gradeup

Geography Notes

English

Prep Smart. Score Better. Go gradeup

www.gradeup.co

India and the Administrative Units; the States and Union Territories

a. Physiography of India

- India lies in the northern hemisphere of the globe between 8º 4’ N and 37º6’ N latitudes and 68º7’ E and 97º25’ E longitudes.
- The southern extent goes up to 6º45’ N latitude to cover the last island of the Nicobar group of islands. The southern extreme is called Pygmalion Point or India Point.
- The Tropic of Cancer passes through the middle part of India and crosses the eight states of Gujarat, Rajasthan, Madhya Pradesh, Chhattisgarh, Jharkhand, West Bengal, Tripura and Mizoram.
- The total land frontier of 15,200 km passes through marshy lands, desert, plains, mountains, snow-covered areas and thick forests.
- The maritime boundary of 6100 km along the main landmass which increases to 7516 km of the coastlines of Andaman-Nicobar and Lakshadweep Islands are added to it.
- India commands a total geographical area of 32,87,263 sq.km which is roughly 0.57% of the area of the earth and 2.4% of the total area of the land hemisphere.
- India is the seventh-largest country of the world after Russia, Canada, USA, China, Brazil and Australia (all are mentioned in the descending order).
- India’s area is almost equal to the area of Europe (excluding Russia), one-third of Canada, one-fifth of Russia, eight times of Japan and twelve times of the United Kingdom.
- India has roughly a quadrangular shape. It measures about 3,214 km from north to south and about 2933 km from east to west, the difference between the two is just 281km.

b. Land frontiers of India

- The Himalayan ranges from a natural frontier between India and China. In the north-west, Jammu and Kashmir share the international border with Sinkiang and Tibet in China.

- In the east, Himachal Pradesh and the mountain region of Uttarakhand have a common frontier with Tibet.
- Nepal has its border with Uttar Pradesh and Bihar.
- West Bengal and Sikkim also touch the Nepalese border for a small distance.
- India-Afghanistan and Pakistan-Afghanistan international boundary are called the Durand Line, determined as a ‘military-strategic border’ between British India and Afghanistan.
- The boundary between with Pakistan and Bangladesh (East Pakistan) was finalized at the time of partition in 1947 through the ‘Radcliff Award’.
- In Punjab, the frontier runs through a smooth and fertile plain, which is purely man-made. The Indian frontier with Pakistan in Kashmir is still disputed and has led to strained relations between the two countries since partition in 1947.
- The eastern boundary of India is formed by a complex chain of the Himalayan offshoots consisting of the Mishmi, the Patkai, the Naga hills, the Barail range, the Mizo hills and finally the Arakan Yoma mountain range.
- The Arakan Yoma is submerged in the Bay of Bengal for a sufficiently long stretch and emerges again in the form of Andaman and Nicobar Islands.
- The boundary line between India and Bangladesh crisscrosses the vast Ganga-Brahmaputra delta. This boundary runs through an entirely flat country in which there is not even a small mount or hill which could be used for demarcating the boundary between two countries.
- Bangladesh and India share a the fifth-longest land border in the world, including Assam, Tripura, Mizoram, Meghalaya, and West Bengal.
- There is a maritime boundary of 6100 km along with the main landmass which increases to 7156 km if the coastlines of Andaman and Nicobar Islands are added to it.
- The nearest neighbour in the south across the seas in Sri Lanka which is separated from India through the narrow channel of Palk Strait.
- Similarly, the Eight Degree Channel forms the boundary between the Lakshadweep and Maldives islands.

Name of the Country	Length in Km
Bangladesh	4,096.7
China	3,488
Pakistan	3,323
Nepal	1,751
Myanmar	1,643
Bhutan	699
Afghanistan	106
Total	15,106.7

The states having a common boundary with the neighbouring countries.

Country	States

Pakistan	3 States: Punjab, Rajasthan, Gujarat and 2 Union Territories- Jammu & Kashmir and Ladakh
Afghanistan	1 Union Territory- Ladakh
China	4 States: Himachal Pradesh, Uttarakhand, Sikkim, Arunachal Pradesh and 1 Union Territory- Ladakh
Nepal	5 States: Uttarakhand, Uttar Pradesh, Bihar, West Bengal, Sikkim
Bhutan	4 States: Sikkim, West Bengal, Assam, Arunachal Pradesh
Myanmar	4 States: Arunachal Pradesh, Nagaland, Manipur, Mizoram
Bangladesh	5 States: West Bengal, Meghalaya, Assam, Tripura and Mizoram

Quick Glance at States Area-wise:

State	Area (Km^2)	Capital	Main Language
Rajasthan	342,239	Jaipur	Rajasthani, Hindi
Madhya Pradesh	308,245	Bhopal	Hindi
Maharashtra	307,713	Mumbai	Marathi
Uttar Pradesh	240,928	Lucknow	Hindi
Gujarat	196,024	Gandhinagar	Gujarati
Karnataka	191,791	Bengaluru	Kannada
Andhra Pradesh	162,968	Hyderabad	Telugu
Odisha	155,707	Bhuvaneswar	Oriyya
Chhattisgarh	135,191	Raipur	Hindi

Tamil Nadu	130,058	Chennai	Tamil
Telangana	112,077	Hyderabad	Telugu
Bihar	94,163	Patna	Hindi
West Bengal	88,752	Kolkata	Bengali
Arunachal Pradesh	83,743	Itanagar	Tribal
Jharkhand	79,714	Ranchi	Hindi
Assam	78,438	Dispur	Assamese
Himachal Pradesh	55,673	Shimla	Hindi
Uttarakhand	53,483	Dehradun	Hindi
Punjab	50,362	Chandigarh	Punjabi
Haryana	44,212	Chandigarh	Hindi

Kerala	38,863	Thiruvananthapuram	Malayalam
Meghalaya	22,429	Shillong	Khasi, Garo, English
Manipur	22,327	Imphal	Manipuri
Mizoram	21,081	Aizawl	Mizo, English
Nagaland	16,579	Kohima	Angami Ao
Tripura	10,486	Bengali, Tripuri	Agartala
Sikkim	7,096	Gangtok	Lepcha, Bhutia
Goa	3,702	Panaji	Marathi, Konkani
Union Territories	Area (sq. km)	Capital	Language

Andaman and Nicobar Is.	8,249	Port Blair	Andamanese, Nicobarese
Delhi	1,490	New Delhi	Hindi
Puducherry	492	Puducherry	Tamil, French
Dadra and Nagar Haveli and Daman and Diu	603	Daman	Gujarati, Marathi
Chandigarh	114	Chandigarh is itself the capital of two states i.e. Punjab and Haryana.	Hindi, Punjabi, and Haryanvi
Lakshadweep	32	Kavaratti	Malayalam
Jammu Kashmir	-	Srinagar (Summer capital) Jammu (winter capital)	Kashmiri, Urdu

Ladakh	-	Leh, Kargil	Urdu, Hindi, English

Physical Geography of India

- India has vast diversity in physical features.
- This diversity of landmass is the result of the large landmass of India formed during different geological periods and also due to various geological and geomorphological processes that took place in the crust.
- According to Plate Tectonic theory folding, faulting and volcanic activity are the major processes involved in the creation of physical features of Indian landscape. For example, the formation of the Himalayas in the north of the country attributed to the convergence of Gondwana land with the Eurasian plate.
- The Northern part of the country has a vast expanse of rugged topography consisting of a series of mountain ranges with varied peaks, beautiful valleys and deep gorges.
- The Southern part of the country consists of stable table land with highly dissected plateaus, denuded rocks and developed series of scarps.
- The Great Northern Plains lies between these two landscapes.
- The physical features of India can be grouped under the following Physiographic Divisions:

1. The Himalayas
2. The Northern Plains
3. The Peninsular Plateau
4. The Indian desert
5. The Coastal Plains

6. The Islands

The Himalayas

- The longest range of this system is Pir Panjal Range.
- This range consists of famous valley of Kashmir, the Kangra and the Kullu Valley.
- The Outer most range of the Himalayas is called the Shiwaliks. They composed of unconsolidated sediments brought down by rivers from the main Himalayan range located farther north.
- The Longitudinal valley lying between lesser Himalayas and Shiwaliks are known as Duns. Example: Dehra Dun, Kotli Dun, Patli Dun.
- The highest peak of Himalayas is: Everest, Nepal (8848 m); Kanchenjunga, India (8598 m); Makalu, Nepal (8481 m)
- On the basis of relief, alignment of ranges and other geomorphological features the Himalayas can be subdivided into following
    - North-western or Kashmir Himalayas
    - Himachal and Uttarakhand Himalayas
    - Darjeeling and Sikkim Himalayas
    - Arunachal Himalayas
    - Eastern Hills and Mountains

North-Western or Kashmir Himalayas

- Important Ranges: Karakoram, Ladakh, Zaskar and Pir Panjal
- Important Glaciers: Siachen, Baltoro, Remo, etc.,
- Important Pass: Zoji la, Bara Lacha la, Banihal, rohtang, etc.,
- Important Peaks: Nanga Parbat, K2, etc.,
- Kashmir valley: lies between Greater Himalayas and Pir Panjal Range.
- Cold Desert: between Greater Himalayas and Karakoram Range.
- Important Lakes: Dal and Wular are freshwater lakes, whereas Pangong Tso and Tso Moriri are saltwater lakes.

- The Southernmost part of this region consists of longitudinal valleys known as Duns. Eg: Jammu dun, Pathankot dun, etc.,

Himachal and Uttarakhand Himalayas

- Important Ranges: Great Himalayas, Dhaoladhar, Shiwaliks, Nagtibha, etc.,
- Important River System: Indus and Ganga
- Important Hill Stations: Dharamshala, Mussoorie, Shimla, kausani, etc.,
- Important Pass: Shipki la, Lipu Lekh, Mana pass, etc.,
- Important Glaciers: Gangotri, Yamunotri, Pindari, etc.,
- Important Peaks: Nanda Devi, Dhaulagiri, etc.,
- Important Duns: Dehradun (largest), Harike Dun, Kota Dun, Nalagarh Dun, Chandigarh-Kalka Dun, etc.,
- This region is known for five Prayags (River Confluences). Valley of flowers is also situated in this region.

The Darjeeling and Sikkim Himalayas

- This lies between Nepal Himalayas in the west and Bhutan Himalayas in the east.
- It is the region of fast flowing rivers and high mountain peaks.
- Important Peaks: Kanchenjunga
- Duar formations replace the Shiwaliks (absent) in this region which enhanced the development of Tea gardens.
- Important Glaciers: Zemu Glacier
- Important Peaks: Nathu La and Jelep La

The Arunachal Himalayas

- This lies between Bhutan Himalayas and Diphu Pass in the east
- Important Peaks: Namcha Barwa and Kangto
- Important Rivers: Subansiri, Dihang, Dibang and Lohit
- Important Ranges: Mishmi, Abor, Dafla, Mihir, etc.,

- Important pass: Diphu pass

The Eastern Hills and Mountains

- These are the part of Himalayan Mountain system having their general alignment from the north to south direction.
- The Himalaya in the eastern boundary of the country is called Purvanchal. These are mainly composed of sandstones (sedimentary rocks).
- Important Hills: Patkai Bum, Naga Hills, Manipur Hills, Mizo hills, etc.

THE NORTHERN PLAINS

- The northern plain has been formed by the interplay of the three major river systems – the Indus, the Ganga and the Brahmaputra.
- Bhabar is a narrow belt ranging between 8-10 km parallel to the Shiwalik foothills at the break-up of the slope. The river after descending from the mountains deposit pebbles in a narrow belt. All the streams disappear in this belt.
- Bhangar is the region south of Terai region. This region is formed by older alluvium. The soil in this region contains calcareous deposits locally known as kankar.
- The region with new alluvium deposits is known as Khadar. They are renewed almost every year and are so fertile, thus ideal for intensive cultivation.
- Riverine Islands – these are the islands which are formed due to depositional work of rivers especially in the lower course due to the gentle slope and resultant decrease in the velocity of rivers. Majuli – in the Brahmaputra is the largest inhabited riverine island in the world
- Distributaries – the rivers in the lower course split into numerous channels sue to deposition of silt are called distributaries.
- Doab – the area which lies behind the confluence of two rivers.

Major Mountain Peaks in India	Description
Godwin Austen (K2)	Highest peak of Karakoram range in POK
Nanga Parbat	Jammu and Kashmir
Nanda Devi	Uttarakhand, Second highest mountain in India and the highest entirely within the country
Kanchenjunga	Nepal and Sikkim (B/w Teesta river in east & Tamur river in the west), the Highest mountain in India & 3rd highest mountain in the world
Nokrek	Highest point of the Garo Hills (Meghalaya)
Gurushikhar	Mt. Abu, Rajasthan, highest point of the Aravalli Range
Kundremukh	Karnataka

Doddabetta	Highest point in Tamil Nadu, near Udhagamandalam (Nilgiri Hills) Second highest peak in the Western Ghats only next to Anamudi
Anaimudi	Located in Kerala, It is the highest peak in the Western Ghats and in South India
Agasthyamalai	Lie at the extreme southern end of Western Ghats, straddle both sides in Kerala and in Tamil Nadu
Saddle Peak	Highest point of the archipelago in the Bay of Bengal, located in North Andaman
Mount Hariet	Third highest peak in the Andaman and Nicobar archipelago only next to, Saddle peak (Highest of Andaman) and Mount Thullier (Highest of Nicobar)
Mahendragiri	Orissa, the Highest peak of Eastern Ghats (According to NCERT)
Arma Konda	Andhra Pradesh

Important Passes in India

State	Pass name	Comment
Jammu and Kashmir	Banihal Pass	Jammu to Srinagar
Jammu and Kashmir	Chang-La	Ladakh with Tibet
Jammu and Kashmir	Pir-Panjal pass	Between Jammu and Kashmir Valley
Jammu and Kashmir	Zoji La	important road link between Srinagar on one side and Kargil and Leh on the other side
Himachal Pradesh	Bara Lacha La	Connecting Mandi in Himachal Pradesh with Leh in Jammu and Kashmir
Himachal Pradesh	Rohtang Pass	road link between Kullu, Lahaul and Spiti Valleys

Himachal Pradesh	Shipki La	Himachal Pradesh and Tibet
Uttarakhand	Lipu Lekh	trijunction of Uttarakhand (India), Tibet (China) and Nepal borders
Uttarakhand	Niti Pass	Uttarakhand with Tibet
Sikkim	Nathu La	Sikkim with Tibet
Sikkim	Jelep La	Sikkim-Bhutan border
Arunachal Pradesh	Bom Di La	Arunachal Pradesh with Bhutan
Arunachal Pradesh	Dihang Pass	Arunachal Pradesh and Myanmar.

The Peninsular Plateau

- It is an irregular triangle in structure extends as Delhi ridge in the north-west, Rajmahal hills in the east, Gir range in the west and Cardamom Hills in the south.

- The important physiographic features of this are - block mountains, rift valleys, spurs, bare rocky structures, series of hummocky hills and wall like quartzite dykes offering natural sites for water storage.
- On the basis of relief features, the peninsular plateau is divided into three broad groups –
- The Deccan Plateau
- The Central Highlands
- The North-eastern Plateau

The Deccan Plateau

- The Deccan Plateau is a triangular landmass that lies to the south of R. Narmada.
- It is bordered by the Western Ghats in the west, the Eastern Ghats in the east and the Satpura, Maikal and Mahadeo range in the north and north-eastern part.
- An extension of the peninsular plateau is also visible in the north-east known as Karbi-Anglong Plateau and North Cachar Hills.
- The Deccan Plateau is higher in the west and slopes gently eastwards.
- Western and Eastern Ghats are prominent features of the Deccan plateau, the comparison between these two ranges are mentioned in the following table

S. NO.	WESTERN GHATS	EASTERN GHATS
1.	They are continuous and can be crossed only through passes.	They are discontinuous and irregular

2.	Average Elevation – (900 – 1600)m	Average Elevation – 600 m
3.	The altitude increases from north to south	The altitude has no general pattern
4.	Important Hills – Nilgiri, Anaimalai, Cardamom, Babubudan, etc.,	Important Hills – Javadi, Palkonda, Nallamala, Mahendragiri, etc.,
5.	Important Peaks – Anaimudi (highest), Doda Betta (Ooty), Kodaikanal etc.	Important Peaks – Mahendragiri (highest) etc.
6.	Most of the peninsular rivers originate here and acts as a water divide between west-flowing and east-flowing rivers.	They are dissected by major rivers like Mahanadi, Godavari, Krishna, Cauvery, etc., which are draining into the Bay of Bengal

The Central Highlands

- The Central Highlands is a part of Peninsular Plateau lying north of R. Narmada covering a major area of Malwa plateau, Vindhyan Range covers the southern extent and Aravalis in the north-west.

- The plateaus like Bundelkhand, Bagelkhand, Chotanagpur makes the eastern extension of the central highlands.
- This region has undergone metamorphic processes in its geologic history, which can be corroborated by the presence of metamorphic rocks such as marble, slate, gneiss, etc.

The North-Eastern Plateau

- This region consists of many plateaus like Meghalaya Plateau, Karbi Anglong Plateau, etc.,
- Important Hills – Khasi, Garo, Jaintia, etc.,

The Indian Desert

- The Great Indian Desert lies in the north-western region of the country.
- The prominent desert features are – Mushroom Rocks, Shifting Dunes and Oasis.
- It is a land of undulating topography dotted with longitudinal dunes and Barchans.
- Most of the rivers in this region are ephemeral. Example: R. Luni
- Low precipitation and evaporation make it a water deficit region.
- The desert can be divided into two regions: Northern part sloping towards Sindh and the Southern part towards the Rann of Kachchh.

The Coastal Plains

- The Peninsular plateau is covered by marine water in 3 sides: the Indian Ocean in the South; the Bay of Bengal in the east and the Arabian Sea in the West.
- The extent of coastline in the country is 6100 km in the mainland and 7517 km in the entire geographical coast of the country (including Islands).
- On the basis of the location and active geomorphological processes, it can be broadly divided into two: the Western Coastal Plains and the Eastern Coastal Plains.

The Islands

- Besides the vast physical features in the mainland of the country, there are two major island groups located in both sides of the peninsular plateau.
- The island groups provide the site for Fishing and Port activities.
- Though more than 4000 islands present in Indian territory Andaman and Nicobar and Lakshadweep are the two major island groups.

ANDAMAN & NICOBAR ISLANDS

- Duncan passage lies between south Andaman and Little Andaman.
- Important Peaks: Saddle Peak, North Andaman (738 m); Mount Diavolo, middle Andaman (515 m); Mount Koyob, South Andaman (460 m); Mount Thuiller, Great Nicobar (642 m).

Note

- **Ten Degree Channel-** Between Little Andaman and Car Nicobar
- **Duncan Passage-** Between great Andaman and Little Andaman

THE LAKSHADWEEP ISLANDS

- Kavaratti Island is the administrative headquarters of Lakshadweep islands.
- Minicoy is the largest island in this group.
- This island group consists of storm beaches consisting of unconsolidated pebbles, shingles, cobbles and boulders.

Note

- Nine Degree Channel- Minicoy is separated from rest of the Lakshadweep
- Eight Degree Channel- Lakshadweep Group separated from the Maldives

Other Islands

- Newmoore Island- located in the Bay of Bengal on the mouth of Ganga.
- Pamban Island- located in the Gulf of Manner between Sri Lanka and India.

INDIAN DRAINAGE SYSTEM

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

Soil and Agriculture in India

Soil Profile and Horizon of soil

- O - Horizon containing a high percentage of soil organic matter.
- A - Horizon darkened by the accumulation of organic matter.

- E - Horizon formed through the removal (eluviation) of clays, organic matter, iron, or aluminium. Usually lightened in colour due to these removals.
- B - Broad class used for subsurface horizons that have been transformed substantially by a soil formation process such as colour and structure development; the deposition (illuviation) of materials such as clays, organic matter, iron, aluminium, carbonates, or gypsum; carbonate or gypsum loss; brittleness and high density; or intense weathering leading to the accumulation of weathering-resistant minerals.
- C - A horizon minimally affected or unaffected by the soil formation processes.
- R - Bedrock.

Types of Indian Soil:

1. Alluvial Soil

- This type of soil mainly found in the Indo-Ganga and Brahmaputra plain i.e. the whole northern plain and in some parts of the river basin in the south and some plateau region.
- This soil is also found in the deltas of the Mahanadi, Godavari, Cauvery and Krishna.
- Alluvial soil can be broadly categorised in two types i.e. New alluvial soil (Khadar) and old alluvial soil (Bhangar). Both the Khadar and Bhangar soils contain calcareous concretions (Kankars).
- Crops Grown: the Alluvial soil is suitable for the Rabi and Kharif crop like cereals, cotton, oilseeds and sugarcane.

2. Regur or Black soil

- The regur or black soils have developed extensively upon the Lava Plateaus of Maharashtra, Gujarat, Madhya Pradesh mainly Malwa and are formed due to volcanic activities.
- These soils are very fertile and contain a high percentage of lime, iron and a moderate amount of potash.

- The type of soil is especially suited for the cultivation of cotton and hence sometimes called ‘black cotton soil.’
  Crops Grown: Cotton, Jowar, Wheat, Linseed, Gram, Fruit and Vegetable.
- The black soil is highly retentive of moisture.

3. Red Soil

- Red soils develop on granite and geneses rocks under low rainfall condition i.e. due to weathering of the metamorphic rocks.
- These soils are red in colour due to the high concentration of Iron Oxide.
- These soils are friable and medium fertile and found mainly in almost whole of Tamil Nadu, South-eastern Karnataka, North-eastern and South-eastern Madhya Pradesh, Jharkhand the major parts of Orissa, and the Hills and Plateaus of North-east India.
- These soils are deficient in Phosphoric acid, organic matter and nitrogenous material.
- Crops Grown: Wheat, Rice, Millet's, Pulses.

4. Laterite Soil

- Laterite is a kind of clayey rock or soil formed under high temperature and high rainfall and with alternate dry and wet period.
- Laterite and lateritic soils are found in South Maharashtra, the Western Ghats in Kerala and Karnataka, at places in Odisha, small parts of Chottanagpur and in some parts of Assam, Tamil Nadu, Karnataka, and in western West Bengal (particularly in Birbhum district).
- Crops Grown: Coffee, Cashew etc.
- This type of soil is unsuitable for agriculture due to the high content of acidity and inability to retain moisture.

5. Desert soil

This type of soils found in Rajasthan, Haryana and the South Punjab, and are sandy.

- In the absence of sufficient wash by rainwater, soils have become saline and rather unfit for cultivation.
- In spite of that cultivation can be carried on with the help of modern irrigation.
- Wheat, bajra, groundnut, etc. can be grown in this soil.
- This type of soil is rich in Phosphates and Calcium but deficient in Nitrogen and humus.

6. Mountain Soil

- Soil found in higher altitude on the mountain is called as Mountain soil.
- The characteristics of this type of soil are changed according to the altitudes.
- This type of soil is suitable for the cultivation of potatoes, fruits, tea coffee and spices and wheat.

Type of Soils based on the size of particles

1. Sandy Soil

- Particles are larger in size.
- The particles cannot fit close together and hence there is enough space among them.
- It is not fit for vegetation as it does not retain water.
- However, millets can be grown on sandy soil.

2. Clayey Soil

- Particles are very small in size.
- Very little space among the particles.
- Water does not drain quickly through clayey soil because of less space among particles.
- So, clayey soil is not well aerated and retains more water.

3. Loamy Soil

- Particles are smaller than sand and larger than clay.
- Loamy soil is the mixture of sandy soil, clayey soil and silt.
- Silt is the deposit in river beds.
- The soil has the right water holding capacity and is well aerated.
- It is considered the best soil for the growth of plants.

Types of Agriculture in India

There are different types of farming activities performed in India which are as follows:

Subsistence Farming

- Subsistence farming is a type of farming in which nearly all the crops or livestock raised are used to maintain the farmer and farmer's family leaving little.
- Subsistence farms usually consist of no more than a few acres, and farm technology tends to be primitive and of low yield.

Mixed farming

- Mixed farming is an agricultural system in which a farmer conducts different agricultural practice together, such as cash crops and livestock
- The aim is to increase income through different sources and to complement land and labour demands across the year.

Shifting cultivation

- Shifting cultivation means migratory shifting agriculture.
- Under this system, a plot of land is cultivated for a few years and then, when the crop yield declines because of soil exhaustion and the effects of pests and weeds, is deserted for another area.
- Here the ground is again cleared by slash-and-burn methods, and the procedure is repeated.

Other Names of Shifting Cultivation

Shifting Cultivation Name	Country
Chena	Sri Lanka
Ladang	Java and Indonesia
Jhum	North-eastern India
Podu	Andhra Pradesh
Milya	Mexico and Central America
Konuko	Venezuela
Roka	Brazil
Milpa	Yucatan and Guatemala

Extensive Farming

- This is a system of farming in which the farmer uses the limited amount of labour and capital on a relatively large area.
- This type of agriculture is practised in countries where population size is small and land is enough.
- Per acre yield is low but the overall production is in surplus due to less population.

- Here machines and technology are used in farming.

Intensive Farming

- This is a system of farming in which the cultivator uses a larger amount of labour and capital on a relatively small area.
- This type of farming is performed in countries where the population to land ratio is high i.e. the population is big and the land is small.
- Annually two or three types of crops are grown over the land.
- Manual labour is used.

Plantation Agriculture

- In this type of agriculture, cash crops are mainly cultivated.
- A single crop like rubber, sugarcane, coffee, tea is grown.
- These crops are major items of export.

Important Lakes in India (State Wise)

- Largest freshwater lake in India – Wular Lake, Jammu and Kashmir
- Largest Saline water lake in India – Chilka Lake, Orissa
- Highest lake in India (Altitude) – Cholamu lake, Sikkim
- Longest Lake in India – Vembanad lake, Kerala
- Largest Artificial Lake in India – Govind Vallabh Pant Sagar (Rihand Dam)

Lakes in India

S.No.	Name	State	District	Type of Lakes	Facts/Description

1	Pulicat Lake	Andhra Pradesh	Nellore	Brackish Water	It encompasses Pulicat Lake Bird Sanctuary; Satish Dhawan Space Centre located here
2	Kolleru Lake	Andhra Pradesh	West Godavari	Freshwater	Home to migratory birds
3	Nagarjuna Sagar	Telangana	Nalgonda	Freshwater	Artificially constructed; Krishna river
4	Haflong Lake	Assam	Silchar	Freshwater	High altitude lake
5	DeeporBeel	Assam	Kamrup	Freshwater	Under Ramsar Convention
6	Son Beel	Assam	Karimganj	Freshwater (Tectonically formed)	Largest wetland in Assam

7	Chandubi lake	Assam	Kamrup	Freshwater	Migratory Birds (winter); formed by 1897 earthquake
8	Kanwar Lake	Bihar	Begusarai	Oxbow (freshwater)	Asia's largest freshwater oxbow lake;
9	Hamirsar lake	Gujarat	Kutch	Artificial	Situated in the centre of Bhuj
10	Kankaria lake	Gujarat	Ahmedabad	Artificial	During 14th century by Muhammed Shah II
11	Narayan Sarovar	Gujarat	Kutch	Artificial freshwater	Pilgrimage site for Hindus
12	Thol Lake	Gujarat	Mehsana	Lentic lake	Constructed for irrigation purpose

13	Vastrapur	Gujarat	Ahmedabad	Freshwater	Narmada River; Picnic spot
14	Badkal Lake	Haryana	Faridabad	Freshwater	Man made
15	Blue Bird Lake	Haryana	Hisar	Freshwater	Migratory Birds, Wetland Habitat
16	Brahma Sarovar	Haryana	Thanesar	Freshwater	Ancient water pool sacred to Hinduism
17	Damdama Lake	Haryana	Sohna	Freshwater	Constructed by the British government for Rainwater Harvesting
18	Karna	Haryana	Karnal	Freshwater	Connected to great epic Mahabharata
19	Tilyar	Haryana	Rohtak	Freshwater (canal inflow)	Located inside Tilyar Zoo

20	Chandra Taal	Himachal Pradesh	Lahul and Spiti	Sweet water lake	Ramsar wetland site
21	Suraj Taal	Himachal Pradesh	Lahul and Spiti	Freshwater (High Altitude)	Bhaga River inflow
22	MaharanaPratapSagar	Himachal Pradesh	Kangra	Freshwater	Ramsar site
23	Prashar lake	Himachal Pradesh	Mandi	Holomitic (Fresh water)	It has a floating Island
24	Dal lake	J &K	Srinagar	Warm monomitic	Remnants of past glacial period
25	Pangong Tso	J &K	Ladakh	Endorheic Lake (saline water)	Indo-China Border

26	Wular lake	J &K	Bandipora	Tectonic lake (fresh water)	Largest freshwater lake in India
27	TsoMoriri	J &K	Ladakh	Saltwater	High altitude lake
28	Agata lake	Karnataka	Bangalore	Freshwater	Located in southwest part of the city
29	Bellandur Lake	Karnataka	Bangalore	Freshwater	-
30	Karachi lake	Karnataka	Mysore	-	Butterfly park
31	Ulsoor lake	Karnataka	Bangalore	Stale water	It has several islands
32	Kukarahalli lake	Karnataka	Mysore	Freshwater	Recreational
33	Honnamana	Karnataka	Kodagu	Freshwater	Holy lake, the place for various festivals

34	Pampa Sarovar	Karnataka	Hampi	Freshwater	Tungabhadra river
35	Ashtamudi Kayal	Kerala	Kollam	Brackish water	Ramsar wetland site
36	Kuttanad	Kerala	Alappuzha, Kottayam		Backwater paddy cultivation
37	Vembanad	Kerala	-	Brackish water	Ramsar wetland; boat race
38	Shashtamkotta	Kerala	Kollam	Freshwater	Ramsar wetland
39	Bhojtal	Madhya Pradesh	Bhopal	Freshwater	Ramsar site
40	Salim Ali	Maharashtra	Aurangabad	Freshwater	Birdwatching
41	Shivsagar	Maharashtra	Satara	Freshwater	Koyna dam

42	Lonar lake	Maharashtra	Buldhana	Crater lake	National Geo-Heritage monument
43	Loktak lake	Manipur	-	Lenticular freshwater	Ramsar wetland; Phumdis (Floating Islands); Multipurpose project
44	Umiam	Meghalaya	Shillong	Freshwater	Famous for cycling and boating
45	Tam Dil	Mizoram	Saitual	Freshwater	-
46	Chilika lake	Orissa	Puri	Brackish water	India's largest brackish water lake; lagoon
47	Kanjia lake	Orissa	Bhubaneswar	Freshwater	Wetland of national importance

48	Harike	Punjab	Ferozepur	Freshwater	Ramsar wetland site
49	Rupar	Punjab	Rupnagar	Freshwater	Manmade riverine lake
50	Kanjli	Punjab	Kapurthala	Freshwater	Ramsar wetland site
51	Sambhar lake	Rajasthan	Sambhar Lake-town	Saltwater	Ramsar wetland; largest inland saltwater lake in India
52	Rajsamand	Rajasthan	Rajsamand	Freshwater	-
53	Tsomgo lake	Sikkim	East Sikkim	Freshwater	Winter frozen
54	Khecheoplari	Sikkim	West Sikkim	Freshwater	Sacred lake for Hindus and Buddhists
55	Ooty lake	Tamilnadu	Nilgiris	Freshwater	Boat House

56	Chembarambakkam	Tamilnadu	Chennai	Artificial lake	-
57	Kodaikanal Lake	Tamilnadu	Dindigul district	Artificial lake	-
58	Hussain Sagar	Telangana	Hyderabad	Artificial lake	Artificial Gibraltar rock island
59	Badrakali lake	Telegana	Warangal	Freshwater	Artificial lake
60	Govind Ballabh Pant Sagar	Uttar Pradesh	Sonbhadra	Man-made lake	Rihand dam
61	Belasagar	Uttar Pradesh	Kulpahar	Freshwater	Irrigation lake
62	Bhimtal	Uttarakhand	Nainital	Freshwater	Medium altitude lake
63	East Calcutta wetlands	West Bengal	Calcutta	Brackish water	Ramsar wetland

Natural Vegetation, Different Types of Forests of India

Tropical Deciduous Forests

- These are the most widespread and the most extensive forests of India.
- They are also known as monsoon forests.
- These are connected with those parts of India which receive annual rainfall between 200 cm and 70 cm.
- Here rainfall is seasonal in nature.
- In this forest type, trees shed their leaves for about six to eight weeks in dry summer.
- The animals found in these are: *lion, tiger, pig, deer, elephant, a variety of birds, lizards, snakes, tortoise, etc.*

(i) Tropical Moist Deciduous Forests

- Annual rainfall between 200 & 100 cm.
- Found in: (a) an eastern part of India- northeastern states, along with the foothills of Himalayas, (b) Jharkhand, West Orissa and Chhattisgarh, (c) on the eastern slopes of the Western Ghats.
- Examples: *teak, bamboos, sal, shisham, sandalwood, khair, kusum, arjun, mulberry, etc.*

(ii) Tropical Dry Deciduous Forests

- Annual rainfall between 100 & 70 cm.
- Found in: (a) the rainier parts of the peninsular plateau and (b) the plains of Uttar Pradesh and Bihar.
- *Examples: teak, sal, peepal, neem* etc.

Tropical Thorn Forests

- These are connected with those parts which receive rainfall less than 70 cm.

- Here, rainfall is erratic, irregular and inconsistent.
- Xerophytes dominate regions covered with the tropical thorn.
- Found in the north-western part including *semi-arid areas of Gujarat, Rajasthan, Madhya Pradesh, Chhattisgarh, Uttar Pradesh and Haryana*.
- Main plant species here are *acacias (babool), palms, euphorbias,* Cactus, khair, , keekar etc.
- In this vegetation type, stem, leaves and roots of plants are adapted to conserve water.
- Stem is succulent and leaves are mostly thick and small to minimize evaporation.
- Common animals here are *rats, mice, rabbits, fox, wolf, tiger, lion, wild ass, horses, camels, etc.*

Tropical Montane Forests

- The decrease in temperature with the rise in altitude is responsible for the corresponding change in natural vegetation.
- There exists the same hierarchy from foothills of the mountain to the top of it as is observed from tropical to tundra region.
- Mostly found in the southern slopes of Himalayas, places having high altitude in Southern and Northeastern India.
- Upto 1500 n of height, tropical moist deciduous forests exist with *shesham* as the main tree.
- Between 1000-2000m of height, wet temperate type of climate persist wherein evergreen broad-leaf trees like *oaks and chestnut*
- Between 1500-3000 m of height, temperate forests covering coniferous trees like *Chir, pine, deodar, silver fir, spruce, cedar, etc.*
- At higher altitudes above 3500m wet temperate grasslands are common like *Merg (Kashmir), bugyals (Uttarakhand), etc.*
- Common animals that are found in these forests are *Kashmir stag, spotted deer, wild sheep, jackals, yak, snow leopard, rare red panda, sheep and goats with thich fur*, etc.

- In India, there are studied under two groups: Northern Montane Forests and Southern Montane Forests.
- Northern Montane Forests: These are connected with Himalayan mountain ranges. Vegetation types are controlled by sunlight, temperature and rainfall which is described above.
- Southern Montane Forests: These are connected with hills of *Nilgiris, Anaimalai and Cardamom*. These are wet temperate forests which have great endemic biodiversity and these are described as Shola forests.

Mangrove Forests

- Mangrove forests are connected with deltaic regions of tropical and sub-tropical zones.
- These are also known as tidal forests and littoral forests as these are connected with the inter-tidal region.
- Their biodiversity and forest density are comparable with equatorial rainforest and tropical evergreen and semi-evergreen forests.
- Mangroves are salt tolerant plants with roots being adapted to become pneumatophores (these roots emerged from the ground and grow in upward direction).
- Mangrove ecosystem is a unique ecosystem as it has tolerance for periodic flooding and dryness; and mild salinity as well.
- India has the largest cover of Mangrove forest in the world.
- Sunderban, Mahanadi, Godaveri-Krishna and Kaveri delta are most importantly covered with these forests.
- *Sunderban* is the largest mangrove in the world. It is famous for *Sundari tree* which provides durable hard timber.
- Some other example are Rhizophora, Avicennia etc.
- *Palm, coconut, keora, agar*, etc. also grow in some parts of the delta.
- *Royal Bengal Tiger* is a famous animal in these forests.
- *Turtles, crocodiles, gharials, snakes,* are also found in these forests.
- Bhitarkanika mangrove of Mahanadi delta is also famous for its rich biodiversity.

Solar System

Facts about Sun and Planets

Sun

- The only star in our solar system and powerhouse of the solar system.
- Composed of Hydrogen (73%), Helium (25%) gases and other metals. Sun carries almost 99% of the mass of our solar system.
- Approximately 15 crore Kilometres further away from Earth. It takes around 8 minutes 30 seconds for light at the speed of 3 lakh Km/sec to reach the earth.
- Temperature at surface= 5800 K or 5600 degree Celsius.
- The temperature at the centre= 15.7 million K

Planets

1. Mercury

- The closest planet to the Sun and a very hot planet.
- Smallest planet in the solar system with a diameter of 4900 Km.
- Fastest Planet with speed of 172500 Km per hour to complete revolution around Sun in 88 days.
- The planet with no water and gases like Nitrogen, Hydrogen, Oxygen and Carbon Dioxide.

2. Venus

- Hottest planet in the solar system with the surface temperature of 478 degree Celsius.
- Also known as “Earth’s Twin”. It is because of similarity in size and mass between Venus and Earth.
- One of the two planets in the solar system which rotate around the axis in a Clockwise direction.

- Brightest Star in the Solar system. It can be seen in the morning and evening with open eyes. So known as “Evening Star” and “Morning Star”.

3. Earth

- The only Planet to give support to life with a pleasant atmosphere.
- Also known as “Blue Planet” because of the presence of water on it.
- It has one natural satellite named “Moon”.

4. Mars

- Known as “Red Planet” because of Iron-rich red soil.
- Second smallest planet in the solar system after Mercury.
- Has two natural moons “Phobos” and “Deimos”.
- Has a thin atmosphere and surface with valleys, craters, deserts and ice caps etc.
- “Olympus Mons” – Largest volcano and the tallest mountain in solar system lies on Mars.

5. Jupiter

- Largest planet of the solar system with the shortest rotation
- Has atmosphere filled with Hydrogen, Helium and other gases
- The third brightest object in the night sky after the Moon and Venus.
- Great Red Spot, a giant storm in the solar system exists on this planet.
- Has at least 69 moons, including 4 large Galilean Moons “Io, Europa, Ganymede, and Callisto” which were discovered by Galileo. “Ganymede” is the largest among them.
- It has an unclear ring around it.

6. Saturn

- Second largest planet in the solar system and a gas giant.

- Has bright and concentric rings around it which are made up of tiny rocks and pieces of Ice.
- Saturn can float on water because it has less density than water.
- Has at least 62 moons and Titan is the largest among them.

7. Uranus

- Has the third- largest planetary radius and fourth largest planetary mass in the Solar system.
- Greenish in colour.
- Discovered by William Herschel in 1781.
- Known as “Ice Giant”. The atmosphere of Uranus is composed of Hydrogen and Helium primarily, but it also contains more water, ammonia etc.
- Has the coldest planetary atmosphere in the solar system.
- Rotates clockwise on its axis like Venus but unlike other planets
- Has at least 25 moons. Famous moons- Miranda, Ariel and Umbriel

8. Neptune

- Farthest planet from the Sun.
- It is also “Ice Giant”. Atmosphere primarily composed of Hydrogen and Helium.
- Bluish in colour because of Methane.
- The fourth largest planet and the third most- massive planet in the solar system
- Discovered by Johann Galle and Urbain Le Verrier in 1846. The only planet in the solar system found by Mathematical Predictions.
- Has known 14 satellites. Famous moon – Triton

Other

Pluto

- As per the new definition of Planets determined by International Astronomical Union (IAU), Pluto has been omitted from the list of planets in 2006.

- Pluto is considered as a dwarf planet (size between planets and asteroids) now and it is a member of Kuiper Belt.

Kuiper Belt

- It is a spherical boundary outside the orbit of Neptune containing a number of asteroids, rocks, and comets.

Important facts of Census 2011

Census 2011

- Census is a process of collecting, compiling, analyzing, evaluating, publishing and disseminating statistical data regarding the population of a country.
- It covers demographic, social and economic data.
- It is conducted every 10 years.
- It started in 1871.
- Census 2011 data was released on 31st March 2011 by Union Home Secretary and RGCCI (Registrar General and Census Commissioner of India) of India.
- Census 2011 was the 15th census of India & 7th census after Independence.
- The motto of census 2011 was “Our Census, Our future”.
- Registrar General & Census Commissioner under whom census 2011 was conducted – C.Chandra Mouli
- Present Registrar General & Census Commissioner – Shri Sailesh,
- Total Population – 1,210,569,573 (1.21 Billion)
- India in 2nd rank in the population with 17.64%. decadal growth.
- Increase in population during 2001 – 2011 is 181 Million
- Census 2011 was held in two phases:
- Houselisting & Housing Census
  (April to September 2010)
- Population Enumeration
  (9th to 28th February 2011)

- Number of Administrative Units in Census 2011
  States/UTs 35
  Districts 640
  Sub-districts 5,924
  Towns 7,936
  Villages 6.41 lakh

Facts about districts

- Thane district of Maharashtra is the most populated district of India.
- Dibang Valley of Arunachal Pradesh is the least populated.
- Kurung Kumey of Arunachal Pradesh registered highest population growth rate of 111.01 Percent.
- Longleng district of Nagaland registered negative population growth rate of (-)58.39.
- Mahe district of Puducherry has the highest sex ratio of 1176 females per 1000 males.
- Daman district has the lowest sex ratio of 533 females per 1000 males.
- Serchhip district of Mizoram has the highest literacy rate of 98.76 Percent.
- Alirajpur of MP is the least literate district of India with the figure of 37.22 Percent only.
- North East Delhi has the highest density with the figure of 37346 people per square kilometre.
- Dibang Valley has the least density of 1 person per sq. km

Facts about cities

- Mumbai city of Maharashtra is the most populated city in India.
- Kapurthala city of Punjab is the least populated.
- Kozhikode of Kerala has the highest sex ratio of 1093 females per 1000 males.
- Bhiwandi city of Maharashtra has the lowest sex ratio of 709 females per 1000 males.

- Aizawl city of Mizoram has the highest literacy rate of 98.76 Percent.
- Sambhal of UP is the least literate city in India with the figure of 48 Percent only.
- North East Delhi has the highest density with the figure of 37346 people per square kilometre.

FEATURE	INDIA	TOP 3 STATES	BOTTOM 3 STATE	OTHER FACT
Average annual growth rate	1.64 %	1. Meghalaya (2.49 %) 2. Arunachal Pradesh (2.3 %) 3. Bihar (2.26 %)	1. Goa (.79%) 2. Andhra Pradesh (1.07%) 3. Sikkim (1.17%)	• During 2001-2011, as many as 25 States/UTs with a share of about 85% of the country's population registered an annual growth rate of Less than 2%.

Decadal growth rate	17.60%	1. Meghalaya (27.8 %) 2. Arunachal Pradesh (25.9 %) 3. Bihar (25.1 %)	1. Nagaland (-0.5 %) 2. Kerala (4.9 %) 3. Goa (8.2 %)	• Nagaland is only the state that has negative growth rate. • 2001-2011 is the first decade (with the exception of 1911-1921) which has actually added lesser population compared to the previous decade • Districts with highest and lowest decadal growth rate were Kurung Kumey and Longleng respectively.

Population Density	382	1. Bihar (1,106 per sq km) 2. West Bengal (1030 per sq km) 3. Kerala (859 per sq km)	1. Arunachal Pradesh (17 per sq km) 2. Mizoram (52 per sq km) 3. J&K (56 per sq km)	• Top 2 Districts: North East (NCT of Delhi) and Chennai • Bottom 2 district: Dibang Valley and Samba.

Population (in terms of numbers)	Total - 1210.19 million Males – 623.7 million (51.54%) Females – 586.46 million (48.46%) Rural population– 833 million Urban population -377 million	Total 1. Uttar Pradesh (19.9 million , 16.5%) 2. Maharashtra (11 million - 9.28%) 3. Bihar (10 million - 8.6%) Male U.P. Maharashtra Bihar Female U.P. Maharashtra Bihar Rural Population UP Bihar West	Total 1. Sikkim (6.07 lakh - 0.05%) 2. Mizoram (10.9 lakh - 0.09 %) 3. Arunachal Pradesh (13.8 lakh - 0.11%) Male 1. Sikkim 2. Mizoram 3. Arunachal Pradesh Female Sikkim Mizoram Arunachal Pradesh Rural Population 1. Mizoram 2. Sikkim 3. Goa Urban population 1. Sikkim 2. Arunachal Pradesh 3. Nagaland	• Top Metros 1. Mumbai (18,394,912) 2. Delhi 3. Chennai • The population of India is almost equal to the combined population of U.S.A., Indonesia, Brazil, Pakistan, Bangladesh and Japan put together (1214.3 million)! • Top 2 Districts: Thane(Maharashtra) and North Twenty Four Parganas (West Bengal) • Bottom 2 Districts: Dibang Valley

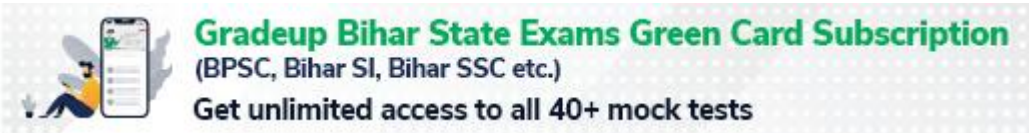
		Bengal Urban populatio n Maharas htra U.P. Tamil Nadu		(Arunachal Pradesh) and Anjaw (Arunachal Pradesh).

Sex ratio	940	1. Kerala (1084) 2. Tamil Nadu (996) 3. Andhra Pradesh (993)	1. Haryana (879) 2. Jammu and Kashmir (889) 3. Sikkim (890)	• This is the highest Sex Ratio recorded since Census 1971 • Top 2 Districts: Mahe and Almora • Bottom 2 Districts: Daman and Leh
Fertility rate (2013)	2.3	1. Bihar (3.4) 2. U.P. (3.17) 3. Meghalaya (3.1)	1. Sikkim (1.45) 2. West Bengal (1.64) 3. Tamil Nadu (1.7)	

Literacy Rate	Overall -74% Male – 82.14% Female -65.46	Overall 1. Kerala (93.9%) 2. Mizoram (91.6%) 3. Tripura (87.8%) Male 1 Kerala (96 %) 2. Mizoram (93.7%) 3. Goa (92.8%) Female 1. Kerala (92%) 2. Mizoram (89.4%) 3. Tripura (83.1%)	Overall 1. Bihar (63.80%) 2. Arunachal Pradesh (67%) 3. Rajasthan (67.11%) Male 1. Bihar (73.5%) 2. Arunachal Pradesh (73.7 %) 3. Andhra Pradesh(75.6 %) Female 1. Rajasthan (52.7%) 2. Bihar (53.3%) 3. Jammu and Kashmir (58%)	• Highest literacy rate according to Religion – Jain (94 %) > Christian (80%) > Buddhist (74%) • Area – Rural (68.9 %) Urban (85%) • Literacy rate has gone up from 64.83 percent in 2001 to 74.04 percent in 2011 showing an increase of 9.21 percentage points. • Ten States and Union Territories viz., Kerala, Lakshadweep, Mizoram, Tripura, Goa, Daman & Diu,

				Puducherry, Chandigarh, NCT of Delhi and Andaman & Nicobar Islands have achieved the literacy rate of above 85 Percent ● The gap of 21.59 percentage points recorded between male and female literacy rates in 2001 Census has reduced to 16.68 percentage points in 2011. ● Top 2 Districts: Serchhip and Aizwal ● Bottom 2 Districts Alirajpur and

				Bijapur



Work participation rate	● Overall (39 %) ● Male (45 %) ● Female (14 %)	1. Mizoram	1. Kerala 2. Goa	
Tribe	● 550 tribes ● 8.2% of the total Population of India ● 10 million population	Population wise 1. MP (1.5 million) 2. Maharashtra (1.0 million) 3. Gujrat (.89 million) Tribal density wise 1. Mizoram 2. Nagaland 3.	Population wise 1. Punjab (zero) 2. Haryana (zero) 3. Goa (32,000) Tribal density wise 1. Punjab (zero) 2. Haryana (zero)	

		Meghalaya		
State (Area)	32.87 Lakh km2	1. Rajasthan (3.42 Lakh km2) 2. M.P. (3.08 Lakh km2) 3. Maharas	1. Goa (3702 km2) 2. Sikkim (7096 km2) 3. Tripura (10,486 km2)	

		htra (3.07 Lakh km2)		
Urbanisation		1. Goa (62%) 2. Mizoram (52%) 3. Tamil Nadu (48%)	1. Himachal Pradesh (10%) 2. Bihar (10.29%) 3. Assam (14%)	• Maharashtra has highest no. of cities – 18 in numbers
Slums	6.5 million total population	1. Maharashtra (1.1 million) 2. Andhra Pradesh 3. Tamil Nadu	1. Arunachal Pradesh (15,000) 2. Goa 3. Sikkim	

Child sex ratio (female per 1000 male in the age group of 0-6)	914	1. Mizoram (971) 2. Meghalaya (970) 3. Chattisgarh (964)	1. Haryana (830) 2. Punjab (846) 3. J&K (859)	• No state in India that crosses 1000 female per 1000 male in the age group of 0-6. • The total number of children in the age-group 0-6 is 158.8 million (-5 million since 2001). • The Child Sex Ratio at India level (914) is lowest since Independence
The proportion of child population in the age group 0-6	13.10%	1. Meghalaya (18.8 %) 2. Bihar (17.9 %) 3. J&K (16 %)	1. Tamil Nadu (9.6 %) 2. Goa (9.6 %) 3. Kerala (10 %)	

Per Capita Net State Domestic Product at Current Prices (2011-12)	60972 Rs.	1. Goa (1,92,000 Rs) 2. Haryana (1,09,000 Rs) 3. Tamil Nadu (84,000 Rs)	1. Bihar (24,000 Rs) 2. U.P. (29,000 Rs) 3. Jharkhand (32,000 Rs)	
Percentage of Population Below Poverty Line (Tendulkar Methodology)	29.8% (2011-12)	1. Bihar 2. Chattisgarh 3. Manipur	1. Goa 2. J&K 3. Himachal Pradesh	
Age structure	Adolescent (36.5 %) Adult (56.7%) Old (6.8 %)			
Major	Hindi (40%) Bengali (8%) Telugu (7.8%)			

language	Language family 1. Indo – European (Aryan – 73%) 2. Dravidian (20%) 3. Austric (Nishad - 1.3%)	
Religion-Percentage of population	Religion Numbers (Percent of the population) Hindu 96.63 crore (79.8 %) Muslim 17.22 crore (14.2%) Christian 2.78 crore (2.3%) Sikh 2.08 crore (1.7%) Buddhist 0.84 crore (0.7%) Jain 0.45 crore (0.4%)	• Hindu, Muslim, Christian, and Sikhs are in majority in 28,4,2,1 state respectively. •

Important dams in India

Some Facts about dams

- Tallest dam in the world- Nurek dam (Tajikistan)
- Longest dam in the world- Hirakund dam (Orissa)
- Longest dam in India- Hirakund dam (Orissa)
- Highest dam in India- Tehri dam (Uttarakhand)
- Highest straight gravity Dam in India- Bhakra dam
- First dam of India-Kallanai Dam (Grand Anicut) on river Kaveri (Tiruchirapalli, Tamilnadu)

Important Dams in India

State	Dam	River
Andhra Pradesh	Nagarjuna Sagar Dam	Krishna
	Srisailam Dam	Krishna
	Polavaram Project	Godavari
	Somasila Dam	Penna
Arunachal Pradesh	Ranganadi Dam	Ranganadi River, a tributary of the Brahmaputra River
Bihar	Nagi Dam	Nagi
	Kohira Dam	Kohira
Chhattisgarh	Minimata (Hasdeo) Bango Dam	Hasdeo
	Dudhawa Dam	Mahanadi

Gujarat	Ukai Dam	Tapti
	Kadana Dam	Mahi
	Sardar Sarovar Dam	Narmada
	Karjan Dam	Karjan
	Mitti Dam	Mitti
	Aji Dam	Aji
	Sipu Dam	Sipu
Himachal Pradesh	Pong Dam	Beas
	Bhakra Dam	Satluj
	Kol Dam	Satluj
	Chamera Dam	Ravi

	Nathpa Jhakri (Sjvnl) Dam	Satluj
Jammu and Kashmir	Baglihar Dam	Chenab
	Salal Dam	Chenab
	Uri Dam	Jhelum
	Pakal Dul Dam	Marusudar
	Nimoo Bazgo Dam	Indus
	Kishenganga Dam	KISHANGANGA
Jharkhand	Panchet Dam	Damodar
	Maithon Dam	Barakar
	Tenughat Dam	Damodar
	Konar Dam	Konar

	North Koel	North Koel
Karnataka	Krishnarajasagar Dam	Cauvery
	Basava Sagar Dam (Narayanpur Dam)	Krishna
	Hemavathy Dam	Hemavathy
	Kabini Dam	Kabini
	Tungabhadra Dam	Tungabhadra
	Hidkal Dam	Ghataprabha
	Almatti Dam	Krishna
	Bhadra Dam	Bhadra
	Supa dam	Kalinadi
	Lakhya Dam	Lakhya hole

Kerala	Cheruthoni Dam	Cheruthoni
	Kakki Dam	Kakki
	Mullaperiyar Dam	Periyar
	Idukki Dam	Periyar
	Kulamavu Dam	Kilivillithode
	Banasura Sagar Dam	Banasura Lake
Madhya Pradesh	Ban Sagar Dam	Son
	Gandhi Sagar Dam	Chambal
	Indira Sagar Dam	Narmada
	Omkareshwar Dam	Narmada
	Tawa Dam	Tawa

Maharashtra	Bhatsa Dam	Bhatsa and chorna
	Koyna Dam	Koyna
	Warna Dam	Varna
	Ujjani Dam	Bhima
	Aruna Dam	Aruna
	Upper Wardha Dam	Wardha
Odisha	Hirakud Dam	Mahanadi
	Indravati Dam	Indravati
	Kapur Dam	Kapur
	Podagada Dam	Podagada
	Rengali Dam	Brahmani

	Upper Kolab Dam	Kapur
	Haladia Dam	Haladia
	Lower Indra Dam	Indra
Punjab	Ranjit Sagar Dam	Ravi
Rajasthan	Bisalpur Dam	Banas
	Jawahar Sagar Dam	Chambal
	Mahi Bajaj Sagar Dam	Mahi
	Rana Pratap Sagar Dam	Chambal
	Jaswant Sagar Dam	Luni
	Jakham Main Dam	Jakham (Mahi)

Sikkim	Rangit III Dam	Ranjit
Tamilnadu	Bhavani Dam	Bhavani
	Mettur Dam	Kaveri
	Sholaiyar Dam	Sholaiyar
	Pillur Dam	Bhavani
Telangana	Nagarjuna Sagar Dam	Krishna (Some Part of Dam also in Telangana)
	Srisailam Dam	Krishna (Some Part of Dam also in Telangana)
	Nizam Sagar Dam	Manjira
	Musi Dam	Musi
	Singur Dam	Manjira

	Sri Rama Sagar (Pochampadu Project)	Godavari
Uttarakhand	Jamrani Dam	Gola
	Lakhwar Dam	Yamuna
	Koteshwar	Bhagirathi
	Ramganga Dam	Ramganga
	Tehri Dam	Bhagirathi
Uttar Pradesh	Rihand Dam	Rihand
West Bengal	Kangsabati Kumari Dam	Kasai

Top Mineral Producer in India (State-wise) and other Countries

Mineral	TYPE	MINES	TOP PRODUCERS (States)	TOP PRODUCERS (COUNTRIES)	TOP RESERVES (States)
IRON ORE	Metallic (Ferrous)	Barabil – Koira Valley(Orissa) Bailadila Mine (Chattisgarh) Dalli-Rajhara(CH) – the largest mine in India	1. Orissa 2. Chattisgarh 3. Karnataka	1. Australia 2. Brazil 3. China 4. India	1. Orissa 2. Jharkhand 3. Chattisgarh
MANGANESE	Metallic (Ferrous)	Nagpur–Bhandara Region (Maharashtra) Gondite Mines (Orissa)	1. Madhya Pradesh 2. Maharashtra	1. China 2. Gabon 3. South Africa 5. India	1. Orissa 2. Karnataka 3. Madhya Pradesh

		Khondolite deposits (Orissa)			
CHROMITE	Metallic (Ferrous)	Sukinda Valley (Orissa) Hasan Region (Karnataka)	1. Orissa 2. Karnataka 3. Andhra Pradesh	1.South Africa 2.India 3.Russia	1. Sukinda Valley (OR) 2. Guntur Region (AP)
NICKEL	Metallic (Ferrous)	Sukinda Valley (Orissa) Singhbhum Region (Jharkhand)	1. Orissa 2. Jharkhand	1. Phillippines 2. Russia 3. Canada	1. Orissa 2. Jharkhand 3. Karnataka

COBALT	Metallic (Ferrous)	Singhbhum Region (Jharkhand) Kendujhar (Orissa) Tuensang (Nagaland)	1. Jharkhand 2. Orissa 3. Nagaland	1.Democratic Republic of Congo 2. China 3. Canada	
BAUXITE	Metallic (Non-Ferrous)	Balangir(Orissa) Koraput (Orissa) Gumla(Jharkhand) Shahdol (Madhya Pradesh)	1. Orissa 2. Gujarat	1. Australia 2. China, 3. Brazil	1. Junagarh (GJ) 2. Durg (CH)
COPPER	Metallic (Non-Ferrous)	Malanjkhand Belt (Madhya Pradesh) Khetri Belt (Rajasthan) Kho-Dariba (Rajasthan)	1. Madhya Pradesh 2. Rajasthan 3. Jharkhand	1. Chile 2. China 3. Peru	1. Rajasthan 2. Madhya Pradesh 3. Jharkhand

GOLD	Metallic (Non-Ferrous)	Kolar Gold Field (Karnataka) Hutti Gold Field (Karnataka) Ramagiri Mines (Andhra Pradesh) Sunarnarekha Sands (Jharkhand)	1. Karnataka 2. Andhra Prdeah	1. China 2. USA 3. South Africa	1. Bihar 2. Rajasthan 3. Karnataka
SILVER	Metallic (Non-Ferrous)	Zawar Mines (Rajasthan) Tundoo Mines (Jharkhand) Kolar Gold Fields (Karnataka)	1. Rajasthan 2. Karnataka	1. Mexico 2. Peru 3. China	1. Rajasthan 2. Jharkhand

LEAD	Metallic (Non-ferrous)	Rampura Aghucha (Rajasthan) Sindesar Mines (Rajasthan)	1. Rajasthan 2. Andhra Pradesh 3. Madhya Pradesh	1. China 2. Australia 3. USA	1. Rajasthan 2. Madhya Pradesh
TIN	Metallic (Non-Ferrous)	Dantewada (Chhattisgarh)	Chhattisgarh (only state in India)	1. China 2. Indonesia 3. Peru	Chattisgarh
MAGNESIUM	Metallic (Non-Ferrous)	Chalk Hills (Tamilnadu) Almora (Uttarakhand)	1. Tamil Nadu 2. Uttarakhand 3. Karnataka	1. China 2. Russia 3. Turkey	1. Tamil Nadu 2. Karnataka

LIMESTONE	Non-Metallic	Jabalpur (Madhya Pradesh) Satna (Madhya Pradesh) Cuddapah (AP)	1. Rajasthan 2. Madhya Pradesh	1. China 2. India	1. Andhra Pradesh 2. Rajasthan 3. Gujarat
MICA	Non-Metallic	Gudur Mines (Aandhra Pradesh) Aravalis (RaJasthan) Koderma (Jharkhand)	1. Andhra Pradesh 2. Rajasthan 3. Orissa	1. India 2. Russia	
DOLOMITE	Non-Metallic	Bastar, Raigarh (Chhattisgarh) Birmitrapur (Orissa) Khammam Region (Aandhra	1. Chattisgarh 2. Andhra Pradesh	1. India	1. Chattisgarh 2. Orissa

		Pradesh)			
ASBESTOS	Non-Metallic	Pali (Rajasthan) – largest mine Cuddapah (Aandhra Pradesh)	1. Rajasthan 2. Andhra Pradesh 3. karnataka	1. Russia 2. China	1. Rajasthan 2. Andhra Pradesh
KYANITE	Non-Metallic	Pavri Mines (Maharashtra) – Oldest kyanite mine in india Nawargaon Mines (Maharasht	1. Jharkhand 2. Maharashtra 3. Karnataka	1. USA 2. China 3. Japan	1. Maharastra 2. Jharkhand

		ra)			
GYPSUM	Non-Metallic	Jodhpur, Bikaner, Jaisalmer-Rajasthan	1. Rajasthan 2. Tamil Nadu 3. Gujarat	1. China 2. USA 3. Iran	1. Rajasthan 2. Tamil Nadu 3. J & K
DIAMOND	Non-Metallic	Majhgawan Panna Mines (Madhya Pradesh) – only active diamond mine in India	1. Madhya Pradesh – only diamond producing state	1. Russia 2. Bostwana 3. Democratic Republic of Congo	

COAL	Non-Metallic (Energy)	Korba Coalfield, Birampur – Chhattisgarh Jharia Coalfield, Bokaro Coalfield, Girdih – (Jharkhand) Talcher field – (Orissa) Singaruli coalfields (Chhattisgarh) - Largest	1. Chattisgarh 2. Jharkhand 3. Orissa	1. China 2. USA 3. India	1. Jharkhand 2. Orissa 3. Chattisgarh

PETROLEUM	Non-Metallic(Energy)	Lunej, Ankleshwar, Kalol– Gujarat Mumbai high– Maharashtra – largest oil field Digboi– Assam– Oldest oil filed in India	1. Maharastra 2. Gujarat	1. Russia 2. Saudi Arabia 3. USA	1. Gujarat 2. Maharastra
URANIUM	Atomic	Jaduguda mine (Jharkhand) Tummalapalle mine (Andhra Pradesh) – largest mine Domiasiat Mine (Meghalaya)	1. Andhra Pradesh 2. Jharkhand 3. Karnataka	1. Kazakhstan 2. Canada 3. Australia	1. Jharkhand 2. Andhra Pradesh 3. Karnataka

THORIUM	Atomic		1. Kerala 2. Jharkhand 3. Bihar	1. Australia 2. USA 3. India	1. Andhra Pradesh 2. Tamil Nadu 3. Kerala

World Geography: List of Mountain Ranges, Peaks, Rivers & Lakes

1. Important Mountain Ranges And Peaks of the Worlds

Sr.No.	Mountain Range	Important/Highest Peaks	Location	Description
1.	Rocky Mountains	Mt. Elbert (highest peak in the Rockies)	North America	It is one of the longest fold mountains in the world and extends from Canada to Western US (New Mexico State)

2.	Appalachian Mountains	Mt. Mitchell, North Carolina, US (highest peak of Appalachian Mountains)	North America	It is a fold mountain with rich in mineral resources
3.	Alps	Mont Blanc (French –Italian border)	Europe	It is a folded mountain and source for rivers like Danube, Rhine, etc.
4.	Sierra Nevada	Mt. Whitney	California, USA	Habitat for many Red Indian tribes
5.	Alaska Range	Mt. McKinley	North America	Mt. McKinley highest peak in North America
6.	Altai Mountains	Belukha mountain	Central Asia	Young folded mountain which extends from Kazakhstan to northern China.
7.	Andes Mountains	Mt. Aconcagua	South America	Longest mountain chain in the world

8.	Atlas Mountains	Mt. Toubkal	Northwestern Africa	Young fold mountain spreading over Morocco and Tunisia.
9.	Drakensberg Mountains	Mt. Lesotho	South Africa	Young folded mountain
10.	Caucasus Mountain	Mt. Elbrus	Europe	Located between the Black Sea and the Caspian Sea
11.	Ural Mountains	Mt. Narodnaya	Russia	This mountain range act as a boundary between Europe and Asia.
12.	Hindukush Mountains	Mt. Trich Mir	Pakistan and Afghanistan	Folded mountain with rugged topography which makes it difficult for transportation.

13.	Himalayas	Mt. Everest	Asia	Young fold mountains in Asia which separates Indian sub-continent from Asian plains
14.	Arakan Yoma	Mt. Kennedy peak	Myanmar	It extends from north to south direction. Shifting cultivation is practised.
15.	Kunlun Mountains	Mt. Muztag	North of Tibetan plateau and western China	It is one of the young folded mountains.
16.	Vosges	Mt. Grand Ballon	Eastern France, Europe	Famous for the cultivation of grapes and manufacture of wines.

17.	Great Dividing Range	Mt. Kosciuszko	Australia	This range is the source for the rivers Darling and Murray.

2. List of Important Rivers of the World

Sr. No.	RIVER	LOCATION	DESCRIPTION
1.	River Amazon	South America	It is the second longest river which flows through Peru, Columbia, Brazil and drains into the Atlantic Ocean.
2.	River Mississippi	North America	It forms a bird-foot like a delta at the Gulf of Mexico, River Missouri is an important tributary of it.

3.	River St. Lawrence	North America	It drains into Gulf of St. Lawrence which is an important transport corridor of North America.
4.	River Orange	South Africa	Longest river of South Africa and contains diamond beds along its mouth.
5.	River Congo	Africa	This river crosses the equator twice and drains into the south Atlantic Ocean.
6.	River Nile	Africa	It is the longest river in the world, originates near Lake Victoria and drains in the Mediterranean Sea.
7.	River Rhine	Western Europe	It flows through Germany and Netherlands. It is one of the busiest waterways of Europe.

8.	River Danube	Europe	It passes through Germany, Hungary, Austria, Slovakia, Serbia, Romania and drains into the Black Sea.
9.	River Volga	Europe, Russia	It is the longest river in Europe, it drains into the Caspian Sea.
10.	River Tigris	Turkey, Iraq	Cities like Mosul, Baghdad, Basra were located along its banks and it drains into the Gulf of Persia.
11.	River Euphrates	Turkey, Syria, Iraq	Main source of water for Syria. It drains into the Persian Gulf.
12.	River Irrawaddy	Myanmar	Drains into Gulf of Martaban
13.	River Mekong	China, Laos, Cambodia, Vietnam	It is also called 'Danube of the east', and it merges with south china sea.

14.	River Yangtze	China	It originates from the Tibetan plateau and ends in east china sea. It is the longest river in China.

3. Important Lakes of The World

Sr. No.	NAME	LOCATION	FACTS
1.	Titicaca lake	South America	It is the highest navigable lake in the world located in the Andes mountains.
2.	Great bear lake	Canada, North America	It is a big glaciated lake of Canada. The Eskimos of Canada camp here during the summer season.

3.	Great lakes	North America	This comprise of five large lakes of North America such as Lake Superior, Michigan, Huron, Erie, Ontario. Lake Superior is the second largest lake in the world.
4.	Lake Malawi	Central Africa	It is the third largest lake of Africa and borders Tanzania, Mozambique.
5.	Lake Tanganyika	East Africa	It is deepest and second largest lake of Africa.
6.	Lake Victoria	Africa	Largest river of Africa and passes through the equator.
7.	Lake Kainji	Africa	Largest manmade lake of Africa, used for irrigation purposes.
8.	Dead sea	West Asia	It is bordered by Jordan in the east and Palestine, Israel in the west. It is known for high salinity.

9.	Aral Sea	Central Asia	Located between Uzbekistan and Kazakhstan. It is shrinking rapidly in recent years.
10.	Lake Baikal	Russia	It is the largest freshwater lake in Asia and deepest in the world.
11.	Caspian Sea	Eurasia	It is the largest lake in the world and is surrounded by Russia, Kazakhstan, Turkmenistan, Iran and Azerbaijan.

Interior Structure of the Earth

Structure of the Earth

Crust

- The crust is the outermost brittle solid part of Earth ranging from 5 – 70 km.
- The Crust can be divided into:

1. Continental Crust: Mean thickness is around 30 km, made of SIAL (Silica and Aluminium) and is thicker than Oceanic crust. Its density is around at 2.7 g/cm^3
2. Oceanic Crust: Mean thickness is around 5 km made of SIMA (Silica and Magnesium). Oceanic crust is *basaltic* in origin and relatively of *younger age* than the continental crust. The basaltic crust is denser at 3.0 g/cm^3

Mantle

- They extend up to 2890 km.
- **Asthenosphere:** The upper portion of the mantle which extends up to around 400 km and the main source of Magma.
- The density of mantle is 3.4 g/cm^3
- The lower mantle is in solid state which extends up to the Core-Mantle boundary. This layer is called as the D″ (pronounced dee-double-prime) layer.

Note:

- The Crust and Upper part of Mantle combined called as Lithosphere.

Core

- The Core extends to 2870 – 6370 km.
- It is divided into
    1. Liquid Outer Core
    2. Solid Inner Core: Made of NIFE – Nickel and Ferrous.

Note: Inner core rotates slightly faster than the rest of the planet.

- The density at the outer core is at 5.5 g/cm^3 which increase to 13 g/cm^3 in the inner core.

Note:

Dynamo theory: It suggests that convection in the outer core, combined with the Coriolis effect, gives rise to Earth's magnetic field.

Schematic sections through the Earth:

- Continental crust
- Oceanic crust
- Upper mantle
- Lower mantle

- Outer core
- Inner core

Boundaries in the Earth's interior

Conrad Discontinuity: Between Upper and lower Continental Crust.

Mohorovičić discontinuity, "Moho": Crust-Mantle boundary

Gutenberg discontinuity: Core-Mantle boundary

Lehmann discontinuity: Boundary between Outer and Inner Core

Important Facts

- Earth's radius: 6370 km.
- Earth diameter: about 12756 km at equator &
  about 12715 km at the poles.
- Crust: 0.5 % of the volume of the Earth
  Mantle: 83 % of the volume of the Earth
  Core: 16 % of the volume of the Earth
- Temperature, Pressure and Density increases with the increasing distance from the surface to the interior in deeper depths
- Gravitation force is greater near the poles and lesser near the equator
- Gravity anomaly is the difference in gravity value according to the mass of the material

Earthquake

- It is a shaking of the Earth which is caused due to the release of energy along a fault line.
- *Hypocentre or Focus:* The point where the energy of an earthquake is released

- *Epicentre:* It is the point on the surface, directly above the focus, the first one to experience the waves.

Earthquake waves are divided into

- Body waves: created due to the release of energy at the Hypocentre (focus). These waves travel in all directions through the body of the earth.
  It can be divided into:
  1. P-waves: They are called Primary waves. They move faster and are first to arrive at the surface. They are similar to sound waves and can travel through Solid, Liquid and Gaseous materials. P waves vibrate *parallel* to the direction of the wave which causes stretching and squeezing of the material
  2. S-waves: They are called Secondary waves which arrive at a time lag with Primary waves. They can travel *only* through Solid materials. S-waves vibrate in *perpendicular* to the wave direction which creates crests and troughs.
- Surface waves: the body waves interact with the surface rocks and generate surface waves which move along the surface rocks. They are the *last* to report on the Seismograph and are the most *destructive* They cause displacement of rocks and structural collapse. Surface waves vibrate *perpendicular* to the wave direction.

The velocity of the waves is directly proportional to the density of the material through which they travel. Differing density leads to reflection or refraction of the seismic waves.

Shadow Zone

Shadow zones are those specific areas where seismic waves are not reported. These zones are distinct for P and S-waves.

- Within the distance, up to 105° from epicentre has recorded the arrival of both waves.

- The zone between 105° - 145° from epicentre is identified as a shadow zone for both types of waves (P & S).
- Beyond 105° Zone does not receive S-waves. Thus the shadow zone of S-wave is much larger than P-wave.
- P-wave appears after 145° from the epicentre.

Types of Earthquake

- Tectonic: They are caused due to the sliding of rocks along a fault plane.
- Volcanic: they are confined to areas of active volcanoes. They are caused due to the explosion of volcanos and the corresponding tectonic disturbances.
- Collapse: they are caused in areas of intense mining activities where the roofs of underground mines collapse causing minor tremors
- Explosion: they are caused due to the explosion of chemical or nuclear devices.

Important facts

- A seismograph is an instrument that records the waves reaching the surface.
- Richter Scale: it is known as *Magnitude* scale as it measures the energy released during the quake. It is expressed in absolute numbers 0-10.
- Mercalli Scale: it is called an *Intensity* scale as it measures the visible damage caused by the earthquake. The range is from 1 – 12.

Tsunami

- These are long-wavelength, long-period sea waves or tidal waves produced by the sudden or abrupt displacement of large volumes of water (including when an earthquake occurs at sea.)
- The effect of Tsunami would occur only if the epicentre of the tremor is below oceanic waters and the magnitude is sufficiently high.

Landforms: Fluvial, Glacial, Karst, Coastal & Arid

Process	Upper or Youth Stage	Middle or Mature Stage	Lower or Senile Stage
Erosion	Vertical Erosion	Vertical and lateral erosion	Later deposition
Gradient	Steep valley sides – V-Shaped valley	U-Shaped valley	Almost base level
Deposition	Active erosion with very little deposition	Erosion equals deposition	Lot of deposition. Formation of Deltas near river mouth

Landforms	Rapids and waterfalls, V-shaped valleys, gorges, river capture	Meanders formation, ox-bow lakes, interlocking spurs, river cliffs and slip-off slopes	Floodplains, deltas, estuary, meanders and oxbow lakes

Glacial Landforms

Landforms of Highland Glaciation

1. Corrie, Cirque or Cwm: A steep horseshoe-shaped basin.
2. Aretes or Pyramidal Peaks: When two corries cut back on opposite sides of a mountain, knife-edged ridges are formed called Aretes.
3. Bergschrund: a deep crack at the head of the glacier.
4. U-Shaped glacial troughs: Valley formed due to the downward movement of glaciers.
5. Hanging valleys: A tributary valley ‘hangs’ above the main valley so that its stream plunges down as a waterfall.
6. Rock basins and rock steps: Excavation of bedrock due to the glacial erosion process
7. Moraines: Pieces of rock fragments which becomes stationary after the glacier melts. They may be lateral moraine, median moraine, terminal moraine etc.

Landforms of Glaciated Lowlands

1. Roche moutonnee: a resistant residual rock hummock.
2. Crag and Tail: a mass of rock with precipitous slope on the upstream side and softer leeward slope.

3. Boulder clay or Glacial till: an unsorted glacial deposit comprising a range of eroded materials forming a monotonous and featureless landform.
4. Erratics: Boulders of varying size transported by the ice and composed of materials entirely different from those of the region.
5. Drumlins: Oval, elongated whale-back hummocks. It is known as the Basket of Eggs topography.
6. Eskers: they are long, narrow, sinuous ridges composed of sand and gravel which mark the former sites of sub-glacial meltwater stream.
7. Terminal moraines: Coarse debris deposited at the edge of the ice sheet.
8. Outwash plains: fluvioglacial deposits washed out from the terminal moraines. They are called Knob and kettle topography.

Arid or Desert Landforms

Desert Landscape

1. Hamada or Rocky desert
2. Reg or stony desert
3. Erg or sandy desert
4. Badlands: Hills are eroded into gullies and ravines.
5. Mountain deserts: Dissected desert highlands due to erosion.

Erosional Landforms

1. Deflation hollows: Winds lower the ground by blowing away the unconsolidated materials.
2. Mushroom rocks: A mushroom rock, also called rock pedestal, or a pedestal rock, is a naturally occurring rock whose shape, as its name implies, resembles a mushroom.
3. Inselbergs: isolated residual hills rising abruptly from the level ground.
4. Demoiselles: These are rock pillars which stand as resistant rocks above soft rocks as a result of differential erosion of hard and soft rocks

5. Zeugens: A table-shaped area of rock found in arid and semi-arid areas formed when more resistant rock is reduced at a slower rate than softer rocks around it under the effects of wind erosion
6. Yardangs: Yardang, a large area of soft, poorly consolidated rock and bedrock surfaces that have been extensively grooved, fluted, and pitted by wind erosion. The rock is eroded into alternating ridges and furrows essentially parallel to the dominant wind direction.
7. Ventifacts or dreikanter: these are pebbles faceted by sand-blasting.

Depositional landforms

1. Dunes: Dunes are hills of sand formed by the accumulation of sand and shaped by the movement of winds.
    1. Barchans: Crescent-shaped dunes occurring transversely to the wind direction.
    2. Seifs: Longitudinal dunes, which are long, narrow ridges of sand, often over a hundred miles long lying parallel to the direction of prevailing winds.
2. Loess: the fine dust blown beyond the desert limits is deposited on neighbouring lands as loess.
3. Bolsons: It is a semiarid, flat-floored desert valley or depression, usually centred on a playa or salt pan and entirely surrounded by hills or mountains. It is a type of basin characteristic of basin-and-range terrain
4. Playas: an alkali flat or sabkha, a desert basin with no outlet which periodically fills with water to form a temporary lake.
5. Pediments: a broad, gently sloping expanse of rock debris extending outwards from the foot of a mountain slope, especially in a desert.
6. Bajadas: A bajada consists of a series of coalescing alluvial fans along a mountain front. These fan-shaped deposits form from the deposition of sediment within a stream onto flat land at the base of a mountain

Karst Topography

- Grykes/Clints: Clints are the blocks of limestone that constitute the paving, their area and shape are directly dependent upon the frequency and pattern of grykes. Grykes, or scailps, are the fissures that isolate the individual clints
- Swallow holes/Sink Holes (Dolines or Uvalas): A sinkhole is a depression or hole in the ground caused by some form of collapse of the surface layer.
- Stalactites/Stalagmites: A stalactite is an icicle-shaped formation that hangs from the ceiling of a cave, and is produced by the precipitation of minerals from water dripping through the cave ceiling. A stalagmite is an upward-growing mound of mineral deposits that have precipitated from water dripping onto the floor of a cave.
- Caverns: Large-scale features where caves are formed due to the dissolution of limestones. May include Poljies.

Coastal Landforms

Erosional Features

1. Capes and Bays: On exposed coasts, softer rocks are worn back into inlets, coves or bays due to erosion while the harder rocks persist as headlands, promontories or capes.
2. Cliffs and wave-cut platforms:
3. Cave, arch, stack and slump
4. Geos and gloups: Where a cave roof collapses, a narrow inlet or geo is formed.

Depositional Features

1. Beaches: Sands and gravels loosened from the land are moved by waves to be deposited along the shore as beaches.
2. Spits and bars: Deposition of material piling up into a ridge forming a spit with one end attached to the land and the other end projecting into the sea. When the ridge of shingle is formed across the mouth of a river, it is called a bar.

3. Marine dunes and dune belts: Due to on-shore wind's force, a large amount of coastal sand is driven landwards forming marine dunes.

- Coastline of Submergence
    1. Ria coasts: Formed in upland coastal regions where the mountains run in right angles to the sea where the lower valley is submerged due to deglaciation.
    2. Fiord coasts: Submerged U-shaped glacial troughs.
    3. Dalmatian coasts: Longitudinal coasts where mountains run parallel to the coast.
    4. Estuarine coasts: In submerged lowlands, the mouths of rivers are drowned so those funnel-shaped estuaries are formed.
- Coastline of Emergence
    1. Uplifted lowland coast: Smooth, gently sloping coastal lowland is formed with shallow lagoons, salt-marshes and mudflats.
    2. Emergent upland coast: Faulting or earth movement thrust up coastal plateau so that whole region is raised, with consequent emergent features such as a steep cliff, deep off-shore waters etc.

Climatology: Classification of Clouds

Types of Clouds

Various kinds of clouds exist. They vary in size, shape, or colour from each other.

They are basically classified into 2 types:

1. Based on their shape
2. Based on their altitude

Clouds on the basis of there shapes:

1. Cirrus

2. Cumulus
3. Stratus

Cirrus Clouds:

- Cirrus is an atmospheric cloud generally characterized by thin, wispy strands. It derives its name from the Latin word cirrus, which means a ringlet or curling lock of hair.

Cumulus Clouds:

- Cumulus clouds have flat bases and are as "puffy", "cotton-like" or "fluffy" in appearance.
- Their name derives from the Latin cumulo-, meaning heap or pile.

Stratus Clouds:

- Stratus clouds have a uniform foundation of horizontal layers. The word "stratus" is derived from the Latin prefix "strato-", meaning "layer".
- The term stratus represents flat, hazy, featureless clouds of low altitude varying in colour from dark grey to white.

Clouds on the basis of their altitude:

1. Low Clouds
2. Middle Clouds
3. High Clouds

Low Clouds

- They are situated below 6,500 feet or 2,000 meters.
- Low clouds are also known as Stratus Clouds.
- They appear dense, dark, and rainy (or snowy) and can also be cottony white clumps interspersed with blue sky.

Middle Clouds

- They develop between 6,500 feet and cirrus level or from 2000 to 6000 metres.
- They are known as “Alto” clouds.
- They frequently indicate an approaching storm.
- They may sometimes produce Virga, which is a type of rain or snow that does not reach the ground.

High Clouds

- They are situated above 6000 metres or 20,000 feet.
- They are widely known as Cirrus Clouds.
- They usually have a thin structure and are made up of ice.
- They do not produce rain and hence indicate fair weather.

Climate and its Factors

The Atmosphere

- Gases and vapours form the atmosphere. When they receive solar energy, it gives rise to ‘Climate’. Thus, the climate is defined as the *average atmospheric conditions of an area over a considerable period of time*. When this consideration of atmospheric condition is about certain place at certain time then it is called weather.
- There are five layers of the atmosphere. Those are:

Elements of climate

1. Temperature
2. Precipitation
3. Rainfall
4. Pressure and planetary winds
5. Land and sea breezes

6. Cyclonic activity

Temperature

Temperature decides the following factors-

- Amount of water vapour, the moisture-carrying capacity of the air.
- Rate of evaporation and condensation, governing degree of stability of the atmosphere.
- Relative humidity affecting nature and types of cloud formation and precipitation.

Factors that affect temperature:

1. Latitude – Temperature diminishes from equatorial regions to poles because of the earth's inclination. Direct rays travel a shorter distance and heat up smaller surface whereas oblique rays travel a longer distance and heat up large area.
2. Altitude – Temperature of air decreases with increasing height above sea level. This rate of decrease in temperature with increasing altitude is called as 'Lapse rate'. This rate is not constant. The lapse rate is greater by day than at night, greater on elevated highlands than on level plains.
3. Continentality – Land surface gets heated more quickly than water surface because of the higher specific heat of the water. (Specific heat is energy required to raise the temperature of giving volume by 1 degree Fahrenheit)
4. Ocean currents and winds – Both transport their heat or coldness into adjacent regions. On-shore winds carry ocean currents landwards thereby affecting the temperature of an area. Local winds also change temperature according to their own temperature.
5. Slope, shelter and aspect – Steep slope show a rapid change in temperature than a gentle slope. Sheltered slope (north facing) has less temperature than sunny slope (south-facing).
6. Natural vegetation and soil – Thick vegetation has less temperature than open spaces. Colour of soil (light or dark) give rise to slight variation in temperature.

Precipitation

- When condensation occurs at ground level, haze, mist or fog are formed.
- When condensation of water vapour takes place in the atmosphere at a temperature below freezing point, snowfall occurs.
- When moist air ascends rapidly cooler layers of the atmosphere, water droplets freeze and fall to the earth as hail or hailstone.
- Frozen raindrops melt and refreeze forming sleet.

Rainfall

- Convectional rain: When earth surface gets heated by conduction, it comes into contact with air. This heated air contains the capacity to hold moisture. This air rises up and cools down. When saturation point is reached, rainfall occurs. In regions with high relative humidity, this moisture carrying capacity is huge, resulting in torrential downpours. Convection current goes through the process of expansion, cooling, saturation and finally condensation.
- Orographic rain: When moist air ascends the windward side of a mountain barrier, it cools down until complete saturation and orographic clouds form. Precipitation occurs on the upwind side. Leeward side acts as a rain shadow area where usually low precipitation occurs.
- Cyclonic or frontal rain: When air masses with different temperatures and different physical properties meet, warmer air rises over cooler air. In ascent, air expands and cools. Condensation takes place in the form of frontal rainfall.

Pressure and planetary winds

World pressure belts: Circulation of air over the surface of the earth caused by the difference in pressure forms pressure belts. Those are:

- Equatorial Low-Pressure Belt- Between 5 degrees north and south, also called as Doldrums. It is the zone of wind convergence.

- Sub-Tropical High-Pressure Belt- Between 30 degrees north and south, also referred to as Horse Latitudes. It is the zone of wind divergence, with cyclonic activity.
- Temperate Low-Pressure Belt- Between 60 degrees north and south, also called as sub-polar low-pressure areas. It is the zone of wind convergence, with anticyclonic activity.
- Polar High-Pressure Belt- At 90 degrees north and south. Here the temperature is permanently low.

Planetary winds

Within the pattern of permanent pressure belts, winds blow from high pressure to low-pressure belts, as planetary winds. Trade winds, westerlies and polar easterlies flow under the effect of Coriolis force.

Land and sea breezes

- Differential heating of land and sea is basic factor responsible for monsoon. Land breeze forms a diurnal rhythm and sea breeze form a seasonal rhythm.

Cyclonic activity

- Tropical cyclones (as named in the Indian ocean), typhoons in China sea (tropical latitudes), hurricanes in West Indian island in Caribbean and tornadoes in Guinea lands of West Africa and southern USA and willy-willies in north-western Australia occurs.

List of Major Straits of the World

Sr. No.	Strait Name	Remarks

1	PALK STRAIT	It connects the Bay of Bengal with the Gulf of Mannar.
2	STRAIT OF GIBRALTAR	It connects the Atlantic Ocean with the Mediterranean Sea and separates Gibraltar and Spain in the north from Morocco in the south.
3	DUNCAN PASSAGE	It is a strait separating Rutland to the North and Little Andaman to the south.
4	NINE DEGREE CHANNEL	This Channel connects Laccadive Islands of Kalapeni, Suheli Par & Maliku Atoll.
5	TEN DEGREE CHANNEL	It separates the Andaman Islands from the Nicobar Islands in the Bay of Bengal.
6	STRAIT OF HORMUZ	It lies between UAE and Oman on the south-west and Iran on the north-east. It connects the Persian Gulf with the Gulf of Oman. It is strategically very important as it controls the oil trade from the Gulf countries.

7	STRAIT OF BAB-EL-MANDAB	It connects the Red Sea with the Gulf of Aden and separates Asia from Africa.
8	MALACCA STRAIT	It separates Peninsular Malaysia from Sumatra island of Indonesia. It connects the Pacific Ocean to the Indian Ocean. It provides a shorter route from the Andaman Sea to the South China Sea and therefore is the busiest waterway of the world.
9	SUNDA STRAIT	It connects the Java Sea to the Indian Ocean and separates Java island of Indonesia from its Sumatra island.
10	BERING STRAIT	It separates Russia and Alaska and connects the East Siberian Sea in the Arctic Ocean with the Bering Sea in the Pacific Ocean.
11	ORANTO STRAIT	Connect the Adriatic Sea with the Ionian Sea and separates Italy from Albania.

12	BOSPHORUS STRAIT	Connects the Black Sea with the Sea of Marmara. It is the world's narrowest navigable strait.
13	DARDANELLES STRAIT	It lies between the Asian Turkey and European Turkey and connects the Aegean Sea with the Sea of Marmara. It is a vital link of transportation between the Black Sea and the Mediterranean Sea.
14	LA PAROUSES STRAIT	It lies between the Sakhalin island and Hokkaido island of Japan and connects the Sea of Okhotsk with the Sea of Japan.
15	STRAIT OF TARTARY/TARTAR	It separates Russian Island Sakhalin from Mainland Asia. It connects the Sea of Okhotsk in the north to the Sea of Japan in the south.
16	TSUGARU STRAIT	It lies between Hokkaido and Honshu in northern Japan and connects the Sea of Japan to the Pacific Ocean.

17	TAIWAN STRAIT OR FORMOSA STRAIT	It lies between Taiwan (Republic of China) and Mailand China (People's Republic of China). It connects South China Sea with the East China Sea.
18	MOZAMBIQUE STRAIT	It lies in the Indian Ocean between Mozambique from Madagascar.
19	YUCATAN STRAIT	It lies between Mexico and Cuba and connects the Gulf of Mexico with the Caribbean Sea.
20	FLORIDA STRAIT	It lies between the Florida state of the USA and Cuba.
21	HUDSON STRAIT	It connects the Hudson Bay (Canada) with the Labrador Sea.
22	DAVIS STRAIT	It connects the Baffin Bay with the Atlantic Ocean.
23	COOK STRAIT	It lies between the North and the South islands of New Zealand and connects the Tasman Sea with the South Pacific Ocean.

24	BASS STRAIT	It separates Tasmania from the Australian mainland.
25	TORRES STRAIT	It lies in the Pacific Ocean, between Cape York Peninsula of Australia and Papua New Guinea
26	MAGELLAN STRAIT	It separates Mainland South America from Tierra Del Fuego (an archipelago off the southern-most tip of the South American Mainland)
27	DOVER STRAIT	It lies in the narrowest part of the English Channel, connecting it with the North Sea. It separates Britain from Continental Europe.
28	NORTH CHANNEL	It separates Ireland from Scotland and connects the Irish Sea with the Atlantic Ocean.

gradeup

To help students in their exam preparation Gradeup brings to you:

- **Exam Specific Notes (Hindi & Eng)**
- **Daily Quizzes (Hindi & Eng)**
- **Monthly Current Affairs Digest (Hindi & Eng)**
- **Free Live Classes for Various Exams (Hindi & Eng) and many more.**