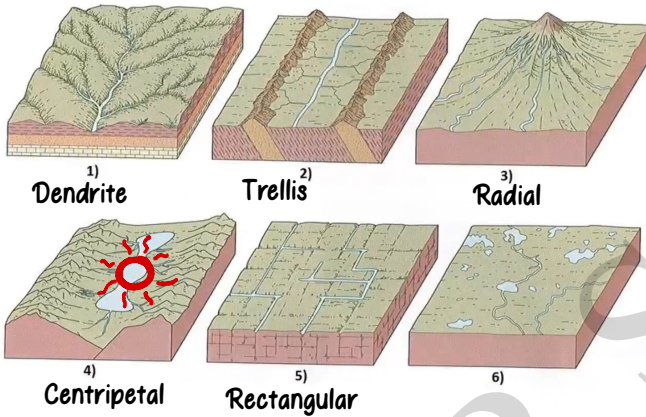


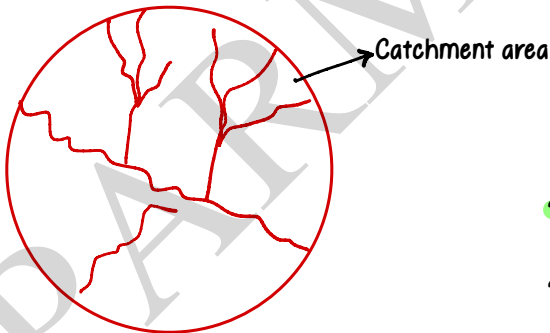
# DRAINAGE SYSTEM



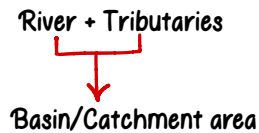
# Different Drainage Patterns



1. **Dendritic:** resemble the branch of a tree
2. **Trellis:** tributaries join the river at right angle
3. **Radial:** rivers originating from a central dome/peak
4. **Centripetal:** rivers draining their water into a central lake/depression



## River System



## Indian River System

1. Himalayan River System
2. Peninsular River System

- **Origin:** source
- **Mouth:** Drains water

## The Himalayan Rivers

1. They are perennial
2. Water throughout the year (Origin/ Source: Glaciers)
3. They have long courses from their source to the sea
4. 3 major rivers: the Indus, Brahmaputra, and Ganga originating from the North of the mountain ranges
5. **Ex:** the Indus, the Brahmaputra, the Ganga
6. Some Himalayan rivers are antecedent (following their original course), **eg:** Satluj, Kosi, Indus

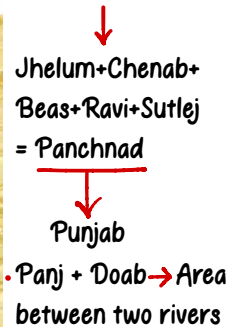
## The Peninsular River

1. They are ephemeral
2. During dry season, large rivers have reduced flow of water in their channels
3. They have shorter and shallower course
4. Most of the rivers here originate in the Western Ghats and flow towards Bay of Bengal
5. **Ex:** Narmada, Tapi, Godavari

## INDUS RIVER SYSTEM

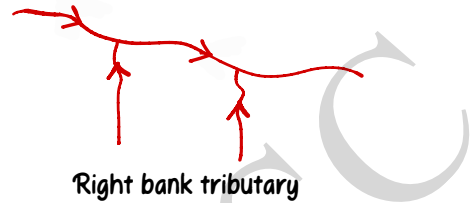
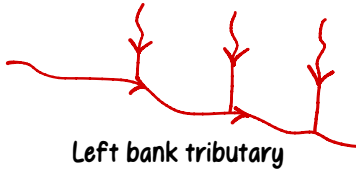


### Tributaries of Indus



## Classification of Tributaries

1. Left Bank Tributary
2. Right Bank Tributary



### Indus

- **Indus+Jhelum:** Sindh Sagar Doab
  - **Jhelum+Chenab:** Jech Doab
  - **Chenab+Ravi:** Rechna Doab
  - **Ravi+Beas:** Bari Doab
  - **Beas+Sutlej:** Bist Doab
  - **Length:** 2880 km/1114 km in India
  - **Flows in:** China → India → Pakistan
  - National river of Pakistan
  - Indus Water Treaty, 1960
    - Signed in Karachi
    - B/w J L Nehru and Ayub Khan
    - **Mediator:** World Bank
    - One of the most successful treaty around the world
- |   |   |   |
|---|---|---|
| <ul style="list-style-type: none"> <li>Indus</li> <li>Jhelum</li> <li>Chenab</li> </ul> | } | <ul style="list-style-type: none"> <li>80% water used by Pakistan</li> <li>20% water used by India</li> </ul> |
| <ul style="list-style-type: none"> <li>Ravi</li> <li>Beas</li> <li>Sutlej</li> </ul>    | } | <ul style="list-style-type: none"> <li>80% water used by India</li> <li>20% water used by Pakistan</li> </ul> |
- **Indus origin:** Bokhar Chu Glacier near Lake Mansarovar
  - **Drains:** into Arabian Sea
  - **Demchok:** enters into India
  - **Leh:** located on the banks of Indus River
  - Indus in Tibet is known as **Singi Khamban** (Lion's mouth)

## Tributaries of Indus

### 1. Jhelum: meanders in its youthful stage

- **Ancient name**: Vitasta
- **Origin**: Verinag (J & K)
- Flows in the border of India and Pakistan
- Srinagar is located on banks of Jhelum
- Wular Lake gets its water from Jhelum

### 2. Chenab → Chandra → Bhaga

- **Ancient name**: Askini
- **Origin**: Baralacha La pass
- Largest tributary of Indus

### 3. Ravi

- **Ancient name**: Purushni
- **Origin**: Rohtang pass

### 4. Beas

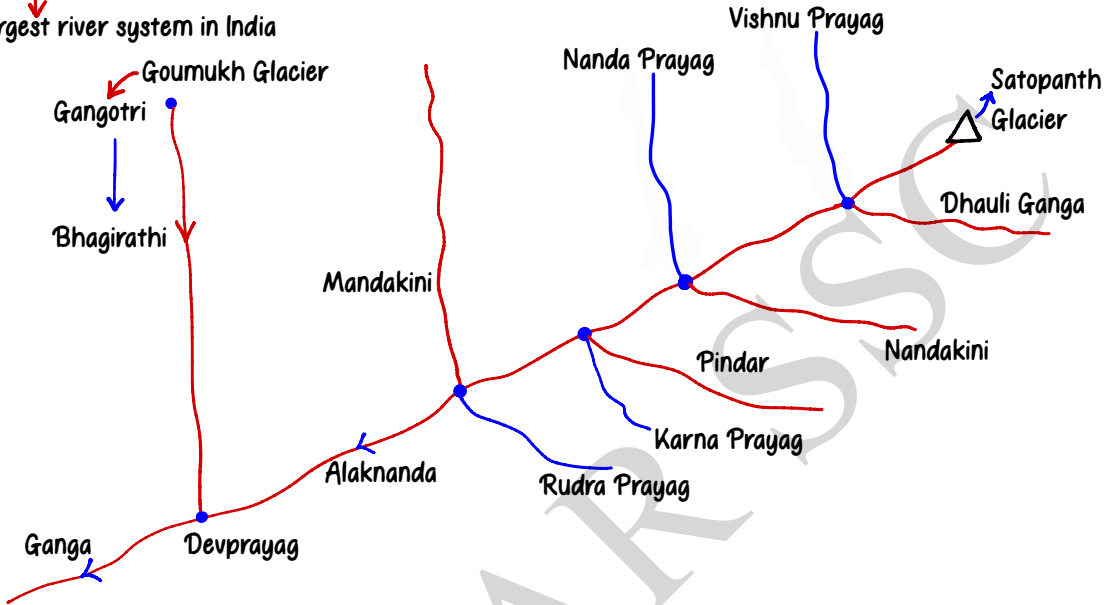
- **Ancient name**: Bipasha
- **Origin**: Rohtang pass
- Only tributary of Indus that does not pass or enter Pakistan

### 5. Sutlej

- **Ancient name**: Shutudri
- **Origin**: Rakas lake (Lake Mansarovar)
- It enters India through Shipkila pass
- Panchnad meet Indus at Mithankot, Pakistan
- **Right Bank Tributaries**: Shyok, Gilgit, Hunza

# GANGA RIVER SYSTEM

Largest river system in India



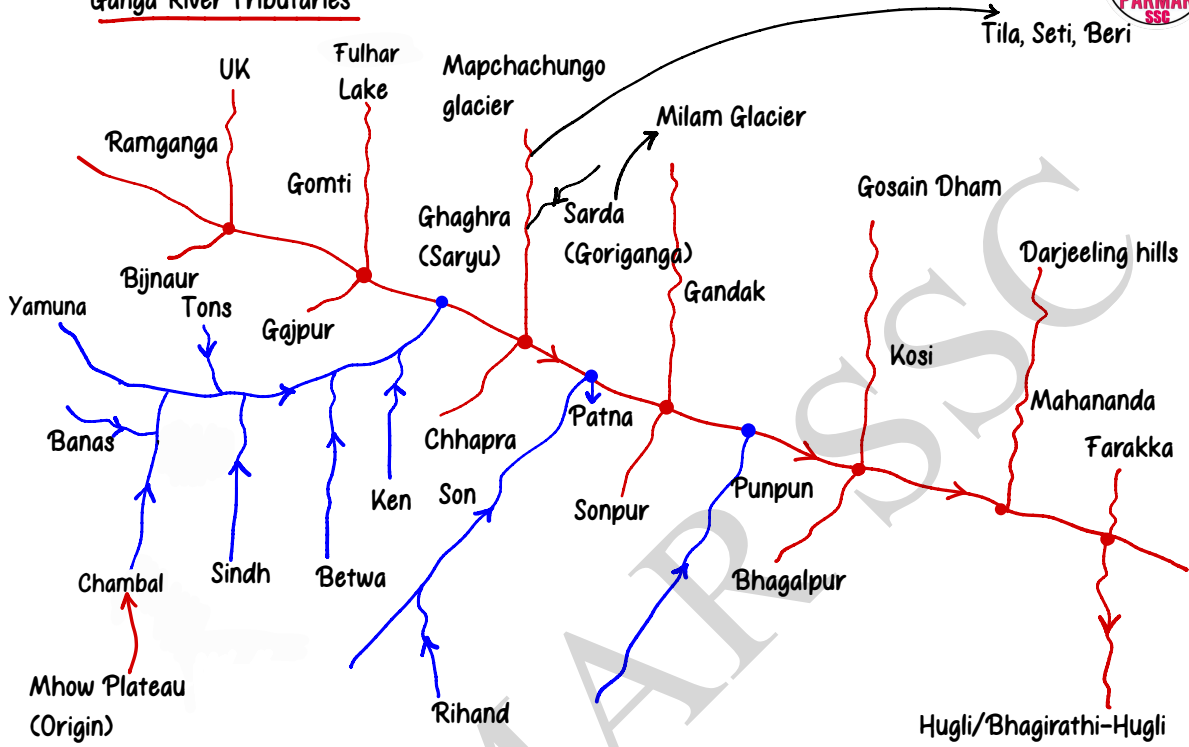
• **Prayag:** Confluence of two rivers

- **Bhagirathi** → **Dev Prayag**
- **Dhauliganga** → **Vishnu Prayag**
- **Nandakini** → **Nanda Prayag**
- **Pindar** → **Karna Prayag**
- **Mandakini** → **Rudra Prayag**





# Ganga River Tributaries



## Yamuna: 1370 km

- It is the longest tributary of Ganga
- **Tributaries:** Chambal, Sindh, Betwa, Ken, Tons

**Origin:** Mhow Plateau

Badland Topography

**Tributaries:** due to Ravines (gully erosion)

- Parbati
- Kalisindh
- Shipra

## Son

- **Origin:** Amarkantak Plateau (Radial Drainage Pattern)
- **Tributaries:** Koel, Rihand
- **Punpun:** joins Ganga at Fatuha near Patna

- **Ganga** then flows in Bangladesh where it known as Padma
- Water from Ganga stored in bottle remains fresh due to presence Bacteriophage viruses
- **Total length:** 2525 km
- National River of India, declared in 2008
- Longest River of India
- **Passes through 5 states:** Uttarakhand, Uttar Pradesh (longest), Bihar, J&K (shortest), West Bengal

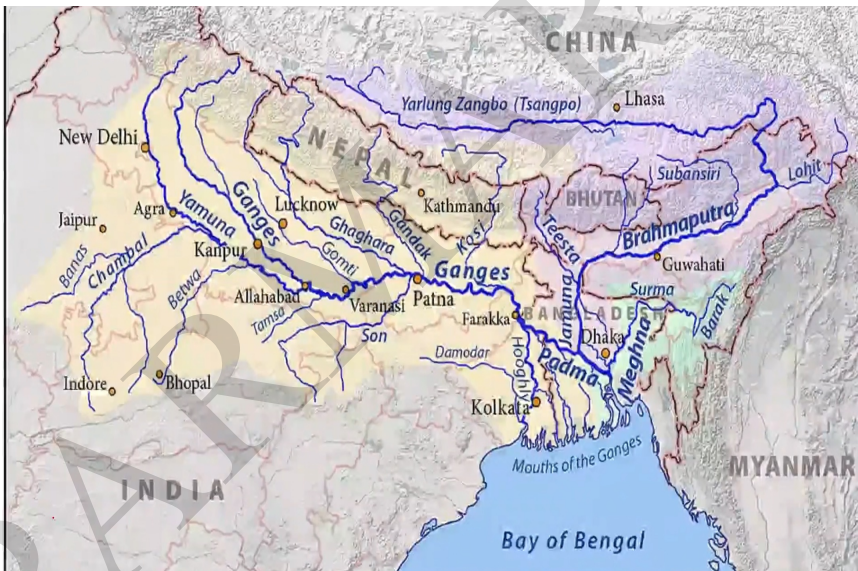
- **Kosi:** Sorrow of Bihar (causes flood in Bihar)

Cities located on banks of Ganga:

- Prayagraj
- Kanpur (largest)
- Varanasi
- Patna

West to East order

BRAHMAPUTRA RIVER SYSTEM



- **Brahmaputra:** 2900 km
- **Length in India:** 916 km
- Different names:
- **Tibet:** Yarlung Tsangpo (origin)
- **Siang and Dihang:** Arunachal Pradesh
- **Assam:** Brahmaputra
- **Jamuna:** Bangladesh

- Takes U-turn in Namcha Barwa
- South turn in Dhubri (Assam)
- **World largest Riverine Island:** Majuli Island
- **Origin:** Chemayungdung Glacier/Angsi Glacier
- Padma + Jamuna = Meghna

Mansarovar Lake    Manipur hills    ← Barak

- **World's largest Delta:** Sundarbans Delta (Sundari tree)





## Tributaries of Brahmaputra

- **Left Bank Tributaries:** Lohit, Dhansiri
- **Right Bank Tributary:** Dibang, Kameng, Manas, Testa, Subansiri
  
- Drainage pattern that forms central spire or dome-like structure: Radial Pattern
- Drainage pattern forms when rivers discharge their waters from all directions in lake or depression: Centripetal
- Peninsular drainage system: Mahanadi and Godavari
- When river originates from a hill and flows in all directions, the drainage pattern formed: Radial
- River that marks easternmost boundary of Himalayas: Brahmaputra
- Snow-fed river: Yamuna (origin: Bandarpuch)
- River that is also called Vyath: Jhelum
- The river Indus was also called Hindos by the the Iranians and the Greeks
- The river Ganga divides the state Bihar into two parts
- The region of Ganga lies in: 10°N to 30°N latitude
- Yamuna rises in Indian Himalayas
- Source of river Ghaggar: Himachal Pradesh
- The headwater of Ganga: Bhagirathi
- Kolkata is in banks of Hooghly river



- **Farakka Agreement:** Between India and Bangladesh signed on 1977
- **NW1:** Longest Waterway → On Bhagirathi Hoogly River Water System
- **NW2:** On Brahmaputra

PARMAR SSC