Drainage System of India

DRAINAGE SYSTEM IN INDIA

- Drainage refers to the channel of a river system in an area.
- Drainage Basin refers to an area which is drained by one river system, i.e. Main River along with its tributaries.
- Drainage system refers to the group of channels of drainages, i.e. channels of main (original) river and its tributaries.
- The function of time of the geological period determines the characteristics of the drainage pattern.
- The major characteristics of drainage pattern are – topography, slope, amount of water flow, nature and structure of rocks.

DRAINAGE PATTERNs

- Drainage patterns are formed based on the channel and shape of rivers which forms a part of the drainage basin.
- Based on the formation of river patterns the drainage patterns are classified into two types – Discordant and Concordant Drainage Pattern.

DISCORDANT DRAINAGE PATTERN

- In Discordant drainage pattern, the rivers will not change its path according to the change in topography or landform in an area.
- The discordant drainage pattern further divided into two types :
- Antecedent and
- Superimposed drainage pattern
- Example: R. Indus, R. Brahmaputra, etc.,

CONCORDANT DRAINAGE PATTERN

- In Concordant drainage pattern, the rivers will change its path in accordance with the slope and topography of a region.
- The concordant drainage patterns are further divided into:
  1. Consequent rivers
  2. Subsequent rivers
  3. Dendritic Drainage pattern
  4. Trellis Drainage Pattern
  5. Radial Drainage Pattern
  6. Centripetal Drainage Pattern

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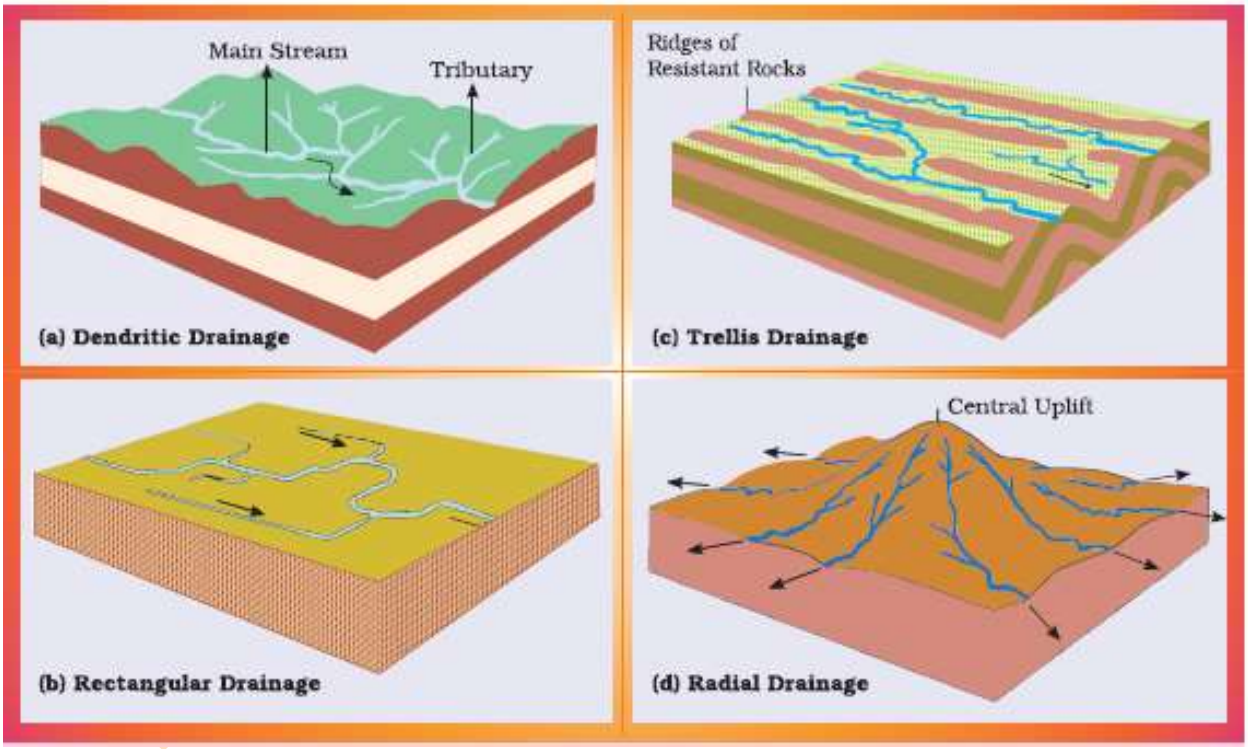
- In consequent rivers, the rivers flow through the general slope of an area. Mostly main (original) rivers have this drainage pattern. Eg: R. Godavari, R. Cauvery, etc.
- In Subsequent rivers, the tributary streams are formed after the formation of the original stream by the vertical and lateral erosion along the slope. Eg: R. Ken, R. Chambal. Etc.
- In Dendritic Drainage pattern, the pattern of flow of the original river and its tributaries looks like branches of a tree. Eg: R. Indus, R. Mahanadi, R. Godavari, etc.,
- In Trellis Drainage Pattern the tributaries (Subsequent rivers) joins the original river at right angles and the tributaries flow parallel to each other.
- In Radial Drainage Pattern the rivers originate from a common area and flow in all direction from the source region. Eg: Amarkantak Plateau
- In Centripetal Drainage Pattern rivers from different directions drains into a common area. Eg: Loktak Lake, Manipur.



Source: NCERT

INDIAN DRAINAGE SYSTEM

- The drainage system of India is mainly classified into:
- Himalayan rivers

- Peninsular rivers

Himalayan River System

- The upliftment of Himalayas in different geological period resulted in the present drainage system of Himalayan rivers.
- The water divide, watershed and the channel of these rivers have changed at different times and the folding leads to the creation of many rivers.
- There are three major river systems in the Himalayas: (i) The Indus System; (ii) The Ganga System; (iii) The Brahmaputra System.

RIVER	SOURCE	MOUTH	TRIBUTARIES	DESCRIPTION
INDUS	Near Bokhar Chu Glacier, Tibetan Plateau	Arabian Sea (near Karachi, Pakistan)	Left: Jhelum, Chenab, Sutlej, Ravi, Beas, Zanskar Right: Shyok, Hunza, Gilgit, Kabul, Khurram, Tochi, Gomal, Viboa, Sangar	Known as Singi Khamban (Lion's Mouth) In India, it flows only in Jammu & Kashmir state
JHELUM	Verinag, J & K	R. Chenab (in Pakistan)	Right: Neelum, Sind	It passes through Srinagar and Wular Lake
CHENAB	Tandi, Himachal Pradesh (formed by two rivers Chandra and Bhaga)	R. Indus (in Pakistan)	Right: Marusadar river	It is also called as Chandrabhaga It is the largest tributary of river Indus

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RAVI	Rohtang Pass, Himachal Pradesh	R. Chenab		
SUTLEJ	Raksas Tal, near Mansarovar, Tibet	R. Chenab, Pakistan	Left: Baspa Right: Spiti, Beas	It is known as Langchen Khambab in its source place. It enters India through Shipki La pass Bhakra Nangal Project is constructed across this river
BEAS	Beas Kund, near Rohtang pass, Himachal Pradesh	R. Sutlej		
GANGA	Confluence of R. Bhagirathi and R. Alaknanda at DevPrayag	Sagar Island, Bay of Bengal (Bangladesh)	Left: Ramganga, Gomati, Gandak, Kosi, Ghaghara, Mahananda Right: Yamuna, Son, Chambal, Betwa	Ganga is India's largest river system
YAMUNA	Yamunotri Glacier	R. Ganga, Allahabad (UP)	Left: Rishiganga Right: Chambal,	It is the longest tributary of Ganga river

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			Betwa, Ken, Sind	
CHAMBAL	Mhow, Malwa plateau	R. Yamuna, Madhya Pradesh	Left: Banas Right: Parbati, Shipra	Badland topography is an important feature of the Chambal river system
GANDAK	Mustang, Nepal	R. Ganga, Sonpur, Bihar	Left: Trisuli Right: Kali Gandak	
GHAGHARA	Mapchachungo, Tibet	R. Ganga, Bihar	Left: Rapti Right: Sarda, Budhi Ganga	
KOSI	Tribenighat, Nepal	R. Ganga, Bihar		It is an antecedent trans-boundary river
RAMGANGA	Pauri Garhwal, Uttarakhand	R. Ganga, Uttar Pradesh		
SON	Amarkantak Plateau	R. Ganga, Bihar (near Patna)		It flows northwards to reach Ganga and its largest south bank tributary
MAHANANDA	Darjeeling Hills	R. Ganga, West Bengal		Last left bank tributary of Ganga
BRAHMAPUTRA	Chemayungdung Glacier, Kailash Range, Tibet	Bay of Bengal	Left: Burhi Dihing, Dhansri, Lohit Right: Subansri, Manas,	It enters India in the state of Arunachal Pradesh (near Sadiya town)

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			Kameng, Sankosh	In Tibet, it is called as Tsangpo Takes U-turn and enters India near Namcha Barwa peak Frequent Shifting of the channel is one of its main characteristics

Peninsular River System

- The course and channel of Peninsular rivers are evolved by passing through various geological events like subsidence, Upheaval of Himalayas, the tilt of Peninsular India
- The Western Ghats acts as a water divide between thus most of the peninsular rivers flow towards the east and few flowing through the west reaching the Arabian Sea with few exemptions which flow northwards.
- The characteristics of river channels of these rivers like the fixed course, absence of meanders, etc., indicates that these rivers are older than Himalayan rivers.

PENINSULAR RIVER	SOURCE	MOUTH	TRIBUTARIES	DESCRIPTION
MAHANADI	Sihawa, Chattisgarh	Bay of Bengal (False Point, Odisha)	Left: Seonath, Mand, Ib Right: Ong, Jonk, Telen	Maharashtra, Chattisgarh, Jharkhand, Odisha are its basin states
GODAVARI	Brahmagiri Hills, Nasik, Maharashtra	Bay of Bengal, Andhra Pradesh (East Godavari	Left: Prahnita, Indravati	It is called as Dakshin Ganga as this river is

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		district)	Right: Manjira, Pravara, Manair	the largest Peninsular River
KRISHNA	Mahabaleshwar, Maharashtra	Krishna district, Andhra Pradesh, Bay of Bengal	Left: Bhima, Musi, Munneru Right: Tungabhadra, Koyna, Dudhganga, Ghataprabha	
CAUVERY	Brahmagiri Hills, Karnataka	Poompuhar, Tamil Nadu, Bay of Bengal	Left: Hemavathi, Arkavathy Right: Kabini, Bhavani, Noyyal, Amaravati	This river receives rainfall from both south-west and north-east monsoon
NARMADA	Amarkantak Hills, Madhya Pradesh	Gulf of Khambat, Arabian Sea	Left: Tawa, Shakkar Right: Hiran, Kolar, Dindori	Known for Marble Rocks (Jabalpur, MP) and falls West flowing river and flows through a rift valley
TAPI	Betul District, Madhya Pradesh	Gulf of Khambat, Surat, Arabian Sea		West flowing river

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Comparison between Himalayan and the Peninsular Rivers of India

S. No.	Aspect	Himalayan River	Peninsular River
1.	Place of origin	Himalayan mountain covered with glaciers	Peninsular plateau and central highland
2.	Nature of flow	Perennial; receive water from the glacier and rainfall	Seasonal; dependent on monsoon rainfall
3.	Type of drainage	Antecedent and consequent leading to the dendritic pattern in plains	Superimposed, rejuvenated resulting in trellis, radial and rectangular patterns
4.	Nature of river	Long course, flowing through the rugged mountains experiencing headward erosion and river capturing; In plains meandering and shifting of course	Smaller, the fixed course with well-adjusted valleys
5.	Catchment area	Very large basins	Relatively smaller basin
6.	Age of the river	Young and youthful, active and deepening in the valleys	Old rivers with the graded profile, and have almost reached their base levels

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