:

- The pre plan period - Mahanadi Main Canal and Tandula Reservoir in Chhattisgarh.
- Plain period –
- Hirakud Dam, Mahanadi delta project, hasdeo bango, Mahanadi Reservoir project
- Industry
- Three important urban centres in the basin – Raipur, Durg and Cuttack.
- Rich mineral resources and Power resources.
- Iron and steel plant in Bhilai.
- Aluminium factory at Hirakud and Kobra
- Paper mill near Cuttack
- Cement factory at Sundargarh.
- Sugar and textile mill.

## E ENTRI

- Mining of iron, coal and manganese.



## GODAVARI RIVER

- Largest river system.
- Dakshina the Ganga.
- Extends – Maharashtra, Andhra Pradesh, Chhattisgarh, Odisha.
- Small parts – Madhya Pradesh, Karnataka, union territory of Pondicherry.
- Having total area of three lakh square km.
- Bounded by – Satmala hills, the Ajanta range, the Mahadeo, Easter ghats on the south and the east and west by the Western Ghats on the west.
- Rises from Rimbakeshwar in the Nashik district of 80 km from the Arabian Sea at an elevation of 1067m.
- The total length from its origin to the outfall of Bay of Bengal is – 1465.

### Tributaries:

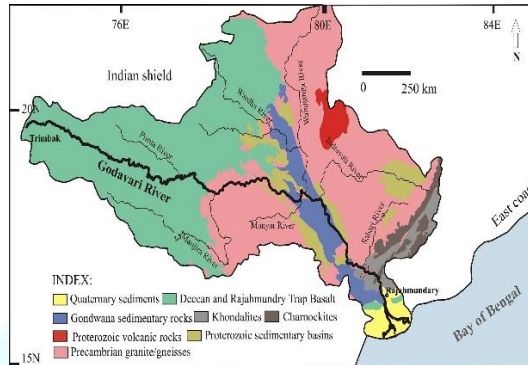
Left bank tributaries	<p>More in number.</p> <p>Larger in size than right bank.</p> <p>Dharna, Penganga, Wainganga, Wardha, Pranahita, Pench, Kahan, Sabari, Indravati, tec.</p>
Right bank tributaries	<p>The Manjra 724km.</p> <p>Joins Godavari after passing the Nizam Sagar.</p> <p>Pravara, Mula, Maner, Peddavagu, etc.</p>

- Below Rajahmundry – the river divides into two main streams – The **Gautami Godavari** on the east and **Vasishta Godavari** on the west.

- Forms a **large delta** before joining Bay of Bengal – delta is of lobate type with round bulge and many distributaries.

Projects:

- Plan period – Sriram Sagar, Godavari Barrage Upper Penganga, Jayakwadi, Upper Wainganga, Upper Indravati, Upper Wardha.
- Ongoing projects – Pranahitra – Chevella and Polavaram.



**KRISHNA RIVER**

- **Second largest east flowing river** in peninsula.
- Extends – Andhra Pradesh, Maharashtra, Karnataka
- Total area – 2.6 lakh square. km
- Bounded by – **Balaghat range** on the north, **Eastern Ghats** on the south, **western ghats** on the west.
- **River rises from the Western Ghats** near Jor Village of Satara district Maharashtra at an altitude of 1337m north of Mahabaleshwar.
- Total length of the river – 1400km.
- **Major part of basin is covered with agricultural land** – 75.86%.
- **Forms large delta with a shoreline** of about 120km.
- **Delta merge with Godavari** and extends 35km into the Sea.

Tributaries:

Left bank tributaries	Ghatprabha, Malaprabha, Tungabhadra.
Right bank tributaries	Bhima, Musi, Munneru.

- **Konya** – smallest tributary - known for Konya Dam.

## **E ▶ ENTRI**

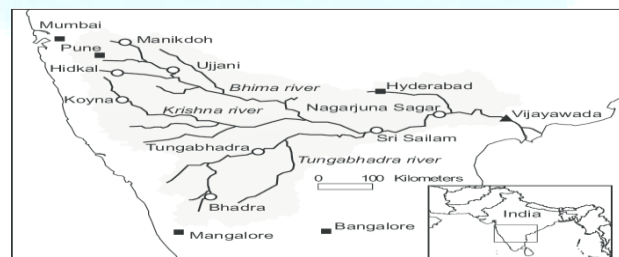
- Main cause for **devastating earthquake in 1967 that killed 150 people.**
- The Bhima originates from the Matheron Hills and joins Krishna near Raichur after a distance of 861 km.
- **Tungabhadra formed by the unification of the Tunga and the Bhadra** – originating from Gangamoola the Central Sahyadri – total length is 531 km.
- At Wazirabad – receives its last important tributary – the Musi – city of Hyderabad is located.

### Project:

- Tungabhadra, Ghataprabha, Nagarjunasagar, Malaprabha, Bhima, Bhadra, Telungu Ganga.
- **Major Hydro Power Station** – Konya, Tungabhadra, Nagarjunasagar, Bhadra, Srisaillam, Almatti, Narayanpur.

### Resources:

- Basin has rich mineral deposits.
- Good potential for industrial development.
- **Iron and steel, cement, sugarcane, vegetable oil extraction, rice milling** – important industrial activities.
- **Recently oil has been struck in the basin** – effect on future industrial scenario of this basin.



## **NARMADA RIVER**

- **Largest west flowing river of peninsula India.**
- Flow west ward through rift valley between Vindhya ranges on north and Satpura ranges on the south.
- Rises from the Maikala range near Amarkantad in Madhya Pradesh -elevation of 1057 km.

## **E ▶ ENTRI**

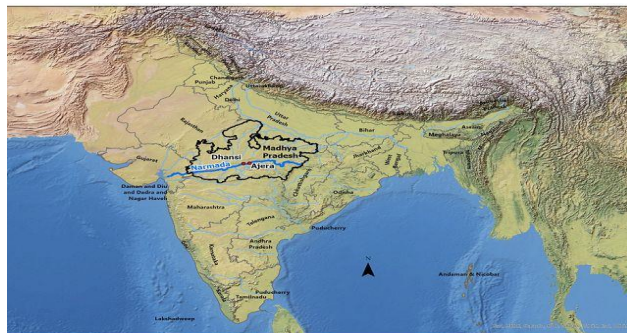
- Extends – over the states - Madhya Pradesh, Gujarat, Maharashtra, Chhattisgarh – one lakh area sq. km.
- Bounded by – Vindhya ranges on the north, Maikal range on the east, Satpura on the south, Arabian Sea on the west.
- Total length from Amarkantad to its estuary in the Gulf of the Khambat – 1310 km.
- Hilly region on the upper part of the basin, lower and middle region: broad and fertile areas- suited for cultivation.
- Jabalpur – only urban centre.
- River slopes down near Jabalpur – cascades a waterfall, 15m into a gorge (composed of marble: marble rocks) to for the Dhan Dhar cloud of mist falls.
- Makes **two waterfalls – Mandhar and Dardi – 12 m.**
- Near Maheswar – river again descend from another small fall of 8m – Sahasradhara falls.
- **Several islands – Aliabet is the largest.**
- Navigate up to 112 km from its mouth.

### Tributaries:

<b>Right bank tributaries</b>	Barna, Hiran River, Tendon River, Choral River, Man River, Uri River, Hatni River, Orsana River
<b>Left bank tributaries</b>	Burhner River, Banjar River, Sher River, Shakkar River, Dudhi River, Tawa River, Ganjal River, Chota Tawa River, Kaver River, Kunji River, Gol River, Karjan River.

### Projects:

- Major **Hydro Power Project – Indira Sagar, Sardar Sarovar, Omkareshwar, Bargi and Maheswar.**



## TAWA RIVER

- Rises from the Satpura range of Betul in Madhya Pradesh.
- Longest river tributary of River Narmada.

## TAPTI RIVER

- Also known as Tapi.
- Second largest west flowing river of peninsula India.
- Known as 'twin or the handmaid' of Narmada.
- Originates – near Multai reserve forest in Madhya Pradesh- elevation of 752m.
- Flows about 724km before out falling into the Arabian Sea through the Gulf of Cambay.
- River along with tributaries – flows over the plains of Vidharbha, Khandesh, Gujarat – states - Madhya Pradesh, Maharashtra and Gujarat 065000sq. km.
- Situated in the deccan plateau.
- Bounded by – Satpura range on north, Mahadeva hills on the east, Ajanta range and Satmala hills on the south and Arabian Sea on the west.
- Hilly regions are well forested – Satpura, Satmala, Mahadeo, Ajanta, Gawligarh Hills.
- Plains are broad and fertile areas suitable for cultivation - Khandesh.

### Tributaries:

Right bank	Suki, Comal, Arunavati, Aner.
Left bank	Vaghur, Amaravati, Buray, Panjhara, Bori, Purna, Mona, Spina

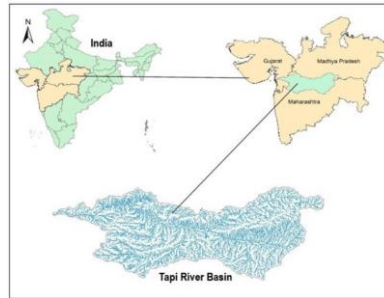
### Projects:

- Hathnur Dam – Upper Tapti Project – Maharashtra.
- Kakrapara Weir and Ukai Dam Project – Gujarat.
- Girna Dam and Dahigam Weir of Girna Project – Maharashtra.

### Industry:

- Textile factories in Surat.
- Paper and news print factory at Nepanagar.





## **SABARMATI RIVER**

- Name given to the combined streams - the Sabar and the Hathmati.
- Extends – states of Rajasthan, Gujarat – 21674 sq. km.
- Bounded by – Aravalli Hills on the north and north east, Rann of Kutch on the west, Gulf of Khambat on the South.
- Basin – triangular in shape – with Sabarmathi river as the base – source of Vatrak River as the apex.
- Originates – Aravalli Hills – elevation – 762m near Tepur Village in the Udaipur district of Rajasthan.
- Total length – 371km.
- Outfall into Arabian Sea.
- Major part of the basin is covered with agriculture – 74.68%.
- Rainfall varies – few mm in Saurashtra to over 1000mm in the Southern part.

### Tributaries:

Left bank	Wakal, Hathmati, Vatrak.
Right bank	The Sei

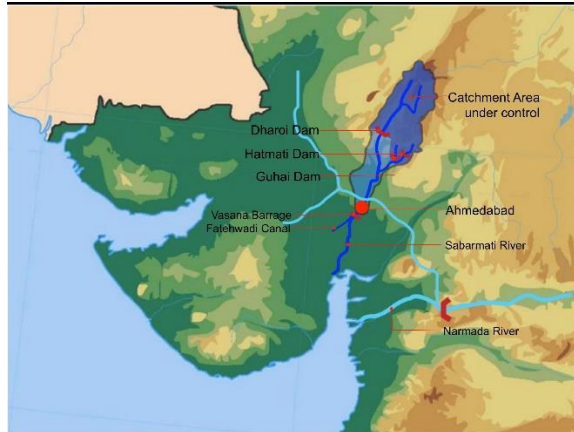
### Projects:

- Sabarmati Reservoir – Dharoi.
- Hathmati Reservoir.
- Meswo Reservoir project.
- Urban centres- Gandhinagar and Ahmedabad.

### Industries:

## E ▶ ENTRI

- Ahmedabad – industrial city on bank of river Sabarmati – danger on water pollution.
- Textile industry, leather and leather goods, plastic, rubber goods, paper, newsprints, automobile, machine tools, drugs and pharmaceutical, etc.



## MAHI RIVER

- Extends over – Madhya Pradesh, Gujarat, Rajasthan – total area 34842sq. km.
- Bounded by – Aravalli Hills on the north and northwest, Malwa plateau on the east, Vindhya on the south, Gulf of Khamabat on the west.
- One of the [major interstates west flowing rivers of India](#).
- Originates from northern slopes of Vindhya at an altitude of 500m in the Dhar district of Madhya Pradesh.
- Total length – 583km.
- Drains into Arabian Sea through Gulf of Khamabat.
- Major part of the basin is covered with agricultural land – 63.63%.

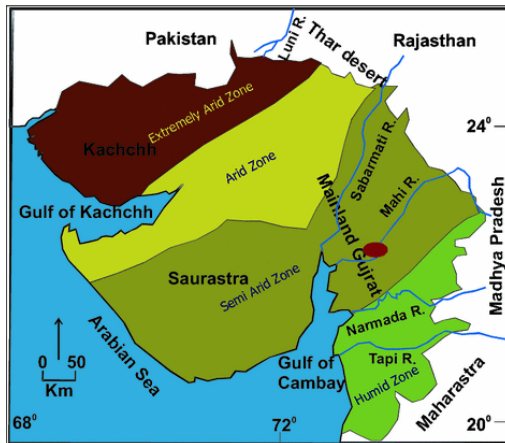
### Projects:

- [Hydro Power Station](#) – located at – Mahi Bajaj Sagar Dam, Kadana Dam, Wanakbori Dam.
- Vadodara – only urban centre.

### Industries:

- Textile, cotton, paper, newsprint, drugs and pharmaceuticals.
- Most of the industries located – Ratiam.

## E ENTRI



## LUNI RIVER

- The Luni or Salt River – Lonari or Lavanari in Sanskrit – water is blackish below Balotra.
- Only river basin of any significance in western Rajasthan – forms the bulk of the arid zone.
- Originates from the western slopes of Aravalli ranges at an elevation – 772 m near Ajmer – flowing in the south west direction and traversing a course – 511km in Rajasthan – finally flows into Rann of Kutch – lost into marsh.
- Most of the tributaries drain steep northwest of Aravalli hills and join on the left side.
- Total catchment area falls in Rajasthan.
- Peculiarity – increase its width rather than deepening the bed because the banks are of soil – easily erodible – beds are of sand.
- Flood develop and disappear so rapidly they have no time to scour the bed.





- The Cauvery River – designated as the ‘Dakshu Bharat Ki Ganga’ or ‘the Ganga of the South’.
- Rises the elevation – 1341m at Talakaveri on the Brahmagiri range near the Cherangala village of Kodagu or Coorg district of Karnataka.
- Total length – 800km.
- Flows in a south easterly direction – 705km – through the states – Karnataka and Tamilnadu – descends the Eastern Ghats in a series of Great falls.
- Tamilnadu – river breaks into large number of distributaries – form wide delta called – ‘garden of the Southern India’.
- Extends – Tamilnadu, Karnataka, Kerala, Union Territory of Puducherry.
- Draining an area – 81 thousand sq.km.
- Bounded by – western Ghats on the west, eastern ghats on the east and south, by ridges separating it from Krishna basin and Pennar basin on the north.
- The Nilgiris – an offshore of western ghats – extended eastward to the eastern ghats and divide the basin into two natural and political regions i.e., Karnataka plateau in the north and Tamilnadu plateau in the south.
- Physiographical - the basin divided into three parts – the western ghats, the plateau of Mysore, the delta.
- The delta – most fertile tract in the basin.
- Soil types – black soils, red soils, laterites, alluvial soil, forest soils, and mixed soils.
- Red soil – occupy large area.
- Alluvial soil – found at delta areas.

## **E ▶ ENTRI**

- Rainfall – Karnataka receives from south west monsoon and particularly from north east monsoon.
- Tamilnadu receives from – north east monsoon.
- Upper catchment area – during summer by the south west monsoon and lower catchment area- during winter season by the retreating north west monsoon.
- A perennial river
- Useful for irrigation and hydroelectric power generation.
- Sivasamudram falls – total 100m – width: 300m in the rainy season.
- Falls supply – hydroelectric power to Mysore, Bengaluru, Kolar Gold Fields.
- Best regulated rivers.
- 90 – 95% - irrigation and power production potential.
- River drains to Bay of Bengal.
- Major part of the basin is covered with agricultural land- 66.21%.

### Tributaries:

Left bank	The Jharangi, The Hemavati, The Shimsha, The Arkavati.
Right bank	The Lakshmanatirtha, the Kabani, the Suvarnavati, The Bhavani, The Noyil, The Amaravati.

- River's descent from south Karnataka plateau to the Tamilnadu.
- At Sivasamudram – river branches off into two parts – falls through height of 91m – series of falls and rapids.
- Falls – utilized for power generation – power station at Shuvana Samudram.
- Two branches – join the falls and flow through wide gorge – **Mekedatu: goats leap**
- Continue journey to form boundary between Karnataka and Tamil states for a distance of 64km.
- Hogennekkal Falls- takes southerly direction and enters the Mettur Reservoir.
- Bhavani joins – Kavery on right bank – 45km below Mettur reservoir.



- Then enters Tamilnadu.
- Noyil and Amaravati – join the right banks – river widens with sandy bed and flow as Akhanda Cauvery.
- Crossing Tiruchirapilli district – river divides into two – northern branch: the Coleron and southern branch: Cauvery.
- Begin Cauvery Delta.
- After 16km – two branch joins – form: Srirangam Island.
- “Grand Anicut” – constructed by Chola King in 1<sup>st</sup> century AD.
- Then splits into two – Cauvery and Vennar.
- These branches divide and subdivides into several networks.

Projects:

- Pre plan project: Krishnarajasagar in Karnataka, Mettur Dam, Cauvery Delta System in Tamil Nādu.
- Projects completed by Plan period – Lower Bhavani, Hemavati, Hranggi, Kabini

**HEMAVATI RIVER**

- Important tributary of Kaveri River.
- Rises from Western Ghats – elevation of about – 1219m near Ballalarayana Durga in the Chikmangalur district of Karnataka – flows through Chickmangaloor – Hassan and Mysore district – before joining Kavery near Krishnaraja Satgara.
- 245km long.
- Large reservoir has been built – Gorur in the Hassan district.

## SHIMSHA RIVER

- Originates an altitude – 9141km – Devarayanadurga Hills – Tumkur District of Karnataka.
- Tributaries of Kaveri.
- Maddur – major town that lies.
- **Markonahalli Dam** – built across the river.
- Waterfall – at Shimshapura in Malavalli Taluk.
- **Shimsha Hydro Electric Project.**

## ARKAVATHY RIVER

- Originates – 161km – Nandi Hills of Chikkanallapur district of Karnataka.
- Tributary of Kaveri River.
- Sangama in Kannada.
- Drains into the **Chikkarayappanahalli Lake** near Kanivenarayanpura.
- **Chunchi Waterfall** – on Arkavati river – picturesque - at Sangam near Kanakapura attracts tourists.
- Water is taken from two reservoirs built in this river – **the Hesarghatta and the Tippagindanahalli Reservoir or T G Halli.**

## LAKSHMANA TIRRTHA RIVER

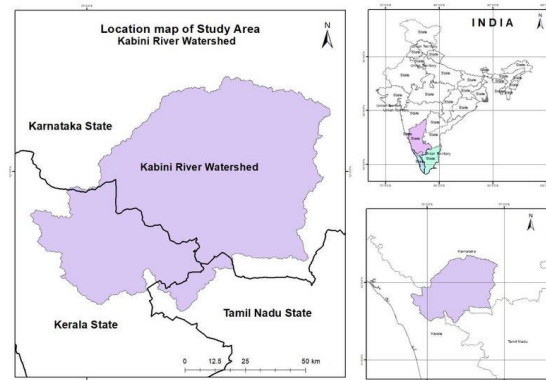
- Rises from – Irupu Falls.
- Located – Brahmagiri range in the Kodagu bordering Wayanad district of Kerala.
- Flows eastward and joins the Kaveri River in the Krishna Raja Sagara Lake.
- Ramthirrtha – major tributary.

## KABINI RIVER

- **Kabini or Kapila.**
- Originates – from -Pakramthalam Hills in the Wayanad district of Kerala from the confluence of the Panamaram River and Mananthavady River.
- **Backwaters of Kabini reservoir – very rich in wildlife sanctuary** – in summer.
- Water level; recedes to form rich grassy meadows.

## **E ▶ ENTRI**

- After traversing two kilometres from the confluence of the Panamaram River, Kabini form an island – **Kuruva Island** – spread over 520 acre – with diverse flora and fauna.



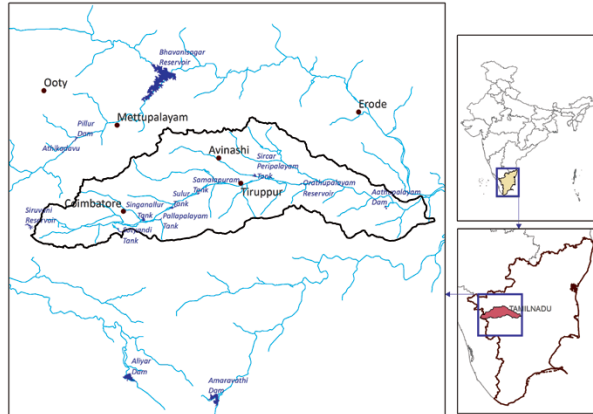
### **SUVARNAVATHY RIVER**

- 88KM long.
- Rises – from Nasrue Ghat Range of Karnataka.
- Tributary of the Kaveri River.
- Catchment area – 1787sq.km.
- Suvarnavathy Dam – located across Suvarnavathy River near Attigulipura village – Chamararajanagar Taluk – 3km away from Chikkahole Reservoir Project.

### **NOYYAL RIVER**

- **Kanchinaadi.**
- Changed its name when its drain into Kaveri River.
- Rises from – Vellingiri Hills in the Western Ghats of Tamil Nādu and drains into Kaveri River.
- The river join Kaveri at Kodumudi in Erode district.
- This place is called – **Noyyal.**
- 173km long tributary – if Kaveri River filled 32 tanks.
- The **interconnecting tanks** – held the water flow from the Noyyal.





### MAJOR INTERSTATE RIVER DISPUTES

RIVERS	STATES
Ravi and Beas	Punjab, Haryana, Rajasthan.
Narmada	Madhya Pradesh, Gujarat, Maharashtra, Rajasthan.
Krishna	Maharashtra, Andhra Pradesh, Karnataka, Telangana
Vamsadhara	Andhra Pradesh and Odisha.
Cauvery	Karnataka, Kerala, Tamil Nādu, Puducherry
Godavari	Maharashtra, Andhra Pradesh, Karnataka, Madhya Pradesh, Odisha.
Mahanadi	Chhattisgarh, Odisha
Mahadayi	Goa, Maharashtra, Karnataka
Periyar	Tamil Nādu and Kerala

### MAIN RIVER AND TRIBUTARIES

RIVERS	LEFT BANK TRIBUTARY	RIGHT BANK TRIBUTARY
Indus	Zansakr, Panjnad, Nubra.	Shylok, Gilgit, Kabul.
Mahanadi	Ib, Mand, Hasdeo, Sheonath.	Ong, Jonk, Tel.
Godavari	Penganga, Wardha, Wainganga, Indravati, Sabari.	Manjira
Krishna	Bhima, Dindi, Musi, Muneru.	Malprabha, Gataprabha, Thungabhadra.

Cauvery	Herangi, Hemavati, Lokapavani, Simsha, Arkavati.	Lakshmantirtha, Kabani, Suvarnavati, Bhavani, Amaravati.
Narmada	Burhner, Banjar, Sher, Shakkar, Tawa, Kundi.	Hiran, Barna, Kolar.
Tapti	Sipna, Khapra, Bhursi, Morna, Girna, Bori, Amaravati	Purna, Betul, Patki, Surkhi, Morna, Arunavati, Gomai.
Ganga	Gomati, Ghaghara, Gandak, Burhi, Gandak and Kosi	Yamuna, Son, Punpun.
Yamuna	Tons	Chambal, Sindh, Betwa, Ken

