# What Is Drainage?

- Drainage: The river system of an area.
  - Small streams join to form main rivers which flow into a sea, ocean, or lake.
  - The area drained by a river and its tributaries is called a drainage basin.
  - Any highland that separates two drainage systems is called a water divide.

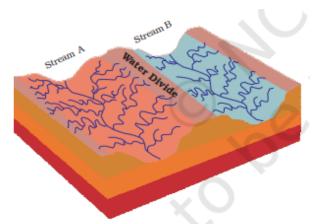


Figure 3.1 : Water Divide



Figure 3.2: A Gorge

# Drainage Systems of India

India has two main river systems:

- 1. The Himalayan Rivers
- 2. The Peninsular Rivers

## Himalayan Rivers

#### Characteristics:

- Perennial (flow throughout the year rain + glacier melt)
- Create gorges, meanders, oxbow lakes, and deltas

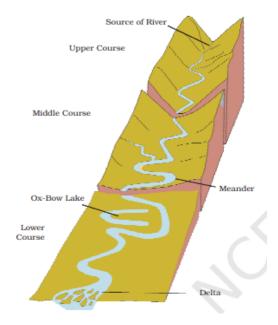


Fig 3.3 – Features formed by rivers (meander, oxbow lake, delta)

## **1**. Indus River System

- Origin: Near Lake Mansarovar (Tibet)
- Enters India in Ladakh → forms gorge
- Main tributaries: Zaskar, Nubra, Shyok, Hunza, Satluj, Beas, Ravi, Chenab, Jhelum
- Flows through India & Pakistan → into Arabian Sea
- Length: 2,900 km

Note: As per Indus Water Treaty (1960), India can use only 20% of Indus waters — mainly in Punjab, Haryana, Rajasthan.

## 🔃 2. Ganga River System

- Source: Gangotri Glacier → called Bhagirathi
- Joins Alaknanda at Devprayag → becomes Ganga



Figure 3.5 : Confluence of Bhagirathi and Alaknanda at Devaprayag

**™** Fig 3.5 – Confluence at Devprayag

- Emerges at Haridwar
- Major Himalayan tributaries: Yamuna, Ghaghara, Gandak, Kosi
- Peninsular tributaries: Chambal, Betwa, Son
- Near Farakka (West Bengal), Ganga splits:
  - → Bhagirathi-Hooghly (India)
  - → Mainstream goes to Bangladesh as Padma → joins Brahmaputra → forms Meghna

### Sundarban Delta:

- Formed by Ganga & Brahmaputra
- World's largest & fastest-growing delta
- Home of Royal Bengal Tiger

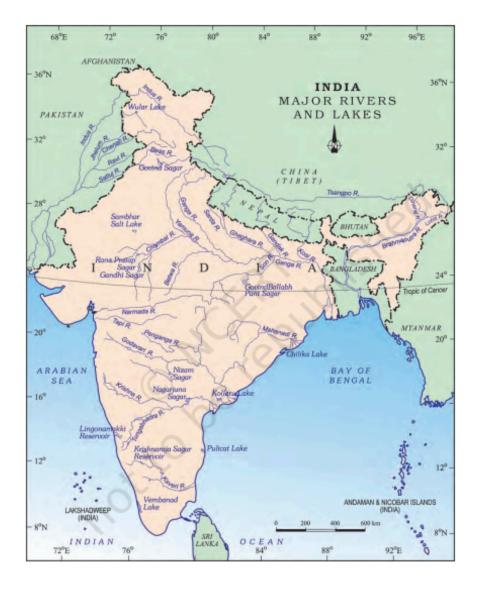


Fig 3.4 – Major rivers and lakes

### 📘 3. Brahmaputra River System

- Source: Mansarovar (like Indus) → called Tsang Po in Tibet
- Makes a U-turn at Namcha Barwa → enters India as Dihang
- Joined by Dibang & Lohit → becomes Brahmaputra in Assam
- Flows into Bangladesh as Jamuna → joins Ganga (Padma) → Meghna → Bay of Bengal

### Features:

- Carries less water in Tibet (dry region), more water & silt in India
- Creates braided channels & riverine islands
- Causes floods in Assam due to silt deposition
- World's largest riverine island = Majuli (Assam)

## Peninsular Rivers

#### Characteristics:

• Seasonal (depend on monsoon)

- Shorter, shallower than Himalayan rivers
- Form deltas or estuaries at mouths
- Flow mainly eastwards into Bay of Bengal
- Western Ghats = main water divide



Fig 3.6 – Loktak Lake (Manipur)

### Major Peninsular Rivers

#### Narmada River

• Source: Amarkantak Hills (Madhya Pradesh)

• Flows west in a rift valley → forms estuary

• Features: Marble Rocks (Jabalpur), Dhuandhar Falls

• Short tributaries join at right angles

States: MP, Gujarat

Namami Devi Narmade = River conservation project

### ◆ Tapi River

Source: Satpura (Betul, MP)

Flows west in a rift valley (parallel to Narmada)

• States: MP, Maharashtra, Gujarat

#### Godavari River

Largest Peninsular river (1,500 km)

• Source: Nasik (Maharashtra) → drains into Bay of Bengal

• Tributaries: Purna, Wardha, Pranhita, Manjra, Wainganga, Penganga

• Also called Dakshin Ganga

• States: Maharashtra, MP, Odisha, Andhra Pradesh

Mahanadi River

- Source: Chhattisgarh Highlands
- Flows through Odisha → Bay of Bengal
- Length: 860 km
- Basin: Maharashtra, Chhattisgarh, Jharkhand, Odisha

Krishna River

- Source: Mahabaleshwar (Maharashtra)
- Length: 1,400 km
- Tributaries: Bhima, Tungabhadra, Musi, Ghatprabha, Koyna
- States: Maharashtra, Karnataka, Andhra Pradesh

Kaveri River

- Source: Brahmagiri Hills (Karnataka)
- Ends: Bay of Bengal (near Cuddalore)
- Length: 760 km
- Tributaries: Amravati, Bhavani, Hemavati, Kabini
- States: Karnataka, Tamil Nadu, Kerala
  - Shivasamudram Falls = 2nd largest waterfall in India

Others (East-flowing):

- Damodar, Brahmani, Baitarni, Subarnarekha
  - † Locate them on map

Lakes of India

Types of Lakes:

- Natural (formed by glaciers, rivers, wind, tectonic activity)
- Artificial (made by dams)

Nimalayan Lakes (Glacial origin):

- Wular (J&K) → Largest freshwater lake (tectonic)
- Dal, Bhimtal, Nainital, Loktak, Barapani

Coastal/Seasonal Lakes:

- Chilika (Odisha)
- Pulicat (AP-TN)
- Kolleru (AP)
- Sambhar (Rajasthan) Saltwater lake → produces salt

Artificial lakes:

• Gobind Sagar (Bhakra Nangal)

Rana Pratap Sagar, Hirakud, Nagarjuna Sagar, Nizam Sagar

#### Value of Lakes:

- Store water, prevent floods, support aquatic life
- Tourism, fishing, power generation
- Climate moderation, aesthetic beauty

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# Importance of Rivers

- Fresh water source for agriculture, drinking
- Cities grew on riverbanks
- Used for irrigation, navigation, hydroelectric power
- Integral to Indian economy & culture

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## River Pollution

### Causes:

- Sewage, industrial effluents, agricultural chemicals
- Reduced water volume → less dilution
- Pollution reduces rivers' self-cleaning ability
- Ganga Action Plan (1985)
- National River Conservation Plan (NRCP − 1995): Aimed to clean major rivers

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E Summary Table

Туре	Key Examples & Notes
Himalayan Rivers	Indus, Ganga, Brahmaputra (Perennial, form deltas, long courses)
Peninsular Rivers	Godavari, Krishna, Mahanadi, Narmada, Tapi (Seasonal, shorter)
West-flowing	Narmada, Tapi (Estuaries), short rivers in Kerala
Major Lakes	Wular, Dal, Chilika, Pulicat, Gobind Sagar
Uses	Irrigation, transport, power, drinking water, tourism

# ¶ Map Exercise:

Rivers → Ganga, Brahmaputra, Narmada, Tapi, Krishna, Godavari, Mahanadi, Satluj, Damodar Lakes → Chilika, Pulicat, Kolleru, Wular, Sambhar