

Chapter : 3 Drainage

KEYTERMS:

- ❖ **Drainage:** It describes the river system of an area.
- ❖ **Drainage basin:** The area drained by a single river system.
- ❖ **Water divide:** Any elevated area, such as a mountain or an upland that separates two drainage basins.
- ❖ **Meanders:** A meander is a winding curve or bends in a river. Meanders are the result of both erosional and depositional processes. They are typical of the middle and lower course of a river. This is because vertical erosion is replaced by a sideways form of erosion called LATERAL erosion, plus deposition within the floodplain.
- ❖ **Oxbow Lakes:** An oxbow lake is a U- shaped body of water that forms when a wide meander from the main stem of a river is cut off, creating a free-standing body of water. This landform is so named for its distinctive curved shape, resembling the bow pin of an oxbow.
- ❖ **Estuary:** An estuary is a partially enclosed coastal body of brackish water with one or more rivers or streams flowing into it, and with a free connection to the open sea. Estuaries form a transition zone between river environments and maritime environments.
- ❖ **Tributary:** A tributary or affluent is a stream or river that flows into a larger stream or main stem (or parent) river or a lake.

DRAINAGE SYSTEMS IN INDIA:

- The Himalayan Rivers
- The Peninsular Rivers

DIFFERENCE BETWEEN THE HIMALAYAN AND THE PENINSULAR RIVERS:

THE HIMALAYAN RIVERS	THE PENINSULAR RIVERS
1. These rivers are perennial as they have water throughout the year.	1. These rivers are not- perennial, during dry season their flow get reduced or even some of these rivers get dried up.
2. These rivers get water from rain and melted snow.	2. These rivers are mainly dependent on rain for water.
3. These rivers have deeper and longer courses.	3. These rivers have shallow and shorter courses.
4. These rivers drain the regions of northern India.	4. These rivers drain the regions of southern India.
5. These rivers perform an erosional and depositional activity with great intensity.	5. These rivers do not perform an erosional or depositional activity with such great intensity.
6. These rivers have large well- developed deltas.	6. These rivers do not have large deltas.
7. Ganga is the largest Himalayan river in India.	7. The Godavari is the largest Peninsular river in India.
8. Example: Ganga, Indus and Brahmaputra	8. Example: Narmada, Tapi, Mahanadi, Godavari, Krishna and Kaveri

THE HIMALAYAN RIVERS:

- i. The major Himalayan Rivers are Indus, Ganga and Brahmaputra. These rivers along with their tributaries form the Himalayan river system.
- ii. Indus and Brahmaputra originate from north of the mountain and enter India by making gorges.
- iii. These rivers perform an intensive erosional activity in their courses and carry a large amount of sand, silt and clay.
- iv. During the middle and lower courses, they perform depositional activities. Meanders, oxbow lakes, deltas are formed during these courses.

INDUS RIVER SYSTEM:

- **Origin:** The River Indus rises from Tibet, near Lake Mansarowar. It enters India by making a gorge in Ladakh district of Jammu and Kashmir.
- **Tributaries:** Its tributaries like Zaskar, Nubra, Shyok and Hunza join it in Kashmir. Its other tributaries like Sutlej, Beas, Ravi, Chenab and Jhelum join it in Mithankot in Pakistan.
- **Length:** 2900 km.
- **Drain Into:** Arabian Sea
- **Other Distinctive Features:**
 - Indus plain has a gentle slope.
 - In India, it flows through the states of Jammu and Kashmir, Himachal Pradesh and Punjab.

GANGA RIVER SYSTEM:

- **Origin:** The headquarters of the Ganga is called 'Bhagirathi' is fed by Gangotri glacier and joined by Alaknanda at Devprayag in Uttarakhand. At Haridwar, the Ganga emerges from mountains and falls on to plains.
- **Tributaries:**
 - Yamuna, Ghaghara, Gandak and Kosi are its tributaries.
 - The Yamuna originates from Yamunotri Glacier and meets Ganga at Allahabad.
 - Ghaghara, Gandak and Kosi rises from Nepal Himalayas.
 - Its tributaries originating from peninsular up-lands, are Chambal, Betwa and Son.
- **Length:** 2500 km.
- **Drain Into:** Bay of Bengal
- **Other Distinctive Features:**
 - Ganga flows eastwards to Farakka in West Bengal. The river bifurcates itself here into Bhagirathi- Hooghly and reaches to the Bay of Bengal.
 - Ganga along with Brahmaputra forms Sundarbans delta.

THE BRAHMAPUTRA RIVER SYSTEM:

- **Origin:** It rises in Tibet east of Lake Mansarowar. It flows eastwards parallel to the Himalayas and on reaching Namcha Barwa takes a 'U' turn and enters in India at Arunachal Pradesh through a gorge.
- **Tributaries:** It is joined by Dibang, Lohit and other tributaries to form the Brahmaputra in Assam.
- **Length:** 2900 km
- **Drain Into:** Bay of Bengal
- **Other Distinctive Features:**
 - It is known as Tsang Po in Tibet and Jamuna in Bangladesh.
 - Every year during the rainy season it overflows and causes widespread devastation due to floods in Assam and Bangladesh.
 - Due to huge deposits of the silt, it causes river bed to rise.
 - It also frequently shifts channel.

Q. Why in its Tibetan part river the Brahmaputra has less silt deposition in comparison to Assam, despite having a longer course in Tibet?

- It carries the smaller volume of water and less silt in Tibet despite having a longer course as it is a cold and dry area.
- In India, it passes through a region of heavy rainfall.
- In India, it carries a large volume of water and a considerable amount of silt hence forming many riverine islands.

THE PENINSULAR RIVERS:

- i. The main water divide in Peninsular India is formed by the Western Ghats.
- ii. Most of the Peninsular Rivers like Mahanadi, Godavari, Krishna and Kaveri drain into the Bay of Bengal. These rivers form deltas at their mouths.
- iii. Narmada and Tapi are only long rivers which flow west and make estuaries.
- iv. Other smaller rivers towards west are Sabarmati, Mahi, Bharathpuzha and Periyar.
- v. Other smaller rivers towards east are Damodar, Brahmani, Baitarni and Subarnrekha.

THE NARMADA BASIN:

- **Origin:** Amarkantak Hills in Madhya Pradesh. It flows towards the west in a rift valley formed due to faulting.
- **Length:** 1300 km
- **Flows Through:** Madhya Pradesh and Gujarat
- **Drain Into:** Arabian Sea
- **Other Distinctive Features:**
 - 'Marble rocks' near Jabalpur and 'Dhuadhar falls' are the notable picturesque locations formed by the river.
 - All the tributaries of Narmada are short, and most of these join the river at right angles.

THE TAPI BASIN:

- **Origin:** It rises in Satpura ranges, in the Betul district of Madhya Pradesh. It also flows in a rift valley parallel to the Narmada.
- **Length:** 720 km
- **Flows Through:** Madhya Pradesh, Gujarat and Maharashtra
- **Drain Into:** Arabian Sea

THE GODAVARI BASIN:

- **Origin:** It rises from the slopes of the Western Ghats in Nasik district of Maharashtra.
- **Tributaries:** Purna, Wardha, Pranhita, Manjra, Wainganga and Penganga.
- **Length:** 1500 km
- **Flows Through:** Maharashtra, Madhya Pradesh, Orissa and Andhra Pradesh
- **Drain Into:** Bay of Bengal
- **Other Distinctive Features:**
 - It is the largest river of the Peninsular river, also known as 'Dakshin Ganga'.

THE MAHANADI BASIN

- **Origin:** It rises in the highlands of Chhattisgarh.
- **Length:** 860 km
- **Flows Through:** Maharashtra, Chhattisgarh, Jharkhand and Odisha
- **Drain Into:** Bay of Bengal

THE KRISHNA BASIN

- **Origin:** It rises from spring near Mahabaleshwar.
- **Tributaries:** Tungabhadra, Koyana, Ghatprabha, Musi and Bhima
- **Length:** 1400 km
- **Flows Through:** Maharashtra, Karnataka and Andhra Pradesh
- **Drain Into:** Bay of Bengal

THE KAVERI BASIN

- **Origin:** It rises in the Brahmagiri range of Western Ghats
- **Tributaries:** Amravati, Bhavani, Hemavati and Kabini
- **Length:** 760 km
- **Flows Through:** Karnataka, Kerala and Tamil Nadu
- **Drain Into:** Bay of Bengal

LAKES IN INDIA

- i. **Oxbow Lakes:** A meandering river across a flood plains forms cut offs that develop into oxbow lakes like Kanwar lake.
- ii. **Lagoon:** Spits and bars form lagoons in coastal areas like Chilika Lake, Pulicat Lake, and Kolleru Lake.
- iii. **Lakes in Regions of Inland Drainage:** In India, such lake are found in the semi-arid regions. They are sometimes seasonal like Sambhar Lake in Rajasthan.
- iv. **Fresh Water Lakes:** These are of glacial origin, formed when glaciers dug out a basin. Wular Lake is the largest freshwater lake in India. Others include Bhimtal, Nainital, and Dal Lake etc.
- v. **Artificial Lakes:** The damming of rivers for the generation of hydel power has led to the formation of lakes like Guru Gobind Sagar on Bhakra Nangal Dam.

IMPORTANCE OF LAKES:

- ✓ Lakes help to regulate the flow of the river.
- ✓ During rainfall, prevents flood and during the dry season, maintain the flow of water.
- ✓ They help for developing hydel power.
- ✓ The moderate climate of surroundings, maintain aquatic ecosystem, enhance natural beauty and develop tourism.

ROLE OF RIVERS IN THE ECONOMY:

- Rivers have supported the economy in many ways. Rivers are used for irrigation, navigation, hydropower generation particularly in India, where agriculture is the main source of livelihood for the majority of its population.
- Rivers have been the ideal for human settlements.

RIVER POLLUTION:

It is caused by:

- Growing domestic, municipal, industrial and agricultural demand of water from rivers has reduced the volume of water.
- Quality of water has been deeply affected by infusing heavy load of untreated sewage and industrial effluents. Self- cleansing capacity of the river has been affected.

Drainage Patterns:

DENDRITIC PATTERN	<ul style="list-style-type: none">•This pattern develops where river channel follows the slope of terrain.•In this pattern, the stream with its tributaries resembles branches of a tree.
TRELLIS pattern	<ul style="list-style-type: none">•This pattern develops where a river is joined by its tributaries at approximately right angles.•It develops where hard and soft rocks lie parallel to each other.
RECTANGULAR PATTERN	<ul style="list-style-type: none">•This pattern develops on a strongly jointed rocky terrain.
RADIAL PATTERN	<ul style="list-style-type: none">•This pattern develops when streams flow in different directions from central peak or dome like structure.

ASSIGNMENT

ONE MARK QUESTIONS:

1. Match the following items:-

Column A	Column B
1. longest river of peninsular India	Ganga river basin
2. largest river basin in India	Sambhar
3. Waterfall made by river Kaveri	Bhagirathi
4. A salt water lake of India	Godavari
5. Headwaters of the Ganga	Sivasamudram

2. Identify the River:

Rising in the Amarkantak hills, it flows to create a gorge in marble rocks of Madhya- Pradesh

3. Fill in the blanks:-

_____ lakes are formed when glaciers dig out a basin which is later filled with snowmelt

4. Correct the following statement and re-write the correct information:-

The major rivers of the Himalaya — Mahanadi, Godavari, Krishna and Kaveri — flow eastwards to drain into the Bay of Bengal.

5. Choose the correct option:

Ganga and the Brahmaputra rivers join together and forms the before submerging into the Bay of Bengal.

- (a) Sunderban Delta (b) Estuaries (c) Water Divide (d) Lagoons

THREE MARKS QUESTIONS:

1. Compare the east and west flowing rivers of peninsular India.
2. What are the causes of river pollution?

3. Why does the Brahmaputra in its Tibetan part have less silt, in comparison to Assam, despite having a longer course?
4. State features of following rivers:
 - a) Tapi
 - b) The Narmada
 - c) The Godavari
 - d) Mahanadi
5. 'Lakes are of great value to human beings.' Justify.
6. Describe the three main features of the Ganga river system.
7. What are the causes of river pollution in river and lakes?
8. Write some important feature of Ganga Brahmaputra Delta.

FIVE MARKS QUESTIONS:

1. Discuss the significant difference between Himalayan and Peninsular rivers.
2. Explain the difference between the Indus basins and the Ganga basin?
3. Name the east flowing rivers of India and explain any two.
4. Describe the various drainage patterns of rivers.
5. Suggest any three measures to control the river pollution.
6. Write two features of :-
 - a) Ox-bow lake
 - b) Artificial Lake.



ACTIVITY

PEDAGOGICAL TOOL :- Poster cum Slogan making

Q. Pollution of rivers, seas and lakes endanger the survival of the planet and all its inhabitants.

Make an informative poster with a catchy slogan highlighting the role of rivers in our economy.

AHLCON INTERNATIONAL SCHOOL, SENIOR SECTION

CLASS/ HOME ASSIGNMENT

CLASS: IX

SUBJECT: SOCIAL SCIENCE (GEOGRAPHY)

TOPIC: DRAINAGE

CLASS ASSIGNMENT:

S. NO	QUESTION	DONE	REMARKS
1.	What is meant by water divide? Give an example.		
2.	Why does Brahmaputra in its Tibetan part have less silt, despite longer course?		
3.	'Rivers and lakes have been fundamental importance throughout human history.' Justify.		
4.	Explain any three characteristic features of Indus river basin.		

HOME ASSIGNMENT:

S. NO	QUESTION	DONE	REMARKS
1.	'In river course of Ganga, large meanders develop between Ambala to Sundarbans.' Why?		
2.	Draw a contrast between Himalayan and Peninsular rivers.		
3.	Explain the various drainage patterns formed by rivers.		
4.	Enumerate the three characteristic features of Godavari Basin.		
5.	'India has many lakes and they differ in size and other characteristics.' Elaborate.		
6.	Do the map work as per the map skill of the chapter (Refer to Index)		

DATE OF EVALUATION: _____

TEACHER'S SIGNATURE: _____