# **Indus River and Division of River System**

Rivers play a major role in the development of an economy. They provide drinking water, means of transportation, irrigation for the crops, generate power and are also a means of livelihood for thousands of people.

Most of the river systems in India either merge with the Bay of Bengal in the east or with the Arabian Sea in the west. Some of them also have inland drainage. But the origin point of all the major river systems can be traced back to the three major water sources.



# List of Major Indian River Systems

Name	Length (km)	Area	Originates From	Ends in	Places Benefited
Indus	3180/ 1114 in India	3,21,289 Sq.Km.	in Tibet in northern slopes of Mount Kailash	Arabian sea	India and Pakistan
Ganga (Bhagirathi)	2525	1.08 million Sq.Km.	Gangotri in Uttrakhand	Bay of Bengal	Uttar Pradesh, Uttrakhand, Bihar, West Bengal
Yamuna (Jamuna)	1376	366223 Sq.Km.	Yamunotri in Garhwall	Bay of Bengal	Delhi, Haryana and UP
Brahmaputra	916 - in India	194413 Sq.Km in India	Angsi glacier in Tibet	Bay of Bengal	Assam, Arunachal Pradesh
Kaveri (Dakshina Ganga or Ganges of the south)	765	81155 Sq.Km.	Brahmagiri hills in Kogadu, Karnataka	Bay of Bengal	Karnataka and Tamil Nadu
Godavari	1465	3,12,812 Sq.Km.	Triambakeshwar in Maharashtra	Bay of Bengal	South-eastern part of Andhra Pradesh
Krishna	1400	258948 Sq.Km.	Mahabaleshwar in Maharashtra	Bay of Bengal	Maharashtra & Andhra Pradesh
Narmada	1312	98,796 Sq.Km.	Amarkantak in Madhya Pradesh	Arabian Sea	Madhya Pradesh and Maharashtra
Tapti	724	65,300 Sq.Km.	Betul district of Madhya Pradesh in the Satpura range	Arabian Sea	Madhya Pradesh and Maharashtra
Mahanadi	858	1,41,600 Sq.Km.	Sihava mountains of Chhattisgarh	Bay of Bengal	Jharkhand, Chhattisgarh, Orissa
Vaigai	258	7,741Sq.Km.	Varusanadu Hills	Bay of Bengal	Madurai in Tamil Nadu
Periyar	244	5,398 Sq.Km.	Sivagiri peaks of Sundaramala, Tamil Nadu.	Bay of Bengal	Tamil Nadu and Kerala
Thamirabarani	185	4,400 Sq.Km.	Agastyarkoodam peak of Pothigai hills of the Western Ghats,	Gulf of Mannar	Tamil Nadu

Indus River System				
Major Rivers of Indus River System	Source	Length		
Indus	Glaciers of Kailas Range (Close to Manasarovar Lake)	2880 km total. 710 km in India		
Jhelum	Verinag	720 km		
Chenab	Bara Lacha Pass	1180 km		
Ravi	Near Rohtang Pass	725 km		
Beas	Near Rohtang Pass	460 km		
Satluj	Manasarovar-Rakas Lakes	1450 km total 1050 km in India		

# FACTS

- India got her name from Indus.
- 'The Indus Valley Civilization' was born around this river.
- It flows in north-west direction from its source (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 square km [more than half of it lies in semiarid plains of Pakistan]. It is joined by **Dhar River** near Indo-China border.
- After entering J&K it flows between the **Ladakh** and the **Zaskar Ranges**. It flows through the regions of Ladakh, Baltistan and Gilgit.
- The gradient of the river in J&K is very gentle (about 30 cm per km).
- Average elevation at which the Indus flows through JK is about **4000 m** above sea level.
- It is joined by the **Zaskar River at Leh** (these kind of points are important for prelims).
- Near **Skardu**, it is joined by the **Shyok** at an elevation of about 2,700 m.
- The Gilgit, Gartang, Dras, Shiger, Hunza are the other Himalayan tributaries of the Indus.
- It crosses the Himalayas (ends its mountainous journey) through a 5181 m deep gorge near Attock, lying north of the Nanga Parbat. It takes a sharp southerly bend here (syntaxial bend).
- **Kabul river** from Afghanistan joins Indus near **Attock**. Thereafter it flows through the **Potwar plateau** and crosses the **Salt Range** (South Eastern edge of Potwar Plateau).
- Some of the important tributaries below Attock include the **Kurram, Toch** and the **Zhob-Gomal.**

- Just above **Mithankot**, the Indus receives from **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 at Verinag** 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 enters a gorge in the hills.
- The river forms steep-sided narrow gorge through **Pir Panjal Range** below **Baramula**.
- At **Muzaffarabad**, the river takes a sharp hairpin bend southward.
- Thereafter, it forms the India-Pakistan boundary for 170 km and emerges at the Potwar Plateau near Mirpur.
- After flowing through the spurs of the Salt Range 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 **Bara Lacha Pass** in the **Lahul-Spiti** part of the **Zaskar Range**.

- Two small streams on opposite sides of the pass, namely **Chandra** and **Bhaga**, form its headwaters at an altitude of 4,900 m.
- The united stream **Chandrabhaga** flows in the north-west direction through the **Pangi valley**, parallel to the Pir Panjal 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 where it joins the **Satluj** after receiving the waters of Jhelum and Ravi rivers.

# > Ravi River

- The Ravi has its source in **Kullu hills** near the **Rohtang Pass** in Himachal Pradesh.
- It drains the area between the **Pir Panjal** and the **Dhaola Dhar ranges**.
- After crossing Chamba, it takes a south-westerly turn and cuts a deep gorge in the Dhaola Dhar 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 Pir Panjal Range**, close to the source of the Ravi.
- It crosses the Dhaola Dhar range and it takes a south-westerly direction and meets the Satluj river at **Harike in Punjab**.
- It is a comparatively small river which is only 460 km long but **lies entirely within the Indian territory.**

# Satluj River

- The Satluj rises from the **Manasarovar-Rakas Lakes** in western Tibet at a height of 4,570 m within 80 km of the source of the Indus.
- Like the Indus, it takes a north-westerly course upto the Shipki La on the Tibet-Himachal Pradesh boundary.
- It cuts deep gorges where it pierces the Great Himalaya and the other Himalayan ranges.
- Before entering the Punjab plain, it cuts a gorge in Naina Devi Dhar, where the famous **Bhakra dam** has been constructed.
- After entering the plain at Rupnagar (Ropar), it turns westwards and is joined by the **Beas at Harike**.
- From near **Ferozepur to Fazilka** it forms the boundary between India and Pakistan for nearly 120 km.
- During its onward journey it receives the collective drainage of the Ravi, Chenab and Jhelum rivers. It joins the Indus a few kilometres above **Mithankot**.
- Out of its total length of 1,450 km, it flows for 1,050 km in Indian territory.

# > Indus Water Treaty

- The waters of the Indus river system are shared by India and Pakistan according to the Indus Water Treaty signed between the two countries on **19th September**, **1960**.
- According to this treaty, India can utilize only **20 per cent of its total discharge of water**.

# **Ganga River System**

River	Source
Bhagirathi (Ganga)	Gangotri glacier
Yamuna	Yamnotri glacier on the Bandarpunch Peak
Chambal	Janapao Hills in the Vindhya Range
Banas	Aravali Range
Betwa	Bhopal district
Ken	Barner Range
Son	Amarkantak Plateau
Damodar ('Sorrow of Bengal')	Chotanagpur plateau
Ramganga River	Garhwal district of Uttarakhand
Ghaghra River	Gurla Mandhata peak, south of Manasarovar in Tibet (river of the trans-Himalayan origin)
The Kali River (border between Nepal and Uttarakhand)	Glaciers of trans-Himalayas
Gandak River	Tibet-Nepal border
Burhi Gandak	Sumesar hills near the India-Nepal border
Kosi ( <b>'Sorrow of Bihar</b> ')	Tumar, Arun and Sun Kosi unite at Triveni north of the Mahabharata Range to form the Kosi.



- The **Ganga** originates as **Bhagirathi** from the **Gangotri glacier** in Uttar Kashi District of Uttarakhand at an elevation of 7,010 m.
- Alaknanda River joins Bhagirathi at Devaprayag.
- From Devapryag the river is called as Ganga.
- The Ganges was ranked as the fifth most polluted river of the world in 2007.
- Pollution threatens many fish species and amphibian species and the endangered **Ganges** river dolphin (Blind Dolphin).
- The Ganga Action Plan, an environmental initiative to clean up the river, has been a major failure thus far, due to corruption, lack of technical expertise, poor environmental planning, and lack of support from religious authoritie
- Ganga **debouches** [emerge from a confined space into a wide, open area] from the hills into plain area at
- It is joined by the **Yamuna** at **Allahabad**.
- Near Rajmahal Hills it turns to the south-east.
- 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
- 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
- A major part of the delta is a **low-lying swamp** which is flooded by marine water during high tide.

# <u>Right Bank Tributaries of The Ganga</u>

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

Non – Peninsular Tributaries	Peninsular Tributaries
1. Rishiganga	1. Chambal
2. Uma	2. Sind
3. Hanuman Ganga and	3. Betwa
<b>4</b> . <b>Tons</b> join it in the mountains.	4. Ken.
5. Hindon joins at Ghaziabad in the plain	
area	

#### Damodar river

- The Damodar river rises in the hills of the **Chotanagpur plateau** and **flows through a rift valley**.
- Rich in mineral resources, the valley is home to large-scale mining and industrial activity.
- 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 the valley, for the generation of hydroelectric power. The valley is called **"the Ruhr of India"**.
- The first dam was built across the Barakar River, a tributary of the Damodar river.
- It used to cause devastating floods as a result 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, the Gomati, the Ghaghra, the Gandak, the Burhi Gandak, the Bagmati, and the Kosi.**

# Ramganga River

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

# Ghaghra River

- Its source is near **Gurla Mandhata peak**, **south of Manasarovar in Tibet (river of the trans-Himalayan origin)**.
- It is known as the **Karnaili** in Western Nepal.
- Its important tributaries are the Sarda, the Sarju (Ayodhya is located on its bank) and the Rapti.
- The Ghaghara joins the Ganga a few kilometres downstream of Chhapra in Bihar.
- After reaching the plain area, its stream gets divided into many branches of which, Koriyab and Garwa are important.

- The river bed is sandy and sudden bends start occurring in the stream.
- The river has a high flood frequency and has shifted its course several times.

#### Kali River

- Rises in the high glaciers of **trans-Himalaya**.
- It forms the boundary between Nepal and Kumaon.
- It is known as the **Sarda** after it reaches the plains near Tanakpur.

#### > Gandak River

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

# > Burhi Gandak

- Originates from the western slopes of **Sumesar hills near the India-Nepal border**.
- It joins the Ganga near Monghyr town.

#### Kosi River

- The Kosi river consists of seven streams namely **Sut Kosi, Tamba Kosi, Talkha, Doodh Kosi, Botia Kosi, Arun and Tamber** and is popularly known as
- These streams flow through **eastern Nepal** which is known as the **Sapt Kaushik region**.
- The sources of seven streams of the Kosi are located in snow covered areas which also receive heavy rainfall.
- Consequently, huge volume of water flows with tremendous speed.
- Seven streams mingle with each other to form 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 after cutting a narrow gorge in the Mahabharata Range.
- The joins the Ganga near
- Soon after debouching onto the plain the river becomes sluggish.
- Large scale deposition of eroded material takes place in the plain region.
- The river channel is braided and it shifts its course frequently. This has resulted in frequent devastating floods and has converted large tracts of cultivable land into waste land in Bihar. Thus the river is often termed as the **'Sorrow of Bihar'**.
- In order to tame this river, a barrage was constructed in 1965 near Hanuman Nagar in Nepal.
- Embankments for flood control have been constructed as a joint venture of India and Nepal.

# Brahmaputra River

- 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.

# Brahmaputra river

The Brahmaputra river map above shows the flow of river Brahmaputra from its source in Tibet region to its final destination, the bay of Bengal.

#### Origin

- Chemayungdung mountain ranges near Mansarovar lake in southern Tibet.
- The spring named **Tamchok khambab** is considered as the origin of the river Brahmaputra.
- It is known as **Tsangpo or Yarlung Tsangpo** in Tibet region and flows parallel to the Himalayan ranges before entering into India through Arunachal Pradesh.
- The river Brahmaputra enters into India through Arunachal Pradesh as **siang or dihang river**. After joining its tributaries **Lohit and the dibang river**, it is known as river **Brahmaputra**.
- After entering into Bangladesh river Brahmaputra is known as **Jamuna** river and it is joined by Ganga river which in Bangladesh is known as **Padma** river. And finally river Brahmaputra empties its water into the bay of Bengal.
- River basin consists of all the land drained by the river and its tributaries .
- The **Brahmaputra river basin** consists of various small rivers and it is so large that it spreads over **Tibet**, **Bhutan**, **Bangladesh and India**. River Brahmaputra basin in India spreads over various States which consists of **Assam**, **Arunachal Pradesh**, **west bengal**, **Meghalaya**, **Nagaland and Sikkim**.

# What is length of Brahmaputra river

Total length of river Brahmaputra is **2880 km** and 1625 km of it lies in the Tibet region and rest in India

# Brahmaputra river flows through which states?

River Brahmaputra enters into India through **Arunachal Pradesh** as siang or dihang river and then flows through **Assam** before entering into Bangladesh.

# Brahmaputra river tributaries

	Burbansier Burbansier Brahmaputra Brahmapu
Left Bank Tributaries	Right Bank Tributaries
Siang river	Subansiri river
Dibang river	Kameng river
Lohit river	Manas river
Burhi Dihing river	Sankosh river
Dhansiri river	Raidak river
Kopili river	Jaldhaka river
	Teesta river

#### Brahmaputra river tributaries

# Left bank tributaries

Left bank tributaries of river Brahmaputra have common feature: have flatter grades, fine alluvial soils and comparatively low silt charge, deep meandering channels

#### **Siang river**

- The river Siang is known by the name of **Yarlung Tsangpo in Tibet** originating at the height of **5300 meter near Kailash range**.
- It follows in east direction **parallel to the Himalayan ranges** for approx 1600 kilometre.
- Just before entering into India it passes through a **deep Gorge** across the eastern extremities of the Himalayan ranges. After entering into India it is **joined by the lohit and the dibang river and together they form the mighty river Brahmaputra**.

#### **Dibang river**

- River dibang **originates in Arunachal Pradesh** near Indo China border in the dibang valley. The **mishmi hills** lie in the upper course of river dibang.
- The river finally **joins the lohit river** and together they join the siang river.

#### Lohit river

- Lohit river **rises in the Tibet** region where it is called as **Zayu river**.
- It enters India through **Arunachal Pradesh flowing mishmi hills** it **joins siang river** to form the Brahmaputra river.
- Lohit river carries abundant amounts of **lateritic soil** with it which provides it a **reddish colour**.

# Burhi Dihang / Burhi dihing river

- Formed by the confluence of two small rivers **Namphuk and Namchik** which Originates in **Patkai hills**, which is part of Eastern Himalayan ranges in Arunachal Pradesh.
- Flowing through Patkai hills and due to change of its course overtime burhi dihing river have created various **oxbow lakes** around it.
- It finally joins river Brahmaputra in Assam plains.
- Its basin is used for **cultivation of tea**.

# Dhansiri river

• Dhansiri originates from **south west Nagaland**, flowing along **Intanki** national park it joins river Brahmaputra in Assam plains.

#### Kopili river

- Kopili river originates in Saipong reserve forest in South East Meghalaya
- It forms the **border between Assam and Meghalaya** States.
- It joins river Brahmaputra at **kopilimukh in Assam plains**.

# **Right bank tributaries**

Right bank tributaries of river Brahmaputra have common feature: have steep slope, coarse sandy beds, shallow braided channels, and carry a heavy silt charge Subansiri river

- The subansiri river rises beyond the Himalayas in the tibet region so technically its a **trans- Himalayan river.**
- Subansiri is formed by **culmination of various small streams which have "chu"** in their names such as Tsari chu, chayal chu. And **sikung chu** is the main source of the subansiri river.
- Subansiri river is the largest tributary of river Brahmaputra.
- Subansiri enters into India through Arunachal Pradesh and flows through Miri hills.
- Subansiri joins the river Brahmaputra in Assam at Jamurighat.

#### **Kameng river**

- Kameng river rises near the **Gorichen mountain in Arunachal Pradesh** near the Indo Tibetan border.
- Flowing through **Kameng district** of Arunachal Pradesh it enters Assam plains and joins river Brahmaputra.
- Kameng river flows between **two important protected areas**, Sessa and eaglenest sanctuary on its west and Pakke tiger reserve on its east.

#### Manas river

• Manas river is a **trans-Himalayan** river and it originates from Tibet region.

- Originating from Tibet **it flows for 24 km before entering into Bhutan** and finally into India, where it joins the river Brahmaputra.
- Manas river system is the **largest river system of Bhutan**.
- Manas river flows through **two important protected areas**, **The Royal Manas National park in Bhutan and the Manas wildlife sanctuary in India**

#### Sankosh river

- The Sankosh river rises in Bhutan's northern part.
- As it is a right Bank tributary of Brahmaputra river, flowing through hills it carries lots of silt with it, and has steep slopes and shallow braided channels.
- It is known as Puna Tsang chu in Bhutan and is one of most beautiful rivers in Bhutan.
- The Sankosh river enters India and flows forming the border between Assam and West Bengal.
- Flowing further it enters Bangladesh and joins Brahmaputra river near Indo- Bangladesh international boundary.

#### Teesta river

- Teesta river originates in the Himalayas of North Sikkim at Zemu glacier in the peaks Kanchenjunga ranges.
- Teesta river is lifeline of Sikkim
- Originating in Himalayan heights it has created a deep gorge in Darjeeling hills and divides Darjeeling hills into Tiger hill range and Kalimpong hill range.
- Flowing further it enters into Bangladesh and joins the mighty Brahmaputra river.

Name	Purpose	River	State	Туре
Doyang Hep Dam	Hydroelectric, Drinking / Water Supply	Doyang	Nagaland	Earthen
Karbi Langpi Dam	Hydroelectric	Borpani	Assam	Gravity & Masonry
Khandong Dam	Hydroelectric	Kopili	Meghalaya	Earthen
Kyrdemkulai (Umiam st- III) Dam	Hydroelectric, Irrigation, Drinking / Water Supply	Umtru	Meghalaya	Gravity & Masonry
Nongkhyllem Dam	Hydroelectric	Umtru	Meghalaya	-
Ranganadi Dam	Hydroelectric		Arunachal Pradesh	Gravity & Masonry
Rangit III Dam	Hydroelectric, Drinking / Water Supply	Rangit	Sikkim	Gravity & Masonry
Rangpo Dam	Hydroelectric	Rongpo	Sikkim	-

Major River Valley Projects/Dams/Barrages associated with the Brahmaputra river system-

Rongli Dam	Hydroelectric	Rongli	Sikkim	-
Subansiri Lower HE (Nhpc) Dam	Hydroelectric	Subansiri	Arunachal Pradesh	Gravity & Masonry
Teesta -V (NHPC) Dam	Hydroelectric	Teesta	Sikkim	Gravity & Masonry
Teesta-III Dam		Teesta	Sikkim	Rockfill
Teesta-III Lower Dam	Hydroelectric	Teesta	West Bengal	Gravity & Masonry
Teesta-IV Dam		Teesta	Sikkim	Gravity & Masonry
Teesta-IV Lower Dam	Hydroelectric	Teesta	West Bengal	Gravity & Masonry
Umiam Dam	Hydroelectric	Umiam	Meghalaya	Earthen / Gravity & Masonry
Umrong Dam	Hydroelectric	Umrong	Assam	Earthen
Umtru Dam	Hydroelectric,Irrigation,Drinking / Water Supply	Umtru	Meghalaya	Earthen / Gravity & Masonry