



# Chapter - 1: Land and People

## Introduction

India, one of the world's oldest and most significant civilizations, spans diverse landscapes from the Himalayas in the north to tropical forests in the south. Encompassing 32,87,263 sq. km, India has made considerable socio-economic progress since gaining independence.

Ranking seventh in size and second in population globally, India's geography is distinct, bordered by mountains and seas, with the Great Himalayas to the north and the Indian Ocean to the south.

Its mainland extends between latitudes 8.4' and 37.6' north and longitudes 68.7' and 97.25' east, covering approximately 3,214 km from north to south and 2,933 km from east to west, with a land frontier of about 15,200 km and a coastline of 7,516.6 km.

## Geographical Background

- Countries having a common border with India are:
  - Afghanistan and Pakistan to the north-west,
  - China, Bhutan and Nepal to the north,
  - Myanmar to the far east and Bangladesh to the east,
  - Sri Lanka is separated from India by a narrow channel of sea formed by the Palk Strait and the Gulf of Mannar.
- The country can be divided into six zones, viz., north, south, east, west, central and north-east zones.
- It has 28 states and 8 union territories.

## Physical Features

The mainland comprises four regions, namely, the great mountain zone, plains of the Ganga and the Indus, the desert region and the southern peninsula.

- **The Great Mountain Zone:**
  - The Himalayas comprise three almost parallel ranges interspersed with large plateaus and valleys, some of which, like the Kashmir and Kullu valleys, are fertile, extensive and of great scenic beauty.
  - Notable passes include Jelep La and Nathu La on the main Indo-Tibet trade route through the Chumbi valley, north-east of Darjeeling and Shipki La in the Satluj valley, north-east of Kalpa (Kinnaur).
  - In the east, between India and Myanmar and India and Bangladesh, hill ranges are much lower. Garo, Khasi, Jaintia and Naga Hills, running almost east-west, join the chain to Mizo and Rakhine Hills running north-south.
- **The Plains of the Ganga and the Indus:**
  - They are formed by basins of three distinct river systems- the Indus, the Ganga and the Brahmaputra. They are one of the world's greatest stretches of flat alluvium and also one of the most densely populated areas on the earth.
- **The Desert Region:**
  - The region can be divided into two parts namely, the '**great desert**', which extends from

the edge of the Rann of Kutch beyond the Luni river northward, and the 'little desert', which extends from the Luni between Jaisalmer and Jodhpur up to the north west.

▪ **The Peninsular Plateau:**

- It is marked off from the plains of the Ganga and the Indus by a mass of mountain and hill ranges, like Aravali, Vindhya, Satpura, Maikala and Ajanta.
- The peninsula is bordered by the Western Ghats in the west, Eastern Ghats in the east and the Satpura, Maikal range in the north and the southern point of the plateau is formed by the Nilgiri Hills, where the Eastern and the Western Ghats meet.
- The Cardamom Hills lying beyond may be regarded as a continuation of the Western Ghats.

## Geological Structure

▪ **The geological regions can be grouped into three regions which are:**

- **The Himalayas and their associated Group of Mountains:** The Himalayan mountain belt to the north and the Naga-Lushai Mountain in the east, are the regions of mountain-building movement.
- **The Indo-Gangetic Plain:** The Indo-Ganga plains are a great alluvial tract that separates the Himalayas in the north from the Peninsula in the south.
- **The Peninsular Shield:** The Peninsula is a region of relative stability and occasional seismic disturbances. Highly metamorphosed rocks of the earliest periods occur in this area; the rest being covered by the Gondwana formations, lava flows belonging to the Deccan Trap formation and younger sediments.

## River Systems

The river systems of India can be classified into four groups: Himalayan Rivers, Deccan Rivers, Coastal Rivers and the rivers of the Inland Drainage Basin.

### Himalayan Rivers

- They are formed by melting snow and glaciers and therefore, continuously flow throughout the year. The main Himalayan river systems are those of the Indus and the Ganga-Brahmaputra-Meghna system.

### The Indus River System

- The Indus, which is one of the great rivers of the world, rises near Mansarovar in Tibet and flows through India and thereafter through Pakistan and finally falls into the Arabian Sea near Karachi.
- Important tributaries flowing in Indian territory are the Sutlej (originating in Tibet), the Beas, the Ravi, the Chenab and the Jhelum.

### Ganga-Brahmaputra-Meghna River System

- The principal sub-basins of this river system are **Bhagirathi and the Alaknanda**, which join at Devprayag to form the Ganga.
  - The **Ganga** traverses through Uttarakhand, Uttar Pradesh, Bihar and West Bengal. Below Rajmahal Hills, the Bhagirathi, which used to be the main course in the past, takes off, while the Padma continues eastward and enters Bangladesh.
  - The Yamuna, the Ramganga, the Ghaghra, the Gandak, the Kosi, the Mahananda and the Son are the important tributaries of the Ganga.
- The Brahmaputra rises in **Tibet**, where it is known as **Tsangpo** and runs a long distance till it crosses over into India in Arunachal Pradesh under the name of Dihang.
  - Near Pasighat, the **Debang and Lohit** join the river Brahmaputra and the combined river runs all along the Assam valley. It crosses into Bangladesh downstream of Dhubri.
  - The principal tributaries of Brahmaputra in India are the **Subansiri, Jia Bhareli, Dhansiri, Puthimari, Pagladiya and the Manas**. The Brahmaputra in Bangladesh fed by Teesta, etc. finally falls into the Ganga.
- The **Padma and the Brahmaputra** join at **Bangladesh** and continue to flow as the Padma or

Ganga.

- **The Barak River**, the head stream of **Meghna**, rises in the hills in **Manipur**. The important tributaries of the river are **Makku, Trang, Tuivai, Jiri, Sonai, Rukni, Katakhal, Dhaleswari, Langachini, Maduva and Jatinga**. Barak continues in Bangladesh till the combined Ganga-Brahmaputra joins it near Bhairab Bazar.

### Deccan Rivers

- The Deccan Rivers are **rain-fed** and therefore fluctuate in volume. Many of these are non-perennial. In the Deccan region, most of the major river systems flowing generally in the **east fall into the Bay of Bengal**.
- The major east flowing rivers are **Godavari, Krishna, Kaveri and Mahanadi**. **Narmada and Tapti** are major **west** flowing rivers.
- **The Godavari** in the southern Peninsula has the **second largest river basin** covering 10% of the area of India. Next to it is the **Krishna basin** in the region and the **Mahanadi** is another large basin of the region.
- The basins of the Narmada in the uplands of the Deccan, flowing to the Arabian Sea and that of the Cauvery in the south, falling into the Bay of Bengal are about the same size, though with different character and shape.

### Coastal Rivers

- The Coastal streams, especially on the **west coast are short in length** and have **limited catchment areas**. Most of them are non-perennial.
- While only a handful of such rivers drain into the sea near the delta of the east coast, there are **as many as 600 such rivers on the west coast**.

### Rivers of the Inland Drainage Basin

- The streams of the inland drainage basin of western Rajasthan are mostly of an **ephemeral character**.
- A few rivers in Rajasthan **do not drain into the sea**. They drain into salt lakes and get lost in sand with no outlet to the sea.
- Besides these, there are the **desert rivers which flow for some distance** and are **lost in the desert**. These are **Luni, Machhu, Rupen, Saraswati, Banas, Ghaggar and others**.

### Climate/Seasons

- The climate of India may be broadly described as a **tropical monsoon type**. The Indian Meteorological Department (IMD) designates the 4 following official seasons:
  - **Winter, from December to early April**. The year's coldest months are **December and January**, when mean **maximum temperature ranges from 0.5o C to 29o C** whereas mean **minimum temperature ranges from -7.7o C to 13.6o C in the region**.
  - Temperatures rise as one proceeds **towards the equator** where mean **maximum temperature ranges from 17.3o C to 33.9o C** whereas mean **minimum temperature ranges from 6.2o C to 29.8o C** in the peninsular region.
  - Summer or pre-monsoon season, lasting from **April to June** (April to July in northwestern India). In **western and southern** regions, the **hottest month is April**; for **northern** regions, **May** is the hottest month. Temperatures average around 32-40°C in most of the interior.
  - **Monsoon or rainy** season, lasting from **June to September**. The season is dominated by the **humid southwest summer monsoon**, which slowly sweeps across the country beginning in late May or early June. Monsoon rains begin to recede from **North India** at the **beginning of October**.
  - Post-monsoon season, lasting from October to December. In northwestern India, October and November are usually cloudless.
- The **Himalayan** states, being more temperate, experience two additional seasons: **autumn and spring**.
- Traditionally, Indians note **six seasons**, each about two months long. These are the **spring,**

### **summer, monsoon, early autumn, late autumn and winter.**

- India's climate is affected by two seasonal winds which are:
  - the north-east monsoon commonly known as **winter monsoon blows from land to sea**, and
  - the south-west monsoon known as **the summer monsoon blows from sea to land** after crossing the **Indian Ocean, the Arabian sea and the Bay of Bengal**. However, it brings most of the rainfall during the year in the country.

### **Flora**

- India ranks **tenth** in the **world** and **fourth in Asia** in **plant diversity**.
  - As per the **Botanical Survey of India (BSI)**, there are **46,000 species** of plants which forms the conspicuous vegetation cover, comprising 15,000 species.
- India can be divided into **eight distinct floral regions**, namely, the western Himalayas, the eastern Himalayas, Assam, the Indus plain, the Ganga plain, the Deccan, the Malabar and the Andamans.
  - The **western Himalayan** region extends from **Kashmir to Kumaon**. Its temperate zone **is rich in forests of chir, pine**, other conifers and broad-leaved temperate trees.
    - Higher up, forests of deodar, blue pine, spruce and silver fir occur. The **alpine zone** extends from the upper limit of the temperate zone of about **4,750 metres or even higher**. The characteristic trees of this zone are **high-level silver fir, silver birch and juniper**.
  - The **eastern Himalayan region** extends from **Sikkim eastwards and embraces Darjeeling, Kurseong and the adjacent tracts**. The temperate zone has **forests of oaks, laurels, maples, rhododendrons, alder and birch**. Many conifers, junipers and dwarf willows also grow here.
  - The **Assam region** comprises the **Brahmaputra and the Surma valleys** with evergreen forests, occasional thick clumps of bamboos and tall grasses.
  - The **Indus plain region** comprises the **plains of Punjab, western Rajasthan and northern Gujarat**. It is dry, hot and supports natural vegetation.
  - The **Ganga plain region** covers the area which is **alluvial plain and is under cultivation of wheat, sugarcane and rice**. Only small areas support forests of widely differing types.
  - The **Deccan region** comprises the entire table land of the **Indian Peninsula** and supports vegetation of various kinds from shrub jungles to mixed deciduous forests.
  - The **Malabar region** covers the **excessively humid belt of mountain country parallel to the west coast of the Peninsula**. Besides being rich in forest vegetation, this region produces important **commercial crops**, such as coconut, betel nut, pepper, coffee, tea, rubber and cashew nut.
  - The Andaman region abounds in evergreen, mangrove, beach and diluvial forests.
- The **Himalayan region** extending from **Kashmir to Arunachal Pradesh** through **Sikkim, Meghalaya and Nagaland and the Deccan Peninsula** are rich in endemic flora, with a large number of plants which are not found elsewhere.
- The flora of the country is being studied by **BSI and its nine circle/field offices** located all over the country along with certain universities and research institutions.
- Ethno-botanical study deals with the utilisation of plants and plant products by ethnic races. A scientific study of such plants has been done by BSI.
  - Owing to the destruction of forests for agricultural, industrial and urban development, several Indian plants are facing threat of extinction. **About 1,336 plant species are considered vulnerable and endangered**.
  - About **20 species of higher plants** are categorised as possibly extinct, as these have not been sighted during the last six to ten decades.
- BSI brings out an inventory of endangered plants in the form of a publication titled '**Red Data Book**'.

### **Faunal Resources**

- India is renowned for its **rich biodiversity**, characterised by diverse **biogeographical locations** and ecosystems, ranging from the deep sea to high mountain ranges like the



Himalayas.

- The **Zoological Survey of India (ZSI)**, under the **Ministry of Environment, Forest and Climate Change**, has been cataloguing the country's faunal resources for over a century, covering everything from Protozoa to Mammalia.
  - ZSI operates from its headquarters in Kolkata and 16 regional centres across India, documenting fauna in various states, union territories, and protected areas across different ecosystems.
- India accounts for **6.52% of global faunal diversity with about 28% endemism**, harboring over **161 documented species**, with **Arthropods** being the most diverse group.
- Over **2,800 species in India** are protected under the **Wildlife (Protection) Act, 1972**.
  - India falls under **two major biogeographic realms**, the Palearctic and Indo-Malayan, **with three main biomes**: Tropical Humid Forests, Tropical Dry Deciduous forests, and Warm Deserts/semi-Deserts.
- The Indian landmass is divided into **10 Biogeographic zones**, with ZSI documenting faunal resources extensively in each zone, including the **Himalayas, Trans-Himalayas, Islands, Northeast, Desert, Semi-Arid, Coasts, Western Ghats, Gangetic Plains, and Deccan Peninsula**.
- India has designated 998 protected areas covering 1 km<sup>2</sup> of geographical area, with ZSI listing fauna from 130 protected areas.
  - With a coastline of **7,516.6 km** and the **18th largest Exclusive Economic Zone (EEZ)**, India boasts diverse marine biodiversity, including species from freshwater, estuarine, and mangrove ecosystems.
- **5,632 Indian fauna species** are included in various categories of the **IUCN Red List**, requiring conservation attention.
  - India has **75 Ramsar sites** recognized for wetland conservation, with ZSI documenting faunal diversity in these sites.
  - **18 Biosphere Reserves** are designated in India, with the **Sunderban Biosphere Reserve** harbouring numerous species.
  - India shares three biodiversity hotspots with high endemism: Himalayas, Indo-Burma, and Western Ghats.
- ZSI conducts long-term monitoring of sea turtles, corals, and other invertebrate fauna, including tagging programs for olive ridley and leatherback sea turtles.
  - Genetic studies by ZSI have identified **37 mammal species in the Himalayan regions** and conducted population genetics studies on various species like Arunachal macaque, barking deer, and Chinese pangolin.

## Demographic Background

### Census

- Census 2011 was the **15<sup>th</sup> census** of its kind **since 1872**. It was held in **two phases: House Listing and Housing Census and Population Enumeration**.
  - It reveals benchmark data on the state of abundant human resources available in the country, their demography, culture and economic structure at a juncture, which marks a centennial and millennial transition.
  - The final population data was released on **April 30, 2013**.
- However, **due to the outbreak of Covid-19 pandemic**, the Census 2021 and related field activities have been postponed until further orders.

### Population

- India accounts for a **meagre 2.4% of the world surface area**, but sustains a whopping **~17% of the world population**.
- As per the **census of India 2011**, the **population of India** stood at **1210.9 million as on March 1, 2011** out of which **833.7 million (68.9 percent) lived in rural areas** and the rest **377.1 million (31.1 percent) lived in urban areas**.
  - The decadal growth rate of population in India **between 2001 and 2011 was 17.7%**. The population of India is estimated to have reached 1363.0 million in 2021 and is projected to reach 1,522.3 million by 2036.

- The population of India as recorded at each decennial census from 1901 has grown steadily except for a **decrease during 1911-21**.

### Population Density

- One of the important indices of population concentration is the **density of population**. It is defined as **the number of persons per sq km**.
- The population density of India in 2011 was **382 per sq. km** and **decadal growth being 17.72%**.
  - The density of population increased in all states and union territories between 1991 and 2011.
  - Among major states, **Bihar** is the **most thickly populated state** followed by **West Bengal and Kerala**. Among **smaller states/union territories**, the population density of NCT of **Delhi** was the highest followed by **Chandigarh**.

### Sex Ratio

- The sex ratio is defined as the **number of females per thousand males**.
  - It was **972 at the beginning** of the **twentieth century** and thereafter showed continuous decline **until 1941**.
  - The sex ratio has improved from **933 in 2001 to 943 in 2011**, however, the **child sex ratio** has **declined to 919 in 2011 from 927 in 2001**.
- However, the child sex ratio (defined as the **number of girls aged 0-6 years per thousand boys aged 0-6 years**) deteriorated from 927 in 2001 to 919 in 2011.

### Literacy

- For the purpose of census 2011, **a person aged 7 and above, who can both read and write with understanding in any language**, is treated as **literate**.
  - A person, who can **only read but cannot write**, is **not literate**. In the censuses prior to 1991, children below 5 years of age were necessarily treated as illiterates.
- According to 2011 census, literacy has **increased** in the country which is **73% (80.9% for males and 64.6% for females) against 64.8% in 2001**.
  - Kerala has the highest literacy rate of 94%, closely followed by Lakshadweep (91.8%).
    - Kerala also has the highest male (96.1%) and female (92.1%) literacy rate.
  - Bihar with a literacy rate of 61.8% ranks last in the country.
    - Bihar has the lowest literacy rates both in the case of males (71.2%) and females (51.5%).

### Fertility and Mortality Rates

- The fertility rate (or Total Fertility Rate, TFR) of a population is the **average number of children that would be born to a woman over her lifetime if she were subjected to the prevailing rate of age-specific fertility in the population**.
- A TFR of about **2.1 children per woman** is called **Replacement-Level Fertility**. From a TFR of 2.5 in 2010 to 2.0 in 2020, India has achieved the replacement level of fertility, according to the National Family Health Survey-5 report released in 2022.

### Crude Birth Rate and Death Rate

- The Crude Birth Rate (CBR) is a measure of **birth rates** and is defined as the **total number of live births in a year divided by the total mid-year population and multiplied by 1000 to express it per 1000 population**.
  - CBR in India has reached **19.5 per 1000 population in 2020**.
- The Crude Death Rate (CDR) is a measure of **mortality rates** and is defined as the **total number of deaths in a year divided by the total mid-year population and multiplied by 1,000 to express it per 1,000 population**.
  - The CDR for the country in 2020 was **6.0 per 1000 population**.

## **Infant Mortality Rate**

- The Infant Mortality Rate (IMR) is another important **indicator of demography** and is defined as the **number of deaths in a year per 1 live births of children under one year of age.**
- India has been able to drastically reduce the Infant Mortality Rate from **47 in 2010 to 28 in 2020.**

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