



# India: Drainage System



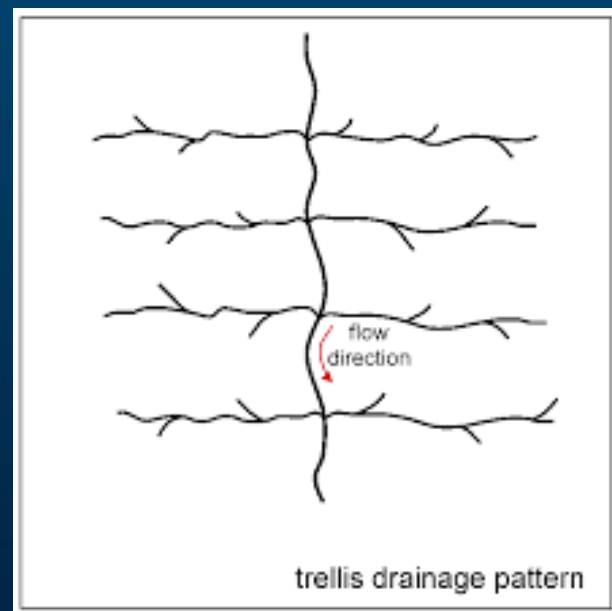
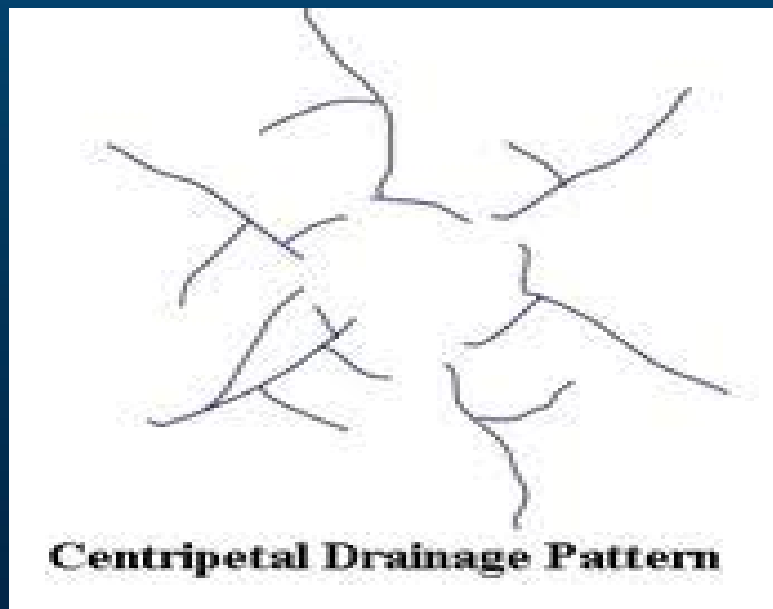
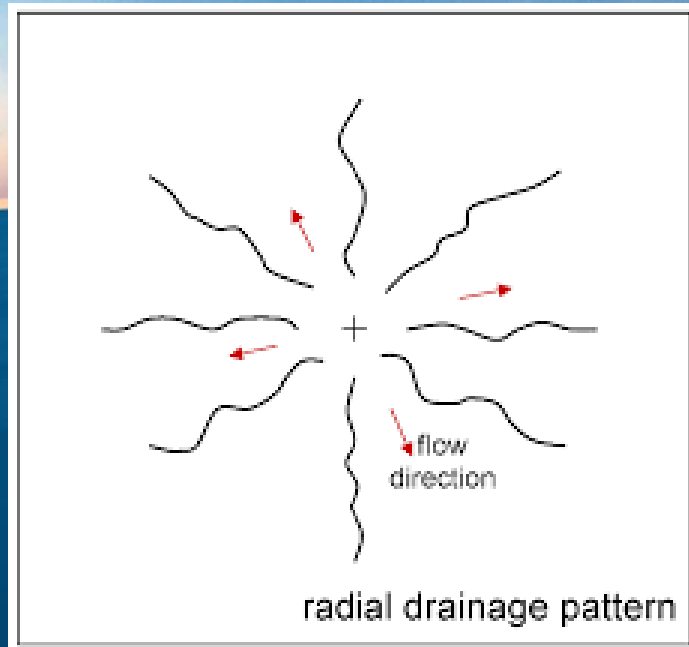
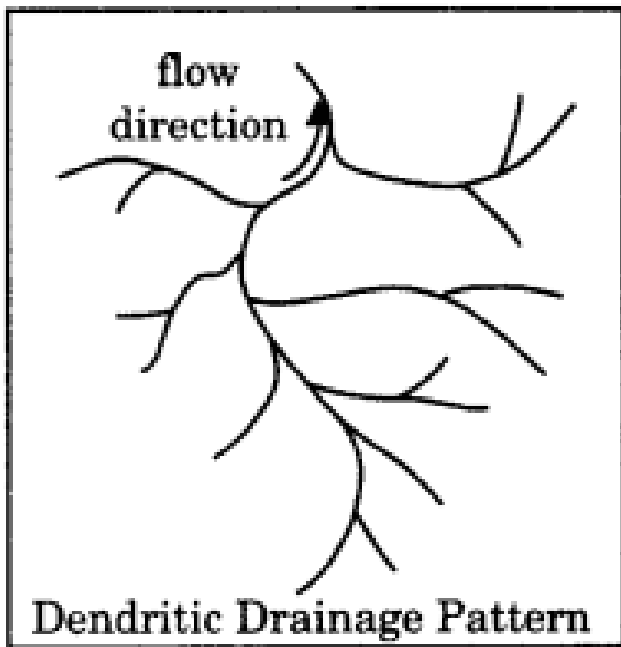
# Introduction

- The flow of water through well-defined channels is known as **drainage** and the network of such channels is known as **drainage system**.
- The drainage pattern of an area is the result of the geological time period, nature, and structure of rocks, topography, slope, etc.
- About 77% of the drainage area consisting of the *Ganga*, the *Brahmaputra*, the *Mahanadi*, the *Krishna*, etc. is oriented towards the Bay of Bengal.
- On the other hand, 23% comprising the *Indus*, the *Narmada*, the *Tapi*, the *Mahi*, and the *Periyar* systems discharge their waters in the Arabian Sea.
- A river drain is a specific area, which is known as the **catchment area** of that river.
- An area drained by a river and its tributaries is known as a **drainage basin**.
- The boundary line separating one drainage basin from the other is called as the **watershed area**.



Following are the major drainage patterns:

- Dendritic
- Radial
- Centripetal
- Trellis





- A drainage pattern which looks like tree branches with lots of twigs is known as **Dendritic drainage pattern**. For example, the rivers of northern plain.
- **Radial drainage patterns** form when rivers originate from a hill and flow in all directions. For example, the rivers originating from the *Amarkantak*.
- **Centripetal drainage pattern is formed** when rivers discharge their waters from all directions into a lake or a depression. For example, *Loktak* lake in Manipur.
- **Trellis drainage pattern is formed** when the primary tributaries of main rivers flow parallel to each other and secondary tributaries join them at right angles. For example, rivers in the upper part of the Himalayan region.



# Classification of Drainage

On the basis of the mode of origin, nature, and characteristics, the Indian drainage is classified as:

- **The Himalayan drainage**
- **The Peninsular drainage**



Source: en.wikipedia.org



# Himalayan Drainage

- **The Indus Rivers**
- **The Ganga Rivers**
- **The Brahmaputra Rivers**





# The Indus

- The total length of the Indus River system is 2,880 km (in India 1,114 km).
- The Indus originates from a glacier near **Bokhar Chu** in the Tibetan region at an altitude of 4,164 m in the *Kailash* Mountain range.
- Major tributaries of Indus are the *Shyok*, the *Gilgit*, the *Zaskar*, the *Hunza*, the *Nubra*, the *Shigar*, the *Gasting*, and the *Dras* in the upper part.
- In the lower part, the *Satluj*, the *Beas*, the *Ravi*, the *Chenab*, and the *Jhelum* are the major tributaries of the *Indus*.
- The *Jhelum* flows through Srinagar and the *Wular* Lake before entering into Pakistan.
- *Jhelum* joins the *Chenab* near Jhang in Pakistan.
- The *Chenab* is the largest tributary of the Indus.



- Originating from the *Beas* Kund near the *Rohtang* Pass at an elevation of 4,000 m above the mean sea level, *Beas* is also an important tributaries of the *Indus*.
- *Beas* enters into the *Punjab* plains and meets with the *Satluj* near *Harike*.
- The *Satluj* passes through the *Shipki La* on the *Himalayan* ranges and enters into the *Punjab* plains.
- The *Satluj* is the river that feeds the canal system of the *Bhakra Nangal* project.





# The Ganga

- The *Ganga* originates from the *Gangotri* glacier near Gaumukh (3,900 m) in the Uttarkashi district of Uttarakhand.
- Some other tributaries of the *Alaknanda* are the *Pindar* (joins at Karna Prayag), the *Mandakini* or *Kali Ganga* (joins at Rudra Prayag).
- The total length of the Ganga in India is 2,525 km, which is shared by Uttarakhand (110 km); Uttar Pradesh (1,450 km); Bihar (445 km); and West Bengal (520 km).
- The Ganga river system is the largest river system in India.
- The *Son* is a major right bank tributary of the Ganga; however, major left bank tributaries are the *Ramganga*, the *Gomati*, the *Ghaghara*, the *Gandak*, the *Kosi*, and the *Mahananda*.



- However, the river, when it originates from the Gangotri glacier is known as the **Bhagirathi**.
- At **Devprayag**, the *Bhagirathi* merges with another river, i.e., the *Alaknanda*; and from here, it is known as the *Ganga*.
- The *Alaknanda* originates from the *Satopanth* glacier above Badrinath.
- The major tributaries of the Alaknanda are the Dhaulī and the Vishnu Ganga; these two rivers meet at Joshimath/Vishnu Prayag.
- Originating from the *Yamunotri* glacier on the western slopes of *Banderpunch* range (6,316 km), the *Yamuna* is the longest tributary of the Ganga.
- The Yamuna joins the Ganga at Allahabad (Prayag), Uttar Pradesh.



- The *Chambal*, the *Sind*, the *Betwa*, and the *Kenon* are the right bank tributaries of the Yamuna and the *Hindan*, the *Rind*, the *Sengar*, the *Varuna*, etc. are the left bank tributaries.
- Originating from the Nepal Himalayas between the Dhaulagiri and Mount Everest, the *Gandak* consists of two streams, namely *Kaligandak* and *Trishulganga*.
- The *Gandak* joins the Ganga at *Sonpur* near Patna, Bihar.
- The *Ghaghara* originates from the *Mapchachungo* glaciers and joins the Ganga at Chhapra, Bihar.
- The *Kosi* originates from the north of Mount Everest in Tibet where it is known as the **Arun**.
- Originating from the *Garhwal* hills near Gairsain, the *Ramganga* joins the Ganga near Kannauj.
- The *Damodar* drains the eastern margins of the *Chottanagpur* plateau, where it flows through a rift valley and finally joins the *Hugli*.
- The *Sarda* or *Saryu* River rises from the *Milam* glacier in the Nepal Himalayas where it is known as the **Goriganga**. However, along the Indo-Nepal border, it is called as **Kali** or *Chauk*, where it joins the *Ghaghara*.

PAKISTAN

Source of the Ganges

H I M A L A Y A S  
C H I N A  
T I B E T  
N E P A L



NEW DELHI

Agra

KATHMANDU

Mt. Everest  
29,035 ft.  
(8,850 m)

BHUTAN

Banas  
Chambal  
Parbati  
Kali Sindh

Sind  
Betwa  
Dhasan  
Ken

Kanpur

Chaghara  
Gomati  
Rapti

Gandak

Sapt Kosi

Ganges

BANGLADESH

DHAKA

Indore

I N D I A

Kolkata  
(Calcutta)

Damodar

Mouths of the Ganges

DECCAN  
PLATEAU

Bay of Bengal

Source: go.grolier.com



0 200 Miles  
0 200 Kilometers

Area drained by the Ganges River and its tributaries

A silhouette of a person standing on a hill, holding a staff or walking stick, against a sunset sky. The person is positioned on the left side of the frame, looking towards the right. The sky is a mix of blue and orange, with a bright horizon line. The overall scene is peaceful and contemplative.

# The Brahmaputra

- The ***Brahmaputra*** originates from the *Chemayungdung* glacier of the Kailash range near the *Mansarovar* Lake.
- In Tibet, the *Brahmaputra* is known as the ***Tsangpo*** (means 'the purifier').
- The *Rango Tsangpo* is the major right bank tributary of the Brahmaputra in Tibet.
- The Brahmaputra enters into India near the west of Sadiya town in Arunachal Pradesh.
- Major left bank tributaries of the Brahmaputra are *Lohit*, *Dibang* or *Sikang*, *Burhi Dihing*, and *Dhansari*.
- Major right bank tributaries of the Brahmaputra are the *Subansiri*, *Kameng*, *Manas*, and *Sankosh*.
- The *Tista* joins the Brahmaputra on its right bank in Bangladesh and from here, the river is known as the *Yamuna*.
- Finally, the Brahmaputra merges with the river *Padma* and falls in the Bay of Bengal.





Source: en.wikipedia.org

# Peninsular River System

- The Peninsular drainage system is older than the Himalayan Rivers.
- The *Mahanadi* originates from *Sihawa* in Raipur district of Chhattisgarh and runs through Madhya Pradesh and Odisha and finally discharges its water into the Bay of Bengal.
- The total length of Mahanadi is 851 km.
- Popularly known as the ***Dakshin Ganga***, the *Godavari* is the largest peninsular river system.
- The *Godavari* originates from Nasik district of Maharashtra and discharges its water into the Bay of Bengal.
- With total 1,465 km length, *Godavari* covers the areas of Maharashtra, Madhya Pradesh, Chhattisgarh, Odisha, and Andhra Pradesh.





- Originating from Mahabaleshwar in Sahyadri, the *Krishna* is the second largest east flowing Peninsular River.
- Of the total catchment area of the *Krishna*, 27% lies in Maharashtra, 44% in Karnataka, and 29% in Andhra Pradesh.
- The *Kaveri* originates from the *Brahmagiri* hills (1,341m) located in Kogadu district of Karnataka.
- The river *Kaveri's* total course of 770 km commands a basin area of 8.8 million hectare mha, of which, 3% lies in Kerala, 41% lies in Karnataka, and 56% lies in Tamil Nadu.
- Major tributaries of the *Kaveri* are the *Kabini*, the *Bhavani*, and the *Amravati*.
- The *Narmada* originates from the western flank of the *Amarkantak* plateau (1,057 m).



Narmada

Mahanadi

Tapti

Godavari

Arabian  
Sea

Bay of  
Bengal

Krishna

Kaveri

Indian Ocean