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Indian and World Geography

[A complete book for competitors]

Prepared by – <http://www.developindiagroup.co.in/>

By – D.S. Rajput

{This book is very useful for those competitors who appearing in the Civil Services, State PSCs, Bank PO, SSC Exams, NDA, CDS, Railway, and others oneday exams.}

Indian Geography

Geographical Location of India

Indian Geographical Location

- Lying between latitude 4° N to 37°6' N and from longitude 68°7' E to 97°25' E, the country is divided into almost equal parts by the Tropic of Cancer (passes from Jabalpur in MP).
- The southernmost point in Indian Territory, (in Great Nicobar Island) is the Indira Point (6°45'), while Kanyakumari, also known as Cape Comorin, is the southernmost point of Indian mainland. The country thus lies wholly in the northern and eastern hemispheres.
- The 82°30' E longitude is taken as the Standard Time Meridian of India, as it passes through the middle of India (from Naini, near Allahabad).

Area Geography & Boundaries Geography

1. India stretches 3,214 km from North to South & 2,933 km from East to West.
2. **Geography Area of India** : 32,87,263 sq. km. Accounts for 2.4% of the total world area and roughly 16% of the world population.
3. Mainland India has a coastline of 6,100 km. Including the Lakshadweep and Andaman and Nicobar Islands, the coastline measures about 7516.6 km.
4. In India, of the total land mass:
 - **Plains Geography**: 43.3%
 - **Plateaus**: 27.7%
 - **Hills**: 18.6%
 - **Mountains Geography**: 10.7%
5. In the South, on the eastern side, the Gulf of Mannar & the Palk Strait separate India from Sri Lanka.
6. Total land neighbours: 7 (Pakistan, Afghanistan, China, Nepal, Bhutan, Bangladesh and Myanmar).
7. India's Islands include the Andaman & Nicobar Islands in Bay of Bengal and Lakshadweep, Minicoy & Amindive Islands in the Arabian Sea.

Physiography of India

Indian Physiography

Physiographically, India can be divided into 3 units:

1. Mountains in the North
2. Plains in the Northern India & the Coast
3. Plateau region of the South

To these can be added the fourth, namely, the coasts and islands

Mountains in North India

The Himalayas in India

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Means 'Abode of Snow'. They are one of the youngest fold mountain ranges in the world and comprise mainly sedimentary rocks.

They stretch from the Indus River in the west to the Brahmaputra River in the east. Total length is about 5000 km. The width of the Himalayas varies from 500 km in Kashmir to 200 km in Arunachal Pradesh. Their average height is 2000m.

The Eastern Himalayas-made up of Patkai Hills, Naga Hills, Mizo Hills and the Garo, Khasi and Jaintia Hills-are also known as Purvanchal.

The Pamir, popularly known as the Roof of the World, is the connecting link between the Himalayas and the high ranges of Central Asia.

Can be divided into 3 parallel or longitudinal zones, each with separate features.

The Great Himalayas or The Himadri

- Average elevation extends upto 6000m & some of the world's highest peaks are here :

| Mt Everest (or Sagarmatha or Chomo Langma) | 8850 m (in Nepal) |
|--|-------------------|
| Mt Kanchenjunga | 8598 m (in India) |
| Mt Makalu | 8481 m (in Nepal) |
| Mt Dhaulagiri | 8172 m (in Nepal) |
| Mt Cho Oyu | 8153m (in Nepal) |
| Mt Nanga Parbat | 8126m (in India) |
| Mt Annapurna | 8078 m (in Nepal) |
| Mt Nando Devi | 7817 m (in India) |

- There are few passes and almost all of them have a height above 4,500 m. they include Shipki La and Bara Lapcha La in Himachal Pradesh, Burzil and Zoji La in Kashmir, Niti, Lipulekh and Thag La in Uttarakhand, and Jelep La and Nathu La in Sikkim.

Lesser Himalayas or The Himachal

- Average height of mountains is 3700 – 4500 m.
- Mountains and valleys are disposed in all direction (mountains rising to 5000 m and the valleys touching 1000 m).
- **Its important ranges are** : Dhauladhar, Pir Panjal, Nag Tibba, Mussoorie.
- **Important hill resorts are** : Shimla, Chhail, Ranikhet, Chakrata, Mussoorie, Nainital, Almora, Darjeeling.

Outer Himalayas or The Shiwaliks

- Lowest range (average elevation is 900-1200 m).
- Forms the foothills and lies between the Lesser Himalayas and the plains. It is the newest range.

Trans – Himalayan Zone

- This range lies to the north of the Great Himalayas. It has some important ranges like Karakoram, Laddakh, Zaskar, etc. the highest peak in this region is K2 or Godwin Austin (8611m, in Pak occupied Kashmir). Other high peaks are Hidden Peak (8068 m), Broad Peak (8047 m) and Gasherbrum II (8035 m).
- The longest glacier is Siachin in the Nubra valley, which is more than 72 km long (biggest glacier in the world). Biafo, Baltaro, Batura, Hispar are the other important glaciers in this region.
- This area is the largest snow-field outside the Polar Regions.

Peninsular Mountains

- While the Himalayas are Fold Mountains, they are not.
- **The Aravalli Mountains (Rajasthan)** : World's oldest. Guru Shikhar is the highest peak on which Mount Abu (1,722 m) is situated.
- The Vindhya Mountains
- The Satpura Mountains (highest point at Dhupgarh [1,350 m] near Pachmarhi)
- **The Western Ghats or Sahyadris** : Average height 1200mtrs, 1600km long. Its southern part is separated from the main Sahyadri range by Palghat Gap (link between Tamil Nadu & Kerala). Other passes are Thalghat (connects Nasik to Mumbai) and Bhorghat (connects Pune to Mumbai).
- **The Eastern Ghats (Highest peak** : Mahendra Giri (1501 m)).
- **The Nilgiris or The Blue Mountains** : Meeting place of the Western and the Eastern Ghats. Two highest peaks are Dodda Betta and Makurti.
- The highest peak of Peninsular India is Anaimudi (2695 m) in Anaimalai Hills.
- Cardamom hills or Ealaimalai is the southernmost mountain range of India.

Facts about position of states

- UP borders the maximum number of States-8 (Uttarakhand, HP, Haryana, Rajasthan, MP, Chhattisgarh, Jharkhand, Bihar). After UP is Assam, which touches the border of 7 States.
- **Tropic of Cancer passes through 8 States** : Gujarat, Rajasthan, MP, Chhattisgarh, Jharkhand, WB, Tripuro, Mizoram.
- **Indian Standard Meridian passes through 5 States** : UP, MP, Chhattisgarh, Orissa, AP.
- **9 States form the coast of India. They are** : Gujarat, Maharashtra, Goa, Karnataka, Kerala, Tamil Nadu. Andhra Pradesh, Orissa and West Bengal.

- 2 Union Territories, viz. Daman & Diu and Pondicherry are also on the coast.
- The Union Territories of Andaman and Nicobar Islands and Lakshadweep are made up of islands only.

The Plains of India

- To the south of the Himalayas and to the north of the Peninsula lies the great plains of North India. They are formed by the depositional works of three major river systems, Indus, Ganga and Brahmaputra. The vast plains of north India are alluvial in nature and the westernmost portion is occupied by the Thar Desert.
- The thickness of the alluvium is maximum in the Ganga plains and minimum in the Western Plains.
- In the Kerala plains are the backwaters or 'Kayak', which are the shallow lagoons or inlets of the sea, lying parallel to the coastline. The largest among these is the Vembanad Lake.
- The plains consist of four divisions:
 - **Bhabar** : Along the foothills of Shiwaliks. Highly porous
 - **Tarai** : Re-emergence of streams. Zone of excessive dampness
 - **Bhangar** : Older alluvium of the plains. Studded with calcareous formations called 'kankar'
 - **Khadar** : New alluvium and forms the flood plains along the river banks.

Peninsular Plateau of India

- Spreads south of the Indo-Gangetic plains flanked by sea on three sides. This plateau is shaped like a triangle with its base in the north. The Eastern Ghats and the Western Ghats constitute its eastern and western boundaries, respectively.
- Narmada, which flows through a rift valley, divides the region into two parts: The Malwa Plateau in the north & the Deccan Plateau in the south.
- Most of the rocks are of the igneous type.
- Vindhya Plateau is situated south of Malwa plateau.
- Chhota Nagpur Plateau lies to the west of Bengal basin, the largest and most typical part of which is the Ranchi plateau.
- The Deccan Plateau is the largest plateau in India. It is made up of lava flows in the Cretaceous-Eocene era through the fissure eruptions.

Islands of India

- **Total coastline of India** : 7516 km. Longest coastline: Gujarat (Second longest is of Andhra Pradesh).
- Indian territorial limits include 248 islands:

The Andaman and Nicobar Group

- Andamans is a group of 204 islands of which the largest is Middle Andaman.
- The Andamans are believed to be extensions of mountains system in the N.E. part of the country.
- Saddle Peak (737 m) in N.Andaman is the highest peak.
- The Nicobars is a group of 19 islands of which the largest is Great Nicobar. Most of them are volcanic in nature.
- Great Nicobar is the southernmost island and is only 147 km away from Sumatra island of Indonesia.
- **Volcanic Islands**: Barren and Narcondam Islands. Barren is in the process of eruption these days after lying dormant for 200 years.

The Arabian Sea Group

- All the islands in the Arabian Sea (Total 25) are coral islands and are surrounded by Fringing Reefs (North : Lakshadweep, South: Minicoy).

Note :

- Ten Degree Channel separates Andamans from Nicobars (Little Andaman from Car Nicobar)
- Duncan Passage lies between South Andaman and Little Andaman.
- Nine Degree Channel separates Kavaratti from Minicoy Island.
- Eight Degree Channel separates Minicoy Island (India) from Maldives.

Rivers of India

In India, the rivers can be divided into two main groups:

1. Himalayan Rivers
2. Peninsular Rivers

Himalayan Rivers of India

In this three major river systems are there:

The Indus System

- It has a total length of 2880 km (709 km in India). Rises in Tibet (China) near Mansarovar Lake.
- In Jammu and Kashmir, its Himalayan tributaries are: Zaskar, Dras, Gartang, Shyok, Shigar, Nubra, Gilgit, etc.

- Its most important tributaries, which join Indus at various places, are: Jhelum (725 km), Chenab (1800 km), Ravi (720 km), Beas (470 km) & Sutlej (1050 km).
- Sources: Jhelum from Verinag (SE Kashmir), Chenab from Bara Lacha Pass (Lahaul-Spiti, H.R), Ravi from Kullu Hills near Rohtang Pass in H. R, Beas from a place near Rohtang Pass in H.E and Satluj from Mansarovar – Rakas lakes in W. Tibet.
- In Nari Khorsan province of Tibet, Satluj has created an extraordinary canyon, comparable to the Grand Canyon of Colorado (US).
- According to the Indus Water Treaty signed between India and Pakistan in 1960, India can utilize only 20% of the total discharge of Indus, Jhelum and Chenab.

The Ganga System

- It is 2525 km long of which 1450 km is in Uttarakhand and UP, 445 km in Bihar and 520 km in West Bengal.
- The Ganga, the head stream is constituted of two main rivers – Bhagirathi and Alaknanda, which combine at Devprayag to form Ganga.
- Before Alaknanda meets Bhagirathi at Devprayag, Mandakini meets Alaknanda at Rudraprayag.
- Sources: Bhagirathi from Gaumukh, Alaknanda from Badrinath, Mandakini from Kedarnath (all from Uttarakhand).
- Yamuna (1375 km) is its most important tributary (on right bank). It rises at the Yamunotri glacier in Uttarakhand. It runs parallel to Ganga for 800km and joins it at Allahabad. Important tributaries of Yamuna are Chambal (1050 km), Sind, Betwa (480 km) and Ken (all from south).
- Apart from Yamuna, other tributaries of Ganga are Ghaghra (1080 km), Son (780 km), Gandak (425 km), Kosi (730 km), Gomti (805 km), Damodar (541 km). Kosi is infamous as 'Sorrow of Bihar', while Damodar gets the name 'Sorrow of Bengal' as these cause floods in these regions.
- Hooghli is a distributory of Ganga flowing through Kolkata.

The Brahmaputra system

- It has a total length of 2900 km. It rises in Tibet (from Chemayungdung glacier), where it is called Tsangpo, and enters the Indian territory (in Arunachal Pradesh) under the name Dihang.
- Important Tributaries: Subansiri, Kameng, Dhansiri, Manas, Teesta.
- In Bangladesh, Brahmaputra is known by the name of Jamuna while Ganga gets the name Padma. Their combined stream is known as Padma only. Meghna is the most important distributory before it enters the Bay of Bengal.
- The combined stream of Ganga and Brahmaputra forms the biggest delta in the world, the Sundarbans, covering an area of 58,752 sq. km. Its major part is in Bangladesh.
- On Brahmaputra is the river island, Majuli in Assam, the biggest river island in the world.
- Brahmaputra, or the Red River, is navigable for a distance of 1384 km up to Dibrugarh and serves as an excellent inland water transport route.

Rivers of the Peninsula in India

- Different from the Himalayan rivers because they are seasonable in their flow (while Himalayan rivers are perennial).
- They can be divided into two groups:

A. East Flowing Rivers of India (or Delta forming rivers)

- **Mahanadi River (858 km)** : Rises in Raipur distt. in Chhatisgarh. Main tributaries: Ib, Seonath, Hasdo, Mand, Jonk, Tel, etc.
- **Godavari River (1465 km)** : Also called Vriddha Ganga or Dakshina Ganga. It is the longest peninsular river. Rises in Nasik. Main tributaries: Manjra, Penganga, Wardha, Indravati, Wainganga, Sabari, etc.
- **Krishna River (1327 km)** : Rises in Western Ghats near Mahabaleshwar. Main tributaries: Koyna, Dudhganga, Panchganga, Malprabha, Ghatprabha, Bhima, Tungabhadra, Musi, etc.
- **Cauvery River (805 km)** : It is the largest peninsular river (maximum amount of water). Infact, it is the only peninsular river which flows almost throughout the year. Known as the 'Ganga of the South'. It rises from the Brahmagir range of Western Ghats. Main tributaries: Hemavati, Lokpawni, Shimsa. It is less seasonal than others as its upper catchment area receives rainfall during summer by the S.W monsoon and the lower catchment area during winter season by the retreating N.E. monsoon. Its 90% – 95% irrigation and power production potential is already being harnessed.
- **Swarnarekha River (395 km) and Brahmani (705 km)** : Rises from Ranchi Plateau.

B. West Flowing Rivers in India

- **Narmada River (1057 km)** : Has only 1/10th part in Gujarat. Rises in Amarkantak Plateau and flows into Gulf of Khambat. It forms the famous Dhuhan Dhar Falls near Jabalpur. Main tributaries: Hiran, Burhner, Banjar, Shar, Shakkar, Tawa, etc.
- **Tapti River (724 km)** : Rises from Betul distt in MR Also known as twin or handmaid of Narmada. Main tributaries: Purna, Betul, Arunavati, Ganjal, etc.
- **Sabarmati River (416 km)** : Rises from Aravallis in Rajasthan.
- **Mahi River (560 km)** : Rises from Vindhya in MR
- **Luni River (450 km)** : Rises from Aravallis. Also called Salt River. It is finally lost in the marshy grounds at the head of the Rann of Kuchchh.
- Sharavati is a west flowing river of the Sahyadris. It forms the famous Jog or Gersoppa or Mahatma Gandhi Falls (289 m), which is the highest waterfall in India.

Inland Drainage

- Some rivers of India are not able to reach the sea and constitute inland drainage. Ghaggar (494 km) is the most important of such drainage.
- It is a seasonal stream which rises on the lower slopes of the Himalayas and gets lost in the dry sands of Rajasthan near Hanumangarh. It is considered the old Saraswati of the Vedic times.

Note:

- The largest man-made lake in India is Indira Sagar Lake, which is the reservoir of Sardar Sarovar Project, Onkareshwar Project and Maheshwar Project in Gujarat-MP.

- Chilka Lake (Orissa) is the largest brackish water lake of India. Otherwise also, it is the largest lake of India.
- Wular Lake (J & K) is the largest fresh water lake of India. Dul Lake is also there in J & K.
- From Sambhar and Didwana Lake (Rajasthan), salt is produced.
- Other important lakes are Vembanad in Kerala and Kolleru & Pulicat in AP.
- The three important Gulfs in the Indian Territory are:
- **Gulf of Kuchch (west of Gujarat)** : Region with highest potential of tidal energy generation
- **Gulf of Cambay or Gulf of Khambat (Gujarat)** : Narmada, Tapi, Mahi and Sabarmati drain into it.
- **Gulf of Mannar (south east of Tamil Nadu)** : Asia's first marine biosphere reserve.

Important River Valley Projects of India

| | |
|-------------------------|--|
| Bhakra Nangal Project | On Satluj in Punjab. Highest in India. Ht 226 m. Reservoir is called Gobind Sagar Lake |
| Mandi Project | On Beas in H.P |
| Chambal Valley Project | On Chambal in M.P & Rajasthan. 3 dams are there: Gandhi Sagar Dam, Rana Pratap Sagar Dam and Jawahar Sagar Dam |
| Damodar Valley Project | On Damodar in Bihar. Based on Tennessee Valley Project, USA |
| Hirakud | On Mahanadi in Orissa. World's longest dam: 4801 m |
| Rihand | On Son in Mirzapur. Reservoir is called Govind Vallabh Pant Reservoir |
| Kosi Project | On Kosi in N. Bihar |
| Mayurkashi Project | On Mayurkashi in W.B |
| Kakrapara Project | On Tapi in Gujarat |
| Nizamsagar Project | On Manjira in A.P |
| Nagarjuna Sagar Project | On Krishna in A.P |
| Tungabhadra | On Tungabhadra in A.P & Karnataka |

| | |
|--------------------------------|--|
| Shivasamudram Project | On Cauvery in Karnataka |
| Tata Hydrel Scheme | On Bhima in Maharashtra |
| Sharavathi Hydrel Project | On Jog Falls in Karnataka |
| Kundah & Periyar Project | In TN |
| Farakka Project | On Ganga in W.B. Apart from power and irrigation it helps to remove silt for easy navigation |
| Ukal Project | On Tapi in Gujarat |
| Mahi Project | On Mahi in Gujarat |
| Salal Project | On Chenab in J & K |
| Mata Tila Multipurpose Project | On Betwa in U.P & M.P |
| Thein Project | On Ravi, Punjab |
| Pong Dam | On Beas, Punjab |

The Climate of India

India has tropical monsoon type of climate. It is greatly influenced by the presence of the Himalayas in the north as they block the cold air masses from Central Asia. It is because of them only that the monsoons have a watershed in India.

- The Tropic of Cancer divides India into two almost equal climatic zones, namely, the northern zone and the southern zone. The warm temperate or the subtropical climate of the northern zone gives it cold winter seasons and the hot summer seasons.
- The southern tropical climatic zone is warmer than the north and does not have a clear-cut winter season.
- The northern zone does not have the midday sun vertically overhead during any part of the year; the southern zone has the midday sun almost vertically overhead at least twice every year.

Climate Seasons in India

- In India, the year can be divided into four seasons, resulting from the monsoons which occur mainly due to the differential heating of land and movement of the sun's vertical rays.
- The vertical rays of the sun advance towards Tropic of Cancer from mid-March, due to which hot and dry weather arrives. As temperatures rise over most of northern and Central India, a vast trough of low pressure is created. The highest temperature experienced in South is in April while in North it is in May and June.
- This part of the year is marked by a dry spell and the north-western parts of the country experience hot, dry winds, called loo. In this period, the country also experiences storms / dust storms at various places.
 1. Tornado like dust storms in Punjab and Haryana, called 'Andhis' in UP and 'Kalbaisakhis' in West Bengal. They involve strong convective movements causing some precipitation.
 2. The 'Norwesters' originate over the Chhotanagpur Plateau and blow in the north-east direction which brings about 50 cm of rainfall in Assam and about 10 cm rainfall in West Bengal and Orissa. This rainfall is very useful for Assam tea and spring rice crops of West Bengal.
 3. Similarly, 'Cherry Blossoms' are there in Karnataka, beneficial to coffee plantation and 'Mango showers' in elsewhere South India, which are beneficial to mango crops.
- This weather is followed by hot, wet weather from June to September. In May, the south – west monsoon sets in. The normal dates of onset of the monsoon are May 20 in the Andaman and Nicobar Islands, June 3 in the Konkan, June 15 in Kolkata and June 29 in Delhi.
- The south – west monsoon enters the country in two currents, one blowing over the Bay of Bengal and the other over the Arabian Sea. This monsoon causes rainfall over most of the country (except Tamil Nadu and Thar Desert area). The S.W monsoon entering from Western Ghats causes heavy rainfall over Kerala coast, but Tamil Nadu falls on the leeward side. In the Thar area, the winds blow parallel to the Aravallis and do not cause rain. The Bay of Bengal current causes heavy rainfall in the north east parts of the country and a part of it turns west along the Himalayas over the Indo-Gangetic plains causing rainfall in this region. But the Bay of Bengal current, by the time it reaches W Rajasthan, runs out of moisture.
- The Bay of Bengal branch after crossing the deltaic region enters the Khasi valley in Meghalaya and gets entrapped in it due to funnel shape of the region. It strikes Cherrapunji in a perpendicular direction causing heavy rainfall in Mawsinram (Approx. 1400 cm).

- From mid-Sept to mid-Dec, the monsoon retreats. As the sun's vertical rays start shifting towards the Tropic of Capricorn, the low pressure area starts moving south and winds finally start blowing from land to sea. This is called north-east monsoon. The withdrawal of monsoon is a much more gradual process than its onset. It causes rainfall in Tamil Nadu as the winds pick some moisture from Bay of Bengal. This explains the phenomenon why Tamil Nadu remains dry when the entire country receives rain and why it gets rain when practically the entire country is dry.
- The cold and dry weather starts in early December. In this, the average temperature in south is 24-25c, and while in the north is 10-15c. In the latter part of December and in January, the dry spell is broken by the westerly depressions (temperate cyclones) from Mediterranean Sea, which causes some rain in north-west India.
- Almost all the precipitation in India is caused by the monsoons and it is primarily orographic in nature. Cyclonic storms provide only a little rain, mainly in the north.

Climatic Regions of India

India can be divided into a number of climatic regions.

- **Tropical Rain Forests in India** : Found in the west coastal plains, the Western Ghats and parts of Assam. Characterized by high temperatures throughout the year. Rainfall, though seasonal, is heavy- about 200 cm annually during May-November.
- **Tropical Savanna Climate** : In most of the peninsula region except the semi-arid zone in the leeward side of the Western Ghats. It is characterized by long dry weather throughout winter and early summer and high temperature (above 18.2c); annual rainfall varies from 76 cm in the west to 150 cm in the east.
- **Tropical Semi-Arid Steppe Climate** : It prevails in the rain-shadow belt running southward from Central Maharashtra to Tamil Nadu in the leeward side of the Western Ghats and the Cardamom Hills. It is characterized by low rainfall which varies from 38 cm to 80 cm, high temperature between 20 and 30.
- **Tropical and Subtropical Steppes** : Large areas in Punjab, Haryana and Kutch region. Temperature varies from 12-35c. The maximum temperature reaches up to 49c. The annual rainfall, varying from 30.5-63.5 cm, is also highly erratic.
- **Tropical desert** : This climate extends over the western parts of Banner, Jaisalmer and Bikaner districts of Rajasthan and parts of Kutch. It is characterized by scanty rainfall (30.5 cm), which is highly erratic. Rains are mostly in the form of cloud-burst. Mean monthly temperature is uniformly high (about 35c).
- **Humid Subtropical Climate with Dry Winters** : This area includes south of the Himalayas, east of the tropical and subtropical steppes and north of tropical savannah. Winters are mild to severe while summers are extremely hot. The annual rainfall varies from 63.5 cm to more than 254 cm, most of it received during the south west monsoon season.
- **Mountain Climate** : Such type of climate is seen in mountainous regions which rise above 6,000 m or more such as the Himalayas and the Karakoram Range.

Soils in India

Indian Council of Agricultural Research (ICAR) has divided Indian soils into eight major groups:

Alluvial Soil in India

- They are by far the largest and the most important soil group of India. They are composed of sediments deposited by rivers and the waves. Their chemical composition makes them one of the most fertile in the world. Usually deficient in nitrogen and humus (thus fertilizers are needed).
- Occupy the plains (from Punjab to Assam) and also occur in the valleys of Narmada and Tapi in M.P. & Gujarat, Mahanadi in the MP and Orissa, Godawari in A.R and Cauvery in T.N.
- Can be divided into Khadar (new) and Bhargar (older, more clayey and kankary) alluvium.

Black Soil in India

- Also called Regur and is ideal for cotton crop. These soils have been formed due to the solidification of lava spread over large areas during volcanic activity in the Deccan Plateau, thousands of years ago.
- They are black due to compounds of iron and aluminium (also because of titaniferous magnetite).
- Mainly found in Deccan Plateau – Maharashtra, Gujarat, M.P, Karnataka, Andhra Pradesh, Tamil Nadu.
- Apart from cotton cultivation, these fertile soils are suitable for growing cereals, oilseeds, citrus fruits and vegetables, tobacco and sugarcane.
- They have high moisture retention level.
- Lack in phosphorus, nitrogen and organic matter.

Red Soil in India

- They are mainly formed due to the decomposition of ancient crystalline rocks like granites and gneisses and from rock types rich in minerals such as iron and magnesium. The term 'red soil' is due to the wide diffusion of iron oxides through the materials of the soil.
- Covers almost the whole of Tamil Nadu, Karnataka, Andhra Pradesh, S.E. Maharashtra, Chhatisgarh, parts of Orissa, Jharkhand and Bundelkhand.
- Generally deficient in nitrogen, humus and phosphorus, but rich in potash.
- Suitable for rice, millets, tobacco and vegetables (also groundnuts and potatoes at higher elevations).

Laterite Soil in India

- Found in typical monsoon conditions – under conditions of high temperature and heavy rainfall with alternate wet and dry periods. The alterations of wet and dry season leads to the leaching away of siliceous matter and lime of the rocks and a soil rich in oxides of iron and aluminium compounds is left behind.

- Found in parts of Western Ghats, Eastern Ghats, Rajmahal hills, Maharashtra, Karnataka, Kerala, Orissa, West Bengal, Assam, Tamil Nadu, etc.
- Poor in nitrogen and minerals.
- Best for tea, coffee, rubber, cinchona, coconut and suitable for rice and millet cultivation if manured.

Forest and Mountain Soils

- Such soils are mainly found on the hill slopes covered by forests. The formation of these soils is mainly governed by the characteristic deposition of organic matter derived from forest growth.
- In the Himalayan region, such soils are mainly found in valley basins, depressions and less steeply inclined slopes. Apart from the Himalayan region, the forest soils occur in higher hills in south and the peninsular region.
- Very rich in humus but are deficient in Potash, phosphorous and lime and needs fertilizers.
- Plantation of tea, coffee, spices and tropical fruits.

Arid and Desert Soils

- A large part of the arid and semi-arid region in Rajasthan and adjoining areas of Punjab and Haryana lying between the Indus and the Aravallis receiving less than 50 cm of annual rainfall is affected by desert conditions.
- This area is covered by a mantle of sand which inhibits soil growth.
- The phosphate content of these soils is as high as in normal alluvial soils. Nitrogen is originally low but its deficiency is made up to some extent by the availability of nitrogen in the form of nitrates. Thus the presence of phosphates and nitrates make them fertile soils wherever moisture is available.
- The changes in the cropping pattern in the Indira Gandhi Canal Command Area are a living example of the utility of the desert soils.

Saline and Alkaline Soils

- In the drier parts of Bihar, Up Haryana, Punjab, Rajasthan and Maharashtra, are the salt-impregnated or alkaline soils. Known by different names: Reh, kallar, USAR, etc.
- Some of the salts are transported in solution by the rivers and canals, which percolates in the sub-soils of the plains.
- The accumulation of salts makes the soil infertile and renders it unfit for agriculture.

Peaty and Marshy Soils

- Originate in the humid regions as a result of accumulation of large amounts of organic matter in the soil. They contain considerable amounts of soluble salts and 10 – 40% of organic matter.

- Peaty soils are found in Kottayam and Alappuzha districts of Kerala, where it is called Kari.
- Marshy soils, high in vegetable matter, are found in northern Bihar, coastal parts of Orissa, Tamil Nadu and West Bengal and parts of UP

Soil Erosion in India

- Acute in hilly and dry regions
- Causes – depletion of forests, wrong use of lands such as cultivation on very steep slopes, cattle rearing. It ultimately leads to Badland Topography.
- Remedy – Afforestation, contour cultivation etc.

Natural Vegetation in India

Tropical Wet Evergreen Forests

In areas over 250cm rainfall. In Western Ghats, hilly areas in N.E. India and Andaman and Nicobar Islands.

Trees are rosewood, shisham, ebony, ironwood, etc.

Tropical Moist Deciduous Forests

- In areas having rainfall between 100 – 200 cm. In peninsular region and along the foothills of Himalayas in Shivaliks, Bhabhar and Tarai.
- The trees of these forests drop their leaves for about 6-8 weeks during the spring and early summer when sufficient moisture isn't available.
- Trees are teak, sal, bamboo, sandalwood, rosewood, etc.

Thorn Forests

- In areas having rainfall between 25 and 80cm. In arid regions of Rajasthan, Punjab, Haryana and Gujarat.
- Trees are palm, acacia, etc.

Hill Forests

- In hills of S.India and the Himalayas.
- **The type of trees depends upon the height of the mountain** : Sal and bamboo below 1000 m; oaks, chestnuts and other fruit trees, and chir forests between 1000 and 2000 m; pine, deodar, silver fern and spruce between 1600 and 3300 m; above 3600 m alpine forests with trees like silver firs, pines, birches, etc. Alpine forests give way to Alpine grasslands and scrubs as we move up further.

Tidal or Mangrove Forests

- Also known as Littoral or Swamp Forests.

- Occur along the sea coast and in the estuaries of rivers, especially in Sunderbans and the Andamans.
- Most important tree is Sundari. It provides hard and durable timber which is used for construction and building purposes as well as for making boats.

Note :

- According to the National Forest Policy, the minimum desired area which is considered safe for a tropical country like India is about 33%.
- Madhya Pradesh has the largest area under forests followed by Maharashtra, Andhra Pradesh, Orissa and Arunachal Pradesh.
- As per percentage of forest area to total area, first is Andaman and Nicobar Islands, followed by Mizoram, Manipur, Himachal Pradesh, Arunachal Pradesh, Tripura and Nagaland. They are in a very comfortable position as more than half of their area is under forests.
- Arunachal Pradesh has the highest per capita forest area.
- In Mangrove forests, West Bengal holds the first position, followed by Gujarat and Andaman and Nicobar Islands.
- The lowest forest percentage is in Haryana and Punjab, because of the extensive agriculture.

Biosphere Reserves in India

- The biosphere reserve program was launched by the UNESCO in 1971 under the aegis of its Man and Biosphere (MAB) Program, to provide a global network of protected areas for conserving natural communities.
- In India, the first biosphere reserve – Nilgiri biosphere reserve – came into being in 1986. So far, 14 biosphere reserves have been set up in the country.

| | |
|---|---|
| Nilgiri (Western Ghats) | Similipal (Orissa) |
| Nanda Devi (Uttarakhand) | Dibru-Daikhowa (Assam) |
| Nokrek (Meghalaya) | Dehong Dabang (Arunachal Pradesh) |
| Manas (Assam) | Panchmarhi (MP) |
| Sunderbans (West Bengal) | Kanchanjunga (Sikkim) |
| Gulf of Mannar (Tamil Nadu) | Agasthyamalai (Kerala) |
| Great Nicobar (Andaman and Nicobar Islands) | Achaanak maar-Amarkantak (Madhya Pradesh) |

Note :

- Out of these 14, Nilgiri, Sunderbans, Manas and Gulf of Mannar have been recognized on World Network of Biosphere Reserves by UNESCO.

Project Tiger

- It was launched on April 1, 1973 to ensure maintenance of viable population of the tigers in India.

<http://www.developindiagroup.co.in/>

- There are 29 tiger reserves in the country:

| Name of Tiger Reserve | State |
|-------------------------|-------------------------|
| Bandipur | Karnataka |
| Corbett | Uttarakhand |
| Kanha | Madhya Pradesh |
| Manas | Assam |
| Melghat | Maharashtra |
| Palamau | Jharkhand |
| Ranthambhore | Rajasthan |
| Similipal | Orissa |
| Sunderbans | West Bengal |
| Periyar | Kerala |
| Sariska | Rajasthan |
| Buxa | West Bengal |
| Indravati | Chhattisgarh |
| Nagarjunsagar | Andhra Pradesh |
| Namdapha | Arunachal Pradesh |
| Dudhwa | Uttar Pradesh |
| Kalakad-Mundanthurai | Tamil Nadu |
| Valmiki | Bihar |
| Pencil | Madhya Pradesh |
| Tadoba-Andhari | Maharashtra |
| Bandhavgarh | Madhya Pradesh |
| Panna | Madhya Pradesh |
| Dampha | Mizoram |
| Bhadra | Karnataka |
| Pench | Maharashtra |
| Pakhui-Nameri | Arunachal Pradesh-Assam |
| Bori, Satpura, Pachmari | Madhya Pradesh |
| Nagarhole | Karnataka |
| Katarniaghat | Uttar Pradesh |
| Nameri | Assam |
| Kaziranga | Assam |

Note :

- Nagarjunsagar Tiger Reserve in AP is the largest, while Pench in Maharashtra is the smallest. Bandipur in Karnataka was the first (1973-74), while Kaziranga is the latest (2006).

Project Elephant

<http://www.developindiagroup.co.in/>

- It was launched in February 1992, to assist States having wild elephants to ensure long term survival of identified viable populations of elephants in their natural habitat.
- There are 14 Elephant Reserves in India.

Agriculture in India

Cropping Seasons in India

Kharif Crops of India

- Sown in summers between May and July, and harvested after the rains, in September and October.
- Eg: Rice, Jowar, Bajra, Maize, Cotton, Jute, Sugarcane, Tobacco, Groundnut, Pulses, etc.

Rabi Crops of India

- Sown at the beginning of winter and harvested before the onset of the summer season, between Feb and April.
- Eg: Wheat, barley, oilseeds, gram, potatoes, etc.

Zayad Crops

- They are raised between April and June.
- E.g. : Melon, watermelon, cucumber, toris, leafy and other vegetables.

Cash Crops of India (Commercial Crops)

- Grown mainly for the market, only a small portion of the product is consumed by the farmers themselves (cotton, sugarcane etc.)

Mineral Resources of India

Coal Resources in India

West Bengal (Raniganj, Burdwan, Bankura, Purulio, Birbhum, Jalpaigudi, Darjeeling), Jharkhand (Jharia, Giridih, Kharhawadi, Bokaro, Hazaribagh, Kamapura, Rampur, Palamau), Orissa (Rampur, Hindgir, Talcher, Sambal), Madhya Pradesh and Chhatisgarh (Rewa, Pench valley, Umaria, Korba, Sohagpur, Mand river area, Kanha valley, Betul), etc. Power sector is the largest consumer of coal in India followed by steel industry, cement industry, etc.

Manganese

Orissa, Maharashtra (Nagpur, Bhandara, Ratnagiri), Madhya Pradesh (Balaghat, Chhindawara), Karnataka (Keonjhar, Bonai, Kalahandi), Andhra Pradesh (Kadur, Garibadi).

Copper Minerals

Madhya Pradesh (Balaghat), Rajasthan (Khetri), Jharkhand (Singhbhum, Masobani, Surda), Karnataka (Chitradurg, Hassan).

Mica Minerals

Jharkhand (Hazaribagh, Giridih, Kodarma), Bihar (Goya, Bhagalpur), Andhra Pradesh (Guntur, Vizag, Kurnool), Rajasthan (Bhilwara, Udaipur, Jaipur).

Petroleum Resources in India

Assam (Digboi, Naharkatiya, Badarpur, Masinpur and Pallharia), Gujarat (Ankleshwar, Khambat, Kalol), Mumbai High, Bassein (south of Mumbai High), etc. Recently oil has been discovered in Cauvery basin, Krishna and Godavary basin, Khambat basin, etc.

Iron Resources

- India possesses Haematite, a very high-grade iron ore. In Madhya Pradesh (Bailadila, Jabalpur), Goa (North Goa), Karnataka (Bababudan hills, Chikmagalur, Hospet), Jharkhand (Singhbhum, Naomundi), Andhra Pradesh, Orissa.
- India is the fifth largest exporter of iron ore in the world. Japan is the biggest buyer accounting for about 3/4th of India's total exports. Major ports handling iron ore export are Vishakhapatnam, Paradip, Mormagao and Mangalore.

Bauxite Resources

Chief ore for producing aluminium. In Orissa (Kalahandi, Koraput, Sundargarh, Bolangir, Sambalpur), Jharkhand (Lohardaga, Gumla), Madhya Pradesh (Jabalpur, Mandla, Shahdol, Kami, Balaghat), Maharashtra, Andhra Pradesh, Gujarat, Tamil Nadu.

Gold Resources in India

Karnataka (Kolar, Hutti, Raichur), Andhra Pradesh (Ramgiri and Yeppamanna goldfields in Chittoor and Anantapur districts).

Silver, Zinc & Lead

Rajasthan (Zawar mines near Udaipur), Andhra Pradesh (Mysore, Chitradurg), Karnataka (Kolar mines).

Uranium Resources in India

Jharkhand (Jaduguda), Rajasthan (Ajmer), Andhra Pradesh (Nellore, Nalgonda), Karnataka (Gulbarga).

Thorium Resources in India

Kerala coast (From Monazite sand), rocks of Aravallis in Rajasthan.

Oil Refineries

There are 19 refineries in India, 16 in public sector, one in joint sector and two in private sector. Public sector refineries are located at Digboi, Guwahati, Bongaigaon, Barauni, Haldia, Koyali, Mathura, Kochi, Chennai, Vishakhapatnam, Mumbai (2), Panipat, Narimanam, Numanigarh and Tatipaka. Joint sector refinery is at Mangalore. The private sector refinery of Reliance Limited is at Jamnagar, Gujarat and Essar Refinery at Vadinar, Gujarat.

1. Haldia Refinery (IOC)
2. Mumbai Refinery (HPCL)
3. Panipat Refinery (IOC)
4. Vishakhapatnam Refinery (HPCL)
5. Digboi Refinery (IOC)
6. Mumbai Refinery Mahaul (BPCL)
7. Gujarat Refinery (IOC)
8. Nagapatnam Refinery (CPCL)
9. Barauni Refinery (IOC)
10. Kochi Refinery (Kochi Refineries Ltd)
11. Guwahati Refinery (IOC)
12. Numaligarh Refinery (NRL)
13. Mathura Refinery (IOC)
14. Mangalore Refinery (MRPL)
15. Bongaigaon Refinery (IOC)
16. Tatipaka Refinery (ONGC)
17. Manali Refinery (IOC)
18. Essar Refinery (Essar)
19. Jamnagar Refinery (Reliance Petroleum)

Industries in India**Cotton Textile Industry in India**

Most important industry in terms of employment and production of export goods. In Maharashtra (Mumbai, Sholapur, Pune, Kolhapur, Satara, Wardha, Hajipur), Gujarat (Ahmedabad, Vadodara, Rajkot, Surat, Bhavnagar), Tamil Nadu (Coimbatore-Manchester of South India). Tamil Nadu has the largest number of cotton textile mills in India.

Silk Textile Industry in India

The location of silk industry is governed by two factors- prevalence of sericulture practices and availability of skilled labour. Karnataka is the leading producer, followed by West Bengal, Bihar, etc.

Woolen Textile Industries

In Punjab (Dhariwai, Amritsar, Ludhiana, Ferozpur), Maharashtra (Mumbai), UP (Kanpur, Mirzapur, Agra, Tanakpur), etc.

Jute Industries India

India manufactures the largest quantity of jute goods in the world. Mainly located in West Bengal, followed by Andhra Pradesh, Bihar, UP, MP.

Iron and Steel Industries

Located near the sources of raw materials and fuel (coal). In Jamshedpur (Jharkhand), Durgapur, Burnpur (W.B.), Bhadravati (Karnataka), Bokaro (Jharkhand), Rourkela (Orissa), Bhilai (Chhatisgarh), Salem (T.N.), Vishakhapatnam (A.P.).

Aluminium Smelting in India

Located mainly near the sources of raw materials, means of transport and cheap electricity. In Hirakud, Koraput (Orissa), Renukoot (UP), Korba (MP), Ratnagiri (Maharashtra), Mettur (TN), Alway

Copper Smelting Industry

In Khetri, Alwar, Jhunjhunu (Rajasthan), Singhbhum (Jharkhand), Agnigundala (A.P.).

Heavy Machinery Industry

In Ranchi, Vishakhapatnam, Durgapur, Tiruchirapalli, Mumbai, Kami.

Machine Tools Industry

It forms the basis for the manufacturing of industrial, defence equipments, automobiles, railway engines and electrical machinery.

In Bangalore, Pinjore (Haryana), Kalamassery (Kerala), Hyderabad, Secunderabad, Srinagar, Ajmer.

Heavy Electrical Equipments

Power generation equipments. In Bhopal, Tiruchirapalli, Jammu, Ramchandrapuram (Hyderabad), Hardwar, Bangalore and Jogdishpur (UP).

Railway Equipments

Locomotives in Indian Railways: In Chittaranjan (WB), Varanasi, Jamshedpur, Bhopal. Coaches: Perambur (TN), Kapurthala (Punjab), also at Bangalore and Kolkata.

Ship Building India

Hindustan Shipyard at Vishakhapatnam, Cochin Shipyard, Mumuai (Mazgaon Dock) and Kolkata (Garden Reach Workshop). For Indian Navy, only at Mazgaon.

Cycles India

In Mumbai, Asansol, Sonapat, Delhi, Chennai, Jalandhar and Ludhiana.

Tractors in India

At Faridabad, Pinjore, Delhi, Mumbai, Chennai.

Fertilizers in India

- The location of fertilizer industry is closely related to petro-chemicals. About 70% of the plants producing nitrogenous fertilizers use naphtha as raw material.
- Naphtha is a by-product of oil refineries. Phosphate plants are dependent on mineral phosphate found in UP and MP. Now natural gas based fertilizer plants are also being set up.
- The Fertilizer Corporation of India (FCL) was set up in 1961. National Fertilizer Limited (NFL) was set up in 1974.
- In Sindri (Bihar), Nangal, Trombay, Gorakhpur, Durgapur, Namrup, Cochin, Rourkela, Neyveli, Varanasi, Vadodara, Vishakhapatnam, Kota and Kanpur.

Pharmaceuticals and Drugs

Antibiotics are prepared at Pimpri and Rishikesh. The Indian Drugs and Pharmaceuticals Limited has 5 plants at Hyderabad, Rishikesh, Chennai, Gurgaon and Muzaffarpur. A number of other units are concentrated in Mumbai, Baroda, Delhi, Kolkata and Kanpur.

Pesticides in India

Delhi and Alwaye

Sugar Industry

JP, Maharashtra, AP, TN, Karnataka and Bihar.

Aircraft Industry in India

Hindustan Aeronautics India Ltd. was formed by merging two aircraft factories at Bangalore and Kanpur. Four other factories are at Nasik, Hyderabad, Koraput (Orissa), Lucknow.

Rubber Industry in India

Bareilly (UP), Baroda (Gujarat Synthetic Rubber Units, Mumbai, Ahmedabad, Amritsar-Reclaimed Rubber Units.

Nuclear Power Stations in India

| | |
|-----------------|---|
| Tarapur | Maharashtra |
| Kalpakkam | Tamil Nadu, called Indra Gandhi Nuclear Power Station |
| Narora | UP |
| Rawatbhata | Kota, Rajasthan |
| Kaiga | Karnataka |
| Kakrapara | Gujarat |
| Kundnkulam (TN) | Under construction with the assistance of Russia. |

Major Thermal Power Plants

| | |
|--------------|-------------|
| Neyveli | Tamil Nadu |
| Korba | Chhatisgarh |
| Obra | UP |
| Harduaganj | UP |
| Rihand | UP |
| Singrauli | UP |
| Parichha | UP |
| Talcher | Orissa |
| Farakka | West Bengal |
| Satpura | MP |
| Ramagundam | AP |
| Vindhyanchal | MP |

Railways in India

Indian railway system is the largest in Asia and the fourth largest in the world. It is the biggest departmental public undertaking in the country.

- The first train ran in India between Bombay and Thane, a stretch of 34 km. on April 16 1853.
- The Indian Railways celebrated its 150th anniversary on April 16, 2003. To commemorate the occasion, 16 January – Shatabdi inter – city express trains were announced to be inducted.
- The second train ran between Howrah and Hooghly in 1854.
- The headquarters of Indian Railway is in New Delhi.
- The first electric train in India was 'Deccan Queen'. It was introduced in 1929 between Bombay and Poona.
- Indian Railways has the second biggest electrified system in the world after Russia.
- The fastest train in India is the Shatabdi Express whose maximum speed is 140 km/hr.
- The total route covered is approx 63,000 km.
- The total number of railway stations in India is 7,100.
- The longest railway platform in India is at Kharagpur (W.B.).
- Mumbai is the destination where maximum number of trains in India head for.
- The longest train route is of 'Himsagar Express' from Jammu Tavi to Kanyakumari. It covers a distance of 3,726 km and passes through ten states.
- The first Metro Rail was introduced in Kolkata (W.Bengal) on October 24, 1984. The two stations connected were Dumdum and Belgachhia.
- The Indian Railways operate in three different gauges :
 1. Broad Gauge Railway (Distance between rails is 1.67 m).
 2. Metre Gauge Railways (Distance between rails is 1.00 m).
 3. Narrow Gauge Railways India (Distance between rails is 0.762 or 0.610 m).

The broad gauge accounts for nearly 50% route followed by metre gauge (43%) and the remaining by narrow gauge.

Indian railways are divided into 16 zones, headed by a General Manager who is responsible to the Railway Board, for all matters.

| Railway Zones | Head Quarters |
|---------------------|-------------------|
| Central | Mumbai VT |
| Eastern | Kolkata |
| Northern | New Delhi |
| North Eastern | Gorakhpur |
| North-East Frontier | Maligaon-Guwahati |
| Southern | Chennai |
| South Central | Secunderabad |
| South Eastern | Kolkata |
| Western | Mumbai Churchgate |
| East Coast | Bhubaneswar |
| East Central | Hajipur |
| North Central | Allahabad |
| North Western | Jaipur |
| South Western | Bangalore (Hubli) |
| West Central | Jabalpur |
| South-East Central | Bilaspur |

- Northern Railway (NR) is the largest railway zone having length of 10,995 km.
- North – East Frontier (NEF) is the smallest railway zone having just 3,860 km route length.
- Konkan Railways India** : It is a project to shorten the distance between Maharashtra, Goa and Karnataka. The total route length is 786 km between Apta (Maharashtra) and Mangalore (Karnataka).

Railway Manufacturing Units :

- Chittaranjan Locomotive Works** : Located in Chittaranjan (W.B) and manufactures electric engines.
- Diesel Locomotive Works** : Located in Varanasi (U.P) and manufactures diesel engines.
- Integral Coach Factory in India** : Located in Perambur (TN) and manufactures rail coaches.
- Wheel and Axle Plant** : Located at Yalahaka (Bangalore, Karnataka) and manufactures wheels and axles.
- Diesel Component Works** : Located at Patiala (Punjab) and manufactures components of diesel engines.
- Rail Coach Factory in India** : Located at Kapurthala (Punjab) and manufactures rail coaches.

Road Transport in India

India's road network is one of the largest in the world. The total length of roads is more than 33 lakh km.

- For the purpose of maintenance and construction, roads are classified into National Highways, State Highways, District Highways, Village Roads, Border Roads, etc.
- National highways are maintained by the Central Government, State highways by the respective state government while District highways by the respective District Board. Border roads and International highways are also the responsibility of Central Government.
- The present length of the National Highways in India is approx. 45,000 km. They constitute only 2% of the total road length and carries nearly 40% of the road traffic.

Some of the Important National Highways are:

- NH 1: New Delhi – Ambala – Jalandhar – Amritsar.
- NH 2: Delhi – Mathura – Agra – Kanpur – Allahabad – Varanasi – Kolkata.
- NH 3: Agra – Gwalior – Nasik – Mumbai
- NH 4: Thane and Chennai via Pune and Belgaun.
- NH 5: Kolkata – Chennai
- NH 6: Kolkata – Dhule
- NH 7: Varanasi – Kanyakumari
- NH 8: Delhi – Mumbai (via Jaipur, Baroda and Ahmedabad)
- NH 9: Mumbai – Vijaywada
- NH 10: Delhi – Fazilka
- NH 11: Agra – Bikaner
- NH 12: Jabalpur – Jaipur
- NH 24: Delhi – Lucknow
- NH 27: Allahabad – Varanasi
- NH 28: Barauni – Lucknow
- NH 29: Gorakhpur – Varanasi
- NH 56: Lucknow – Varanasi
- NH – 7 is the longest highway of India.

Note:

The Golden Quadrilateral Project connecting the four Metropolitan cities of Delhi, Mumbai, Chennai and Kolkata covering a total distance of 5846 km is currently being processed. It is the first phase of the National Highways Development Project (NHDP). Total cost of the project is Rs 300 billion, funded largely by the government's special petroleum product tax revenues and government borrowing. As of June '08, 5669 km of the intended road has been 4-laned.

- The North South – East West Corridor (NS-EW) is the largest ongoing expressway project in India. It is the second phase of the National Highways Development Project (NHDP), and consists of building 7300 kilometers of four/six lane expressways connecting Srinagar, Kanyakumari, Porbandar and Silchar. The final completion date of the project has been set as December 2009.
- Maharashtra has the maximum length of surfaced roads in India.

Air Transport in India

J.R.D. Tata was the first person to make a solo flight from Mumbai to Karachi in 1931.

1. In 1935, the 'Tata Air Lines' started its operation between Mumbai and Thiruvananthapuram and in 1937 between Mumbai and Delhi.
2. In 1953, all the private Airline companies were nationalised and Indian Airlines and Air India came into existence.
3. Air India administers international flights while Indian Airlines caters to the domestic circuit.
4. Indian Airlines is now known by the name of 'Indian'.
5. Vayudoot Limited started in 1981 as a private air carrier and later on it merged with Indian Airlines.
6. Pawan Hans Limited operates helicopter support services to oil sector, hill stations and remote areas.
7. A number of private airlines also operates in India. They are Jet Airways, Sahara, etc.
8. The Civil Aviation Centre in Fursatgarh near Allahabad provided, among other things, ground training to the pilots.

Airports in India :

There are 12 International Airports in India :

- Begumpet Airport, Hyderabad
- Calicut International Airport, Calicut
- Chatrapati Shivaji International Airport, Mumbai
- Chennai International Airport, Chennai
- HAL Airport, Bangalore
- Goa Airport in Vasco da Gama city, Goa
- Lokpriya Gopinath Bordolio International Airport, Guwahati
- Indira Gandhi International Airport, Delhi
- Netaji Subhash Chandra Bose International Airport, Kolkata
- Rja Sansi International Airport, Amritsar
- Sardar Vallabhbhai Patel International Airport, Ahmedabad
- Thiruvananthapuram International Airport, Thiruvananthapuram

The Indira Gandhi International Airport and the Chatrapati Shivaji International Airport handle more than half of the air traffic in South Asia. Besides these airports several other domestic airports are located in India.

In total, there are more than 334 civilian airports in India – 238 with paved runways and 108 with unpaved runways.

Water Transport in India

Most efficient, least costly and environment friendly means of transportation. The total length of navigable waterways in Indian comprising rivers, canals, backwaters, etc, is 14,500 km out of which 3700 km is navigable by mechanised boats.

The government has recognised the following National Waterways of India:

- NW 1: Allahabad to Haldia – 1,629 km
- NW 2: Sadia to Dhubari (on Brahmaputra river) – 819 km
- NW 3: Kollam to Kottapuram – 186 km
- NW 4: Kakinada to Marakkanam (Along Godawari and Krishna river) – 1,100 km

Ports in India

- The Waterways Authority in India divides Indian ports into three categories, major, minor and intermediate.

- India has about 190 ports in all, with 12 major and the rest intermediate and minor.
- The 12 Major Ports are:

| Port | State |
|----------------------------|----------------|
| Kolkata (including Haldia) | West Bengal |
| Paradip | Orissa |
| Vishakhapatnam | Andhra Pradesh |
| Chennai | Tamil Nadu |
| Ennore | Tamil Nadu |
| Tuticorin | Tamil Nadu |
| Cochin | Kerala |
| New Mangalore | Karnataka |
| Mormugao | Goa |
| Jawaharlal Nehru | Maharashtra |
| Mumbai | Maharashtra |
| Kandla | Gujarat |

All these ports are administered by the respective Port Trusts, except the newly constructed Ennore port which is under the Ennore Port Ltd. Company.

Salient Features :

- **Kolkata Port (including Haldia)** : Kolkata is a riverine port, located about 128 km from the Bay of Bengal on the banks of river Hooghly. Haldia was developed because excessive silting prevented the entry of large marine vessels in Kolkata.
- **Paradip Port** : Located on the Orissa coast along the Bay of Bengal. India exports raw iron to Japan from here.
- **Vishakhapatnam Port** : The deepest port, located in Andhra Pradesh. It serves the Bhilai and Rourkela steel plants.
- **Chennai Port** : Oldest artificial harbour. This port ranks only second after Mumbai in terms of the traffic handling capacity.
- **Ennore Port** : Declared a major port in 2001. It is the first port with corporate participation. Provided with all the modern facilities for handling the thermal coal required for Tamil Nadu Electricity Board Power Station.
- **Tuticorin Port** : It came into existence during the reign of Pandya kings. It has an artificial deep sea harbour.
- **Cochin Port** : A fine natural harbour located on Kerala coast. Handles the export of tea, coffee and spices and import of petroleum and fertilisers.
- **New Mangalore Port** : The 'Gateway of Karnataka'. Handles the export of iron-ore of Kudremukh.
- **Marmugao Port** : It has a naval base. India's leading iron-ore port.

- **Mumbai Port** : A natural port, India's busiest. A new port, Nhava Sheva, is being developed near Mumbai port.
- **Jawaharlal Nehru Port** : Occupies the 5th position in the world's faster growing ports.
- **Kandla Port** : Called the 'offspring of partition' as it was developed after the partition as a substitute of Karachi port. It is a tidal port and a free trade zone located in the Rann of Kachchh.

Nick Names of Important Indian Places

| Nick Name | Place |
|--------------------------|--------------------------|
| Golden City | Amritsar |
| Manchester of India | Ahmedabad |
| City of Seven Islands | Mumbai |
| Queen of Arabian Sea | Cochin |
| Space City | Bangalore |
| Garden City of India | Bangalore |
| Silicon Valley of India | Bangalore |
| Electronic City of India | Bangalore |
| Pink City | Jaipur |
| Gateway of India | Mumbai |
| Twin City | Hyderabad - Sikandarabad |
| City of Festivals | Madurai |
| Deccan Queen | Pune |

| Nick Name | Place |
|-------------------------|-------------------------|
| City of Buildings | Kolkata |
| Dakshin Ganga | Godavari |
| Old Ganga | Godavari |
| Egg Bowls of Asia | Andhra Pradesh |
| Soya Region | Madhya Pradesh |
| Manchester of the South | Coimbatore |
| City of Nawabs | Lucknow |
| Venice of the East | Cochin |
| Sorrow of Bengal | Damodar river |
| Sorrow of Bihar | Kosi river |
| Blue Mountains | Nilgiri |
| Queen of the Mountains | Mussoorie (Uttarakhand) |
| Sacred river | Ganga |
| Hollywood of India | Mumbai |
| City of Castles | Kolkata |
| State of Five Rivers | Punjab |
| City of Weavers | Panipat |

| Nick Name | Place |
|---------------------------|-------------------------------|
| City of Lakes | Srinagar |
| Steel City of India | Jamshedpur (Called Tatanagar) |
| City of Temples | Varanasi |
| Manchester of the North | Kanpur |
| City of Rallies | New Delhi |
| Heaven of India | Jammu & Kashmir |
| Boston of India | Ahmedabad |
| Garden of spices of India | Kerala |
| Switzerland of India | Kashmir |
| Abode of the God | Prayag (Allahabad) |
| Pittsburg of India | Jamshedpur |

Important Indian Towns on Rivers

| Town | River |
|-----------|---|
| Allahabad | At the confluence of the Ganga and Yamuna |
| Patna | Ganga |
| Varanasi | Ganga |
| Kanpur | Ganga |
| Hardwar | Ganga |
| Badrinath | Alaknanda |
| Agra | Yamuna |
| Delhi | Yamuna |
| Mathura | Yamuna |
| Ferozpur | Satluj |
| Ludhiana | Satluj |
| Srinagar | Jhelum |
| Lucknow | Gomti |

| Town | River |
|------------|-------------|
| Jaunpur | Gomti |
| Ayodhya | Saryu |
| Bareilly | Ram Ganga |
| Ahmedabad | Sabarmati |
| Kota | Chambal |
| Jabalpur | Narmada |
| Panji | Mandavi |
| Ujjain | Kshipra |
| Surat | Tapti |
| Jamshedpur | Swarnarekha |

| Town | River |
|-----------------|-------------|
| Dibrugarh | Brahmaputra |
| Guwahati | Brahmaputra |
| Kolkata | Hooghly |
| Sambalpur | Mahanadi |
| Cuttack | Mahanadi |
| Seriranganatnam | Cauvery |
| Hyderabad | Musi |
| Nasik | Godavari |
| Vijayvada | Krishna |
| Cumool | Tungabhadra |
| Tiruchirapalli | Cauvery |

Famous Hill Stations in India

| Hill Stations | Height From Sea Level (m) | States |
|-------------------|---------------------------|-------------|
| Gulberga | 2550 | J & K |
| Ooty (Ootacamund) | 2290 | Tamil Nadu |
| Shimla | 2210 | H.P |
| Pahalgam | 2200 | J & K |
| Darjeeling | 2135 | West Bengal |
| Kodaikanal | 2120 | Tamil Nadu |
| Lansdowne | 2120 | Uttarkhand |
| Dalhousie | 2035 | H.P |
| Mussoorie | 2006 | Uttarkhand |
| Mukteshwar | 1975 | Uttarkhand |
| Nainital | 1940 | Uttarkhand |
| Kasauli | 1985 | H.P |

| Hill Stations | Height From Sea Level (m) | States |
|---------------|---------------------------|-------------|
| Coonoor | 1860 | Tamil Nadu |
| Gangtok | 1850 | Sikkim |
| Manali | 1830 | H.P |
| Ranikhet | 1830 | Uttarkhand |
| Ranchi | 1800 | Jharkhand |
| Srinagar | 1770 | J & K |
| Almora | 1650 | Uttarakhand |
| Shillang | 1500 | Maghalaya |
| Mahabaleshwar | 1370 | Maharashtra |
| Kalimpong | 1250 | West Bengal |
| Mt. Abu | 1220 | Rajasthan |

| Hill Stations | Height From Sea Level (m) | States |
|---------------|---------------------------|-------------|
| Kullu Valley | 1200 | H.P |
| Panchgani | 1200 | Maharashtra |
| Mannar | 1160 | Kerala |
| Panchmarhi | 1065 | M.P |
| Periyar | 915 | Kerala |
| Mandi | 709 | H.P |
| Lonawala | 620 | Maharashtra |
| Khandala | 620 | Maharashtra |

Tribal Groups of India

| Tribal Groups | Found in |
|---------------|--------------------|
| Abhors | North-East |
| Adivasis | MP (Bastar distt.) |
| Angami | Manipur |
| Apatamis | Arunachal Pradesh |
| Badagas | Tamil Nadu |
| Baigas | M.P |
| Bakkarwals | J & K |
| Bhils | M.P & Rajasthan |
| Bhotias | Uttarakhand |
| Bhuia | M.P |
| Birhors | M.P and Bihar |
| Chang | North - East |
| Chenchus | A.P and Orissa |

| Tribal Groups | Found in |
|---------------|---------------------|
| Chutia | Assam |
| Gaddis | Himachal Pradesh |
| Gallong | North-East |
| Garos | Assam and Meghalaya |
| Gonds | M.P and Bihar |
| Gujjars | J & K and H.P |
| Irula | Tamil Nadu |
| Jaintias | Meghalaya |
| Jarawas | Little Andamans |
| Kanikar | Tamil Nadu |
| Katkari | M.P |
| Kharia | M.P |
| Khond | M.P |
| Khas | U.P |

| Tribal Groups | Found in |
|---------------|----------------------|
| Khasis | Assam and Meghalaya |
| Khonds | Orissa |
| Kol | M.P |
| Kolam | A.P |
| Kotas | Tamil Nadu |
| Kuki | Manipur |
| Lahaulas | Himachal Pradesh |
| Lepchas | Sikkim |
| Lushai | Tripura |
| Murias | M.P |
| Minas | Rajasthan |
| Moplahs | Kerala |
| Mundas | Bihar |
| Murias | M.P |
| Nishi | North - East |
| Nagas | Nagaland |
| Oarons | Bihar and Orissa |
| Onges | Andaman & Nicobar |
| Pho | North - East |
| Santhals | WB, Orissa and Bihar |
| Sangtam | North-East |
| Sema | Nagaland |
| Sentinelese | Andaman & Nicobar |
| Shompens | Andaman & Nicobar |
| Todas | Tamil Nadu |
| Uralis | Kerala |
| Wancho | North - East |
| Warlis | Maharashtra |

Indian Towns Associated with Industries

| Town | State | Industries |
|------------|-------------|------------------------------|
| Ahmedabad | Gujarat | Cotton Textiles |
| Agra | U.P | Leather, Marble, Carpet |
| Aligarh | U.P | Locks, Cutlery |
| Ankleshwar | Gujarat | Oil Fields |
| Ambarnath | Maharashtra | Machine Tools |
| Amritsar | Punjab | Woolen Clothes |
| Anand | Gujarat | Milk and its Products |
| Alwaye | Kerala | Fertilizer, Monazite Factory |

| Town | State | Industries |
|-----------|-------------|--|
| Ambala | Haryana | Scientific Instruments |
| Bokaro | Jharkhand | Steel Plant |
| Bangalore | Karnataka | Telephones, Aircrafts, Motors, Cotton Textiles, Toys |
| Batanagar | West Bengal | Shoes |
| Bareilly | U.P | Resin Industries, Match Factory |

| Town | State | Industries |
|------------|----------------|--|
| Bhilai | Chhattisgarh | Steel Plant |
| Barauni | Bihar | Chemical Fertilizer |
| Burnpur | West Bengal | Steel Plant |
| Bhirkunda | Jharkhand | Glass Industries |
| Bhagalpur | Bihar | Silk industries |
| Bhandara | Maharashtra | Explosives |
| Bhadravati | Karnataka | Iron & Steel |
| Bongaigaon | Assam | Petroleum |
| Bhadoi | U.P | Carpets |
| Churk | M P | Cement |
| Cyberabad | Andhra Pradesh | Electronics, Computers, Information technology |
| Chitranjan | West Bengal | Locomotive |
| Kolkata | West Bengal | Jute, Leather, Electric goods |
| Cochin | Kerala | Ship building, coconut oil, rubber |
| Calicut | Kerala | Coffee, coconut |
| Coimbatore | Tamil Nadu | Cotton industries |
| Dhariwal | Punjab | Woolen clothes |
| Durgapur | West Bengal | Steel |
| Digboi | Assam | Petroleum |
| Delhi | Delhi | Textiles, Electronics, D.D.T |
| Dalmanagar | Bihar | Cement |
| Darjeeling | W. Bengal | Tea |
| Dindigul | Tamil Nadu | Cigar, Tobacco |
| Frozabad | M.P | Bangle works |
| Guntur | Andhra Pradesh | Cotton industries |
| Gwalior | Madhya Pradesh | Pottery, Tobacco |
| Gomia | Jharkhand | Explosives |
| Hardwar | Uttarakhand | Heavy electricals |
| Hatia | Jharkhand | Heavy Engineering Corporation |
| Haldia | W. Bengal | Chemical fertilizer |
| Hazira | Gujarat | Artificial Rayon |
| Jamshedpur | Jharkhand | Iron & Steel, Locomotives, Railway coaches |

| Town | State | Industries |
|-------------|-----------------|---|
| Jallundhur | Punjab | Surgical goods and sports articles |
| Jaipur | Rajasthan | Cloth Printing, Brass |
| Jharia | Jharkhand | Coal mines |
| Jabalpur | Madhya Pradesh | Bidi industry |
| Jainakot | Jammu & Kashmir | H.M.T watch |
| Japla | Jharkhand | Cement |
| Kanpur | U.P | Cotton and Woollen mills, Leather, Sugar |
| Katni | M.P | Cement |
| Korba | Chattisgarh | Aluminium factory, Thermal plant |
| Koyna | Maharashtra | Aluminium factory |
| Koyali | Gujarat | Petrochemical industries |
| Kolar | Karnataka | Gold mining centre |
| Kota | Rajasthan | Atomic power plant |
| Kanchipuram | Tamil Nadu | Silk clothes |
| Karnal | Haryana | Dairy product |
| Kandla | Gujarat | Chemical fertiliser, famous port |
| Khetri | Rajasthan | Copper industries |
| Ludhiana | Punjab | Hosiery |
| Lucknow | U.P | Embroidery work, Chicken work |
| Chennai | Tamil Nadu | Leather, cigarette, Integral coach factory |
| Madurai | Tamil Nadu | Cotton and Silk Weaving |
| Mirzapur | U.P | Carpet, Pottery, Brass industries |
| Muradabad | U.P | Brassware, cutlery |
| Mathura | U.P | Oil refinery |
| Mysore | Karnataka | Sandalwood oil, Silk goods |
| Meerut | U.P | Publication work, Sports goods, Scissors making |
| Mumbai | Maharashtra | Cinema industries, Cotton textiles |
| Modinagar | U.P | Nylon thread |
| Moorie | Jharkhand | Aluminium |
| Majhagaon | Maharashtra | Ship building |
| Nagpur | Maharashtra | Cotton mills, Oranges |
| Nepanagar | Madhya Pradesh | Newsprint |
| Nasik | Maharashtra | Security Printing Press |
| Neyveli | Tamil Nadu | Lignite industries |
| Nunamati | Assam | Oil refineries |
| Narora | U.P | Atomic Power Plant |
| Nangal | Punjab | Fertilisers |
| Panna | M.P | Diamond mining |

| Town | State | Industries |
|--------------------|-----------------|---|
| Pinjore | Haryana | Hindustan Machines Tools |
| Perambur | Tamil Nadu | Integral coach factory |
| Pimpri | Maharashtra | Penicillin factory |
| Raniganj | W. Bengal | Coal mining |
| Rourkela | Orissa | Steel plant, Chemical fertiliser |
| Rana Pratap Sagar | Rajasthan | Hydro Power Plant |
| Renukoote | U.P | Aluminium Plant |
| Roopnarayanpur | W. Bengal | Cables |
| Rishikesh | Uttarakhand | Antibiotic Plant |
| Saharanpur | U.P | Cigarette factory, News print |
| Sindri | Jharkhand | Chemical fertilizers |
| Srinagar | Jammu & Kashmir | Woolen shawls, Silk, Woodwork |
| Surat | Gujarat | Cotton textiles, Diamond Cutting |
| Surajpur | Haryana | Cement factory |
| Suratgarh | Rajasthan | Agriculture implements |
| Singhbhum | Jharkhand | Copper, Iron |
| Singreni | Andhra Pradesh | Cool mining |
| Salem | Tamil Nadu | Iron and Steel |
| Samastipur | Bihar | Jute, Paper, Tobacco, Sugar |
| Tarapur | Maharashtra | Atomic Power Plant |
| Titagarh | W. Bengal | Paper & Jute |
| Thiruvananthapuram | Kerala | Coir matting |
| Trombay | Maharashtra | Oil refinery |
| Tiruchirapalli | Tamil Nadu | Cigar |
| Tirupati | Andhra Pradesh | Scooter |
| Tanjore | Tamil Nadu | Silk clothes |
| Thumba | Kerala | Rocket launching Station |
| Vijaypur | M.P | Fertilizers |
| Viiaynagar | Karnataka | Steel Plant |
| Vishakhapatnam | A.P | Ship building, Iron and Steel, Oil refinery |
| Varanasi | U.P | Rail Engines and Saari industries |
| Worli | Maharashtra | Baby food |
| Zainkot | J & K | HMT Watches |

Largest Longest Highest and Smallest in India

| Longest River | Ganges |
|--------------------------------------|--------------------|
| The Longest Tributary River of India | Yamuna |
| The Longest River of the South | Godavari |
| Highest Mountain Peak | Godwin Austin (K2) |

| Longest River | Ganges |
|------------------------------|--|
| Largest Lake (Fresh Water) | Wular Lake (Kashmir) |
| Highest Dam | Bhakra Dam (Punjab) |
| Largest Mosque | Jama Masjid, Delhi |
| Longest Road | Grand Trunk Road |
| State with Longest Coastline | Gujarat |
| Longest Railway Route | From Jammu to Kanyakumari |
| Longest Tunnel | Jawahar tunnel (Jammu & Kashmir) |
| Longest National Highway | NH - 7 which runs from Varanasi to Kanyakumari |
| Longest Dam | Hirakud Dam (Orissa) |
| Longest River Bridge | Mahatma Gandhi Setu, Patna |

| Longest River | Ganges |
|--------------------------------|--|
| Largest Populated City | Mumbai (1.60 crore) |
| Largest Museum | National Museum, Kolkata |
| Largest Delta | Sunderban Delta, W. Bengal |
| Largest Dome | Gol Gumbaz, Bijapur (Karnataka) |
| Largest Zoo | Zoological Gardens, Alipur, Kolkata |
| Largest Man - made Lake | Govind Vallabh Pant Sagar (Rihand Dam) |
| Largest Desert | Thar (Rajasthan) |
| Highest Tower | Pitampura Tower, Delhi |
| Smallest State (Area) | Goa |
| Smallest State (Population) | Sikim |
| Highest Waterfall | Gersoppa waterfall (Karnataka) |
| Longest Electric Railway Line | From Delhi to Kolkata via Patna |
| Densest Populated State | West Bengal |
| Largest Cave Temple | Kailash temple, Ellora (Maharashtra) |
| Largest Animal Fair | Sonepur (Bihar) |
| Highest Gateway | Buland Darwaza, Fatehpur Sikri (Agra) |
| Biggest Hotel | Oberai-Sheraton (Mumbai) |
| Largest State (Area) | Rajasthan |
| Largest State (Population) | Uttar Pradesh |
| Place of Heaviest Rainfall | Mausinram (Meghalaya) |
| Largest Corridor | Rameshwaram temple corridor (Tamil Nadu) |
| Largest Cantilever Span Bridge | Howrah Bridge (Kolkata) |
| Largest Forest State | Madhya Pradesh |
| Highest Straight Gravity Dam | Bhakra Dam |
| Longest Railway Platform | Kharagpur (W. Bengal) |
| Largest Stadium | Salt Lake (Yuva Bharti), Kolkata |

| Longest River | Ganges |
|---|-----------------------------------|
| Largest Port | Mumbai |
| Highest Lake | Devatal (Garhwal) |
| Largest Lake (Saline Water) | Chilka Lake, Orissa |
| Highest Award | Bharat Ratna |
| Highest Gallantry Award | Paramveer Chakra |
| Largest Gurudwara | Golden Temple, Amritsar |
| Deepest River Valley | Bhagirathi & Alaknanda |
| State with Longest Coastline of South India | Andhra Pradesh |
| Longest River which forms estuary | Narmada |
| Largest Church | Saint Cathedral (Goa) |
| Longest Beach | Marina Beach, Chennai |
| Highest Battle Field | Siachin Glacier |
| Highest Airport | Leh (Laddakh) |
| Largest River Island | Majuli (Brahmaputra River, Assam) |
| Largest Planetarium | Birla Planetarium (Kolkata) |

Important Monuments in India

| Name | Place | Built by |
|-----------------------------|-------------------|---------------------|
| Ajanta - Ellora Caves | Aurangabad (Mah.) | Gupta rulers |
| Aram Bagh | Agra (UP) | Babur |
| Agra Fort | Agra (UP) | Akbar |
| Akbar's Mausoleum | Sikandra (UP) | Akbar |
| Itmod - ud - daula Fort | Agra (UP) | Noorjahan |
| Anand Bhawan | Allahabad (UP) | Motilal Nehru |
| Bada Imambara | Lucknow (UP) | Asaf-ud-daula |
| Bharatpur Fort | Bharatpur (Raj.) | Raja Surajmal Singh |
| Bibi Ka Maqbara | Aurangabad (Mah.) | Aurangzeb |
| Char - Minor Hyderabad (AP) | Quli | Qutub Shah |
| Charar - e - Sharif | Jammu & Kashmir | Zainul Abedin |
| Chhota Imambara | Lucknow (UP) | Muhammad Ali Shah |

| Name | Place | Built by |
|-----------------------|------------------|--------------------|
| Dargah Ajmer Sharif | Ajmer (Raj.) | Sultan Shyasadin |
| Dilwara's Jain Temple | Mount Abu (Raj.) | Siddharaja |
| Deewan - e - Khas | Agra Fort (UP) | Shahjahan |
| Adhai Din Ka Jhopra | Ajmer (Raj.) | Qutubuddin Aibak |
| Elephanfa's cave | Mumbai (Mah.) | Rashtrakuta rulers |
| Fatehpur Sikri | Agra (UP) | Akbar |
| Ferozshah Kotla | Delhi | Ferozshah Tughlaq |
| Golghar | Patna (Bih.) | British Government |

| Name | Place | Built by |
|-------------------------------|-------------------|-----------------------|
| Gateway of India | Mumbai (Mah.) | British Government |
| Hauz Khas | Delhi | Alauddin Khilji |
| Hawa Mahal | Jaipur (Raj.) | Maharaja Pratap Singh |
| Humayun's Tomb | Delhi | Hymayun's wife |
| Jama Masjid | Agra (UP) | Shahjahan |
| Jama Masjid | Delhi | Shahjahan |
| Jagannath Temple | Puri (Ori.) | Anantvarmun Ganga |
| Jantar - Mantar | Delhi | Sawai Jai Singh |
| Jaigarh Fort | Jaipur (Raj.) | Sawai Jai Singh |
| Jim Corbett Park | Nainital (Uttar.) | Sir Malcom Hqilley |
| Jodhpur Fort | Jodhpur (Raj.) | Rao Jodhoji |
| Kanheri's Fort | Mumbai (Mah.) | Buddhists |
| Khirki Masjid | Delhi | Ghyasuddin Tughlaq |
| Lai Bagh | Bangalore (Kar.) | Hyder Ali |
| Lakshmi Narayan Temple | Delhi | Birla Family |
| Makka Masjid | Hyderabad (AP) | Quli Qutub Shah |
| Moti Masjid | Agra Fort (UP) | Shahjahan |
| Moti Masjid | Delhi Fort | Aurangzeb |
| Nahargarh Fort | Jaipur (Raj.) | Sawai Jai Singh |
| Nishat Garden | Srinagar (J & K) | Asaf Ali |
| Parana Qila | Delhi | Shershah Suri |
| Pathar Ki Masjid | Patna (Bih.) | Pervez Shah |
| President House | Delhi | British Government |
| Qutub Minor | Delhi | Qutubuddin Aibak |
| Red Fort | Delhi | Shahjahan |
| Safdar Jung Tomb | Delhi | Shuja-ud-daula |
| Sabarmati Ashram | Ahmadabad (Guj.) | Mahatma Gandhi |
| Shantiniketan | West Bengal | Rabindra Nath Tagore |
| Shish Mahal | Agra (UP) | Shahjahan |
| Shalimar Garden | Srinagar (J & K) | Jahangir |
| Shershah's Tomb | Sasaram (Bih.) | Shershah's son |
| Saint George Fort | Chennai (TN) | East India Company |
| Sati Burj | Mathura (UP) | Raja Bhagwan Das |
| Sun Temple | Konark (Ori.) | Narsimhadeva |
| Swarna Mandir (Golden Temple) | Amritsar (Pun.) | Guru Ramdas |
| Taj Mahal | Agra (UP) | Shahjahan |
| Vellure Math | Kolkata (WB) | Swami Vivekanand |
| Victoria Memorial | Kolkata (WB) | British Government |

| Name | Place | Built by |
|------------------|--------------------|-----------------|
| Vishnupad Temple | Gaya (Bih.) | Rani Ahiliabai |
| Viiaya Stambha | Chittorgarh (Raj.) | Maharana Kumbha |

States in India

India, a union of states, is a Sovereign, Secular, Democratic Republic with a Parliamentary system of Government.

- The President is the constitutional head of Executive of the Union. In the states, the Governor, as the representative of the President, is the head of Executive.
- The system of government in states closely resembles that of the Union. There are 28 states and 7 Union territories in the country. Union Territories are administered by the President through an Administrator appointed by him.
- From the largest to the smallest, each State / UT of India has a unique demography, history and culture, dress, festivals, language etc.

List of States in India

| | | |
|-----------------|-------------------|------------------|
| Andhra Pradesh | Arunachal Pradesh | Asom or Assam |
| Bihar | Chattisgarh | Goa |
| Gujarat | Haryana | Himachal Pradesh |
| Jammu & Kashmir | Jharkhand | Karnatataka |
| Kerala | Madhya Pradesh | Maharashtra |
| Manipur | Megalaya | Mizoram |
| Nagaland | Orissa | Punjab |
| Rajasthan | Sikkim | Tamil Nadu |
| Tripura | Uttarkhand | Uttar Pradesh |
| West Bengal | | |

Union Territories of India

Andaman & Nicobar Islands India

| Capital | Port Blair |
|-------------|--|
| Area | 8,249 sq km |
| Population | 356,152 |
| Sex Ratio | 846 |
| Growth Rate | 26.94% |
| Literacy | 81.30% |
| Districts | 2 |
| Languages | Hindi, Nicobarese, Bengali, Malayalam, Tamil, Telegu |

- Andamans is a group of 204 islands, while Nicobars is a group of 19 islands. Out of these only 36 islands in Andamans and 12 islands in Nicobars are inhabited.
- India's southern-most location, Indira Point, is located in Nicobars only.
- These islands are mostly inhabited by tribals. Important tribes are the Great Andamanese, Onge, Jarawas and Sentinalese in Andamans and Nicobarese and Shompens in Nicobars.
- Tourism and agriculture is the mainstay of economy.
- Mangrove forests are found in abundance in these islands.

Chandigarh in India

| Capital | Chandigarh |
|-------------|-------------------------|
| Area | 114 sq. km |
| Population | 900,914 |
| Sex Ratio | 773 |
| Growth Rate | 40.33% |
| Literacy | 81.94% |
| Languages | Hindi, Punjabi, English |

- It is one of the most beautiful and well-planned places in India. It was designed by a French architect, Le Corbusier.
- Chandigarh serves as a joint capital of Punjab and Haryana.
- Many large and small scale industries are here which give Chandigarh its revenue.

Dadra & Nagar Haveli

| Capital | Silvassa |
|-------------|-----------------|
| Area | 491 sq. km |
| Population | 220,490 |
| Sex Ratio | 811 |
| Growth Rate | 59.20% |
| Literacy | 57.63% |
| Languages | Gujarati, Hindi |

- It is predominantly a rural area having about 79% population of tribals.
- Forests cover about 40% of the total area.

Daman & Diu India

| Capital | Daman |
|-------------|------------|
| Area | 112 sq. km |
| Population | 158,204 |
| Sex Ratio | 989 |
| Growth Rate | 55.59% |

| Capital | Daman |
|-----------|----------|
| Literacy | 78.18% |
| Districts | 2 |
| Languages | Gujarati |

- Agriculture and small-scale industries are the back-bone of economy.

Delhi Union Territory

| Capital | Delhi |
|-------------|----------------------------------|
| Area | 1,483 sq. km |
| Population | 1,37,82,976 |
| Sex Ratio | 821 |
| Growth Rate | 46.31% |
| Literacy | 81.67% |
| Districts | 9 |
| Languages | Hindi, Punjabi, Urdu and English |

- Delhi is the eighth largest metropolis in the world by population.
- Delhi is the largest commercial centre of northern India and is the largest centre of small industries.
- Delhi has greater number of vehicles than the total vehicles of Mumbai, Kolkata and Chennai put together.

Lakshadweep in India

| Capital | Kavaratti |
|-------------|---------------------------------|
| Area | 32 sq. km |
| Population | 60,595 |
| Sex Ratio | 947 |
| Growth Rate | 17.19% |
| Literacy | 86.66% |
| Languages | Jeseri (Dweep Bhasha) and Mahal |

- Lakshadweep is group of 25 coral islands. It is the smallest Union Territory.
- Coconut is the only major crop.
- Fishing is another major activity.

Puducherry Union Territory

| Capital | Puducherry |
|------------|------------|
| Area | 492 sq. km |
| Population | 973,829 |
| Sex Ratio | 1001 |

| Capital | Puducherry |
|-------------|---|
| Growth Rate | 20.56% |
| Literacy | 81.24% |
| Districts | 4 |
| Languages | Tamil, Telegu, Malayalam, English, French |

- It is a former French colony, consisting of four districts, and named after the largest. In Sept 2006, the territory changed its name from Pondicherry to the vernacular original, Puducherry, which means, "New Village".
- It is basically an agriculture based economy.

Sanctuaries and Parks in India

| Name | Location | Reserves for |
|--|------------------------------------|---|
| Achanakmar Sanctuary | Bilaspur, Chhattisgarh | Tiger, bear, chital, sambar, bison |
| Bandhavgarh National Park | Shahdol, Madhya Pradesh | Tiger, panther, chital, nilgai, wild bear |
| Bandipur Sanctuary | Border of Karnataka and Tamil Nadu | Elephant, tigers, panther, sambar, deer, birds |
| Banarghatta National Park | Bangalore | Elephant, chital, deer, gray |
| Bhadra Sanctuary | Chikmagalur, Karnataka | Elephant, chital, panther, sambar, wild bear |
| Bhimabandh Sanctuary | Monghyr, Bihar | Tiger, leopard, sambar, wild bear, chital, water birds |
| Bori Sanctuary | Hoshangabad, Madhya Pradesh | Tiger, panther, sambar, chital, wild boar, barking deer |
| Borivli National Park | Mumbai | Panther, sambar, langur, wild boar, chinkara |
| Chandraprabha Sanctuary | Near Varanasi Uttar Pradesh | Famous for Gir lions, chital and sambar |
| Corbett National Park named in memory of Jim Corbett, famous sportsman | Nainital, Uttaranchal | Tiger, leopards, elephants, sambar |

| Name | Location | Reserves for |
|-------------------------|-----------------------|--|
| Dachigam Sanctuary | Dachigam, Kashmir | Kashmiri stag |
| Datma Sanctuary | Singbhum, Uttaranchal | Elephants, leopard, wild bear, barking deer |
| Dandeli Sanctuary | Dharwar, Karnataka | Tiger, panther, elephant, chital, sambar, wild bear |
| Dudhwa National Park | Lakhimpurkheri U.P. | Tiger, panther, sambar, chital, nilgai, barking deer |
| Gandhi Sagar Sanctuary | Mandsaur, M.P. | Chital, sambar, chinkara, barking deer, wild birds |
| Garampani Sanctuary | Diphu, Assam | Elephant, leopard, wild buffalo, langur |
| Ghana Bird Sanctuary | Bharatpur, Rajasthan | Water birds, black-buck, chital, sambar |
| Gir Forest | Junagarh, Gujarat | India's biggest wild life sanctuary famous for Gir lions |
| Gautam Buddha Sanctuary | Gaya, Bihar | Tiger, leopard, sambar, chital, barking deer |
| Hazaribagh Sanctuary | Hazaribagh, Jharkhand | Tiger, leopard, chital, nilgai, sambar, wild cat |
| Intangki Sanctuary | Kohima, Nagaland | Elephant, gaur, tiger, panther, barking deer, wild boar |
| Jaldapara Sanctuary | West Bengal | Rhinoceros |

| Name | Location | Reserves for |
|------------------------------|---------------------------------------|---|
| Kawal Sanctuary | Adilabad, A.P. | Tiger, panther, gaur, chital, wild bear |
| Kaziranga National Park | Jorhat, Assam | Horned rhinoceros, gaur, elephant, leopard, wild buffalo |
| Khangchazendra National Park | Gangtok, Sikkim | Snow leopard, musk deer, Himalayan bear |
| Kinnersani Sanctuary | Khamrsan, A.P. | Tiger, panther, gaur, chital, sambar, nilgai |
| Kolleru Pelicanary | Elluru A.P. | Pelicans, painted stork |
| Nagerhole National Park | Coorg, Karnataka | Elephant, tiger, panther, sambar, chital |
| Namdafa Sanctuary | Tirap, Arunachal Pradesh | Elephant, panther, sambar, tiger, chital, king cobra |
| Nawegaon National Park | Bhandara, Maharashtra | Tiger, panther, sambar, chital, nilgai |
| Pachmarhi Sanctuary | Hoshangabad, M.P. | Tiger, panther, bear, sambar, nilgai, barking deer |
| Pakhhal Sanctuary | Warangal A.P. | Tiger, panther, sambar, chital, nilgai |
| Parambikulam Sanctuary | Palghat, Kerala | Tiger, leopard, gaur, elephant, nilgai, chital |
| Pench National Park | Nagpur, Maharashtra | Tiger, panther, gaur, sambar, chital, nilgai |
| Periyar Sanctuary | Idukki, Kerala | Elephant, tiger, panther, gaur, nilgai, sambar, wild bear |
| Ranganthitoo Bird Sanctuary | Islands in Cauvery river in Karnataka | Important bird sanctuary |
| Rohla National Park | Kulu, H.P. | Snow leopard, brown bear, musk deer, snow cock, snow pigeon |
| Sariska Sanctuary | Alwar, Rajasthan | Tiger, panther, sambar, nilgai, chital, chinkara |
| Sharaswathy Valley Sanctuary | Shimoga, Karnataka | Elephant, tiger, panther, sambar, gaur, chital, wild bear |
| Shikari Devi Sanctuary | Mandi, H.P. | Black bear, musk deer, panther, leopard, partridge |
| Shivpuri National Park | Shivpuri, M.P. | Tiger, panther, sambar, hyena, sloth bear, nilgai |
| Simlipal Sanctuary | Mayurbhanj, Orissa | Elephant, tiger, leopard, gaur, chital |
| Someshwara Sanctuary | Canara, Karnataka | Tiger, panther, wild boar, leopard |
| Sunderban Tiger Reserve | South 24 parganas, West Bengal | Tiger, deer, wild boar, crocodile, Gangetic dolphin |

Important Indian Towns on Rivers

| Town | River |
|-----------|---|
| Allahabad | At the confluence of the Ganga and Yamuna |
| Patna | Ganga |
| Varanasi | Ganga |
| Kanpur | Ganga |
| Hardwar | Ganga |
| Badrinath | Alaknanda |
| Agra | Yamuna |
| Delhi | Yamuna |
| Mathura | Yamuna |
| Ferozpur | Satluj |
| Ludhiana | Satluj |
| Srinagar | Jhelum |

| Town | River |
|------|-------|
|------|-------|

| Town | River |
|-----------------|-------------|
| Lucknow | Gomti |
| Jaunpur | Gomti |
| Ayodhya | Saryu |
| Bareilly | Ram Ganga |
| Ahmedabad | Sabarmati |
| Kota | Chambal |
| Jabalpur | Narmada |
| Panji | Mandavi |
| Ujjain | Kshipra |
| Surat | Tapti |
| Jamshedpur | Swarnarekha |
| Dibrugarh | Brahmaputra |
| Guwahati | Brahmaputra |
| Kolkata | Hooghly |
| Sambalpur | Mahanadi |
| Cuttack | Mahanadi |
| Seriranganatnam | Cauvery |
| Hyderabad | Musi |
| Nasik | Godavari |
| Vijayvada | Krishna |
| Cumool | Tungabhadra |
| Tiruchirapalli | Cauvery |

Heights of Some Important Indian Peaks

| S No | Peak | Height in metres above mean Sea Level |
|------|---------------|---------------------------------------|
| 1 | K2 | 8,611 |
| 2 | Kanchen Junga | 8,598 |
| 3 | Nanga Parvat | 8,126 |
| 4 | Gasher Brum | 8,068 |
| 5 | Broad Peak | 8,047 |
| 6 | Disteghil Sar | 7,885 |
| 7 | Masher Brum E | 7,821 |
| 8 | Nanda Devi | 7,817 |
| 9 | Masher Brum W | 7,806 |
| 10 | Rakaposhi | 7,788 |
| 11 | Kamet | 7,756 |
| 12 | Saser Kangri | 7,672 |
| 13 | Skyang Kangri | 7,544 |
| 14 | Sia Kangri | 7,422 |

| S No | Peak | Height in metres above mean Sea Level |
|------|-----------------------------|---------------------------------------|
| 15 | Chaukhamba (Badrinath Peak) | 7,138 |
| 16 | Trisul West | 7,138 |
| 17 | Nunkun | 7,135 |
| 18 | Pauhunri | 7,128 |
| 19 | Kangto | 7,090 |
| 20 | Dunagiri | 7,066 |

Lengths of Some Important Indian Rivers

| S No | River | Length (km) |
|------|-------------|-------------|
| 1 | Indus | 3,000 |
| 2 | Brahmaputra | 2,900 |
| 3 | Ganga | 2,510 |
| 4 | Godavari | 1,450 |
| 5 | Narmada | 1,290 |
| 6 | Krishna | 1,290 |
| 7 | Mahanadi | 890 |
| 8 | Cauvery | 760 |

Major Ports in India

| Sl. No. | Western Coast | Eastern Coast |
|---------|--|---------------------------------------|
| 1 | Kandla (Child of Partition) | Kolkata - Haldia (Riverine Port) |
| 2 | Mumbai (busiest and Biggest) | Paradip (Exports Raw Iron into Japan) |
| 3 | Jawahar Lal Nehru (Fastest Growing) | Vishakhapatnam (Deepest Port) |
| 4 | Marmugao (Naval base also) | Chennai (Oldest and Artificial) |
| 5 | Mangalore (Exports Kudremukh Iron - ore) | Ennore (Most Modern in Private Hands) |
| 6 | Cochin (Natural Harbour) | Tuticorin (Southernmost) |

World Geography

Cosmology Important Facts

The Universe or the Cosmos, as perceived today, consists of millions of Galaxies. A galaxy is a huge congregation of stars held together by the forces of gravity.

- Edwin Hubble in 1924 first demonstrated existence of galaxies beyond Milky Way. He proved that these galaxies are flying away from each other and that the farther they are, the faster they fly. This means that the universe is expanding like a balloon that is being blown up.
- In the ancient times, the knowledge about the universe was vague and confined to mystery and religious perceptions.

- In 140 AD, Ptolemy propounded the theory that the earth was the centre of the universe and the sun and other heavenly bodies revolved around it. In 1543, Copernicus argued that the sun and not the earth was the centre of the universe.
- However, he still equated the universe with the solar system. Kepler supported Copernicus but said that the sun was the centre of the solar system and not the universe. In 1805, Hershel made it clear that the solar system was a part of the much larger system of stars called galaxy.
- Our galaxy is Milky Way Galaxy (or the Akash Ganga). It is spiral in shape. It consists of over a 100 billion stars rotating and revolving about its centre. Nearest galaxy to ours is Andromeda.
- The Big Bang Theory evaluates that 15 billion years ago, cosmic matter (universe) was in an extremely compressed state, from which expansion started by a primordial explosion. This explosion broke up the super-dense ball and cast its fragments far out into space, where they are still traveling at thousands of miles per second.
- It is from these speeding fragments of matter that our galaxies have been formed. The formation of galaxies and stars has not halted the speed of expansion. And, as it happens in all explosions, the farthest pieces are flying the fastest.
- Later, Pulsating (Oscillating) Universe Theory was given which says that universe periodically expands from the explosion of the primordial body, then contracts back and explodes again, over immensely long cycles, ad infinitum.
- Measurement Units of Space are :
 - **Light Year** : It is the distance covered by light in one year in vacuum at a speed of 3 105 km/s.
 - **Astronomical Unit (A.U)** : It is the mean distance between the earth and the sun. One light year is equal to 60,000 A.U.
 - **Parsec** : It represents the distance at which the mean radius of earth's orbit subtends an angle of one second of an arc. It is equal to 3.26 light years.
- Stars are self – luminous bodies that account for 98 per cent of the material in the galaxy. The rest 2 per cent consists of interstellar or galactic gas and dust in an attenuated form.
- Stars are formed by gravitational contractions from these vast clouds of galactic gas and dust. Star forming clouds are thousands of times denser than the normal interstellar gas. Star forming matter is richer in hydrogen and helium.
- A star's colour indicates the temperature of its surface. Blue colour denotes maximum temperature. Then comes yellow, then red, etc.
- The life of a star is spread over billions of years. It begins to form by compression of galactic gas and dust. Compression generates heat which in turn causes hydrogen to be converted into helium in nuclear fusion, thereby emitting large amount of heat and light.
- Continued nuclear fusion over a period of time starts depletion of hydrogen and the helium core becomes increasingly heavy, resulting into swelling and reddening of outer regions. Such stars of gigantic dimensions are termed as Red Giants.
- If the star is of sun's size, it becomes a White Dwarf. Their central density can reach up to 10⁸ grams per cubic cm.
- If the star is bigger than the sun but not more than twice as big, it will turn into a Neutron Star or Pulsar. Their central density is 10¹⁴ grams per cubic cm. They are formed due to Novae or Super novae explosion.
- Stars having mass greater than three times that of the sun, because of their great gravitational power, have contracted so much that they have developed super density of 10¹⁶ grams per cubic cm. It is so dense that nothing, not even light, can escape from its gravity and hence called 'Black Hole'.
- Brightest star outside our Solar System is Sirius, also called Dog Star.
- Closest star of Solar System is Proxima Centauri (4.2 light years away). Then come Alpha Centauri (4.3 light years away) and Barnard's Star (5.9 light years away).

Earth Solar System

Earth solar system consists of :

- The Sun
- The Planets
- Dwarf Planets

and countless fragments of left – overs called asteroids, meteors, comets and satellites of the planets (Called small solar system Bodies).

Origin of Solar System

Various theories have been given by different persons to explain the origin of Solar System.

| | |
|------------------------------|------------------------------|
| Gaseous Hypothesis | Kant |
| Nebular Hypothesis | Laplace |
| Planetesimal Hypothesis | Chamberlin and Moulton |
| Tidal Hypothesis | James Jeans & Harold Jeffrey |
| Binary Star Hypothesis | H. N. Russel |
| Fission Hypothesis | Ross Gun |
| Cepheid Hypothesis | A.C. Banerji |
| Nova Hypothesis | Hoyle & Lyttleton |
| Electromagnetic Hypothesis | H. Alfven |
| Interstellar Dust Hypothesis | Schmidt |
| Nebular Cloud Hypothesis | Dr. Von Weizsacker |
| Protoplanet Hypothesis | G. Kuiper |

| Solar System Some Facts | |
|--------------------------------|-----------|
| Biggest Planet | Jupiter |
| Smallest Planet | Mercury |
| Nearest Planet to Sun | Mercury |
| Farthest Planet from Sun | Neptune |
| Nearest Planet to Earth | Venus |
| Brightest Planet | Venus |
| Brightest star after Sun | Sirius |
| Planet with maximum satellites | Jupiter |
| Coldest Planet | Neptune |
| Hottest Planet | Venus |
| Heaviest Planet | Jupiter |
| Red Planet | Mars |
| Biggest Satellite | Gannymede |

| Solar System Some Facts | |
|------------------------------|---------|
| Smallest Satellite | Deimos |
| Blue Planet | Earth |
| Morning/Evening Star | Venus |
| Earth's Twin | Venus |
| Green Planet | Neptune |
| Planet with a big red spot | Jupiter |
| Lord of the Heavens | Jupiter |
| Greatest Diurnal Temperature | Mercury |

Earth Movements

The Earth also called Blue Planet. It is the densest of all planets.

Earth Circumference : 40,232 Kilometers.

Earth Area : 510 million Square Kilometers Average distance from sun: 149 million-Kilometers.

Earth Perihelion : Nearest position of earth to sun. The earth reaches its perihelion on January 3 every year at a distance of about 147 million-Kilometers.

Aphelion : Farthest position of earth from sun. The earth reaches its aphelion on July 4, when the earth is at a distance of 152 million Kilometers.

The shape of the earth is oblate spheroid or oblate ellipsoid (i.e. almost spherical, flattened a little at the poles with a slight bulge at the centre).

2 Types of Earth Movements:

1. Rotation or daily movement.
2. Revolution or annual movement.

Earth Rotation

- Spins on its imaginary axis from west to east in 23 hrs, 56 min and 40.91 sec.
- Rotational velocity at equator is 1667 Kilometers/h and it decreases towards the poles, where it is zero.
- Earth's rotation results in

- i . Causation of days and nights;
- ii . A difference of one hour between two meridians which are 15° apart;
- iii. Change in the direction of wind and ocean currents;
 - Rise and fall of tides everyday.
The longest day in North Hemisphere is June 21, while shortest day is on 22 Dec (Vice-versa in S. Hemisphere).
 - Days and nights are almost equal at the equator.

Earth Revolution

- It is earth's motion in elliptical orbit around the sun. Earth's average orbital velocity is 29.79 Kilometers/s.
- Takes 365 days, 5 hrs, 48 min and 45.51 sec. It results in one extra day every fourth year.
- Revolution of the earth results in

- i . Change of seasons
- ii . Variation in the lengths of days and nights at different times of the year
- iii . Shifting of wind belts
- iv . Determination of latitudes.

- **Inclined Axis:** The axis is an imaginary line running from north to south and passing through the centre of the earth. It always remains inclined at an angle of $66\frac{1}{2}^\circ$ to the plane of the earth's orbit, and is tilted $23\frac{1}{2}^\circ$ from a line perpendicular to this plane. The two facts, i.e., a fixed angle of the earth's axis to the plane of the orbit and the axis always pointing in the same direction, when combined with the earth's movements, results in varying lengths of days and nights, seasonality and changes in the altitude of sun at different times of the year.
- **Earth Seasons** are periods into which the year can be divided as a result of the climatic conditions, largely due to the changes in the duration and intensity of solar radiation.

The 4 Earth Seasons are:

- **Spring:** On March 21, the sun is directly overhead the equator. This is the season of spring in the northern hemisphere.
- **Summer:** On June 21, the sun is directly overhead the Tropic of Cancer. Thus, the northern hemisphere experiences summer.
- **Autumn:** On September 23, the sun returns to the equator, and the northern hemisphere experiences autumn.
- **Winter:** On December 22, the sun is at the Tropic of Capricorn, and the northern hemisphere experiences winter.

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Earth Some Important Facts

| | |
|---------------------|--------------------------------|
| Age | 4,60,00,00,000 years |
| Total surface area | 51,01,00,500 Square Kilometers |
| Land area (29.08%) | 14,89,50,800 Square Kilometers |
| Water area (70.92%) | 36,11,49,700 Square Kilometers |
| Mean density | 5.52 gm. per cc |
| Equatorial diameter | 12,755 Kilometers |
| Polar diameter | 12,712 Kilometers |
| Escape velocity | 11.2 Kilometers/sec |
| Mass | 5.880 1024 kg |

| Volume | 10,83,20,88,40,000 kg ³ |
|--|---|
| Distance from Moon | 3,82,200 Kilometers |
| Highest place on Earth | Mount Everest (8,850 m) |
| Deepest point in Ocean | Challenger Deep in Mariana Trench in Pacific Ocean near Philippines (11,033 m deep) |
| Deepest point on Land | Dead Sea (396 m deep) |
| Rotation time | 23 hrs, 56 min, 40.91 sec |
| Revolution time | 365 days, 5 hrs, 48 min, 45.51 sec |
| Satellite | 1 (Moon) |
| Tilt of axis from Orbital Plane | 23° 27' |
| Distance from Sun | 14,94,07,000 Kilometers |
| Equatorial circumference | 40,075 Kilometers |
| Polar circumference | 40,024 Kilometers |
| Average Ocean depth | 3,554 m |
| Date of perihelion (minimum distance from Sun) | Jan 3 |
| Date of aphelion (maximum distance from Sun) | July 4 |
| Orbital circumference | 924,375,700 Kilometers |
| Average Orbital speed | 29.783 Kilometers/sec. (107,218 Kilometers/h) |
| Minimum surface temperature | 88° C |
| Mean surface temperature | 14° C |
| Maximum surface temperature | 58° C |

Earth Latitude and Longitude

Earth Latitude

- Imaginary lines drawn parallel to the equator. Measured as an angle whose apex is at the centre of the earth
- The equator represents 0° latitude, while the North Pole is 90° N and the South Pole 90° S
- 23½° N represents Tropic of Cancer while 23½° S represents Tropic of Capricorn.
- 66½° N represents Arctic Circle while 66½° S represents Antarctic Circle.
- There are total 181 latitudes including the equator. Each parallel of latitude is a circle, but they are not equal.
- The circle becomes smaller towards the poles. Equator is the 'Greatest Circle' that can be drawn on the earth's surface.
- The distance between any two parallels of latitude is always equal.

Earth Longitude

- It is the angular distance measured from the centre of the earth. On the globe the lines of longitude are drawn as a series of semicircles that extend from the North Pole to the South Pole through the equator. They are also called meridians.
- The distance between any two meridians is not equal. At the equator, 1 degree = 111 km. At 30°N or S, it is 96.5 km. It goes on decreasing this way until it is zero at the poles.
- There are 360 meridians of longitude. The prime meridian is a longitude of 00, passing through the Royal Observatory at Greenwich near London.
- This meridian is taken by geographers to divide the earth into the eastern and the western hemispheres.
- Each meridian of longitude is a semi-circle. 180° meridian (International Date Line) lies exactly opposite to 0° meridian. Such points are called Antipodal Points.
- The earth is divided into 24 longitudinal zones, each being 15° or 1 hour apart in time (4 minutes / degree).

Longitude and Time

- Places that are on the same meridian have the same local (sun) time. Since the earth makes one complete revolution of 360° in 24 hours, it passes through 15° in one hour or 1° in 4 minutes.
- The earth rotates from west to east, hence places east of Greenwich see the sun earlier and gain time whereas places west of Greenwich see the sun later and lose time.
- A suitable memory acronym can be: East-Gain-Add (E.G.A.) and West-Lose-Subtract (W.L.S.). So, if it is noon in London (near 0°), 15° east will be one hour ahead of London or 1 p.m. and Chennai of 80°E will be 5 hours 20 minutes ahead. To avoid confusion about having many local times within one country, a particular Meridian is chosen for the whole country whose time is known as 'standard time'.
- Generally, the standard meridians are chosen to differ from the Greenwich meridian by the multiples of fifteen degree or seven and a half degree, i.e., by exact number of hours or half hours. The world is thus divided into a number of time zones. Larger countries like Russia, Canada, USA etc., have greater east-west extension, so they adopt several time zones. Russia has 11 time zones while USA and Canada have 5 time zones.
- India, whose longitudinal extent is approx. 30°, has adopted only one time zone, selecting the 82.5°E for the standard time which is 5 hours and 30 minutes ahead of GMT (Greenwich Mean Time).

International Date Line

- It is the 180° meridian running over the Pacific Ocean, deviating at Aleutian Islands, Fiji, Samoa and Gilbert Islands.

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- Travelers crossing the Date Line from west to east (i.e., from Japan to USA) repeat a day and travelers crossing it from east to west (i.e., from USA to Japan) lose a day.

Earth Eclipses

Earth Lunar Eclipse

- When earth comes between sun and moon.
- Occurs only on a full moon day. However, it does not occur on every full moon day because the moon is so small and the plane of its orbit is tilted about 5° with respect to the plane of the earth's orbit. It is for this reason that eclipses do not occur every month.
- Can last up to one hour 40 minutes. The moon does not become completely dark during most lunar eclipses. In many cases, it becomes reddish. The earth's atmosphere bends part of the sun's light around the earth and towards the moon.
- This light is red because the atmosphere scatters the other colors present in sunlight in greater amounts than it does red.

Earth Solar Eclipse

When moon comes between sun and earth.

- Can be partial or total.
- Occurs only on a new moon day when the moon is in line with the sun. However, due to the inclination of the moon's orbit, a solar eclipse doesn't occur on every new moon day.

Earth Climate

Earth Climate

The average weather conditions over a large area is called the climate of a place. Weather conditions over a specific length of time, usually a period of 31 years, are taken into consideration.

On a large scale, the climate of a particular region is determined by:

- i. Latitude and tilt of the earth's axis, which determines the amount of solar radiation received by the area
- ii. The distribution of land and sea and proximity of ocean currents
- iii. The altitude and topography of the area
- iv. The location of the area in relation to the main circulation belts of the earth.

Climate can be classified on the basis of temperature, rainfall, evaporation, evapotranspiration and water balance. One of the universally accepted climate classifications is by Koeppen which is being described here.

Types of Climates

1. Tropical Rain Forest Climate

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- Also called equatorial type of climate or Selvas.
- 5° – 10° of equator, nights and days equal.
- Average monthly temperature is 24° – 27°c, annual range least. Diurnal range of temperature far greater than the annual range. Here night is the winter.
- Called 'Belt of Calm' or Doldrums.
- Convective rainfall. Annual rainfall is 250 cm.
- Broad-leaved evergreen dense forests. Trees are gregarious and there is competition for sunlight. Have more species of plants and animals than in all others combined.
- In Amazon basin, Congo basin, Indonesia.

2. Tropical Monsoon Climate

- Complete seasonal reversal of winds.
- Rainfall seasonal (generally in summers). Due to this vegetation is deciduous.
- Approx. 200 cm of rainfall.
- Occurs in Western Guinea coast of Africa, South-Eastern Asia, Northern Australia, some parts of Amazon valley and West Indies.

3. Tropical Grasslands/Savanna Climate

- Average annual temperature is 23°c. Annual rainfall is about 150 cm. Area- Africa, East and Central South America.
- Bounded by tropical rain forest climate towards the equator and dry climate towards the poles, the Savannah type is characteristic of grasslands in tropical and subtropical latitudes. Grasslands are dotted with scattered trees and bushes that can survive the drought season.
- Rainfall in summer owing to convective ascent of air. Distinct dry season in winter. Trees with longer roots, fire-resistant.

4. Tropical-Subtropical hot Desert

- Situated in the trade wind belt. Occupy the western margins of continents. The area includes North America – Colorado Desert, Mexican Desert; Africa-Sahara, Kalahari, Namib Desert; S.W.Asia-Arabian, Iranian, Thar Desert; S.America-Atacama; Australia-Great Australian Desert.
- Average annual temperature is 38° c; annual summer temperature is 40° c, annual winter temperature is 15° c. average annual rainfall is about 25-40 cm. Greatest diurnal temperature.
- Highest insolation, as there is no clouds cover to scatter the insolation.
- Vegetation is xerophytic.

5. Middle Latitude Desert Climate

- Found between 35°-50° N and S.
- **Area:** Tarim, Gobi, Russian Turkistan and C. Iran. In Southern Hemisphere, only in Patagonia.
- Unlike the hot deserts, they have very cold winters because of their interior location.

6. Tropical and Subtropical Steppes

- Transition belt between hot deserts and humid climates. Occupy pole-ward margins of the tropical and subtropical deserts.
- Average annual temperature is 21° c.

- Semi-arid climate characterized by abundance of shrubs and grasses.
- Known by different names:

- Prairies – North America
- Pampas – South America
- Veldt – South Africa
- Downs – Australia
- Steppes – Eurasia
- Canterbury – New Zealand
- Postaz – Hungary
- Manchurian – Russia

7. Mediterranean Climate

- In the western coast of continents between 30°-45° N & S; Around the Mediterranean Sea, in South Europe, North Africa, California coast, Central Chile, Cape of Good Hope and South East Australia.
- Characterized by dry summer and humid winter. Off-shore trade winds blow in summer; they are dry and give no rainfall. Cyclonic rainfall in winter.
- Average annual temperature is 16° c. average winter temperature, 10° c, summer 25°c annual rainfall is 40-60 cm.
- Olives, grapevine and citrus family fruits are the chief products of these regions which are also known for grain farming.

8. China Type Climate

- Average annual temperature is 19° c, annual rainfall 120 cm.
- In the eastern coasts of continents between 25°- 45° N & S. Areas- China, South East USA, South Brazil, Eastern Argentina, South East Africa, South East Australia, South Japan. It is the eastern counterpart of the Mediterranean type.
- Characteristics-Hot summers and mild winters. Rainfall throughout the year.

9. West European Type Climate

- On the western side of continents between 40°-65° N & S. Areas- North West Europe including British Isles, West coast of Canada, South Chile, Southern New Zealand.
- Summers are moderate to cool (15°-18°); winters mild (2°-10°). Average annual temperature is 10° c.
- Annual Rainfall: 75-100 cm. No dry season as the westerly winds blow from the ocean throughout the year. Rainfall is mostly of cyclonic origin.

10. Cool East Coast Climate

- The Corn Belt of US has this type of climate; that is why it is known as 'Corn-Belt' climate.
- Average summer temp is 21°-24°c; it is long, warm and humid.
- Winter temp average-4° to 1.7° for a period of 3-5 months.

11. Continental Type Climate

- Coldest winter month average -12° to -6.7°c.
- Hottest summer months average 18°c to 21°c.

- In the interior parts of big continents.

12. Taiga Climate

- Taiga means snow forests or coniferous forests; needle shaped leaves, composed of evergreen spruce, fir and pine. Extends in two large belts in east-west direction from Alaska to Newfoundland in North America and from Norway to Kamchatka Peninsula in Eurasia.
- Cool and short summers (around 10°C) and very cold and long winters (below 0°C).
- Annual range of temperature highest. (In Verkhoyansk, Jan temp is -50°; annual range being 64°C)
- Total annual precipitation below 50 cm.
- These forests are the most important source of softwood and fur bearing animals.

13. Tundra Climate

- Summers are warm enough to melt the thin snow cover or small water bodies, with the result that land is water soaked and marshes, swamps are common.
- Precipitation less than 30 cm.
- Blizzards blow.
- Lichens and mosses common.

14. Highland Climate

- Experienced in the mountainous regions.
- Determined by elevation, shape of the highland, exposure to winds and location.
- Here winds are much stronger than at low levels.
- Vegetation varies as we move up.

Important Deserts of the World:

- Sahara – N. Africa (Includes the Libyan and the Nubian Desert)
- Australian – Australia (Includes Gibson, Simpson, Victorian, Great Sandy)
- Arabian – Arab Countries (Includes Rub'al Khali & An-Nafad of S. Arabia and Dast-e-Lut & Dast-e-Kavir of Iran)
- Kalahari – Africa (mainly in Botswana)
- Gobi – Mongolia
- Atacama – Central Chile
- Patagonian – Argentina
- Nabib – Namibia
- TaklaMakan – Sinkiang, China
- Karakum – Turkmenistan
- Sonoran – Arizona and California (USA)
- Thar – India

Isopleth

- Lines drawn on map along which the value of a particular phenomenon is uniform.

Some Important Isopleths are:

| Isopleth | Reactions |
|-----------------------------|------------------------------------|
| Isobars | Equal pressure |
| Isobaths | Equal depth in sea |
| Isobronts | Thunder-storm at the same time |
| Isohaline | Salinity |
| Isohels | Sunshine |
| Isohyets | Rainfall |
| Isohypse (or Contour Lines) | elevation above sea-level |
| Isonif | Snow |
| Isotherms | Temperature |
| Isoneph | Cloudiness |
| Isodapan | Equal transportation cost distance |
| Isocline | Slope |

The Earth Hydrosphere

The Earth Hydrosphere

- Earth Hydrosphere is the name given to the mass of water that covers about 71% of the earth's surface.
- The average depth of oceans is about 4 km.

Earth Ocean Floor

- It is very irregular as the surface of the continents.
- Four major units of Earth ocean floor are:

Continental Shelf of India

- It is the coastal part of the ocean which is not very deep and the slope of the bottom is very gentle.
- Extends to a depth of 100 fathoms (1 fathom = 1.8 m).
- In regions where the mountains extend along the coast, the shelf is narrower.

About 20% petrol and gas found here. They also provide the richest fishing ground in the world. Marine life exists entirely here.

They occupy about 7% of the total ocean area.

Continental Slopes

- Extends seawards from the Continental Shelf. The continent blocks are supposed to end at the site of continental slope.
- The boundary between shelf and slope is known as Andesite Line, named after the andesite rock.
- Depth is up to 2000 fathoms.

- They cover about 8.5% of the total ocean area.

Continental Rises

- At the foot of slope is found an area slightly rising due to the accumulation of debris transported over the slope.
- Oil deposits occur here.

Abyssal or the Deep Sea Plains

- It is the deepest and the most extensive part of the ocean floor and accounts for about 40% of the total ocean floor.
- Parts of the abyssal plains are occupied by raised ridges or submarine mountains and by very deep trenches or canyons.
- Ridges are the raised areas in sea. E.g., Mid-Atlantic ridge (S-shaped), Indian Ocean ridge (inverted Y-shaped).
- A ridge rising more than 1000m above the ocean floor is called Seamount. Flat topped seamounts are called Guyots (maximum in Pacific Ocean)
- Some parts of the ridge or volcanic peaks reach the surface of the oceans and form islands (E.g. Hawaii Islands).
- Trenches are narrow and steep sided depressions. They occur where two plates of the earth's crust are moving together and one is being pushed down below the other. Deepest is Challenger Deep, a part of Mariana Trench in Pacific Ocean, near Philippines, is more than 11 km deep.
- Submarine canyons are the deep gorges on the ocean floor and are restricted to the continental shelves, slopes and rises.

Salinity of Water

The proportion of dissolved salts to pure water is called salinity. The average salinity in the oceans and seas is 35‰, i.e., 35 grams of salt in one litre of water.

Salinity in decreasing order is: NaCl, MgCl, MgSO₄, CaSO₄, KSO₄, etc. Chlorine is the most abundant element.

Max salinity: Lake Van (Turkey) – 3330‰. Then Dead Sea – 2400‰. Most saline sea is Red Sea.

- The main source of salinity is dissolution of the rocks of oceanic crust, which contains salts.
- It is maximum at the tropics, because here temperature is high. Equatorial regions come second because although they have high temperatures, they have high rainfall also. Poles have minimum salinity because of addition of fresh water in the form of icebergs and excessive snowfall.
- It causes vertical circulation of water.

Earth Waves

- They are caused due to the friction with the winds.
- There is no forward movement of water in a wave. When a wave enters shallow water, it breaks. The top of it is thrown forward and this is when water moves forward. Water from the breaking wave runs up the shore as swash and back down the shore as backwash
- The maximum height of waves in most oceans is about 12 m but they may be as high as 15 m. Seismic waves or tsunamis are the waves caused by earthquakes in volcanic eruptions in the sea bottom. The tsunamis which hit the coasts in the SE Asia on Dec 26, 2004, caused havoc in that region.

Coral Reefs in India

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- Corals are a kind of calcareous rocks chiefly made of the skeletons of minute sea organisms called 'polyps'. They are formed due to accumulation and compaction of skeletons of these lime secreting organisms.
- Corals are found mainly in the tropical oceans and seas because they require high mean annual temperature ranging around 20° c. They cannot survive at a greater depth than 60-77m below sea level. Muddy or very saline water is injurious for their growth.
- The coral reefs are classified on the basis of nature, shape and mode of occurrence into the following three:

1. **Fringing Reef:** Coral reefs that develop along the continental margins or along the islands are called fringing reefs. The seaward slope is steep and vertical while the landward slope is gentle. Sometimes there is a lagoon or shallow channel between the fringing reef and the land. Such reefs are found near Rameshwaram in the Gulf of Mannar.
2. **Barrier Reef:** They are the largest, most extensive, highest and widest reefs of all. They are formed off the coastal platforms and parallel to them. There is an extensive but shallow lagoon between the coastal land and the barrier reef. The Great Barrier Reef of Australia is the largest barrier reef in the world.
3. **Atoll:** A reef of narrow growing corals of horse shoe shape and crowned with palm trees is called an atoll. It is generally formed around an island or in an elliptical form on a submarine platform. There is a lagoon in the middle of the coral ring. E.g. Fiji Atoll.

Earth Tides

Earth Tides

- Refer to the phenomenon of regular rise and fall of the sea water. Though both sun and moon exert gravitational force on earth, resulting in the production of tides, the moon, by nature of its closeness to the earth, has greater control over the timings of the tidal rises and falls.
- The interval between two tides is 12 hrs and 26 minutes.

Spring Tide

- When the sun, moon and the earth are in a straight line, the gravitational force is at its greatest because tide producing forces of both sun and moon complement each other and they pull together. This produces tides of unusually great range, called the spring tide.
- **These occur about twice a month:** at new moon when the sun and the moon are in conjunction and at full moon when they are in opposition.

Neap Tide

- Lowest magnitude as the tide producing forces of sun and moon act opposite to each other, as they form a triangle.
- This happens during phases of first and third quarter, i.e., at half moon, the sun's tide producing force tends to balance the tide producing force of the moon., resulting in tides of unusually small range known as neap tides.

Internal Structure of Earth

The Crust of Earth

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- It is the outermost and the thinnest layer of the earth's surface, about 8 to 40 km thick. The crust varies greatly in thickness and composition – as small as 5 km thick in some places beneath the oceans, while under some mountain ranges it extends up to 70 km in depth.
- The crust is made up of two layers- an upper lighter layer called the Sial (Silicate + Aluminium) and a lower density layer called Sima (Silicate + Magnesium).
- The average density of this layer is 3 gm/cc.

The Mantle of Earth

- This layer extends up to a depth of 2900 km.
- **Mantle is made up of 2 parts:** Upper Mantle or Asthenosphere (up to about 500 km) and Lower Mantle. Asthenosphere is in a semi-molten plastic state, and it is thought that this enables the lithosphere to move about it. Within the asthenosphere, the velocity of seismic waves is considerably reduced (Called 'Low Velocity Zone').
- The line of separation between the mantle and the crust is known as Mohorovicic Discontinuity.

The Core of Earth

- Beyond a depth of 2900 km lies the core of the earth.
- The outer core is 2100 km thick and is in molten form due to excessive heat out there. Inner core is 1370 km thick and is in plastic form due to the combined factors of excessive heat and pressure. It is made up of iron and nickel (Nife) and is responsible for earth's magnetism. This layer has the maximum specific gravity.
- The temperatures in the earth's core lie between 2200 °c and 2750 °c.
- The line of separation between the mantle and the core is called Gutenberg-Wiechert Discontinuity.

Note:

Temperature Inside the Earth: In the first 100 km, 12° increase per km. In the next 300 km, 2° increase per km. After that it is 1° increase per km.

Composition of Earth

- Made up of over 100 elements.
- The following 8 are important:

| | |
|-----------|--------|
| Oxygen | 46.5% |
| Silicon | 27.72% |
| Aluminium | 8.13% |
| Iron | 5.01% |
| Calcium | 3.63% |
| Sodium | 2.85% |
| Potassium | 2.62% |
| Magnesium | 2.09% |
| Magnesium | 2.09% |

Earth Rocks

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Rocks of Earth

Any aggregate of material particles that forms part of the earth's crust is called a rock.

There are 3 major types of rock types :

Igneous Rocks

- Formed by the solidification of molten magma from the interior of the earth.
- Most abundant of the three types of rocks (95%).
- They do not occur in layers. Most of them are crystalline and do not contain fossils.
- All other types of rocks originate from these rocks, thus called Primary rocks.

They are classified on several grounds as mentioned below:

1. On the basis of mode of occurrence

- **Intrusive Igneous Rocks:** They are formed by the solidification of magma beneath the earth's surface. They are further divided into plutonic and hypabyssal igneous rocks. Plutonic rocks cool deep beneath the earth. E.g., Granite. Hypabyssal rocks cool just beneath the earth's surface. E.g., Batholith, laccolith, phacolith, sills, dykes, etc.
- **Extrusive Igneous Rocks:** They are formed due to cooling and solidification of hot and molten lava at the earth's surface. E.g., Basalt, gabbro, etc.

2. On the basis of Silica Content

- Acidic igneous rocks having more silica. E.g. Granite.
- Basic igneous rocks having less silica. E.g. Gabbro.

Sedimentary Rocks

- Made up of weathered remains of igneous rocks. Also contains fossils of plants and animals.
- Comprise only about 5% of the earth's crust but cover about 75% of the total land surface.
- The layers of sedimentary rocks hold all reserve of coal, oil and natural gas.
- Also known as Stratified Rocks because of the layers.
- Sedimentary rocks fall into three main groups:

1. **Mechanically Formed:** These are called clastic sedimentary rocks; the sediments are largely derived from pre-existing rocks that have been broken down and then transported by water, wind or ice to form rocks.
2. **Organically Formed Rocks:** These rocks are derived from remains of plants (e.g. peat, lignite, bituminous coal), or animals (e.g., chalk and coral).
3. **Chemically Formed:** E.g., Gypsum, salt rock, etc.

Metamorphic Rocks

- Sometimes igneous or sedimentary rocks metamorphize or change due to great 'pressure, intense temperature or the action of water and chemical activity.
- Examples of metamorphic rocks formed from different rocks are:

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| Metamorphic Rock | Made From |
|------------------|------------------------------|
| Slate | Shale and mudstone |
| Quartzite | Sandstone |
| Gneiss | Aranite |
| Marble | Limestone, dolomite or chalk |
| Schist | Shale |
| Anthracite | Coal |

Earthquakes

Earthquakes

- Tremors or vibrations of earth's surface produced by internal forces.
- The point of origin of earthquake is called Seismic focus. Most of the earthquakes originate at the depth of 50-100 km inside the earth.
- The point on the earth's surface vertically above the earth's surface is called Epicentre.
- The passage of earthquake waves is recorded by Seismograph.
- The magnitude of waves is measured on Richter's scale. For measurement of the intensity of the earthquake (damage caused), the Modified Mercalli Intensity Scale is used.

Types of Waves Earthquakes

1. **Primary Waves (P-Waves):** Travel from the point of happening by the displacement of surrounding particles. They are transmitted through solids, liquids and gases. Travels fastest.
2. **Secondary Waves (S-Waves):** Travels through solids only. Thus they cannot pass through core.
3. **Surface Waves or Long Waves (L-Waves):** Travels on earth's surface and causes maximum destruction. They are recorded after the P and S waves.

Distribution of Earthquakes

- Around the Pacific Ocean along a belt of volcanoes known as the Ring of Fire. 68 per cent of the volcanoes are experienced in this region.
- From the middle of Asia (Himalayas, Caspian Sea) through the Mediterranean Sea to West Indies. 21 per cent earthquakes are experienced in the region.
- Mid-Atlantic ridge belt which accounts for 11 per cent of the earthquakes.

Earth Volcanoes

A volcano is a vent or opening usually circular in form through which heated materials consisting of gases, water, liquid lava and fragments of rocks are ejected from the highly heated interiors to the surface of the earth.

Volcanic eruptions are closely associated with several interconnected processes such as

- The gradual increase in temperature with increasing depth at a rate of 1°C per 32 m due to heat generated by degeneration of radioactive elements inside the earth
- Origin of magma because of lowering of melting point caused by reduction in pressure of overlying rocks due to fractures caused by splitting of plates

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- Origin of gases and water-vapour due to heating of water
- Ascent of magma due to pressure from gases and vapour
- Occurrence of volcanic eruptions. These eruptions are closely associated with plate boundaries.

Classification of Volcanoes

1. Classification on the basis of Periodicity of Eruptions:

- **Active Volcano:** Volcano which erupt periodically. E.g. Maona Loa in Hawaii, Etna in Sicily, Vesuvius in Italy, Stromboli in Mediterranean Sea, etc.
- **Dormant Volcano:** Volcano which has been quiescent for a long time but in which there is a possibility of eruption. E.g. Fujiyama in Japan, Krakatoa in Indonesia, Barren island Volcano in Andamans, etc.

2. Classification on the basis of Mode of Eruption

- **Central Eruption Type or Explosive Type:** E.g. Hawaiian type, Strombolian type, Volcanian type, Pelean type, Vesuvius type, etc.
- **Fissure Eruption or Quiet Eruption Type:** Large quantities of lava quietly flow up from fissures and spread out over the surrounding areas. Successive lava flow results in the growth of a lava plateau. E.g. Deccan Plateau, etc.

Distribution of Volcanoes in the World

- About 15% of world's active volcanoes are found along the 'constructive or divergent' plate margins, whereas 80% volcanoes are associated with the 'destructive or convergent' plate boundaries.
1. The Circum-Pacific belt or the 'Ring of Fire'. It extends across the Kamchatka Peninsula, Kurile Islands, the Islands of Japan, Philippines, New Guinea, New Zealand and the Solomon Islands. It also passes through the Antarctica and the western coast of America.
 2. The Mid-Continent belt includes volcanoes of Alpine mountain chain, the Mediterranean Sea and the fault zone of eastern Africa. E.g. Stromboli, Vesuvius, Etna, Kilimanjaro, etc.
 3. The Mid-Atlantic belt in which the volcanoes are fissure eruption type. E.g. Iceland, Canary Islands, Cape Verde, Azores, etc.

Earth Mountains

Types of Mountains

Fold Mountains of the World

They are formed when the rocks of the crust of the earth folded under stress, mainly by forces of compression (as a result of series of earthquakes).

E.g. – All big mountain systems: Himalayas, Alps, Andes, Rockies, Atlas, etc.

On the basis of age, fold mountains are grouped into: Young / New Fold Mountains

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Came into existence after the continental drift. E.g. Himalayas, Andes, Rockies, Alps. Himalayas are regarded the youngest mountains in the world.

Old Mountains

They belong to pre-drift era, then subjected to denudation and uplift; many faults were formed; occur as relict mountains today. E.g. Pennines (Europe), Appalachians (US), Aravallis (India).

Block Mountains of the World

These are formed when great blocks of earth's crust may be raised or lowered. During the uplift of structural mountains, sometimes magma flows upwards into the crust.

On its cooling and hardening beneath the surface, it contracts and the overlying rock may crack into large blocks moving up or down. An intense folding of rocks is generally followed by faulting of strata due to horizontal forces of tension.

The land between the two parallel faults either raises forming Block Mountains or Horsts, or subsides into a depression termed as Rift Valley or Graben.

Eg: Narmada, Tapti and Damodar valley in India, the Vosges in France and Black forest in Germany (through which Rhine River flows).

Volcanic Mountains of the World

Formed as a result of volcanic eruption & the outflow of lava (through crater, the opening). Also called Mountains of Accumulation. Have a gentle slope.

E.g: Cotopaxi in Andes, Vesuvius and Etna in Italy, Fujiyama in Japan, Mauna Loa and Kilauea (Most active volcano) in Hawaii, Ojos del Salado in Argentina / Chile (Highest active volcano), Popocatepeti in Mexico, Rainier of Washington, Stromboli in Mediterranean (called Lighthouse of the Mediterranean), Mirapi and Krakatao in Indonesia, etc.

Relict Mountains

Sometimes, the mountains are carved out as a result of erosion of plateaus & high planes by various agents of erosion. E.g., Highlands of Scotland, Sierras of Spain, Catskill mountains of New York and Nilgiri, Parasnath, Girnar, Rajmahal of India.

Major Mountain Ranges of the World

| | | |
|-------------------------------|--------------------|-------|
| Andes | South America | 6,960 |
| Himalayas-Karakoram-Hindukush | South Central Asia | 8,850 |
| Rockies | North America | 4,401 |
| Great Dividing Range | East Australia | 2,228 |
| Western Ghats | Western India | 2,637 |
| Caucasus | Europe, Asia | 5,642 |
| Alaska | USA | 6,194 |

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| | | |
|-------------|---------------|-------|
| Alps | Europe | 4,808 |
| Apennines | Europe | 2,912 |
| Ural | Asia | 1,895 |
| Pennines | Europe | 893 |
| Pyrenees | Europe | 3,404 |
| Appalachian | North America | 2,040 |

Earth Pressure and Winds

Air moving in a particular direction is called wind. The principal cause of winds is difference in pressure. Air always moves from areas of high pressure to those with low pressure. The slope of the pressure from high to low is known as Pressure Gradient and the direction of this direction decides the direction of winds.

- Wind velocity is directly related to the steepness of the pressure gradient.
- In addition, the direction of winds is affected by the Coriolis Force, which is caused by the rotation of the earth. Under the influence of this effect, winds are deflected to their right in the Northern Hemisphere and to their left in the Southern Hemisphere.
- This is referred to as Parrel's Law. Coriolis force is absent at the equator and increases towards the poles. Due to this, the winds, which would blow at right angles to the isobars under the pressure gradient, blow obliquely to them.

Global Pressure Belts

Equatorial Low Pressure Belt (or Doldrums)

- From 5°N to 5°S.
- Tremendous heat, thus warm air rises creating low pressure. Also, the centrifugal force is very high at the equator, where the velocity of rotation is high. Hence, the air masses tend to be thrown out, resulting in low pressure.
- Wind speed low, that's why called Doldrums (Belt of Calm).

Tropical High Pressure Belt (or Horse Latitudes)

- From 30° to 35° N and S.
- Apart from 2 months, usually high temperature.
- Here the pressure is high, although high temperature, because here pressure depends on the rotation and movement of air (as winds from Doldrums belt rises up and accumulate here. Also winds from Sub-Polar Low Pressure Belt accumulate here).

Sub-Polar Low Pressure Belt

- From 60° to 65° N and S
- Here the low pressure is created because of intense high pressure at the poles.

Winds and Their Types

- **3 broad categories are:**

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1. **Regular Winds/Prevailing Winds/Planetary Winds:** (E.g.: Trade winds, Westerlies and Polar Easterlies).
2. **Periodical Winds (which blow seasonally):** Monsoons
3. **Variable Winds:** Cyclones and other local winds

Trade Winds

- Trade in German means Track. To blow trade means to blow steadily in the same direction and in a constant course'.
- These are steady currents of air blowing from the sub-tropical high pressure belts towards the equatorial low pressure areas (doldrums). Under the influence of the Coriolis force they blow from the north-east in the northern hemisphere and from the south-east in the southern hemisphere.

Westerlies

- Blows from subtropical high pressure to sub-polar low pressure belt.
- In the northern hemisphere, land masses cause considerable disruption in the westerly wind belt. But between 40° and 60° S lies the almost unbroken ocean belt. Westerlies are strong and persistent here, giving rise to mariner's expressions- 'Roaring Forties', 'Furious Fifties' and 'Shrieking Sixties'.

Polar Easterlies

- Move from high pressure poles to sub-polar low pressure areas.
- These are deflected by the Earth's rotation to become east winds, or the polar easterlies.

Local Winds

| | |
|---------------------|---|
| Land and Sea Breeze | They are experienced in coastal areas. Due to differential heating, the atmospheric pressure over the land mass is lower than over the neighboring sea during the day. Therefore, winds blow from sea to land (sea breeze). At night the air pressure over land is higher due to a lower temperature than over the adjacent ocean and the wind starts blowing from land to sea (land breeze). Land breeze is not as strong as sea breeze. |
| Chinook | Hot, dry wind in Rockies, also called 'snow eater'. |
| Foehn | Hot, dry wind in the Alps. |
| Khamsin | Hot, dry wind in Egypt. |
| Sirocco | Hot, moist wind from Sahara to Mediterranean Sea. |
| Solano | Hot, moist wind for Sahara towards Iberian Peninsula. |
| Harmattan | Hot, dry wind blowing outwards from the interior of West Africa, also called 'Guinea Doctor'. |
| Bora | Cold, dry wind blowing outwards from Hungary to the north of Italy (near AdriaticSea). |
| Mistral | Very cold wind, which blows down from the Alps over France. |
| Punas | Cold, dry wind blowing down towards the western side of Andes. |
| Blizzard | Very cold winds in Tundra region. |
| Brickfielder | Hot wind in Australia. |
| Purga | Cold wind in Russian tundra. |
| Levanter | Cold wind in Spain. |
| Norwester | Hot wind in New Zealand. |
| Santa Ana | Hot wind in Southern California in USA. |

Cyclones & Anticyclones

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Cyclones in World

- It is a system of very low pressure in the center surrounded by increasingly high pressure outwards.
- In this, the winds blow in a circular manner in Anticlockwise direction in Northern Hemisphere. Clockwise direction in Southern Hemisphere.
- In the temperate region, they occur due to the coming close and imperfect mixing of two masses of air of contrasting temperature and humidity conditions. Cycles of this type are also known as Wave Cyclones or Temperate Cyclones.
- On the other hand, in the tropical regions, they occur due to intense heating up of air in some regions causing very low pressure in these locations. Tropical seas and oceans are most conducive to the development of tropical cyclones.

These are known as :

- Cyclones – in the Indian Ocean
- Hurricanes – in the Caribbean Islands
- Typhoons – in the China Sea
- Willy-Willies – in the North West Australia
- Tornadoes – in coastal US.
- Twisters – in Mississippi Valley, USA

Tornadoes are very strong tropical cyclones of a smaller size. They are especially feared in the Mississippi Valley in US and here they are called Twisters. They differ from cyclones in that they generally develop over land. They are more destructive than cyclones as the speed of winds is very high, exceeding 320 km per hour.

Anticyclones

- They are opposite to cyclones in all respects. They are the centers of high pressure with gentle outward flow of air.
- The air circulation is clockwise in the northern hemisphere and anticlockwise in the southern hemisphere.
- Weather associated with an anticyclone is fair weather.

Earth Humidity

Earth Humidity refers to the amount of water vapour present in the air.

- The ratio between the amount of water vapour actually present in the air mass and the maximum amount that the air mass can hold at that temperature is called relative humidity. It is expressed as a percentage. It varies inversely with temperature, given a fixed amount of water vapour.
- Absolute humidity denotes the actual quantity of water vapour present in the air and it is defined as the weight of water vapour (grams) in a given volume of air (cubic meter).
- The term specific humidity is applied to express the ratio of weight of water vapour to the weight of moist air (including water vapour). It is stated as grams of water vapour per kilogram of moist air.
- Earth Humidity is measured by an instrument called hygrometer. Another instrument used for the same purpose is sling psychrometer.

Condensation, Dew Point and Related Aspects

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- The physical process of transformation from the vapour to the liquid state is condensation. This is the basis of all types of precipitation- the fall of water from the atmosphere to the ground in any form.
- Dew point is the temperature at which the air is fully saturated and below which condensation normally occurs.
- Dew is the deposition of water droplets on the ground. It occurs when the temperature of the ground surface falls and the air in contact with it is cooled below its dew point. Dew is likely to occur on clear and calm nights.
- Frost is a weather condition that occurs when the air temperature is at or below 0°C moisture on the ground surface and objects freezes to form an icy deposit.
- Fog is made of the droplets of water suspended in the lower layers of the atmosphere, resulting from the condensation of water vapour around nuclei of floating dust or smoke particles. A visibility of less than 1 km is the internationally recognized definition of fog. Fog is not considered as a form of precipitation.
- Smog (Smoke + Fog) is a form of fog that occurs in areas where the air contains a large amount of smoke.
- Mist is the term for reduction of visibility between 1-2 km, caused by condensation producing water droplets within the lower layers of atmosphere.
- Haze is formed by water particles that have condensed in the atmosphere and the visibility in this case is more than 1 km but less than 2 km. Haze may also be produced by presence of dust and smoke, which reduce visibility.

Earth Clouds

Earth Clouds are masses of minute water droplets and / or ice crystals formed by the condensation of water vapour and held in suspension in the atmosphere. Condensation, which results from cooling, usually takes place around nuclei such as dust, smoke particles and salt. Such particles are called condensation nuclei.

Earth Clouds are of different types and they can be classified on the basis of their form and altitude.

On the basis of form, there are two major groups:

1. Stratiform or layered types, and
2. Cumuliform or massive types.

Stratiform Clouds

- These clouds, which are fairly thin and blanket like, are sub-divided into three main categories on the basis of altitude.
- High Clouds (mean ht 5-13 km)
 - **Cirrus Clouds:** Indicates fair weather.
 - **Cirrocumulus Clouds:** Forms the mackerel sky.
 - **Cirrostratus Clouds:** Produces a halo around sun and moon.
- Middle Clouds (mean ht 2-7 km)
- **Alto-cumulus Clouds:** Indicate fine weather.
- **Alto-stratus Clouds:** Associated with development of bad weather.
- Low (mean ht up to 2 km)
 - **Stratus Clouds:** Brings dull weather, usually accompanied with a drizzle.
 - **Nimbostratus Clouds:** If rain or snow is falling from a stratus cloud, it is called nimbostratus.

- **Stratocumulus Clouds:** Indicators of fair or clearing weather.

Cumulus Clouds

- They are massive clouds having a vertical extent from 1,500 to 9,000 m. They resemble the head of a cauliflower. When these clouds are sunlit, they are brilliantly white and are called 'wool-clouds'. They occur mainly in summer and are produced by convection.
- **Cumulonimbus Clouds:** Under different weather conditions, a cumulus cloud may develop into cumulonimbus, the thunderstorm cloud mass of enormous size which brings heavy rainfall, thunder and lightning and gusty winds.

Precipitation Clouds

- It refers to falling of water, snow or hail from the clouds and results when condensation is occurring rapidly within a cloud.
- The most common form of precipitation is rain and it is formed when many cloud droplets coalesce into drops too large to remain suspended in the air. Rainfall occurs when the dew point of air is above the freezing point.
- Sometimes the raindrops freeze before reaching the ground and precipitation occurs in the form of ice pellets, called sleet.
- Snow is produced when condensation takes place at a temperature below freezing point, so that the minute crystals (spicules) of ice form directly from the water vapour.
- Hail consists of masses of ice with a layered structure. It occurs when there are very strong updrafts in the clouds carrying raindrops up to a high altitude, causing them to freeze. Hail stone is a rounded lump of ice having concentric layers.

Conditions for Precipitation

- There are three possible ways by which precipitation is produced.

Convective Precipitation

- It is caused by heating of moist air in the lower layers of atmosphere which rises, expands, and is cooled adiabatically to its dew point. Convection rain is often accompanied by lightning and thunder. It occurs in regions near the equator in the afternoon as a result of the constant high temperature and high humidity.

Orographic Precipitation

- In this, precipitation is caused by moisture-laden air being forced to rise over a relief barrier (mountain ranges). As the air rises in the windward side, it is cooled at the adiabatic rate. If sufficiently cooled, precipitation results; when the air descends on the leeward side, it gets warmed and dry, having no source from which to draw up moisture. A belt of dry climate, often called a rain shadow, may exist on the leeward side.

Cyclonic frontal Precipitation

- When the air is caused to rise upwards due to cyclonic circulation, the resulting precipitation is said to be of the cyclonic type.

Earth Ocean Currents

Actual transportation of water from one part of ocean to another. Because of differences in density, salinity, temperature of ocean waters, rotation of earth, shape of coastline and the prevailing winds. Currents circulate in clockwise direction in Northern Hemisphere and in anti-clockwise direction in Southern Hemisphere.

Currents in Pacific Ocean

- a. **North-Equatorial Current (Warm):** Flows across from east to west, i.e., from North America it reaches the Philippines.
- b. **Kuroshio Current (Warm):** N. Eq. current along the Philippines, Taiwan & Japan coast form this current. From the S.E. Japan the current, under the influence of prevailing westerlies, flows right across the ocean.
- c. **After reaching the west coast of N. America, it bifurcates into 2 branches :**
 - i. **Alasca Current (Warm):** Along the coast of British Columbia & Alasca.
 - ii. **California Current (Cold):** It moves southward along the coast of California
- d. **Oyashio Current (Cold):** Flows along the east coast of Kamchatka peninsula.
- e. **Okhotsk Current (Cold):** Comes from the N. Pole & merges with the Oyashio current.
- f. **East Australian Current (Warm):** Flows from east to west in S. Pacific Ocean.
- g. **Peru Current (Cold):** Cold current near the west coast of S. America.

Currents of Atlantic Ocean

- a. **Guinea Current (Warm):** Flows off the W. African coast (hot).
- b. **Florida Current (Warm):** Along the coast of US up to the cape Hatterus.
- c. **Gulf Stream (Warm):** Beyond the Cape Hatterus up to the Grand Banks of New Found Land, Florida current is known as Gulf Stream. From the Grand Banks the Gulf Stream moves eastward across the Atlantic as the Atlantic Drift.
- d. **Atlantic Drift divides into 2 branches:**
 - i. **Norwegian Current:** The main current passes along the Norway coast & enters the Arctic Ocean.
 - ii. **Canary Current:** The south branch of N. Atlantic drift flows near Spain by this name.
- e. **2 Cold Currents:** The East Greenland Current & the Labrador Current flows from the Arctic Ocean into the Atlantic Ocean. The Labrador Current meets the Gulf Stream. The influence of these 2 currents produces the famous fogs around New Found Land. [Most busy fishing ground of the world].
- f. **Brazil Current (Warm):** Flows along the S. American coast from North to South

- g. **Benguela Current (Cold):** Cold current from S. to N near the 'Cape of Good Hope',
- h. **Falkland Current (Cold):** Cold flowing along the S.E. coast of S. America from S. to N. (meets the Brazil current)

Currents of the Indian Ocean

- The currents in the N. Indian Ocean differ entirely from the general pattern of circulation. They change their direction from season to season in response to the seasonal rhythm of the monsoons.
- In winters the N. Equatorial current & the S. Equatorial current flows from East to West.
- **Mozambique Current:** Warm current flowing through the Mozambique Channel.
- **Agulhas Current:** Warm current at the South-East coast of Africa.

Continents of the World

World Continents

Asia, Africa, North America, South America, Europe, Australia and Antarctica are the seven continents of the world.

These seven continents were believed to be part of Pangaea which was a single landmass around 250 million years ago.

Due to the tectonic movement, the landmass broke up and the component continents separated and moved away to its present position. All these took around 1 million years to complete.

Pangaea was surrounded by a sea, the Panthalassa.

The continents of the world map will give you information about the geographical positions of the continents as well as their political divisions.

The Continents of the World,

- Asia Continents Countries
- Africa Continents Countries
- North America Continents Countries
- South America Continents Countries
- Europe Continents Countries
- Australia Continents Countries
- Antarctica Continents Countries

World Continents: Some Facts

| Continents | Biggest Country | Highest Peak | Longest River |
|---------------|-----------------|--------------------------|---------------|
| Asia | China | Mt. Everest (8850 m) | Yangtze Kiang |
| Africa | Sudan | Mt. Kilimanjaro (5895 m) | Nile |
| North America | Canada | Mt. Mckinley (6194 m) | Mississippi |
| South America | Brazil | Mt. Aconcagua (6960 m) | Amazon |

| Continents | Biggest Country | Highest Peak | Longest River |
|------------|-----------------|------------------------|---------------|
| Europe | Russia | Mt. Elbrus (5642 m) | Ob |
| Australia | Australia | Mt. Coscuisco (2228 m) | Darling |
| Antarctica | - | Vinson Massif (5140 m) | - |

Moon Important Facts

Earth Moon

- **Moon Circumference:** 11,000 km. Diameter: 3475 km. Gravitational pull: 1/6th of Earth.
- Its orbit around earth is elliptical. The maximum distance (Apogee) of the moon from the earth is 406,000 km and the minimum distance (Perigee) is 364,000 km. the average distance is 3,82,200 km.
- All other satellites (except Charon) have sizes below 1/8th the size of mother planets. But moon is about 1/4th the size of earth.
- Takes 27 days, 7 hrs, 43 min and 11.47 sec to complete one revolution around earth.
- Rotates on its axis in exactly the same time as it takes to complete one revolution. That is why we see only one side of the moon (only 59% of its surface).
- To our unaided vision, moon seems to be made-up of bright and dark patches. The bright parts are the mountains and highlands, while the darker patches are low – lying planes.
- The highest mountains on moon are Liebnitz Mountains, which are 10,660 m high. They are situated at moon's South Pole.
- Moon has no atmosphere, no twilight and no sound.
- Moonlight takes 1.3 sec to reach earth.
- It has a low albedo (amount of sunlight reflected). It reflects only 7% and the rest is absorbed (Earth : 30%, Venus: 70%)
- Neil Armstrong and Buzz Aldrin reached moon on July 20, 1969 on Apollo XI and set the foot on. July 21, 1969 (landing spot is called Sea of tranquility).

Moon Some Important Facts

- Moon Distance from Earth – 3,82,200 km
- Moon Diameter – 3,475 km
- Moon Mass (with respect to Earth) – 1 : 8.1
- Ratio of Gravitational Pull of Moon and Earth – 1 : 6
- Part of Moon not visible from Earth – 41%
- Maximum distance from Earth (Apogee) – 4,06,000 km
- Minimum distance from Earth (Periqee) – 3,64,000 km
- Revolution period around Earth – 27 days, 7 hrs, 43 min and 11.47 sec
- Rotation period – 27 days, 7 hrs, 43 min and 11.47 sec
- Atmosphere – Absent
- Highest mountain – 35,000 ft (Leibnitz Mts)
- Time taken by moonlight to reach Earth – 1.3 sec
- Rotation speed – 3,680 kmph
- Speed of revolution around Earth – 3,680 kmph

Principal Rivers of the World

| River | Origin | Falls in | Length |
|----------------------|--------------------------|----------------------|--------|
| Nile | Victoria lake | Mediterranean Sea | 6,650 |
| Amazon | Andes (Peru) | Atlantic Ocean | 6,428 |
| Yangtze | Tibetan Kiang Plateau | China Sea | 6,300 |
| Mississippi Missouri | Itaska lake (USA) | Gulf of Mexico (USA) | 6,275 |
| Yenisei | Tannu-Ola Mts | Arctic Ocean | 5,539 |
| Huang Ho | Kunlun Mts | Gulf of Chibii | 5,464 |
| Ob | Altai Mts., Russia | Gulf of Ob | 5,410 |
| Congo | Lualaba & Luapula rivers | Atlantic Ocean | 4,700 |
| Amur | Northeast China | Sea of Okhotsk | 4,444 |
| Lena | Baikal Mts | Laptev Sea | 4,400 |
| Mekong | Tibetan Highlands | South China Sea | 4,350 |
| Mackenzie | Great Slave Lake | Beaufort Sea | 4,241 |
| Niger | Guinea | Gulf of Guinea | 4,200 |

Major Lakes of the World

| | |
|---------------------------|--------------------------|
| Largest Lake | Caspian Sea |
| Highest lake | Lake Titicaca in Bolivia |
| Largest saline water lake | Caspian Sea |
| Deepest lake | Lake Baikal in Siberia |
| Largest fresh water lake | Lake Superior |
| India's largest lake | Chilka lake in Orissa |

Oceans of the World

| Names | Area (Sq.Km) | Greatest Depth |
|----------|--------------|--------------------|
| Pacific | 166,240000 | Mariana Trench |
| Atlantic | 86,560000 | Puerto Rico Trench |
| Indian | 73430000 | Java Trench |
| Arctic | 13230000 | - |

Principal Plateaus of the World

| Plateau | Situation |
|-----------------------|---|
| Tibetan Plateau | Between Himalayas and Quinloo Mountains |
| Deccan Plateau | Southern India |
| Arabian Plateau | South - West Asia |
| Plateau of Brazil | Central - Eastern South America |
| Plateau of Mexico | Mexico |
| Plateau of Colombia | USA |
| Plateau of Madagascar | Madagascar |

| Plateau | Situation |
|---------------------|-----------------------------------|
| Plateau of Alaska | North - West North America |
| Plateau of Bolivia | Andes Mountain |
| Great Basin Plateau | South of Colombia Plateau, USA |
| Colorado Plateau | South of Great Basin Plateau, USA |

Major Gulfs of the World

| Names | Area (Sq. Km) |
|----------------------|---------------|
| Gulf of Mexico | 15,44,000 |
| Gulf of St. Lawrence | 2,37,000 |
| Gulf of Hudson | 12,33,000 |
| Gulf of California | 1,62,000 |
| Arabian Gulf | 2,38,000 |
| English Channel | 89,900 |

Major Peninsulas of the World

| Peninsulas | Areas (Sq. Km) |
|----------------|----------------|
| Arabia | 32,50,000 |
| Labrador | 13,00,000 |
| Southern India | 20,72,000 |
| Scandinavia | 8,00,000 |
| Alaska | 15,00,000 |
| Iberian | 584,000 |

Important Straits of the World

| Straits | Water Bodies joined | Area |
|---------------|--------------------------------------|---------------------------|
| Bab-al-Mandeb | Red Sea & Arabian Sea | Arabia & Africa |
| Bering | Arctic Ocean & Bering Sea | Alaska & Asia |
| Bosphorus | Black Sea & Marmara Sea | Turkey |
| Dover | North Sea & Atlantic Ocean | England & Europe |
| Florida | Gulf of Mexico & Atlantic Ocean | Florida & Bahamas Islands |
| Gibraltar | Mediterranean Sea & Atlantic Ocean | Spain & Africa |
| Malacca | Java Sea & Bay of Bengal | India & Indonesia |
| Palk | Bay of Bengal & Indian Ocean | India & Sri Lanka |
| Magellan | South Pacific & South Atlantic Ocean | Chile |
| Sunda | Java Sea & Indian Ocean | Indonesia |

Smallest and Biggest Countries

<http://www.developindiagroup.co.in/>

| Biggest Nations (Area - Wise) | Biggest Nations (Population - Wise) |
|-------------------------------|-------------------------------------|
| Russia | China |
| Canada | India |
| China | USA |
| USA | Indonesia |
| Brazil | Brazil |
| Australia | Pakistan |
| India | Bangladesh |
| Argentina | Nigeria |
| Kazakhstan | Russia |
| Sudan | Japan |

| Smallest Nations (Area - Wise) | Smallest Nations (Population - Wise) |
|--------------------------------|--------------------------------------|
| Vatican City | Vatican City |
| Monaco | Tuvalu |
| Nauru | Nauru |
| Tuvalu | Palau |
| San Marino | San Marino |
| Liechtenstein | Monaco |
| Marshall Islands | Liechtenstein |
| Saint Kitts and Nevis | Saint Kitts and Nevis |
| Maldives | Antigua and Barbados |
| Malta | Dominica |

Important Cities on River Banks (World)

| Adelaide | Australia | Torrens |
|------------|-------------|-----------------------|
| Amsterdam | Netherlands | Amsel |
| Alexandria | Egypt | Nile |
| Ankara | Turkey | Kazil |
| Bangkok | Thailand | Chao Praya |
| Basra | Iraq | Eupharates and Tigris |
| Baghdad | Iraq | Tigris |
| Berlin | Germany | Spree |
| Bonn | Germany | Rhine |
| Budapest | Hungary | Danube |
| Bristol | UK | Avon |

| Buenos Aires | Argentina | Laplata |
|--------------|------------|---------|
| Chittagong | Bangladesh | Majyani |

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| Buenos Aires | Argentina | Laplata |
|----------------|-----------------|---------------------------------|
| Canton | China | Si-Kiang |
| Cairo | Egypt | Nile |
| Chung King | China | Yang-tse-king |
| Cologne | Germany | Rhine |
| Dandzing | Germany | Vistula |
| Dresden | Germany | Elbe |
| Dublin | Ireland | Liffy |
| Hamburg | Germany | Elbe |
| Kabul | Afghanistan | Kabul |
| Karachi | Pakistan | Indus |
| Khartoum | Sudan | Confluence of Blue & White Nile |
| Lahore | Pakistan | Ravi |
| Leningrad | Russia | Neva |
| Lisbon | Portugal | Tagus |
| Liverpool | England | Messey |
| London | England | Thames |
| Moscow | Russia | Moskva |
| Montreal | Canada | St. Lawrence |
| Nanking | France | Yang-tse-kiang |
| New Orleans | USA | Mississippi |
| New York | USA | Hudson |
| Ottawa | Canada | Ottawa |
| Paris | France | Seine |
| Philadelphia | USA | Delaware |
| Perth | Australia | Swan |
| Prague | Czech Republic | Vitava |
| Quebec | Canada | St. Lawrence |
| Rome | Italy | Tiber |
| Rotterdam | The Netherlands | New Mass |
| Stalingrad | Russia | Volga |
| Shanghai | China | Yang-tse-kiang |
| Sidney | Australia | Darling |
| Saint Louis | USA | Mississippi |
| Tokyo | Japan | Arakava |
| Vienna | Austria | Danube |
| Warsaw | Poland | Vistula |
| Washington D.C | USA | Potomac |
| Yangoon | Myanmar | Irrawaddy |

World Islands

- In decreasing order of size: Greenland, New Guinea, Borneo, Madagascar, Baffin, etc.
- Largest River Island is Majuli (Asom).
- Most populated island is Java (Indonesia).
- Largest island of India is Middle Andaman.

Famous Industrialised Countries of the World

Country Associated Industry

| | |
|-------------|------------------------------|
| Afghanistan | Carpets, wool and dry fruits |
| Australia | Wheat, wool, meat |
| Austria | Machinery, Textiles |
| Belgium | Glass, Textiles |
| Brazil | Coffee |
| Canada | Wheat, Newsprint |
| Chile | Copper |
| China | Rice, Wheat, Silk |
| Cuba | Sugar, Tobacco |
| Denmark | Dairy Products |

| England | Textiles, Machinery |
|--------------|----------------------------|
| Finland | Textiles |
| France | Textiles, Wine |
| Germany | Machinery |
| India | Mica, Tea, Jute, Textiles |
| Indonesia | Rubber, Cinchona |
| Iran | Petroleum, Carpets |
| Iraq | Petroleum, Dates |
| Japan | Electronics, Automobiles |
| Italy | Mercury, Textile |
| Kuwait | Petroleum |
| Malaysia | Tin, Rubber |
| Mexico | Silver |
| Netherlands | Electrical goods |
| Russia | Heavy Machinery, Petroleum |
| Saudi Arabia | Oil and Dates |
| Spain | Lead |
| Sweden | Matches |
| Switzerland | Watches |
| Taiwan | Camphor |

| | |
|--------------|-------------------------|
| England | Textiles, Machinery |
| South Africa | Gold and Diamond Mining |
| U.S.A | Automobiles, Machinery |

Foreign Towns Associated with Industries

| Town (Country) | Associated Industry |
|--------------------------|------------------------------------|
| Baku (Azerbaijan) | Petroleum |
| Bangkok (Thailand) | Ship building |
| Belfast (Ireland) | Ship building |
| Buenos Aires (Argentina) | Meat |
| Cadiz (Portugal) | Cork |
| Chicago (U.S.A) | Agricultural implements, Meat |
| Cologne (Germany) | Cotton and woollen Industries |
| Dhaka (Bangladesh) | Jute |
| Detroit (U.S.A) | Motor cars |
| Dresden (Germany) | Optical and photographic apparatus |

| Glasgow (Great Britain) | Machinery |
|--------------------------|--------------------------|
| Havana (Cuba) | Tobacco, Cigars |
| Hollywood (U.S.A) | Film Industry |
| Johannesburg (S. Africa) | Gold mines |
| Kimberlay (S. Africa) | Diamond mining |
| Leeds (England) | Woollen Goods |
| Lyons (France) | Silk Industries |
| Manchester (England) | Cotton Industry |
| Mauritius (Indian Ocean) | Fishing, Shipping, Sugar |
| Milan (Italy) | Silk |
| Morocco (North Africa) | Leather |
| Munich (Germany) | Lenses |
| New Orleans (U.S.A.) | Cotton industry |
| Osaka (Japan) | Cotton fabrics |
| Pittsburg (U.S.A.) | Iron and Steel |
| Plymouth (England) | Ship-building |
| Sheffield (England) | Cutlery |
| Venice (Italy) | Glass manufacturing |
| Vienna (Austria) | Glass manufacturing |
| Wellington (New Zealand) | Dairy Product |

World's Geographical Surnames

| Surname | Name |
|-------------------------------|--------------------|
| Bengal's Sorrow | Damodar River |
| Blue Mountains | Nilgiri Hills |
| City of Sky-scrapers | New York |
| City of Seven Hills | Rome |
| City of Dreaming Spires | Oxford |
| City of Palaces | Kolkata |
| City of Golden Gate | San Francisco |
| City of Magnificent Buildings | Washington D.C |
| City of Eternal Springs | Quito (S. America) |
| China's Sorrow | Hwang Ho |

| Belgium | |
|----------------------------|-------------------------|
| Africa | |
| Emerald Isle | Ireland |
| Eternal City | Rome |
| Empire City | New York |
| Forbidden City | Lhasa (Tibet) |
| Garden City | Chicago |
| Gate of Tears | Strait of Bab-el-Mandeb |
| Gateway of India | Mumbai |
| Gift of the Nile | Egypt |
| Granite City | Aberdeen (Scotland) |
| Hermit Kingdom | Korea |
| Herring Pond | Atlantic Ocean |
| Holy Land | Jerusalem |
| Island Continent | Australia |
| Island of Cloves | Zanzibar |
| Isle of Pearls | Bahrein (Persian Gulf) |
| Key to the Mediterranean | Gibraltar |
| Land of Cakes | Scotland |
| Land of Golden Fleece | Australia |
| Land of Maple Leaf | Canada |
| Land of Morning Calm | Korea |
| Land of Midnight Sun | Norway |
| Land of the Thousand Lakes | Finland |
| Land of the Thunderbolt | Bhutan |

| Belgium | |
|----------------------------|---------------------------------|
| Land of White Elephant | Thailand |
| Land of Five Rivers | Punjab |
| Land of Thousand Elephants | Laos |
| Land of Rising Sun | Japan |
| Loneliest Island | Tristan De Gunha (Mid-Atlantic) |
| Manchester of Japan | Osaka |
| Pillars of Hercules | Strait of Gibraltar |
| Pearl of the Antilles | Cuba |
| Playground of Europe | Switzerland |
| Quaker City | Philadelphia |
| Queen of the Adriatic | Venice |
| Roof of the World | The Pamirs, Central Asia |
| Rose Pink City | Jaipur |
| Sugar bowl of the world | Cuba |
| Venice of the North | Stockholm |
| Windty City | Chicago |
| Whiteman's grave | Guinea Coast of Africa |
| Yellow River | Huang Ho (China) |

Famous Tribes of the World

| | |
|----------|---|
| Abhors | People of Mongolian blood living between Assam and Eastern tribes |
| Afridis | Tribes residing in the North-west Frontier (Pakistan) |
| Bantus | Negroes living in the Central and South Africa |
| Boers | The Dutch settlers of South Africa |
| Cossacks | People living in the southern and eastern frontiers of Russia |
| Eskimos | Inhabitants of Greenland and of Arctic regions |
| Flemings | A term used for the people of Belgium |
| Hamites | Inhabitants of North-West Africa |
| Khirgiz | People Living in Central Asia |
| Kurds | Tribes living in Kurdistan (Iraq) |
| Magyars | Inhabitants of Hungary |

| Maoris | Inhabitants of New Zealand |
|-------------|---|
| Negroes | Mostly found in Africa |
| Pygmies | Short sized people found in Congo basin in Africa |
| Red Indians | Original inhabitants of North America |
| Semites | Caucasian people of ancient times |
| Zulus | People of South Africa living in certain part of Nata |

World Famous Sites

| Site | Location |
|-----------------------|-----------------|
| Bastille Prison | Paris |
| Brandenburg Gate | Berlin |
| Big Ben | London |
| Broadway | New York |
| Buckingham Palace | London |
| Colosseum | Rome |
| Downing Street | London |
| Eiffel Tower | Paris |
| Empire State Building | New York |
| Fleet Street | London |
| Grand Canyon | Arizona (U.S.A) |

| Harley Street | London |
|---------------------|----------------------|
| Hyde Park | London |
| India House | London |
| Jodrell Bank | Manchester (U.K) |
| Kaaba | Mecca (Saudi Arabia) |
| Kremlin | Moscow (Russia) |
| Leaning Tower | Pisa (Italy) |
| Louvre | Paris |
| Merdeca Palace | Djakarta |
| Oval | London |
| Pentagon | Washington D.C |
| Porcelain Tower | Nanking |
| Potala | Lhasa |
| Red Square | Moscow |
| Pyramids | Egypt |
| Scotland Yard | London |
| Shiwe Dragon Pagoda | Yangoon |
| Sphinx | Egypt |
| Statue of Liberty | New York |
| Vatican City | Rome |
| Wall Street | New York |
| Wailing Wall | Jerusalem |
| Wembley | London |

| Harley Street | London |
|---------------|----------------|
| White Hall | London |
| White House | Washington D.C |

Biggest, Highest, Largest, Longest in the World

| | |
|---|--|
| Tallest Animal in the World | Giraffe |
| Largest Archipelago in the World | Indonesia |
| Fastest Bird in the World | Swift |
| Largest Bird in the World | Ostrich |
| Smallest Bird in the World | Humming Bird |
| Longest Railway Bridge in the World | Huey P. Long Bridge, Louisiana (U.S.A) |
| Tallest Building in the world | Burj Dubai, UAE |
| Canal, Longest Irrigational | The Kalakumsky Canal |
| Longest Canal in the World | Suez Canal |
| Highest Capital in the World | La Paz (Bolivia) |
| Biggest City in Area in the World | Mount Isa (Australia) |
| Largest City in Population in the World | Tokyo |

| Costliest City in the World | Tokyo |
|--|-----------------------------------|
| Highest City in the World | Van Chuan (China) |
| Largest Continent in the World | Asia |
| Smallest Continent in the World | Australia |
| Biggest Country in the World by Area | Russia |
| Largest Country in the World by Population | China |
| Largest Country in the World by Electorate | India |
| Largest Creature in the World | Blue whale |
| Largest Delta in the World | Sunderban (Bangladesh & India) |
| Largest Desert in the World | Sahara (Africa) |
| Largest Desert in Asia | Gobi |
| Largest Dam in the World | Grand Coulee Dam (U.S.A) |
| Dam Highest in the World | Hoover Dam (U.S.A) |
| Diamond Largest in the World | The Cullinan |
| Largest Dome in the World | Astrodome, in Houston (U.S.A) |
| Largest Epic in the World | Mahabharat |
| Largest Irrigation Scheme in the World | Lloyd Barrage, Sukkhar (Pakistan) |
| Largest Island in the World | Greenland |
| Largest Sea in the World | Mediterranean Sea |
| Deepest Lake in the World | Baikal (Siberia) |
| Largest Lake (Artificial) in the World | Lake Mead (Boulder Dam) |

| Costliest City in the World | Tokyo |
|---|---|
| Highest Lake in the World | Titicaca (Bolivia) |
| Largest Lake (Fresh water) in the World | Superior |
| Largest Lake (Salt water) in the World | Caspian |
| Largest Library in the World | United States Library of Congress, Washington D.C |
| Highest Mountain Peak in the World | Everest (Nepal) |
| Longest Mountain Range in the World | Andes (S. America) |
| Largest Museum in the World | British Museum, London |
| Largest Ocean in the World | Pacific |
| Biggest Palace in the World | Vatican (Italy) |
| Largest Park in the World | Yellow Stone National Park (U.S.A) |
| Largest Peninsula in the World | Arabia |
| Coldest Place (Habitated) in the World | Verkhoyansk (Siberia) |
| Dryest Place in the World | Iquique (in Atacama Desert, Chile) |
| Hottest Place in the World | Azizia (Libya, Africa) |
| Rainiest Place in the World | Mausinram (Meghalaya, India) |
| Biggest Planet in the World | Jupiter |
| Brightest Planet in the World | Venus |
| Smallest Planet in the World | Mercury |
| Highest Plateau in the World | Pamir (Tibet) |
| Longest Platform in the World | Kharagpur (India) |
| Longest Railway in the World | Trans-Siberian railway |
| Largest Railway Station in the World | Grand Central Terminal, Chicago (U.S.A) |
| Longest River in the World | Nile (Africa) |
| Largest River in the World | Amazon (S. America) |
| Largest Sea-bird in the World | Albatross |
| Brightest Star in the World | Sirius |
| Tallest Statue in the World | Statue of Motherland, Volgograd (Russia) |
| Largest Telescope Radio in the World | New Mexico (U.S.A) |
| World's Tramway first in the World | New York |
| Longest Tunnel (Railway) in the World | Tanna (Japan) |
| Longest Tunnel (road) in the World | Mont Blanc Tunnel between France and Italy |
| Highest Volcano | Ojos del Salado (Andes, Ecuador) |
| Most Volcano Active in the World | Maunaloa (Hawaii - U.S.A) |
| Longest Wall in the World | Great Wall of China |
| Highest Waterfall in the World | Angel (Venezuela) |
| Lowest Water body in the World | Dead Sea |
| Largest Zoo in the World | Kruger National Park, South Africa |

Agriculture : Top 5 Producers

| | |
|--------------|--|
| Rice | China, India, Indonesia, Bangladesh, Vietnam |
| Wheat | China, India, USA, Russia, France |
| Maize | USA, China, Brazil, Mexico, Argentina |
| Groundnut | China, India, Nigeria, USA, Indonesia |
| Tea | India, China, Sri Lanka, Kenya, Turkey |
| Cotton | China, USA, India, Pakistan, Brazil |
| Rubber | Indonesia, Thailand, Malaysia, India, China |
| Coffee | Brazil, Vietnam, Indonesia, Colombia, Mexico |
| Pulses Total | Brazil, India, China, Myanmar, Mexico |

Mineral : Top 3 Producers

| | |
|-------------|---------------------------|
| Iron Ore | China, Brazil, Australia |
| Copper Ore | Chili, Peru, USA |
| Tin | China, Indonesia, Peru |
| Lead | China, Australia, USA |
| Zinc | China, Australia, Peru |
| Manganese | South Africa, USA, Brazil |
| Aluminium | China, Russia, Canada |
| Cement | China, India, USA |
| Petroleum | Saudi Arabia, Russia, USA |
| Natural Gas | Russia, USA, Canada |
| Silver | Peru, Mexico, China |
| Coal | China, USA, India |

Important Boundaries

| | |
|------------------|---|
| Durand Line | Pakistan & Afghanistan |
| MacMohan Line | India & China |
| Radcliffe Line | India & Pakistan |
| Maginot Line | France & Germany |
| Oder Niesse Line | Germany & Poland |
| Hindenberg Line | Poland & Germany (at the time of First World War) |
| 38th Parallel | North & South Korea |
| 49th Parallel | USA & Canada |

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