

DRAINAGE1. Drainage :

- Drainage describe the river system of an area.
- The area drained by a single river system is called a drainage basin.
- Any upland or a mountain separating two adjoining drainage basin is known as water divide.
- The world largest drainage basin is of the amazon river.
- The Ganga basin is the largest basin in India.

(2.) The Drainage System in India :

- The Indian Rivers are divided into two major Groups.
  - The Himalyan rivers.
  - The Peninsular rivers.

• Features of Himalyan rivers :

- These are Perennial (Flow all year) (Delta)
- These rivers receive water from rain as well as from melted snow from the lofty mountains.
- The Himalyan rivers have long courses from their source to the sea.
- The Himalyan rivers form meanders, oxbow lakes and many other depositional features in their flood plains.

• Features of peninsular rivers :

- They are Seasonal.
- Their flow is dependent on rainfall.
- The peninsular rivers have shorter and shallower courses as compared to their Himalyan rivers.

→ Most of the rivers of peninsular India originate in the Western Ghats and flow in the Bay of Bengal.

### ⇒ Drainage Patterns:

• The streams within a drainage basin form certain patterns, depending on the slope of land, underlying rock structure as well as the climatic condition of the area.

#### • Types of Drainage Patterns:

- Dendritic Drainage
- Trellis Drainage
- Rectangular Drainage.
- Radial Drainage.

### ⇒ The Himalayan Rivers:

- The Indus, The Ganga and the Brahmaputra are major Himalayan River.
- A River along with its tributaries may be called a river system.

### ⇒ The Indus River System:

- Source: The River Indus rises in Tibet, near Lake Mansarovar.
- It enters India in the Ladakh district of Jammu and Kashmir flowing west.

#### • Tributaries of Indus:

- The Zaskar, The Nubra, The Shyok and the Hunza join it in the Kashmir region.
- The Satluj, The Beas, The Ravi, The Chenab and The Jhelum join together to enter the Indus near Mithankot in Pakistan.

- The Indus plain has a very gentle slope.
- Total length: 2900 km.
- A Third of the Indus basin is located in India in the States of Jammu & Kashmir, Himachal Pradesh and the Punjab and the rest is in Pakistan.

### ⇒ The Ganga River System:

- Source: The headwaters of the Ganga, called the 'Bhagirathi' is fed by the Gangotri Glacier.
- Tributaries of Ganga:
  - Alaknanda joined at Devprayag in Uttarakhand.
  - The Yamuna rises from the Yamunotri Glacier in the Himalayas joined at Allahabad.
  - The Ghaghara, The Gandak and the Kosi rise in the Nepal Himalaya.
  - The Chambal, The Betwa and the Son rise from the semi-arid areas.
- The River bifurcates at Farakka in West Bengal
  - The Bhagirathi - Hooghly (a distributary) flows southwards through the deltaic plains to the Bay of Bengal.
  - The mainstream flows southwards into Bangladesh and is joined by the Brahmaputra.
- Total length: 2500 km.

- Sunderban Delta: The delta formed by the rivers the Ganga and the Brahmaputra is known as the Sunderban Delta.

⇒ The Brahmaputra River System:

• Source: The Brahmaputra rises in Tibet east of Mansarowar Lake very close to the sources of the Indus and the Satluj

• Tributaries of Brahmaputra:

→ Dibang, the Lohit.

• Flows eastward parallel to the Himalayas, it takes a 'U' on reaching the Namcha Barwa and enter India in Arunachal Pradesh through a Gorge.

→ Here, it is called the Dihang and it is joined by the Dibang the Lohit and many other Tributaries.

• In Tibet, the river carries a smaller volume of water and less silt as it is a cold and dry Area.

→ In India it passes through a region of high rainfall and the river carries a large volume of water and considerable amount of silt.

• It form many riverine Island

• Every year during the rainy season, the river overflows its banks causing widespread devastation due to Flood in Assam and Bangladesh.

# Majuli is the world largest riverine island formed by the Brahmaputra.

⇒ The Peninsular River:

• The main water divide in Peninsular India is formed by the Western Ghats.

• Major River of peninsula such as the Mahanadi, the Godavari, The Krishna and the Kaveri Flows eastwards and the drain into the Bay of Bengal.

• The Narmada and the Tapi are the only long River, which flows west and make estuaries.

### The Narmada Basin:

- Source it rise in the Amarkantak hills in Madhya Pradesh
- It Flows towards the west in a rift valley formed due to Faulting.
- All the Tributaries of the Narmada are very short and most of these join the main stream at right angles.
- The Narmada basin covers parts of Madhya Pradesh and Gujarat.

### ⇒ The Tapi Basin:

- Source it rises in the Satpura ranges, in the Betul district of Madhya Pradesh.
- It also flows in a rift valley parallel to the Narmada but it is much shorter in length.
- Its basin covers parts of Madhya Pradesh, Gujarat and Maharashtra.

\* Other West Flowing rivers: Sabarmati, Mahi, Bharathpuzha and Periyar.

### ⇒ The Godavari Basin:

- Sources it rises from the slop of Westernghats in the Nasik district of Maharashtra.
- It is the largest Peninsular River ✓
- Tributaries of Godavari.
  - The Purna, The Wardha, The Pranhita, The Manjra, The Wainganga and the Pengang.
- The basin covers parts of Maharashtra, Madhya Pradesh, Odisha and Andhra Pradesh.
- It drains into Bay of Bengal.
- Total Length: 1500 km.
- Because of its length and the area it covers, it is also known as the Dakshin Ganga.

⇒ The Mahandi Basin:

- Sources: The Mahanadi rises in the highlands of Chattisgarh.
- It flows through Odisha to reach the Bay of Bengal.
- Its drainage basin is shared by Maharashtra, Chattisgarh, Jharkhand and Odisha.
- Total length: 860 km.

⇒ The Krishna Basin:

- It rises from spring near Mahabaleshwar.
- Tributaries of Krishna:
  - The Tungabhadra, the Koyana, the Ghatalprabha, The Musi and the Bhima.
- Total length: 1400 km.
- Its drainage basin is based or shared by Maharashtra, Karnataka and Andhra Pradesh.

⇒ The Kaveri Basin:

- Source it rises in the Brahmagiri range of Western Ghats.
- Tributaries of Kaveri:
  - Amravati, Bhavani, Hemavati and Kaveri
- Total length: 760 km.
- It reaches the Bay of Bengal in South of Cuddalore, in Tamil Nadu.

Other east flowing rivers: The Damodar, The Brahmani, The Baitarni and the Subarnrekha.

⇒ Lakes:

- India has many lakes which differ from each other in the size and other characteristics.
- Most lakes are permanent while some contain water only during the rainy season.
- Some of the lakes are result of the action of glaciers and ice sheets, while the other have been formed by wind, river action and human activities.

- A meandering river across a flood plain forms cut-offs that later develop into ox-bow lakes.
- Most of the fresh water lakes are in the Himalayan region.
  - They formed when glaciers dug out a basin which was later filled with snowmelt.
- The Wular lake in Jammu and Kashmir is the result of the tectonic activity which is the largest freshwater lake in India.
- Artificial lake: The damming of the rivers for the generation of hydro power has also led to the formation of lakes such as Guru Gobind Sagar.

### Importance of lakes:

- Helps to regulate the flow of a river. During heavy rainfall, it prevents flooding and during the dry season it helps to maintain an even flow of water.
- Also used for developing hydro power.
- They moderate the climate of the surroundings.
- Maintain the aquatic ecosystem.
- Enhance natural beauty.
- Helps in developing tourism and providing recreation.

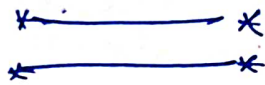
### Role of Rivers in the Economy:

- From ancient times, rivers banks attracted settlers as water from the river is a basic natural resource essential for various human activities.
- Rivers are used for irrigation, navigation and hydro-power generation.

### River Pollution:

- The demand for water from river is increasing to meet growing domestic, municipal, industrial and agriculture need which naturally affects the quality of water.

- More and more water is being drained out of the (8) River reducing their volume.
- Also a heavy load of untreated sewage and Industrial effluents are emptied into the river which affects not only the quality of water but also the self-cleansing capacity of the rivers.
- Concern over rising pollution in our rivers, led to the launching of various action plans to clean the rivers.



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