GEOGRAPHY -- Indus River System

Indus River System

Indus River

- India got her name from Indus.
- 'The Indus Valley Civilization' was bornaround this river.
- It flows in north-west direction from itssource **(Glaciers of Kailas Range –** Kailash range in Tibet near Lake Manasarovar**)** till the **Nanga Parbhat** Range.
- It's length is about 2,900 km. Its total drainage area is about 1,165,000 squarekm [more than half of it lies in semiaridplains of Pakistan]. It is joined by **DharRiver** near Indo-China border.
- After entering J&K it flows between the**Ladakh**and the **Zaskar Ranges**. It flowsthrough the regions of Ladakh, Baltistanand Gilgit.
- The gradient of the river in J&K is verygentle (about 30 cm per km).
- Average elevation at which the Indus flowsthrough JK is about **4000 m** above sealevel.
- It is joined by the **Zaskar River at Leh**
- Near **Skardu**, it is joined by the **Shyok**atan elevation of about 2,700 m.
- The **Gilgit, Gartang, Dras, Shiger, Hunza**are the other Himalayan tributaries of theIndus..
- **Kabul river**from Afghanistan joins Indusnear **Attock.** Thereafter it flows throughthe **Potwar plateau** and crosses the **SaltRange** (South Eastern edge of PotwarPlateau).
- Some of the important tributaries belowAttock include the **Kurram, Toch**and the**Zhob-Gomal.**
- Just above **Mithankot**, the Indus receivesfrom **Panjnad (Panchnad)**, the accumulated waters of the five eastern tributaries—the **Jhelum, the Chenab, the Ravi, the Beas and the Satluj.**
- The river empties into the Arabian Sea south of **Karachi** after forming a huge delta.

Major Tributaries of Indus River

Jhelum River

- The Jhelum has its source in a **spring atVerinag**in the south-eastern part of the**Kashmir Valley.**
- It flows northwards into **Wular Lake** (north-western part of Kashmir Valley). From Wular Lake, it changes its course southwards. At **Baramulla**the river entersa gorge in the hills.
- The river forms steep-sided narrow gorgethrough **PirPanjal Range** below **Baramula**.
- At **Muzaffarabad**, the river takes a sharphairpin bend southward.
- Thereafter, it forms the India-Pakistan boundary for 170 km and emerges at thePotwar Plateau near Mirpur.
- After flowing through the spurs of the SaltRange it **debouches (emerge from a confined space into a wide, open area)** on the plains near the city of Jhelum.
- It joins the Chenab at **Trimmu.**
- The river is **navigable for about 160 km** out of a total length of 724 km

Chenab River

- The Chenab originates from near the **BaraLacha Pass** in the **Lahul-Spiti**part of the**Zaskar Range.**
- Two small streams on opposite sides of thepass, namely **Chandra** and **Bhaga**, form itsheadwaters at an altitude of 4,900 m.
- The united stream **Chandrabhaga**flows inthe north-west direction through the **Pangivalley**, parallel to the PirPanjal range.
- Near **Kistwar**, it cuts a deep gorge.
- It enters the plain area near **Akhnur** in Jammu and Kashmir.
- From here it through the plains of Pakistani Punjab to reach Panchnad whereit joins the **Satluj**after receiving the watersof Jhelum and Ravi rivers.

Ravi River

- The Ravi has its source in **Kullu hills** nearthe **Rohtang Pass** in Himachal Pradesh.
- It drains the area between the **Pirpanjal**and the **DhaolaDhar ranges**.
- After crossing Chamba, it takes a southwesterlyturn and cuts a deep gorge in theDhaolaDhar range.
- It enters Punjab Plains near **Madhopur** and later enters Pakistan below Amritsar.
- It debouches into the Chenab a little above**Rangpur in Pakistani Punjab**.

Beas River

- The Beas originates near the Rohtang Pass, at a height of 4,062 m above sea level, on the southern end of the PirPanjalRange, close to the source of the Ravi.
- It crosses the DhaolaDhar range and ittakes a south-westerly direction and meetsthe Satlujriver at **Harike inPunjab.**
- It is a comparatively small river which isonly 460 km long but **lies entirely withinthe Indian territory.**

Satluj River
- The Satluj rises from the **Manasarovar- Rakas Lakes** in western Tibet at a heightof 4,570 m within 80 km of the source ofthe Indus.
- Like the Indus, it takes a north-westerlycourse upto the **Shipki La** on the Tibet-Himachal Pradesh boundary.
- It cuts deep gorges where it pierces theGreat Himalaya and the other Himalayanranges.
- Before entering the Punjab plain, it cuts agorge in Naina Devi Dhar, where thefamous **Bhakra dam** has been constructed.
- After entering the plain at Rupnagar (Ropar), it turns westwards and is joinedby the **Beas at Harike.**
- From near **Ferozepur to Fazilka**it formsthe boundary between India and Pakistanfor nearly 120 km.
- During its onward journey it receives thecollective drainage of the Ravi, Chenab andJhelum rivers. It joins the Indus a fewkilometres above **Mithankot.**
- Out of its total length of 1,450 km, it flowsfor 1,050 km in Indian territory.

Indus water treaty
- The waters of the Indus river system areshared by India and Pakistan according tothe Indus Water Treaty signed between thetwo countries on **19th September, 1960.**
- According to this treaty, India can utilizeonly **20 per cent of its total discharge ofwater.**

Ganga River System

Ganga River
- The **Ganga** originates as **Bhagirathi** fromthe **Gangotri glacier** in Uttar Kashi District of Uttarakhand at an elevation of7,010 m.
- Alaknanda River joins Bhagirathi at Devaprayag.
- From Devapryag the river is called as Ganga.

Major tributaries of Alaknanda
- East Trisul**(joins Alaknanda at Karan Prayag)**
- Pindar **(rises from Nanda Devi)**
- Mandakini or Kali Ganga **(joins Alaknanda at RudraPrayag)**
- **Dhauliganga**
- **Bishenganga.**
  [Kishenganga **is the tributary of Jhelum]**

Major tributaries of Bhagirathi
- Bheling Ganga **debouches** [emerge from a confined space into a wide, open area] from the hills into plain area at **Haridwar.**
- It is joined by the **Yamuna** at **Allahabad.**
- Near Rajmahal Hills it turns to the southeast.
- At Farraka, it bifurcates into **Bhagirathi- Hugli in West Bengal** and **Padma-Meghna in Bangladesh** (it ceases to be known as the Ganga after Farraka).
- Brahmaputra (or the Jamuna as it is known here) joins Padma-Meghna at **Goalundo.**
- The total length of the Ganga river from its source to its mouth (measured along the Hugli) is 2,525 km.

Ganga – Brahmaputra Delta
- Before entering the Bay of Bengal, the Ganga, along with the Brahmaputra, forms the **largest delta of the world** between the **Bhagirathi/Hugli** and the **Padma/Meghna**covering an area of 58,752 sq km.
- The coastline of delta is a highly indented area.
- The delta is made of a web of distributaries and islands and is covered by dense forests called the **Sunderbans.**
- A major part of the delta is a **low-lying swamp** which is flooded by marine water during high tide.

Right Bank Tributaries of The Ganga
- Most of them **except Yamuna** originate in the peninsular region.

Yamuna River
- Largest and the most important tributary.
- It originates from the **Yamnotri glacier** on the **Bandarpunch Peak** in the Garhwal region in Uttarakhand at an elevation of about 6,000 meters.
- It cuts across the **Nag Tibba**, the **Mussoorie**and the Shiwalik ranges.

- It emerges out of the hilly area and enters plains near **Tajewala.**
- Its main affluent in the upper reaches is the **Tons** which also rises from the **Bandarpunch glacier**.
- It joins Yamuna below Kalsi before the latter leaves the hills.
- At this site, the water carried by the Tons is twice the water carried by the Yamuna.

Non – PeninsularTributaries

1. **Rishiganga**
2. **Uma**
3. **Hanuman Gangaand**
4. Tons **join it in themountains.**
5. Hindon**joins atGhaziabad in the plain area**

PeninsularTributaries

Most of thePeninsular riversflow into theYamuna betweenAgra andAllahabad.

1. **Chambal** 2. **Sind**
3. **Betwa** 4. **Ken.**

- It unites with the Ganga near **Triveni Sangam, Allahabad.**
- The total length of the Yamuna from itsorigin till Allahabad is 1,376 km.
- It creates the highly fertile alluvial, **Yamuna-Ganges Doab** region between itself and the Ganges in the Indo-Gangeticplain.

Chambal River

- The Chambal rises in the highlands of **Janapao Hills** (700 m) in the **Vindhyan Range**.
- It flows through the **Malwa Plateau.**
- It joins the Yamuna in **Etawah district** ofUttar Pradesh.

Dams on the Chambal

- **The Gandhi Sagar dam** is the first of thefour dams built on the Chambal River,located on the Rajasthan-Madhya Pradeshborder.
- **The RanaPratapSagar**dam is a dam located 52 km downstream of Gandhi Sagar dam on across the Chambal River inChittorgarh district in Rajasthan.
- **The JawaharSagar Dam** is the third damin the series of Chambal Valley Projects,located 29 km upstream of Kota city and26 km downstream of RanaPratapSagardam.
- **The Kota Barrage** is the fourth in the series of Chambal Valley Projects, locatedabout 0.8 km upstream of Kota City inRajasthan.
- **Keoladeo National Park** is supplied with water from Chambal river irrigation project.

The Banas

- The Banas is a tributary of the Chambal.
- It originates in the southern part of the**Aravali Range.**
- It join the Chambal on Rajasthan – Madhya Pradesh border near Sawai Madhopur.

The Sind

- The Sind originates in **Vidisha Plateau** ofMadhya Pradesh.
- It flows for a distance of 415 km before itjoins the Yamuna.

The Betwa

- The Betwa rises in **Bhopal district (Vindhyan Range)** and joins the Yamuna near **Hamirpur.**
- It has a total length of 590 km.
- **The Dhasan**is its important tributary.

The Ken

- The Ken river rising from the **Barner Range** of Madhya Pradesh joins the Yamuna near Chila.

The Son

- The Son River rises in the **Amarkantak Plateau.**
- Its source is close to the origin of the Narmada.
- It passes along the **Kaimur Range.**
- It joins the Ganga near Danapurin Patnadistrict of Bihar.
- It flows for a distance of 784 km from itssource.
- The important tributaries of the Son arethe Johilla, the Gopat, the Rihand, theKanhar and the North Koel. Almost all thetributaries **join it on its right bank.**

Damodarriver

- The Damodarriver rises in the hills of the Chotanagpur plateau and flows through arift valley.
- Rich in mineral resources, the valley ishome to large-scale mining and industrialactivity.
- It has a number of tributaries and subtributaries, such as **Barakar, Konar, Bokaro, Haharo, etc.**
- The **Barakar**is the most important tributary of the Damodar.
- Several dams have been constructed in thevalley, for the generation of hydroelectricpower. The valley is called **"the Ruhr ofIndia".**
- It used to cause devastating floods as aresult of which it earned the name **'Sorrow of Bengal'.** Now the river is tamed by constructing numerous dams.
- It joins the **Hugli River** 48 km below Kolkata.
- The total length of the river is 541 km.

Left Bank Tributaries of The Ganga River

- These rivers originate in the Himalayas.
- The major tributaries apart from the Yamuna, are the Ramganga, theGomati,the Ghaghra, the Gandak, the BurhiGandak, the Bagmati, and the Kosi.

Ramganga River

- The Ramgangariver rises in the **Garhwal**district of Uttarakhand.
- It enters the Ganga Plain near Kalagarh.
- It joins the Ganga at **Kannauj.**
- The Khoh, the Gangan, the Aril, the Kosi,and the Deoha (Gorra) are importanttributaries of Ramganga.

Ghaghra River

- Its source is near GurlaMandhata peak,south of Manasarovar in Tibet (river of thetrans-Himalayan origin).
- It is known as the **Karnaili**in Western Nepal.
- Its important tributaries are the Sarda, theSarju (Ayodhya is located on its bank) andthe Rapti.
- The Ghaghara joins the Ganga a few kilometres downstream of Chhapra in Bihar.
- After reaching the plain area, its streamgets divided into many branches of which,Koriyab and Garwa are important.
- The river bed is sandy and sudden bendsstart occurring in the stream.
- The river has a high flood frequency andhas shifted its course several times.

Kali River

- Rises in the high glaciers of **trans-Himalaya.**
- It forms the boundary between **Nepal andKumaon.**
- It is known as the **Sarda**after it reachesthe plains near Tanakpur.
- It joins the **Ghaghara.**

Gandak River

- Originates near the Tibet-Nepal border at aheight of 7,620 m
- It receives a large number of tributaries inNepal Himalaya.
- Its important tributaries are the Kali Gandak, the Mayangadi, the Bari and theTrishuli.
- It debouches into the plains at **Tribeni.**
- It flows into Ganga at **Hajipur in Bihar**.

Kosi River

- The Kosiriver consists of seven streamsnamely SutKosi, TambaKosi, Talkha,DoodhKosi, BotiaKosi, Arun and Tamberand is popularly known as Saptkaushiki.
- These streams flow through **eastern Nepal**which is known as the **SaptKaushikregion.**
- The sources of seven streams of the Kosiare located in snow covered areas whichalso receive heavy rainfall.
- Consequently, huge volume of water flowswith tremendous speed.
- Seven streams mingle with each other toform three streams named the Tumar,Arun and Sun Kosi.
- They unite at **Triveni**north of the **Mahabharata Range** to form the Kosi.
- The river enters the Tarai of Nepal aftercutting a narrow gorge in the MahabharataRange.
- The joins the Ganga near **Kursela.**
- Soon after debouching onto the plain theriver becomes sluggish.
- Large scale deposition of eroded materialtakes place in the plain region.
- The river channel is braided and it shiftsits course frequently. This has resulted infrequent devastating floods and hasconverted large tracts of cultivable landinto waste land in Bihar. Thus the river isoften termed as the **'Sorrow of Bihar'.**

- In order to tame this river, a barrage wasconstructed in 1965 near Hanuman Nagarin Nepal.
- Embankments for flood control have beenconstructed as a joint venture of India andNepal.

Brahmaputra River System

Region	Name
Tibet	Tsangpo (Meaning 'The Purifier')
China	Yarlung Zangbo Jiangin
Assam Valley	Dihang of Siong, South of Sadiya: Brahmaputra
Bangladesh	Jamuna River
	Pandam River : Combined Waters of Ganga and Brahmaputra
	Meghana : From the confluence of Padma and Meghna [View image above]

The Brahmaputra (meaning the son of Brahma).

- It is 2,900 km in length.
- Source: **Chemayungdung glacier (Kailas Range)** at an elevation of about 5,150 m. It's source is very close to the sources of Indus and Satluj.
- **Mariam La** separates the source of the Brahmaputra from the Manasarovar Lake.
- Brahmaputra flows eastwards in Southern Tibet for about 1,800 km.
- In Tibet it passes through the d**epression formed by the Indus-Tsangpo Structure Zone** between the Great Himalayas in the south and the Kailas Range in the north.
- Inspite of the exceptionally high altitude, the Tsangpo has a **gentle slope.** The river is sluggish and has a wide navigable channel for about 640 km.
- It receives a large number of tributaries in Tibet. The first major tributary is the **RagaTsangpo**meeting the Tsangpo near **LhatseDzong**.
- The river **Ngangchu**flows through the tradecentre of **Gyantse**in the south andjoins the main river.
- Towards the end of its journey in Tibet, itscourse abruptly takes a south ward turnaround **NamchaBarwa (7,756 m) (Syntaxial Bend).**
- Here it cuts across the eastern Himalayathrough the **Dihang or Siang Gorge** andemerges from the mountains near **Sadiya**in the Assam Valley.
- Here it first flows under the name of **Siongand then as the Dihang**.
- In the north-eastern parts of Assam Valley,it is joined by two important tributaries viz,the **Dibang (or Sikang)** from the north and**Lohit from the south**.
- From Sadiya (Assam Valley) onwards, thismighty river is known as the **Brahmaputra.**
- The main streams merging with the Brahmaputra from the north are, Subansiri, Kameng, Dhansiri (north), Raidak, Tista etc..
- The Tista was a tributary of the Ganga prior to the floods of 1787 after which it diverted its course eastwards to join the Brahmaputra.
- The Brahmaputra has a **braided channel**(flow into shallowinterconnected channelsdivided by deposited earth) for most of itspassage through Assam where channelskeep shifting. It carries a lot of silt andthere is **excessive meandering.**
- The river is nearly 16 km wide at Dibrugarh and forms many islands, the most important of which is **MAJULI.** It is 90 km long and measures 20 km at its widest.
- With rainfall concentrated during the monsoon months only the river has to carry enormous quantities of water and siltwhich results in disastrous floods. TheBrahmaputra is thus truly a **River ofSorrow**.
- The river is navigable for a distance of 1,384 km uptoDibrugarh from its mouthand serves as an excellent inland watertransport route.
- Brahmaputra bends southwards and enters Bangladesh near Dhubri.
- It flows for a distance of 270 km in the name of **Jamuna river** and joins the Ganga at **Goalundo.**
- The united stream of the Jamuna and the Ganga flows further in the name of **Padma.**
- About 105 km further downstream, the Padma is joined on the left bank by the **Meghna**, originating in the mountainous region of Assam.
- From the confluence of Padma and Meghna, the combined river is known asthe **Meghna**which akes a very broad estuary before pouring into the Bay of Bengal.

Peninsular River System or Peninsular Drainage

- Peninsula rivers are much **older** than the Himalayan rivers {Discordant}.
- The peninsular drainage is mainly Concordant except for few rivers in the upperpeninsular region.
- They are **non-perennial** rivers with a maximum discharge in the rainy season.
- The peninsular rivers have reached **mature stage** {Fluvial Landforms} and have almost reached their base level. **[Vertical downcutting is negligible].**
- The rivers are characterized by **broad andshallow valleys.**

- The river banks have gentle slopes exceptfor a limited tract where faulting formssteep sides.
- The main **water divide** in peninsular riversis formed by the Western Ghats, which runfrom north to south close to the westerncoast.
- The velocity of water in the rivers and the**load carrying capacity of the streams islow** due to low gradient.
- Most of the major rivers of the peninsulasuch as the Mahanadi, the Godavari, theKrishna and the Cauvery flow eastwards and drain into the Bay of Bengal. These rivers make **deltas at their mouths.**
- But the west flowing rivers of Narmada and Tapi as well as those originating from the Western Ghats and falling in the Arabian Sea form **estuaries in place of deltas**.
- There are few places where rivers form superimposed and rejuvenated drainage which are represented by **waterfalls.**
- Examples: The **Jog on the Sharvati**(289 m), **Yenna of Mahabaleshwar**(183 m), **Sivasamundram on the Cauvery** (101 m), **Gokak on the Gokak** (55 m), **Kapildhara** (23 m) and **Dhuandar**(15 m) on the Narmada are the major waterfalls in the Peninsular India.

Mahanadi River

- The Mahanadi basin extends over states of Chhattisgarh and Odisha and comparatively smaller portions of Jharkhand, Maharashtra and Madhya Pradesh, draining an area of 1.4 lakh Sq.km.
- It is bounded by the Central India hills on the north, by the Eastern Ghats on the south and east and by the **Maikala range** on the west.
- The **Mahanadi ("Great River")** follows a total course of 560 miles (900 km).
- It has its source in the northern foothills of **Dandakaranya in Raipur District** of Chhattisgarh at an elevation of 442 m.
- The Mahanadi is one of the major rivers of the peninsular rivers, in water potential and **flood producing capacity**, it ranks second to the Godavari.

Tributaries of Mahanadi River

- Its upper course lies in the saucer-shaped basin called the **'Chhattisgarh Plain'.**
- This basin is surrounded by hills on the north, west and south as a result of which a large number of tributaries join the main river from these sides.
- Left bank Tributaries: The **Seonath**, the **Hasdeo**, the **Mand**and the **Ib.**
- Right bank Tributaries: The **Ong**, the **Tel** and the **Jonk.**

Godavari River

- The Godavari is the largest river system of the Peninsular India and is revered as Dakshina Ganga.
- The basin is bounded by **Satmala hills**, the**Ajanta range** and the **Mahadeo hills** on the north, by the Eastern Ghats on the south and the east and by the Western Ghats on the west.
- The Godavari River rises from **Trimbakeshwar in the Nashik district** of Maharashtra about 80 km from the Arabian Sea at an elevation of 1,067 m.
- The total length of Godavari from its origin to outfall into the Bay of Bengal is 1,465 km.

Tributaries of Godavari River

- The left bank tributaries are more in number and **larger** in size than the right bank tributaries.
- The **Manjra** (724 km) is the only important right bank tributary. It joins the Godavari after passing through the **NizamSagar.**
- *Left Bank Tributaries:* Dharna, Penganga, Wainganga, Wardha, Pranahita [conveying the combined waters of Penganga, the Wardha and Wainganga], Pench, Kanhan, Sabari, Indravati etc.
- *Right Bank Tributaries:* Pravara, Mula, Manjra, Peddavagu, Maner etc.
- Below Rajahmundry, the river divides itself into two main streams, the **Gautami Godavari** on the east and the **Vashishta Godavari** on the west and forms a large delta before it pours into the Bay of Bengal.
- The delta of the Godavari is of **lobate type** with a round bulge and many distributaries.

Krishna River

- The Krishna is the second largest east flowing river of the Peninsula.
- The Krishna Basin extends over Andhra Pradesh, Maharashtra and Karnataka having a total area of ~2.6 lakh Sq.km.
- It is bounded by **Balaghat range** on the north, by the Eastern Ghats on the south and the east and by the Western Ghats on the west.
- The Krishna River rises from the **Western Ghats** near **Jor village of Satara district of Maharashtra** at an altitude of 1,337 m just north of **Mahabaleshwar.**
- The total length of river from origin to its outfall into the Bay of Bengal is 1,400 km.

Tributaries of Krishna River

- Right bank: the Ghatprabha, the Malprabha and the Tungabhadra.
- Left Bank: the Bhima, the Musiand theMunneru.
- The **Koyna**is a small tributary but is known for **Koyna Dam**. This dam was perhaps the main cause of the devastating **earthquake** (6.4 on richter scale) in 1967 that killed 150 people.
- The Bhima originates from the **Matheron Hills** and joins the Krishna near Raichur after for a distance of 861 km.
- The Tungabhadra is formed by the unification of the **Tunga**and the **Bhadra** originating from **Gangamula**in the **Central Sahyadri**. Its total length is 531 km.
- At Wazirabad, it receives its last important tributary, the **Musi**, on whose banks the city of Hyderabad is located.

Cauvery River

- The Kaveri (Cauvery) is designated as the**'Dakshina Ganga'** or **'the Ganga of theSouth'.**
- The Cauvery River rises at an elevation of1,341 m at **Talakaveri**on the **Brahmagirirange**near Cherangala village of **Kodagu(Coorg) district of Karnataka.**
- The total length of the river from origin tooutfall is 800 km. during summer by the south-west monsoon and the lower catchment area during winter season by the retreating north-east monsoon.
- It is, therefore **almost a perennial river** with comparatively less fluctuations in flow and is **very useful for irrigation** and hydroelectric power generation.
- Thus the Cauvery is **one of the best regulated rivers** and 90 to 95 per cent of its irrigation and power production potential already stands harnessed.
- The river drains into the Bay of Bengal. The major part of basin is covered with agricultural land accounting to 66.21% of the total area.

Tributaries of the Cauvery River

- Left Bank: the **Harangi**, the **Hemavati**, the **Shimsha**and the **Arkavati**.
- Right Bank: **Lakshmantirtha**, the **Kabbani**, the **Suvarnavati**, the **Bhavani**, the **Noyil** and the **Amaravati** joins from right.

Narmada River

- Narmada is the largest west flowing river ofthe peninsular India.
- Narmada flows westwards through a **riftvalley**between the Vindhyan Range on thenorth and the Satpura Range on the south.
- It rises from **Maikala range near Amarkantak**in **Madhya Pradesh**, at an elevation of about 1057 m.
- Narmada basin extends over states of Madhya Pradesh, Gujarat, Maharashtra and Chhattisgarh having an area ~1 LakhSq.km.
- It is bounded by the Vindhyas on the north, Maikala range on the east, Satpuras on the south and by the Arabian Sea on the west.
- Its total length from its source in **Amarkantak**to its estuary in the **Gulf of Khambhat**is 1,310 km.
- The hilly regions are in the upper part ofthe basin, and lower middle reaches arebroad and fertile areas well suited forcultivation.
- **Jabalpur** is the only important urban centre in the basin.
- The river slopes down near Jabalpur where it cascades (a small waterfall, especially one in a series) 15 m into a gorge to form the***DhuanDhar (Cloud of Mist) Falls.***
- Since the gorge is composed of marble, it ispopularly known as the Marble Rocks.
- It makes two waterfalls of 12 m each atMandhar and Dardi. Near Maheshwar theriver again descends from another smallfall of 8 m, known as the **Sahasradhara Falls.**
- There are several islands in the estuary ofthe Narmada of which **Aliabet**is thelargest.
- The Narmada is navigable upto 112 kmfrom its mouth.

Tributaries of Narmada River

- The other right bank tributaries are the **Orsang, the Barna and the Kolar**.
- A few left bank tributaries drain the northern slopes of the Satpura Range and join the Narmada at different places.

Tapti River

- The Tapti (also known as the Tapi) is the second largest west flowing river of the Peninsular India and is known as 'the twin' or 'the handmaid' of the Narmada.
- It originates near **Multai reserve forest in Madhya Pradesh** at an elevation of 752 m.
- Flows for about 724 km before outfallinginto the Arabian Sea through the **Gulf ofCambay [Gulf of Khambhat].**
- The Tapti River along with its tributaries flows over the plains of **Vidharbha, Khandesh**and Gujarat and over large areas in the state of Maharashtra and a small area in Madhya Pradesh and Gujarat.
- The basin extends over states of MadhyaPradesh, Maharashtra and Gujarat havingan area of ~ 65,000 Sq.km
- Situated in the Deccan plateau, the basinis bounded by the **Satpura range** on thenorth, **Mahadev hills** on the east, **Ajanta Range** and the **Satmala hills** on the south and by the Arabian Sea on the west.
- The hilly region of the basin is well forested while the plains are broad and fertile areas suitable for cultivation.
- There are two well defined physica regions, in the basin, viz hilly region and plains; the hilly regions comprising **Satpura, Satmalas, Mahadeo, Ajanta** and **Gawilgarh hills** are well forested.
- The plain covers the **Khandesh areas** (Khandesh is a region of central India, which forms the northwestern portion of Maharashtra state) which are broad and fertile suitable for cultivation primarily.

Tributaries of Tapti River

- *Right Bank:* the Suki, the Gomai, the Arunavati and the Aner.
- *Left Bank:* the Vaghur, the Amravati, the Buray, the Panjhra, the Bori, the Girna, thePurna, the Mona and the Sipna.

Sabarmati River

- The Sabarmati is the name given to thecombined streams the **Sabar** and **Hathmati**.
- The Sabarmati basin extends over states of Rajasthan and Gujarat having an area of 21,674 Sq km.
- The basin is bounded by **Aravallihills**on the north and north-east,byRann of Kutch on the west andby Gulf of Khambhat on the south.

- The basin is roughly triangular inshape with the Sabarmati River asthe base and the source of the **Vatrak River** as the apex point.
- Sabarmati originates from **Aravallihills**at an elevation of 762 m nearvillageTepur, in **Udaipur districtof Rajasthan.**
- The total length of river from originto outfall into the Arabian Sea is371 km.
- The major part of basin is coveredwith agriculture accounting to74.68% of the total area.
- Rainfall varies from a meager fewmm in Saurastra to over 1000 mmin southern part.
- Left bank tributaries: the Wakal,theHathmati and the Vatrak.
- Right bank tributaries: the Sei.
- Projects: Sabarmati reservoir(Dharoi), Hathmati reservoir andMeshwo reservoir project are majorprojects completed during the planperiod.

Ghaggar River – Inland Drainage

- Some rivers of India are not able to reachthe sea and constitute inland drainage.
- Large parts of the **Rajasthan desert** andparts of **Aksai Chin** in **Ladakh**have inlanddrainage.
- The ***Ghaggar***is the most important riverof inland drainage. It is a seasonal streamwhich rises on the lower slopes of theHimalayas and forms boundary between**Haryana and Punjab.**
- It gets lost in the dry sands of Rajasthannear Hanumangarh after traversing adistance of 465 km.
- Earlier, this river was an affluent of theIndus, the dry bed of the old channel isstill traceable.
- Its main tributaries are the Tangri, the Markanda, the **Saraswati**and the Chaitanya.