2

CHAPTER

# Indus Valley Civilization

Indus valley civilisation (IVC) or Harappan culture was a **Bronze Age civilisation** that existed in Northwest and western part of the subcontinent, covering parts of **Pakistan, Afghanistan, and India**. At its peak (mature phase), it was a highly developed urban culture compared to many contemporary and later cultures. It is classified as **part of proto history**.

## EXTEND OF THE CIVILISATION

- **Extend in India**: It covered the present-day regions of Jammu and Kashmir, Rajasthan, Gujarat, Western Uttar Pradesh, Haryana, Punjab and parts of Maharashtra.
- **Directional extend of IVC**: It extended from **Sutkagendor in Pakistan** in the west, to **Alamgirpur in Uttar Pradesh** in the east and from **Manda in Jammu** in the north to **Daimabad in Maharashtra** in the south.
- **Significance**: IVC constitute the **largest Bronze Age civilisation in terms of size**. (Egyptian, Mesopotamian and Chinese cultures were contemporary Bronze Age civilisations).

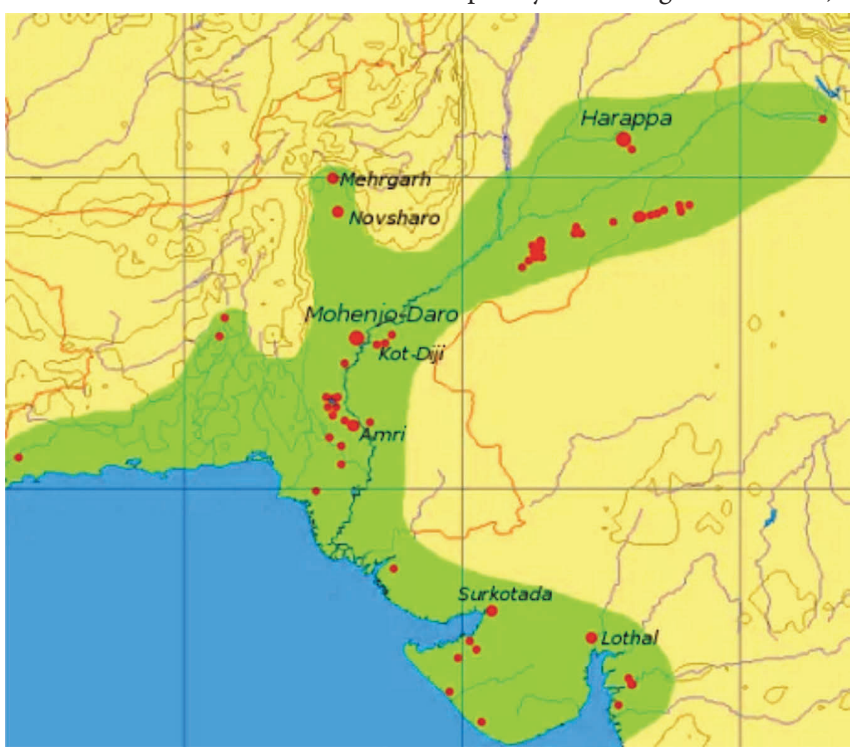



***Fig. 2.1** : Extend of Indus Valley Civilisation*

## DISCOVERY OF THE CIVILISATION

In the early decades of 20th century, **Dayaram Sahni** recognised Harappa as part of a very old civilisation. In 1924, **John Marshall**, then director of ASI declared the establishment of a new civilisation in Indus valley.

| Important Figures | Contribution |
|---|---|
| Alexander Cunningham | First Director-General of Archaeological Survey of India (ASI), known as the "Father of Indian Archaeology" |
| John Marshall | Led the excavation campaign in Harappan region (1921 – 22) |
| Dayaram Sahni | Discovery of Harappa |
| R D Banerji | Discovery of Mohenjo-Daro in 1922 |
| J P Joshi | Discovery of Dholavira in 1985 |

***Table 2.1** : Personalities associated with excavation of IVC.*

## ORIGIN AND EVOLUTION

IVC is very likely predated by farming cultures from the nearby Baluchistan hills whose residents later descended to the Indus plains.

- **Early Harappan phase (3300-2600 BCE)**: A civilisation with rural character developed. It was distinguished by a specific way of life. **Example**: Kot Dijian pottery
- **Mature phase (2600-1900 BCE):** Prosperous trade and rich agriculture led to the development of an urban culture from the rural phase.
- **Later Harappan phase (1900-1300 BCE)**: There has been a sudden decline of the urban nature of civilisation, marked by the formation of multiple rural settlements. Gradually the civilisation gave way to Vedic culture which flourished post 1500 BCE.

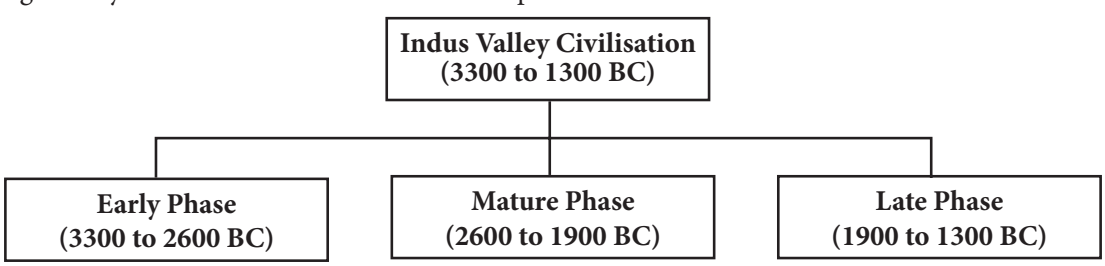



***Fig. 2.2** : Phases of Indus Valley Civilisation*

## SALIENT FEATURES OF THE HARAPPAN CULTURE

### *Political Organisation*

- True nature of Harappan polity is not yet discovered.
- Unlike Mesopotamia or Egypt, **Harappa lacks large scale temple structures**. This rule out the possibility of priest-kings.
- Owing to remarkable unity of civilisation, a central authority is highly likely.
- But the large extend of the civilisation, **lack of large-scale weaponry** and lack of swift modes of transport (**horses were absent in IVC**) points out the possibility of a decentralised system.

## *Economic Life*

### Agriculture

Flooding of the Indus system deposited fertile soil for agriculture. The region had rich vegetation during that period, which attracted rainfall.

- **No large-scale irrigation system** was found in general. However, traces of canal system were discovered from **Shortughai** in Afghanistan. **Dholavira** had water reservoirs.
- **Wheat, Barley, peas, lentils, mustard,** and **sesame** where widely cultivated. Millets were also grown in some areas. In **Lothal and Rangpur** (**Gujarat**), **rice** was cultivated.
- **Cotton** was widely cultivated and used. Pieces of cotton attached to artefacts were discovered. Moreover, discovery of **spindle whorls** suggest that they knew spinning.
- **Ploughshare**: Actual pieces of ploughshares were not found. But numerous **toys** suggesting their use were excavated. They likely used **wooden ploughshares**. Moreover, furrows of **ploughed field** discovered from **Kalibangan in Rajasthan**.
- They also **domesticated animals** like **cattle, sheep, poultry** etc. **Discovery of bones of wild animals** like wild boar, gharial etc. indicates that these were hunted.
- **Elephants, rhinos and camels** were known to Harappans. However, **horses were absent**. Unverified claims of a horse remain are reported from **Surkotada** in Gujarat.

### Trade

With prosperous agriculture, trade flourished. Trade links were established with South India, Afghanistan, Iran, Egypt, Arabia and Mesopotamia.

- **Dilmun** (Bahrain) and **Makan** (Oman) where mentioned in **Mesopotamian sources** as intermediate trading stations to **Meluha** (IVC).
  - **Omani copper**, having nickel content, was discovered from IVC. Harappan jars coated with black clay and other artefacts were found from Oman.
- They were expert **boat-makers**. Mesopotamian sources mention **Meluha** as land of seafarers.
- **Carts** with **solid wheels (Ekka)** were used for trade through land. They **did not use spoked wheel**.
- Grains, pottery, craftworks etc were exported. Large-scale expeditions where also conducted to procure raw materials for crafts.
- Harappans did not use metal money. **Barter system** was likely popular.
- Existence of uniform script, regulated weights and measures and the use of seal indicates the importance and spread of domestic trade. Harappans established settlements in sites where raw materials were abundant.
  - **Example**: **Nageshwar for seashells**, **Shortughai for lapiz lazuli** (precious stone)
- They also conducted trade with non-Harappan settlements in India at the time.

| Raw Material | Procured from |
|---|---|
| Copper | Rajasthan, Oman |
| Tin | Iran, Afghanistan |
| Gold | South India |
| Precious stones | Gujarat, Iran, Afghanistan |

***Table 2.2** : Sources of raw materials for the civilisation*

**Craft**: Harappans were expert craft persons. They employed themselves in multiple craftworks including metal works, bead-making, shell works, weights, seal-making, boat making, pottery etc. **Iron was absent** in IVC.

## *Social Life*

**Inequality** was not stark compared to contemporary Mesopotamia or Egypt. However, existence of citadel, differences in the size and nature of cities indicates elements of inequality. Rare and valuable objects were largely **found in large urban centres like Mohenjo-Daro**.

### Ornaments and Fashion

- Harappans were conscious of fashion.
- Men and women wore two separate pieces of attire similar to dhoti and shawl. They used **wool** and **cotton** to make clothes.
- **Cinnabar** was used as a cosmetic and face-paint, **lipstick** and **collyrium** (eyeliner) were also known to them.
- Various ornaments made of different materials were also used.

### Entertainment

Harappans liked **dance** and **music**. They also played a **game similar to dice**. Large open spaces were found in some sites, which could have been used for festivals.

### Religion

Harappan religious practices are not entirely known. There is a general absence of large temples.

- Terracotta figurines of **mother-goddess** are found in large scale.
- **Fertility worship**: Earth was a symbol of fertility. Terracotta figurines of a plant coming out of the womb of a female also indicate this.
- **Phallus worship**: Symbols of male and female sex organs were also discovered. **Rig Veda** mentions non-Aryan phallus worshipping communities.
- **Zoolatry**: Worship of animals and trees was also likely popular.
- **Amulets** were found in large numbers. **Atharva Veda** (non-Aryan Veda) probably advocate use of amulets to ward off evil spirits and diseases in this light.

***Fig. 2.3** : Mother Goddess*

- Some figures in Harappan seals were also upheld as an indicator of religious beliefs. **Seals** were also used as amulets.
  - **Pashupati Mahadeva** seal is believed to be **proto-shiva** by some historians.
  - Large scale use of different animals (including a mystic, unicorn-like figure) is heralded as an example of zoolatry.
- **Fire Altars** in **Kalibangan** and **Lothal** and **Great Bath** in **Mohenjo-Daro** are believed to have religious significances.

### Burials

- Dead were generally laid in pits. Pits were not of uniform shape.
- Some burials contained various artefacts (like pottery, ornaments etc.). However, they generally did not believe in burying valuables with the dead.
- A **mass burial site** (Cemetery H) was unearthed in Harappa.
- **Urn burials**, **symbolic burials**, use of **wooden box coffins** in burials etc were also reported.
- **No evidence of Sati.**

## *Script*

- Harappans used a **pictographic script** like Egyptians, but it is **not deciphered yet**.
- Long inscriptions are generally absent in Harappan sites. It is generally written from **right to left**.
- Harappans wrote on a variety of objects – seals, jewellery, metal surfaces etc. They probably wrote on perishables as well.

# ART AND ARCHITECTURE OF IVC

## *Architecture*

### Town Planning

- Most Harappan sites were divided into two – **citadel** and **Lower Town**.
- **Town Structure**: Citadel is usually in the western side of the town and located in a higher platform. It is walled and physically separated from the Lower Town, which is separately walled. However, different patterns also are observed in other sites.
  - **Example**: **Dholavira** has a 3-level division – Citadel, Middle Town and Lower Town.
- **Town Pattern**: The streets and buildings were laid in a **rectangular grid-pattern**. **Main streets** were generally laid in **North-South direction** while **secondary streets** were laid in **East-West direction**.

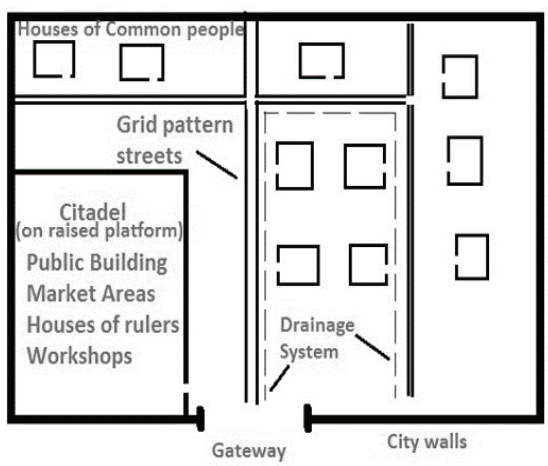



***Fig. 2.4** : Town planning showing grid pattern in Indus Valley towns*

- **Drainage system**: An efficient drainage system was also laid in a **grid pattern** which shows that Harappan people gave importance to health.
  - Drainages were covered with bricks or slabs and are laid in a gentle sloping pattern with **inspection holes** at regular intervals to clear them.
  - Almost every house had its own **bathrooms**. Drainages from each house connected to larger drains, eventually connecting to a main drainage.
  - It appears that streets with drainages were laid first and then buildings were constructed.
- To construct the buildings **burnt and sun-dried bricks** were used.
  - Bricks used throughout was of a **standardised ratio** (length: breadth: height = 4:2:1, providing further evidence of planning) and were laid in an interlocking pattern for construction.
  - Comparing to Mesopotamia, **burnt bricks were used in a wider scale** (contemporary Egyptians used only dried bricks).

### Structures

- **Residential buildings** were generally constructed around a central courtyard with rooms around.
  - There were **no windows in ground level** rooms.
  - **Staircases** were constructed to reach upper floors.
  - Main entrance did not generally give view of interior. Thus, Harappans generally valued privacy.
  - Many houses had **wells**, which could be used from outside. Travellers probably used these.
  - Every house opened to a street.
- **The Great Bath**: In the citadel of **Mohenjo-Daro**, a large rectangular tank in a courtyard surrounded by a corridor is found.
  - **Steps** leading to the tank were found in **North and South**. It is thought to have been used for **ritual purposes**.
  - **Burnt bricks** were used to construct the structure, which was made watertight using a **mortar of gypsum**.
  - There are rooms on three sides. One room contained a **well**, from which water was drawn for the tank. A drain was used to empty the tank.

*Fig. 2.5* : *Great Bath*

- Important structures were generally located in the citadel, but comparing to Mesopotamia, no magnificently large structures were discovered.
  - The largest building in Mohenjo-Daro is a **granary**.
  - In the citadel of Harappa, we find **six granaries**, close to which are **circular platforms** used for threshing grains and **barracks** for labourers.
  - In Kalibangan and Lothal, **fire altars** are also found in the citadel.

## *Sculptures*

### Stone Sculptures

- **'Bearded man' or 'Priest-king'**: Stone bust of a male figure from **Mohenjo-Daro** was found.
  - Made of **steatite**
  - Eyes are elongated and half closed - indicating a **meditating pose**. Stylistic beard and shaven upper lips.
  - A shawl is worn across the left shoulder – it has **trefoil pattern**.
  - **Armlet** is seen in the right hand. Holes around neck indicate a necklace.

***Fig. 2.6** : Priest-king, Mohenjo-Daro*

***Fig. 2.7** : Male Torso, Harappa*

- **Male torso** from **Harappa**
  - Made of **Red sandstone.**
  - Socket holes in neck and shoulder for attaching head and arms.
  - Prominent abdomen

### Bronze Sculptures

Harappans used the technique of **Cire Perdue (lost-wax technique)** to cast bronze images. Apart from sculptures, wide range of daily-use artefacts were also found. Number of pure copper artefacts was greater than alloyed bronze artefacts.

- **'Dancing girl'**: 4-inch bronze figure from **Mohenjo-Daro** in **Tribhanga pose**.
  - She is wearing a cowry shell necklace and also has tied her hair in a bun.
  - Bangles cover left arm, and a bracelet and an amulet adorn her right arm.
  - Right hand is placed on her hip and left is clasped in traditional Indian dance gesture.

***Fig. 2.8** : Dancing girl*

- **Bronze bull: Mohenjo-Daro** - where the head is turned to right and there is a chord around the neck.
- **Copper dog and bird: Lothal**

## *Other artefacts*

### Terracotta

- Crude in nature compared to their metal and stone works since they employed **pinching method** to manufacture them rather than any advanced methods.

- **Mother goddess** figures were made in terracotta.
  - **Necklaces** hanging over the prominent breast, wearing a loin cloth and girdle.
  - **Fan-shaped head-dress** with a cup like projection on each side is distinct.
  - The **pellet eyes** and **beaked nose** constructed in a rudimentary way.
  - Mouth is indicated by a slit.
- Various **face masks**, **toys** and other artefacts were also made from terracotta.

### Faience

- It is artificially produced.
- A gum is used to shape sand or powdered quartz into desired object. This is then glazed, producing a glassy surface with blue or sea-green colour.
- **Beads, bangles, toys** etc where also made using faience.

### Seals

Numerous seals were unearthed from IVC. It is believed to have been used as stamps in long-distance trade, as amulets or identity cards.

*Fig. 2.9* : *Pashupati Seal*

- **Shape**: Standard dimensions were **square** plaque 2x2 square inches. **Rectangular** seals were also obtained.
- **Material**: Various materials were used to make them – **steatite, silver, faience, ivory** etc. Steatite seals were the most abundant.
- Seals generally had a motif and a short inscription.
- Motifs include diverse elements like **bull**, **rhinoceros**, **crocodile**, **tiger**, **elephant**, **geometric patterns** etc.
- **Pashupati Mahadeva seal**: Depicts a **three-headed**, **horned** human figure seated **cross-legged**.
  - **An elephant and a tiger** are depicted to the **left side** of the figure, while **on the right a rhinoceros and a buffalo** are seen.
  - **Two antelopes** (deer) are shown below the seat (nearby his feet).
  - Some historians believe that it depicts **proto-shiva.**

### Pottery

- Harappans used different varieties of pots and wares. Most pots where **wheel turned**.
- **Polychrome ware:** Vases decorated with geometric patterns in red, black, white, green and yellow.
- **Perforated pottery**: Probably used to strain liquids and beverages.
- **Plain pottery** is the most common type.
- When painted, they used **vegetal patterns, tree and animal figures** or **geometric designs**.
- **Miniature pottery** portrays their skill in a significant manner.

*Fig. 2.10* : *Perforated pottery*

### Weights and Measures

- Remarkable uniformity in the use of weights and measures throughout the civilisation distinguishes IVC from other civilisations.
- **Use of binary** and **multiples of 16** in weighing can be found. Weights were usually made in **chert stone** with **no markings** in **cubical shape**.
- **Measuring rods** with markings, made of metal or other materials were discovered.

### Bead Industry

- Beads were made from precious and semi-precious stones like **agate, turquoise, carnelian, lapis lazuli** etc. Shells, gold, silver, bronze, terracotta were also used.
- Different equipment was used to make beads. **Example**: **Stone drills.**
- **Barrel-shaped beads with trefoil pattern** are a unique finding from Indus Valley.
- They also made other ornaments like bracelets, earrings, head ornaments etc.

## MESOPOTAMIA VS INDUS VALLEY – A COMPARISON

| Feature | Mesopotamia | Indus Valley |
|---|---|---|
| **Age** | Bronze Age | Bronze Age |
| **Town planning** | Absent, haphazard growth | Planned in rectangular-grid pattern with drainage system |
| **Polity** | Dominated by priest-kings | Unknown |
| **Religious sphere** | Dominated by priests and large temples | Largely Unknown. Evidence points out |
| **Script** | Cuneiform | Pictographic, not yet deciphered |
| **Construction style** | Use of both burnt and dried bricks. Dried bricks dominate | Dominated by burnt bricks of standard ratio |

***Table 2.3** : Comparing IVC with other civilisations.*

## IMPORTANT SITES

| Harappan site | Location | Features | Unique findings |
|---|---|---|---|
| **Mohenjo-Daro** | Sindh, Pakistan. On the banks of **Indus river** | Known as "**City of wells**". Both early and mature phases observed. It is also a UNESCO world heritage site | Great bath, "Priest-king" sculpture, Dancing girl |

| | | | |
|---|---|---|---|
| **Harappa** | Punjab, Pakistan. On the banks of **Ravi**. | Early, mature, and late phases | Cemetery H – mass burial site, six granaries, barracks for workers |
| **Chanhudaro** | Sindh, on the banks of river **Indus** | Only Harappan site **without fortified citadel**. A **craft production** centre (beads, shells, metal works etc.) | Numerous factories, imprints of **dog paw on brick**. |
| **Kalibangan** | Rajasthan, on the banks of **Ghaggar** | Pre-Harappan and Harappan phases. Earliest sign of **earthquake**. | Fire altars, ploughed field, cylindrical seals were found |
| **Rakhigarhi** | Hissar district, Haryana | **Largest Harappan site**, shows signs of early and mature phases | Toy cart |
| **Banawali** | Haryana, on the banks of Rangoi river | Early, mature, and late phases | Terracotta ploughs |
| **Ropar** | Punjab | Absence of early phase | |
| **Lothal** | Gujarat, near **Bhogava river** | Harappan **port** and production centre. Provide direct evidence of trade with Mesopotamia. People consumed **rice** | Fire altars, dockyard |
| **Dholavira** | Khadir Beyt in Rann of Kutch, Gujarat | • Divided into three parts.<br>• Large open area<br>• Water harvesting system and storm water drainage.<br>• UNESCO heritage site | Large letters in Harappan script carved in white stone |
| **Surkotada** | Near Bhuj, Kutch district | Mature phase | Remains of horse |
| **Nageshwar** | Gulf of Kutch, Gujarat | Specialised **shell** objects making centre | |
| **Balakot** | Near Karachi | Shell-making centre | |

***Table 2.4 :*** *Major Harappan sites*

## *Other Harappan Sites*

- **Kot-Diji**: pre-Harappan and Early Harappan site in Pakistan
- **Siswal**: Early Harappan site, also show signs of late Harappan phase. Located in Haryana.
- **Amri**: Early, mature, and late Harappan site in Sindh
- **Ganweriwala**: Located in Pakistan Punjab near Indian border. Near Ghaggar Hakra river
- **Desalpur**: small Harappan site situated in Kutch district, famous for disproportionately large fortification.

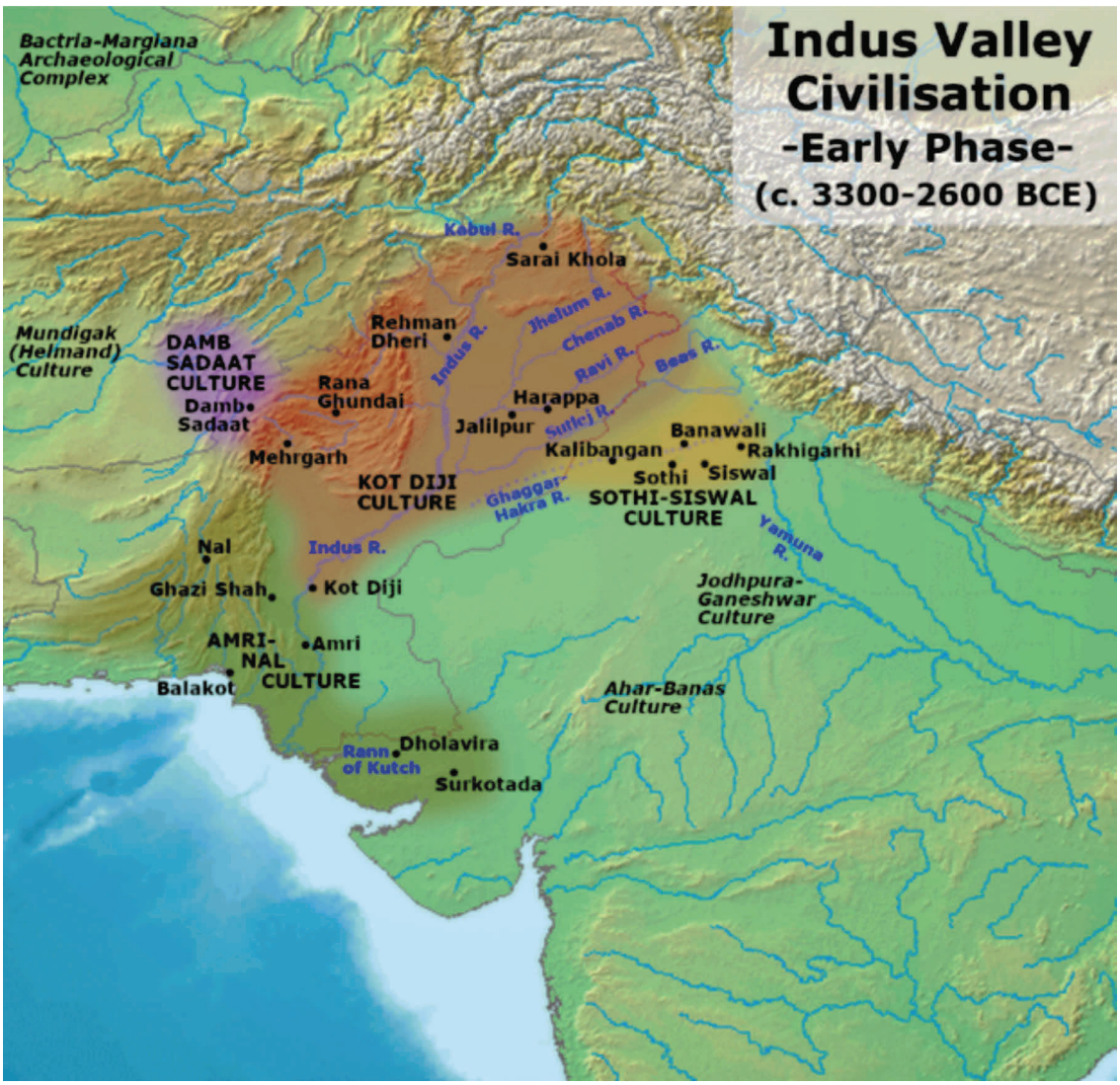



***Fig. 2.11 :*** *Early Harappan sites*

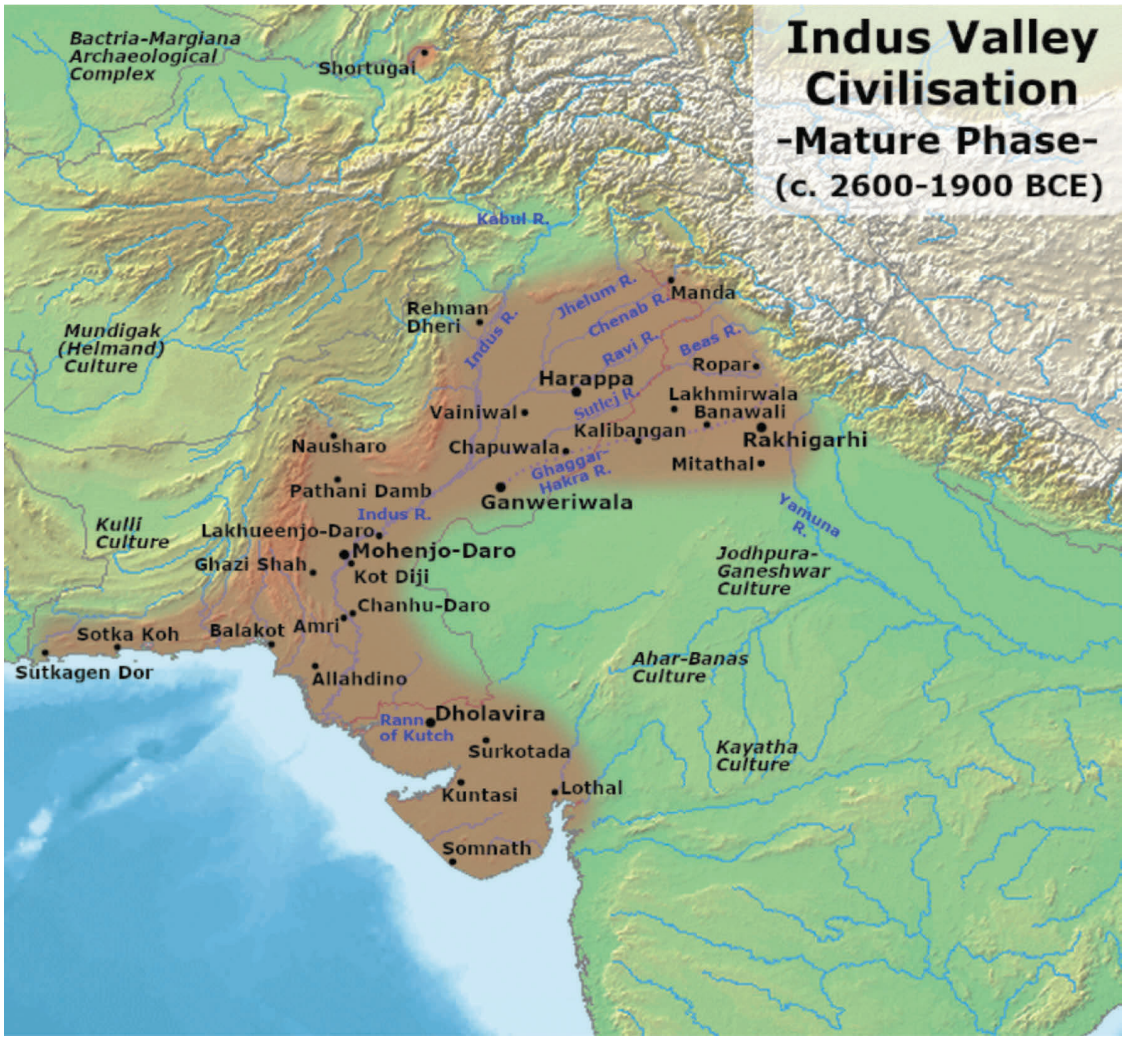



*Fig. 2.12* : *Mature Harappan sites*

## DECLINE OF IVC

Post 1800 BCE, there seems to be an abrupt decline in the Harappan way of life. Population expansion happened towards the east and south, marked by an increase in the number settlements in these regions. Gradually, the urban nature of the civilisation faded to rural cultures.

- Writing, seals, weights etc. ceased from usage.
- Drainage system and town planning broke down.
- However, many cultural elements survived – use of symbols, worship of mother goddess, phallus worship etc.

Historians argue about the reasons for decline. **Flood, Aryan migration, drying up of rivers, ecological destruction etc**. are some theories propounded as possible cause of decline. However, given the large extend of civilisation, possibly multiple factors contributed to it.

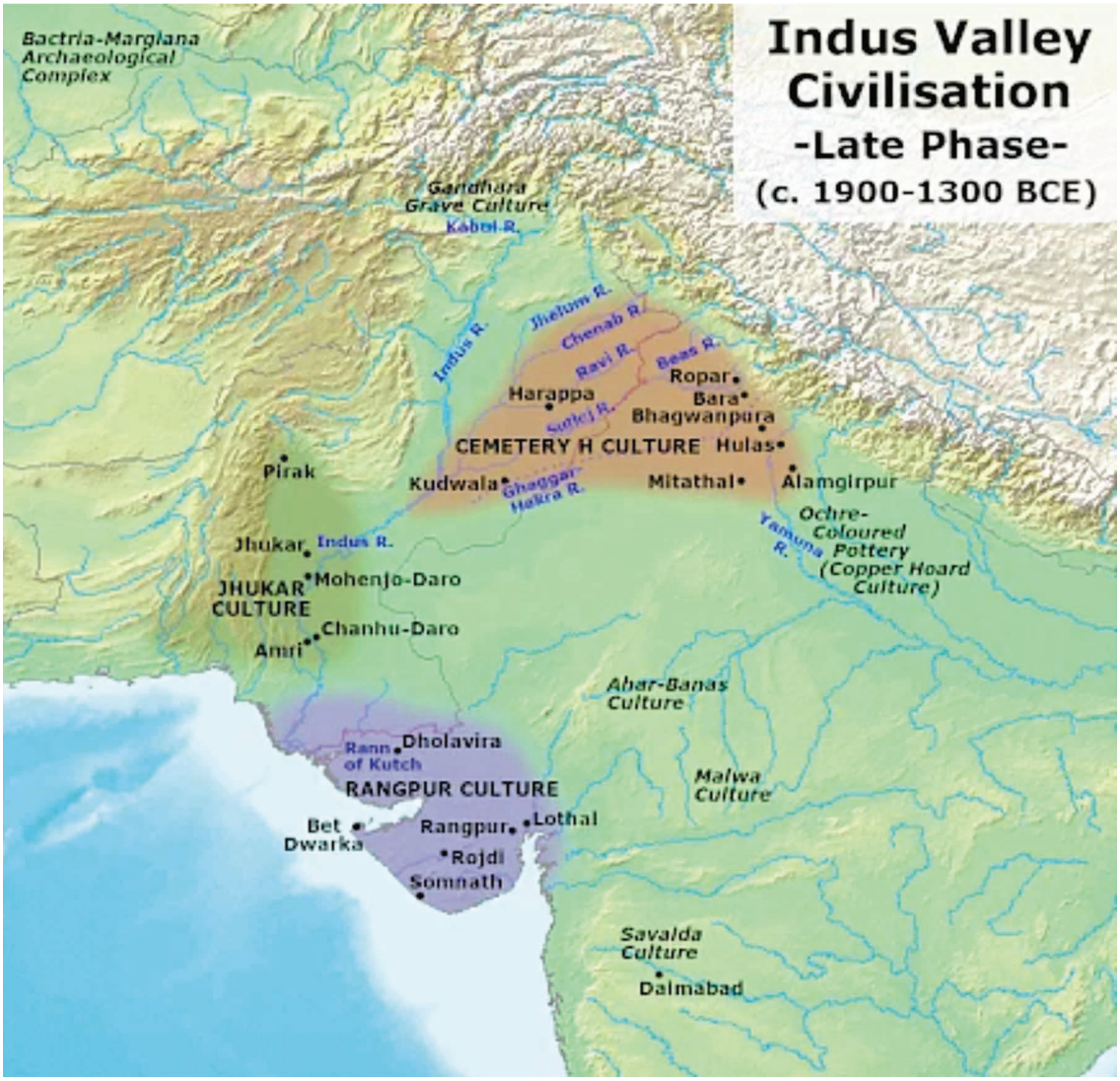



***Fig. 2.13*** **:** *Late Harappan sites*

## PREVIOUS YEAR QUESTION (PYQs)

**1.** Which one of the following ancient towns is well known for its elaborate system of water harvesting and management by building a series of dams and channelizing water into connected reservoirs? **(2021)**

(a) Dholavira (b) Kalibangan (c) Rakhigarhi (d) Ropar

**2.** Which one of the following is not a Harappan Site? **(2019)**

(a) Chanhudaro (b) Kot Diji (c) Sohgaura (d) Desalpur

**3.** Which of the following characterizes/characterize the people of Indus Civilization?

1. They possessed great palaces and temples.
2. They worshipped both male and female deities.
3. They employed horse-drawn chariots in warfare.

Select the correct answer using the code given below: **(2013)**

(a) 1 and 2 only (b) 2 only

(c) 1, 2 and 3 (d) None of the given statements is correct

**4.** Regarding the Indus Valley Civilization, consider the following statements:

1. It was predominantly a secular civilization and the religious element, though present, did not dominate the scene.
2. During this period, cotton was used for manufacturing textiles in India.

Which of the statements given above is/are correct? **(2011)**

(a) 1 only (b) 2 only (c) Both 1 and 2 (d)Neither 1 nor 2

## ANSWER KEYS

**1.** (a) **2.** (c) **3.** (b) **4.** (c)

*Scan QR code For Solved Mains PYQs*

CHAPTER 2

# The Earth

The earth, our planet, is situated in the **habitable zone** of our solar system, where conditions are just right to support life. It is the third planet from the sun, and **the only known planet with liquid water on its surface.** The origin and evolution of the earth, its distance from the sun, its shape and the nature of movements, and the system of interconnected processes on it together have contributed to the formation of such a unique environment.

## EVOLUTION OF THE EARTH

Earth was initially (4.6 billion years ago) a **hot and molten mass with a thin atmosphere of hydrogen and helium.** The gradual process of cooling down of the earth's crust paved the way for the evolution of **three major realms of the earth, namely the lithosphere, the atmosphere and the hydrosphere.**

### *Evolution of lithosphere*

- The body of the earth got layered through the **process of differentiation. Heavier materials like iron and nickel sank** towards the centre, and lighter ones started floating over them.
- With the passage of time, the earth cooled and condensed into smaller size.

### *Evolution of atmosphere*

- The primordial atmosphere of hydrogen and helium was lost by the action of **solar winds.**
- **Degassing:** The hot interior of the earth erupted gases such as **methane, ammonia, water vapour and carbon dioxide,** which contributed to the formation of the atmosphere.
- **Oxygen revolution:** The composition of the atmosphere was further modified by the oxygen released through **photosynthesis (2.5 billion years ago).** This allowed the development of more complex organisms.

### *Evolution of hydrosphere*

- The water vapour generated through **volcanic eruptions** started condensing when earth started cooling down.
- The condensed water vapour **gave birth to oceans through continuous precipitation** (4 billion years ago).
- The earliest photosynthetic lifeforms like **blue-green alga** converted carbon dioxide dissolved in water into oxygen. The oceans once saturated with oxygen released the same into the atmosphere.
- **Ice ages:** These are periods of glaciation when large parts of the earth's surface were covered with ice. The glaciers formed and melted, changing sea levels and altering ocean currents.

## GEOLOGICAL TIMESCALE

The geological timescale is a chronological framework that **divides the history of the earth into distinct intervals of time** based on some major events. The geological history is broadly divided into eons, which are further divided into eras, each of which is composed of several periods, and each period is further divided into epochs **(Eon > Era > Period > Epoch).**

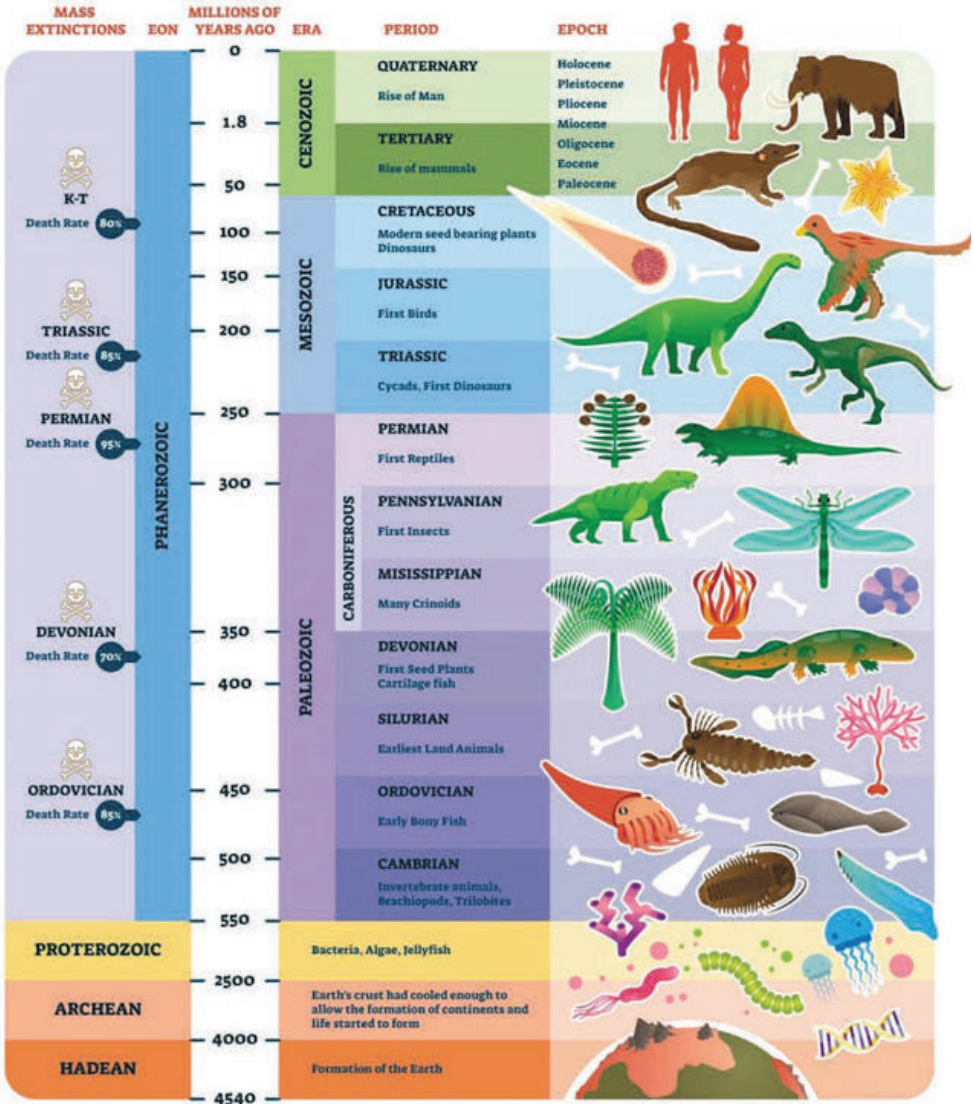



*Fig. 2.1* : *Geological Timescale*

- **Eon:** It is the **second largest division of time** in the geological timescale, following the supereon. The **supereon Precambrian** is divided into three eons, namely **Hadean, Archean and Proterozoic. The current eon is Phanerozoic.**
- **Era:** Era is a division of time that is **shorter than an eon and longer than a period**. The three eras **Palaeozoic, Mesozoic and Cenozoic** together constitute the Phanerozoic era.

- **Period:** A period is **shorter than an era and longer than an epoch**. The three eras of Phanerozoic eon are subdivided into a total of **eleven periods**, namely Cambrian, Ordovician, Silurian, Devonian, Carboniferous, Permian (together make up Palaeozoic era), Triassic, Jurassic, Cretaceous (together form Mesozoic era), Tertiary and Quaternary **(the current era, Cenozoic).** Carboniferous era is often subdivided into Mississippian and Pennsylvanian eras.
- **Epoch:** It is **shorter than a period** and longer than an age. The **current period Quaternary** is divided into two epochs, namely **Holocene and Pleistocene.**

## THE SHAPE OF THE EARTH

- **Geodesy:** It is the science of measuring the earth's geometric shape, orientation and gravitational field.
- The shape of the earth is best described as an **oblate spheroid,** which means that it is **roughly spherical in shape, but flattened at the poles and bulging at the equator.**
- This shape is due to the **centrifugal force generated by the earth's rotation.**

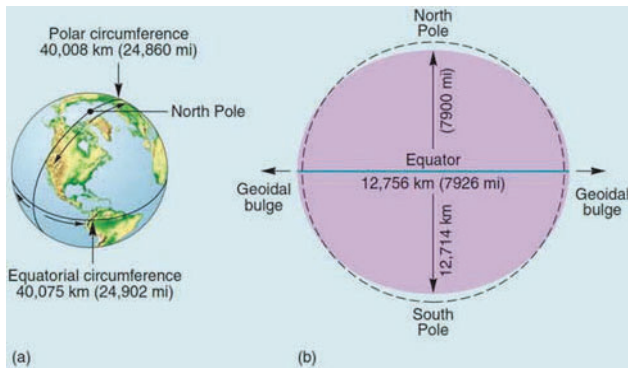



***Fig. 2.2** : Oblate-Spheroidal Shape of the Earth*

- The equatorial diameter of the earth is approximately 12,756 kilometres, while its polar diameter is 12,714 kilometres, i.e., the earth is about **42 kilometres wider at the equator than it is at the poles.**
- **Geoid:** The word geoid means earth-shaped.

## KEY DOMAINS OF EARTH

The major domains of the earth are the **lithosphere, atmosphere, hydrosphere and biosphere, which are interconnected and interdependent.**

- **Lithosphere:** It is the solid, rocky shell covering the entire surface of the earth **(Refer Chapter 3).**
- **Atmosphere:** It is the **layer of gases** that surrounds the earth, and is held in place by the **force of gravity** (Refer Chapter 10).
- **Hydrosphere:** This part of the earth consists of **all the water** found on, under and over the surface of it **(Refer Chapter 8).**
- **Biosphere:** It is the part of the earth that constitute all **living organisms as well as the physical environment with which they interact.** It depends on the other domains of the earth for its survival.

### *Latitudes and longitudes*

Latitudes and longitudes are **geographic coordinates used to describe locations** on the surface of the earth. They are **measured in degrees**. An imaginary grid made up **of parallels of latitudes and meridians of longitude** helps us locate any spot on the earth.

## LATITUDES

- Latitude is the **angular distance measured north or south of the equator.** It is a measure of how far north or south a location is from the equator.
- The angle between the **line made by a given point with the earth's centre**, and the **equatorial plane** gives the latitude of the point.
- It varies from **$0^0$ to $90^0$ north and $0^0$ to $90^0$ south** of the equator.
- **Parallels of latitude:** Parallel is an imaginary **line connecting all points of the same latitude.** They are **circular** in shape. **$0^0$ parallel is called equator.**
- **Major parallels of latitude:** They include the equator, the Tropic of Cancer, the Arctic Circle, the Tropic of Capricorn and the Antarctic Circle.
  - **The equator:** The equator is located at an **equal distance from the north pole ($90^0$ N) and the south pole ($90^0$ S)** of the earth. It is the **longest parallel** on the planet (40,075 km). It **has an overhead sun twice a year (during the two equinoxes).**
  - **The Tropic of Cancer:** It is a parallel located at approximately $23.5^0$ north of the equator **($23.5^0$ N).** It marks the northernmost parallel on the earth at which the **sun's rays can be directly overhead (occurs on summer solstice).**
  - **The Tropic of Capricorn:** It is a parallel located at about $23.5^0$ south of the equator **($23.5^0$ S).** It marks the southernmost parallel on the earth at which the **sun's rays can be directly overhead (occurs on winter solstice).**
  - **The Arctic Circle:** It is a parallel located at about $66.5^0$ north of the equator **($66.5^0$ N).**
  - **The Antarctic Circle:** It is a parallel located at $66.5^0$ south of the equator **($66.5^0$ S).**

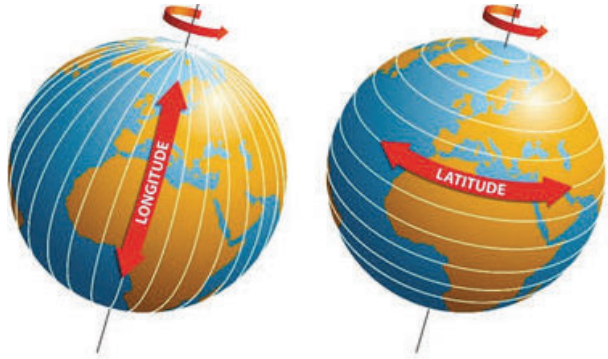



*Fig. 2.3 : Geographic Coordinates – Latitudes and Longitudes*

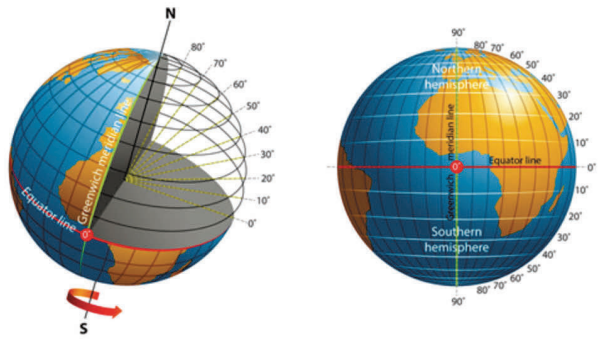



*Fig. 2.4 : Latitudes and Parallels*

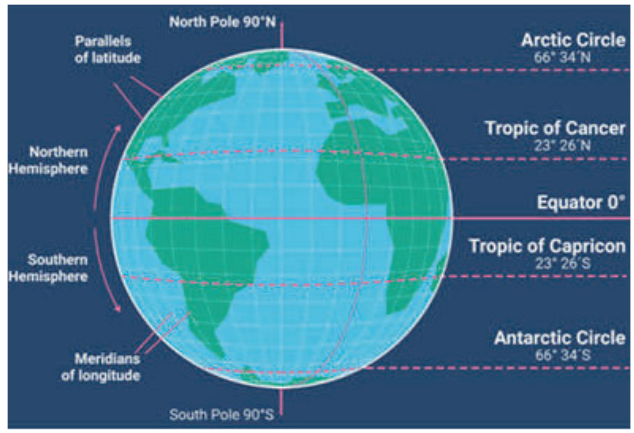



*Fig. 2.5 : Major Parallels of Latitude*

## *Latitudinal temperature zones of the earth*

- **Early Greek theory**
  - Ancient Greek scholars believed that the earth was divided into **three zones** based on their climatic conditions, namely **the torrid zone, the temperate zone and the frigid zone.**
  - They defined the zones **based on the angle of the sun's rays hitting the earth's surface at different latitudes.**

| Name of the Zone | Torrid Zone | Temperate Zone | Frigid Zone |
|---|---|---|---|
| **Location** | Region around the equator | Between the tropics and the polar circles | Near the poles |
| **Angle of Inclination of the Sun's Rays** | $90^0$ | Oblique angle | Highly oblique angle |
| **General Climatic Conditions** | Hot and humid | Milder temperature and more seasonal variations | Very cold and harsh conditions |

***Table 2.1** : Torrid, Temperate and Frigid Zones*

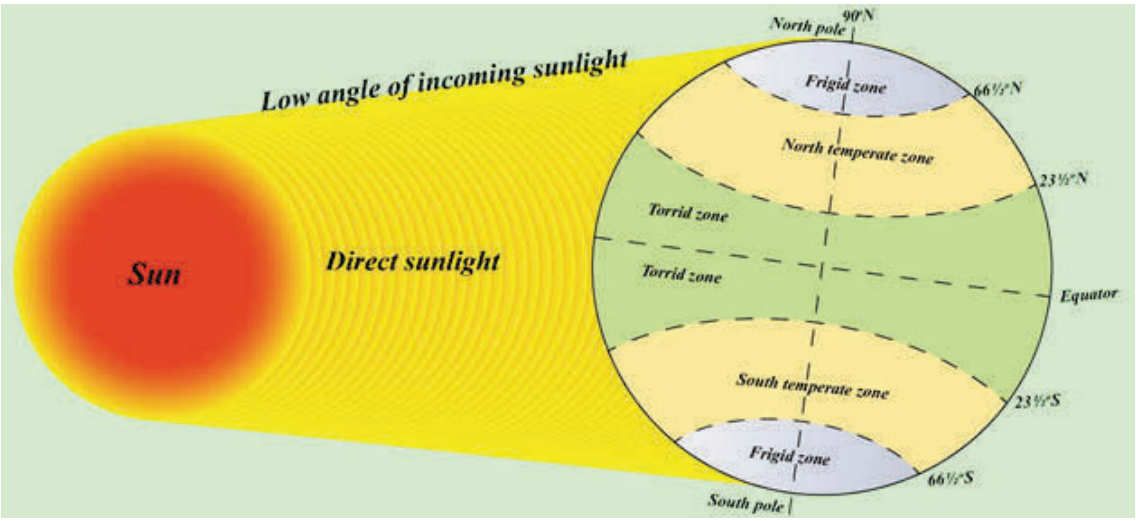



***Fig. 2.6** : The Early Greek Theory – Torrid, Temperate and Frigid Zones*

- **Latitudinal zones – modern understandings**
  - **Equatorial region:** It is a narrow region/belt **between $10^0$ N and $10^0$ S.**
  - **Tropical region:** It is the region **between the Tropic of Cancer and the Tropic of Capricorn.** At any latitude in this region, the sun is **directly overhead twice a year.** Outside the tropics (north and south), the sun is never directly overhead.
  - **Sub-tropical region:** It is the region that **borders the tropics.** The region lies **between the Tropic of Cancer and the $35^0$ N parallel in the northern hemisphere**, and **between the Tropic of Capricorn and the $35^0$ S parallel** in the southern hemisphere. It forms a **part of the temperate zone.**

- **Temperate/Mid-latitude Region:** It lies **between the Tropic of Cancer and the Arctic Circle in the northern hemisphere**, and **between the Tropic of Capricorn and the Antarctic Circle** in the southern hemisphere.
- **Sub-polar region:** It is usually found **between latitudes $50^0$ and $70^0$ north or south** of the equator.
- **Polar region:** The region is found **between the Arctic Circle and the North Pole** in the northern hemisphere, and **between the Antarctic Circle and the South Pole** in the southern hemisphere of the earth.

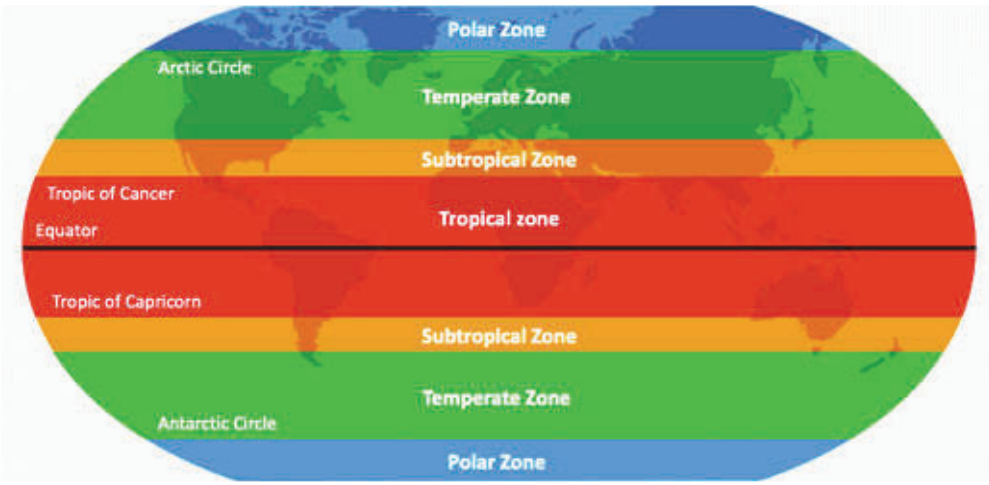



*Fig. 2.7 : Latitudinal Zones of the Earth*

## LONGITUDES

- Longitude is the **angular distance measured east or west of the $0^0$ meridian (Prime Meridian).** It is a measure of **how far east or west a location is** from the the Prime Meridian.
- **Prime Meridian:** It is a **geographical reference line** that passes through the **Royal Observatory in Greenwich, London,** connecting the north and south poles with each other.

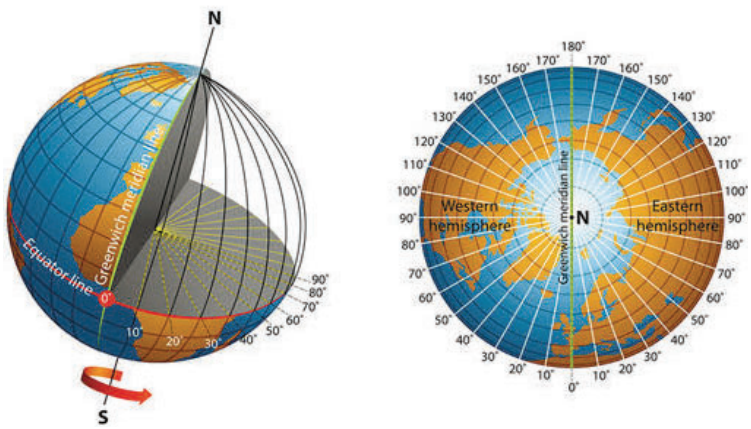



*Fig. 2.8 : Longitudes and Meridians*

- **Meridian:** It is any imaginary **line on the earth's surface, passing through the geographic poles.** It is **semi-circular** in shape.
- The **angle between the meridian passing through a given point and the Prime Meridian** gives the longitude of that point.

- Longitude varies from **$0^0$ to $180^0$ east or west of the Prime Meridian**.
- **A meridian connects all places having the same longitude.**

## *Local time at a place*

- Local time at a place is **fixed with reference to the path of the sun** in the sky.
- It is **12:00 noon** local time when the **sun is overhead at that place (angle of inclination of the sun's rays is maximum = $90^0$).** This occurs when the sun **crosses the longitude passing through the place.**
- All places on **a given longitude have the same local time**.
- To avoid complexities, a **uniform time throughout a region/country** is followed.

## *Time zones*

- The globe is divided into **24 equal time zones based on longitude**, with each zone corresponding to a timespan of **one hour.**
- The earth completes **a rotation ($360^0$ angle) in 24 hours** ($24 \times 60 = 1440$ minutes), i.e., **$1^0$ longitude difference corresponds to a time difference of 4 minutes** (1440 minutes ÷ 360) Further, each zone representing **one hour corresponds to a $15^0$ section of longitude** ($360° \div 24 = 15°$).
- Each **longitude that is a multiple of $15^0$** ($0^0$, $15^0$, $30^0$, $45^0$, etc.) serves as the **central meridian of a time zone.** The local time corresponding to the central meridian is applied to the region spanning **$7.5^0$ each on both the sides** (east and west) of the longitude.

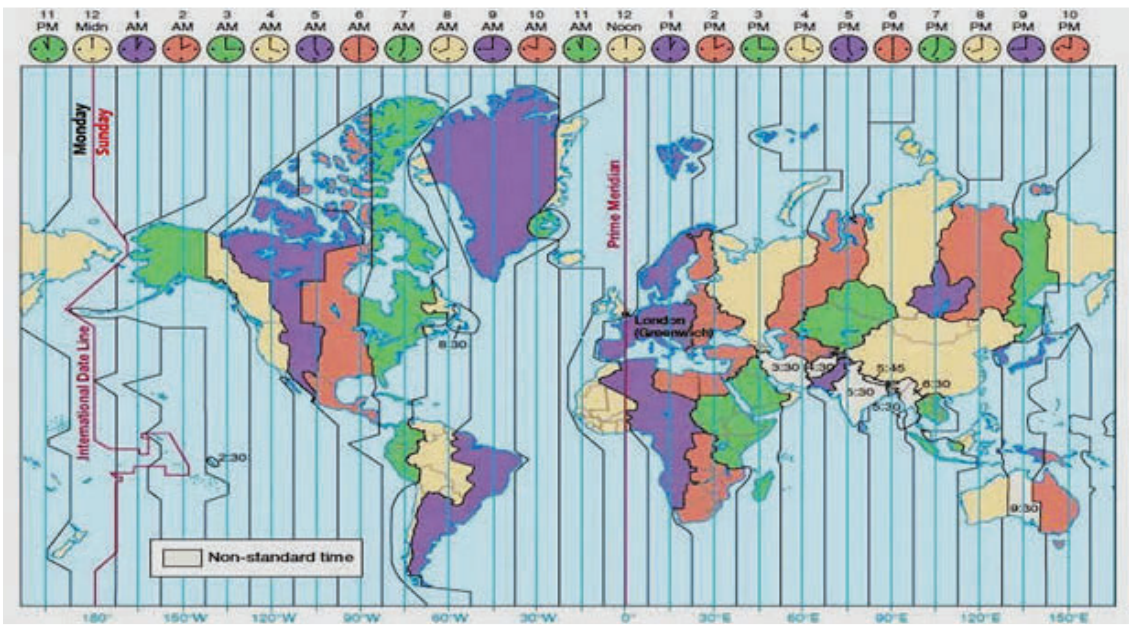



***Fig. 2.9 :*** *Time Zones, Prime Meridian and International Date Line*

## Greenwich Mean Time (GMT)

- It is the mean solar time at the Prime Meridian.
- **Prime Meridian is the reference point for the world's time zones.** It is used as the **starting point for calculating the time** in different parts of the world.
- Time zones representing 15 or 1 hour each appear to be **arranged on both the sides of the Prime Meridian.**
- As the **earth rotates from west to east, the time moves from east to west.** Therefore, the regions that lie to the **east of the Prime Meridian are ahead of the GMT**, and the regions that lie to the **west are behind the GMT.**

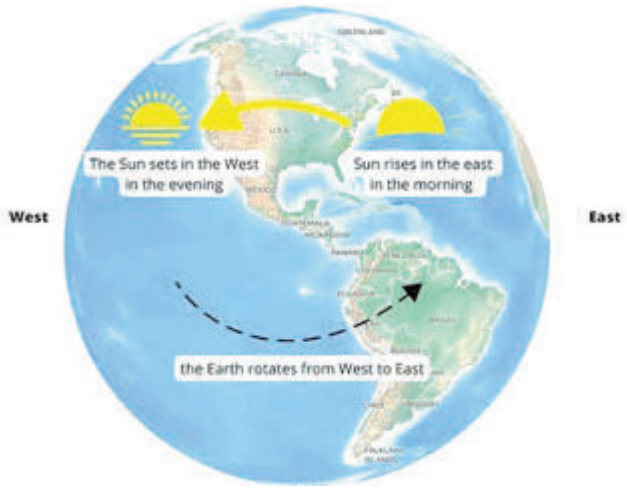



***Fig. 2.10 :*** *The Apparent Diurnal Path of the Sun*

- **Example :** When it is **12:00 noon GMT,** the time is **2:00 pm at Amsterdam** (2 hours ahead, or $2 \times 15° = 30^0$ east of Prime Meridian), and **8:00 am at Washington, D.C.** (4 hours behind, or $4 \times 15^0 = 60^0$ west of the Prime Meridian).

## International Date Line (IDL)

- It is an imaginary line that runs through the Pacific Ocean, **roughly along the $180^0$ longitude.** It **zigzags** to avoid crossing through populated areas.
- **Example :** IDL **deviates from $180^0$ meridian in the Bering Sea to include all the islands of Aleutian Island Arc within the same day**.
- It marks the **transition from one calendar day to the next,** and it is where the **date changes** from one day to the next.
- When **one crosses the IDL from east to west, they lose one calendar day**, and when the IDL is crossed from **west to east, one gains a calendar day.**
- **The new day first appears on the earth at midnight, west of the IDL ($180^0$ E with respect to Prime Meridian).** For the next 24 hours, the new day's sunrise advances westwards, reaches the east of the IDL (**$180^0$ W**), and finally **leaves after 48 hours** from its first appearance.

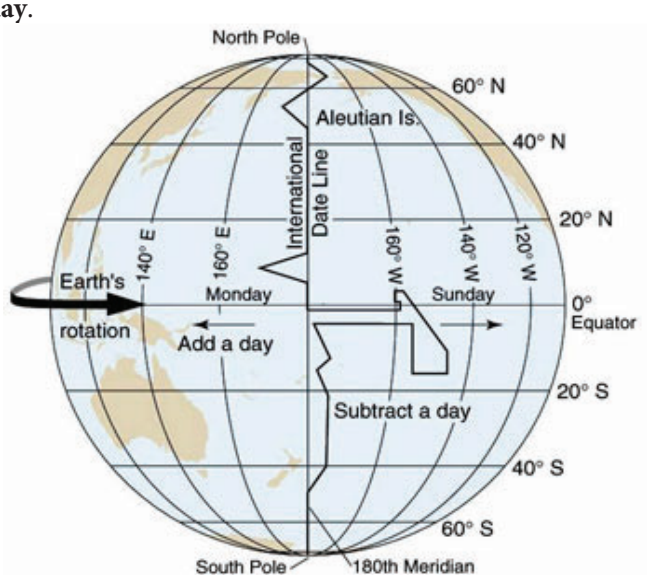



***Fig. 2.11 :*** *International Date Line (IDL)*

- Since the IDL is at the middle of a time zone, there is **no time zone change** at that point, i.e., **only a change of the calendar and not of the clock.**

For instance, consider **a random date** 25th December to understand the following sequence.

- When it is 25th December midnight at 180° W, it is 26th December midnight (a new day appears on earth) at 180° E [See Fig 2.12 (a)]. This indicates a change in date (from 25th to 26th) with no change in time (12:00 midnight on both E and W of 180° meridian).
- 24 hours later, when the old day 25th December has disappeared from earth, the new day 26th December midnight has gradually advanced towards west and completed a rotation to reach 180° W [See Fig 2.12 (b)].
- 26th December stays on earth another 23 hours, 59 minutes and 59 seconds, until it is 11:59:59 pm at 180° W [See Fig 12.12 (c)]. The date disappears completely from earth the very next second, when it becomes 12:00:00 midnight, 27th of December at 180° W.

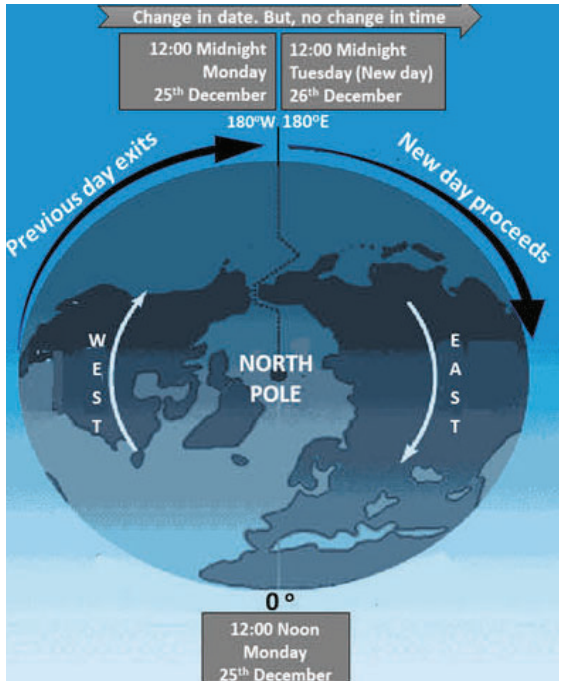



*Fig. 2.12 (a) : Change of Date at the IDL*

- Thus, 26th of December has **stayed on earth for almost 48 hours (24 hours + 23 hrs + 59 minutes + 59 seconds), or it is said to have left the earth after 48 hours of its appearance.**

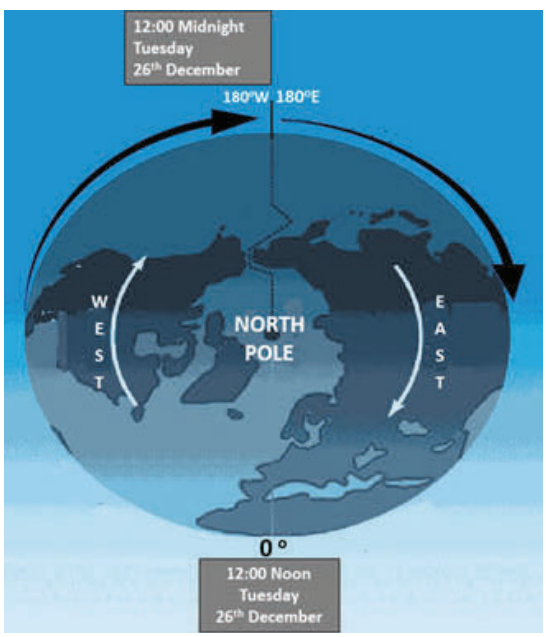



*Fig. 2.12 (b) : Change of Date at the IDL (24 hours later)*

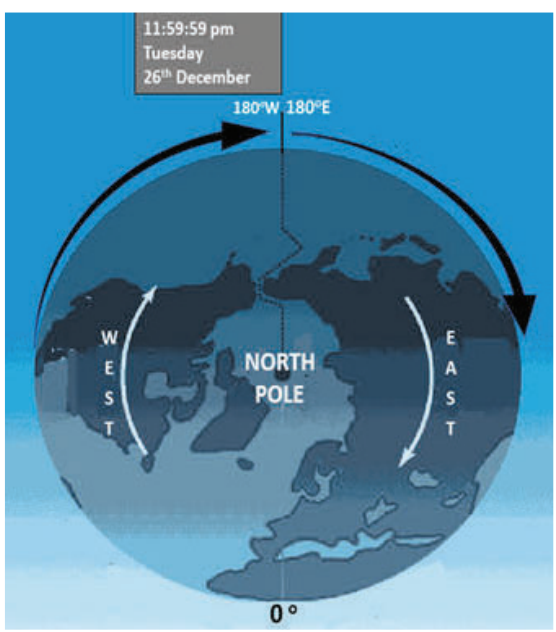



*Fig. 2.12 (c) : Change of Date at the IDL (Another 23 hrs 59 mins 59 secs later)*

| Name of the Meridian | Prime/Greenwich Meridian | International Date Line |
|---|---|---|
| **Corresponding Longitude** | $0^0$ | $180^0$ |
| **Passes Through** | Greenwich, London | Pacific Ocean |
| **Importance** | The reference point of time zones | The point of transition between two consecutive days |
| **On East of the Meridian** | Ahead of GMT | One gains a day |
| **On West of the Meridian** | Behind the GMT | One loses a day |

***Table 2.2*** **:** *Prime Meridian Vs International Date Line*

## *Standard Meridian*

- Standard Meridian of a country/region is its **central meridian, or the meridian on which the most important city is located.**
  - Example : (i) The **Standard Meridian of India is $82.5^0$ E longitude**, which almost bifurcates the country, (ii)The **Standard Meridian of China is $120^0$ E longitude,** which passes through its capital, **Beijing**.
- It is selected in such a way that it is **divisible by $7.5^0$,** so that the standard time **differs from the GMT by multiples of half an hour.**
- **Large countries** with vast longitudinal extend usually follow **more than one standard meridian** (an exception is China).
  - Example : **Russia has 11 time zones, France has 12 time zones due to its overseas territories.**

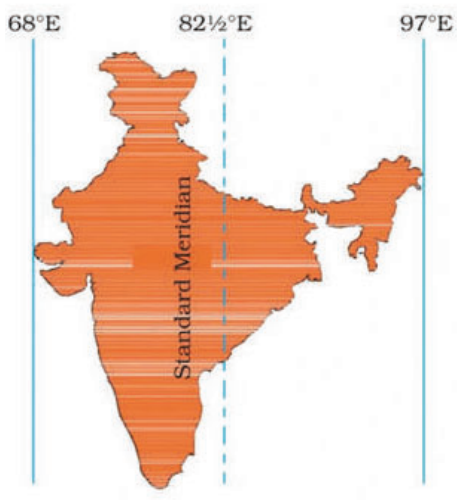



***Fig. 2.13 :*** *The Standard Meridian of India*

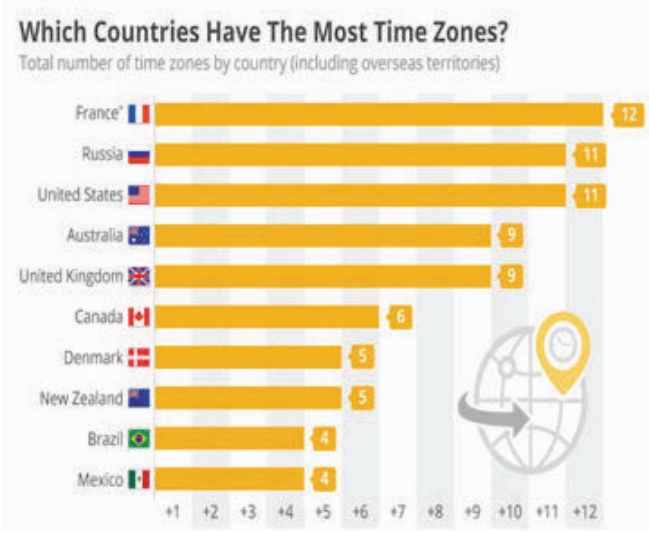



***Fig. 2.14 :*** *Total Number of Time Zones by Country (Including Overseas Territories)*

### *Comparison between latitude and longitude*

| Name of the Coordinate | Latitude | Longitude |
|---|---|---|
| **Alignment** | From east to west | From north to south |
| **Associated Lines** | Parallels | Meridians |
| **Reference Line ($0^0$)** | Equator | Prime Meridian |
| **Extend** | From $0^0$ to $90^0$ north and south of the equator | From $0^0$ to $180^0$ east and west of the Prime Meridian |
| **Significance** | Associated with temperature zones, also helps locate places on earth | Associated with time, also helps locate places on earth |
| **Pattern of the Lines** | Length of parallels is maximum at equator, and reduces gradually towards the poles. | All meridians are of same length |

***Table 2.3** : Latitude Vs Longitude*

## THE MOVEMENTS OF THE EARTH

The **two fundamental motions** of the earth that describe its movement in space are its **revolution and rotation.**

- **Revolution:** It refers to the **motion of the earth along its orbit around the sun.**
- **The Plane of the ecliptic:** It is an imaginary **plane containing the earth's orbit** around the sun, and it **passes through the centre of the sun.**

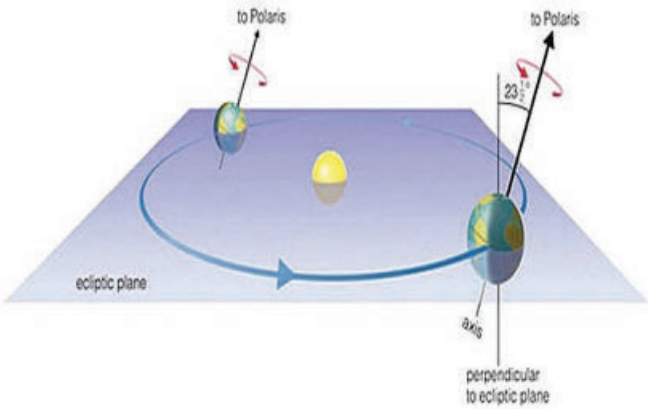



***Fig. 2.15** : The Ecliptic Plane*

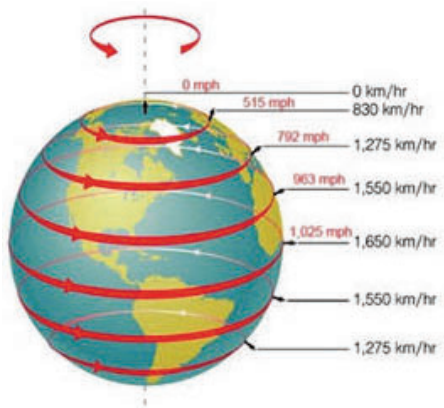



***Fig. 2.16** : Rotation of the Earth*

- **Rotation:** It is the **spinning motion of the earth on its own axis.**
- **Axial tilt:** The earth's axis is tilted at an angle of about **$66.5^0$ relative to the plane of ecliptic.** In other words, the axis makes an angle of **$23.5^0$ with a perpendicular drawn to the ecliptic plane.**
- **The circle of illumination:** It is the boundary **line separating the illuminated side of the earth from its dark side** at a particular moment in time. At any given time, **half of the earth is in daylight and the other half is in darkness.**

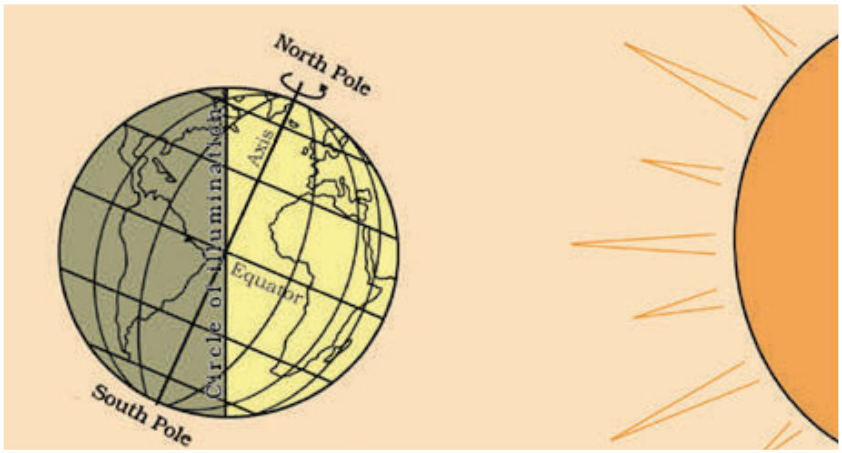



*Fig. 2.17 : The Circle of Illumination*

| Type of Motion | Revolution | Rotation |
|---|---|---|
| **Central Point** | Sun | Earth's axis |
| **Direction of Motion** | Anti-clockwise | From west to east |
| **Nature of the Motion** | Elliptical | Circular |
| **Time Taken** | 365 days, 6 hours and 9 minutes | 24 hours |

*Table 2.4 : The Motions of the Earth*

- **Aphelion and Perihelion**
  - The **orbit of the earth is elliptical** in shape. Unlike a circle, an ellipse does not have a centre that is equidistant from all the points on its periphery. Therefore, the **distance between the sun and the earth is not constant throughout the year.**

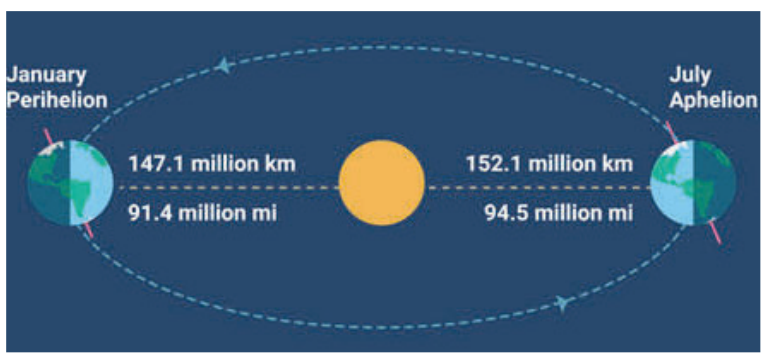



*Fig. 2.18 : Aphelion and Perihelion*

  - **Aphelion:** It is a point on the earth's orbit where the **earth is farthest away from the sun.** It usually occurs on **4th of July.**
  - **Perihelion:** It refers to a point on the orbit of the earth where it is **closest to the sun.** It usually occurs on **4th of January.**

## EFFECTS OF REVOLUTION AND ROTATION

The effects of the revolution and the rotation of the earth includes day & night, Coriolis Effect, seasons, and climate & weather patterns.

## Day & Night

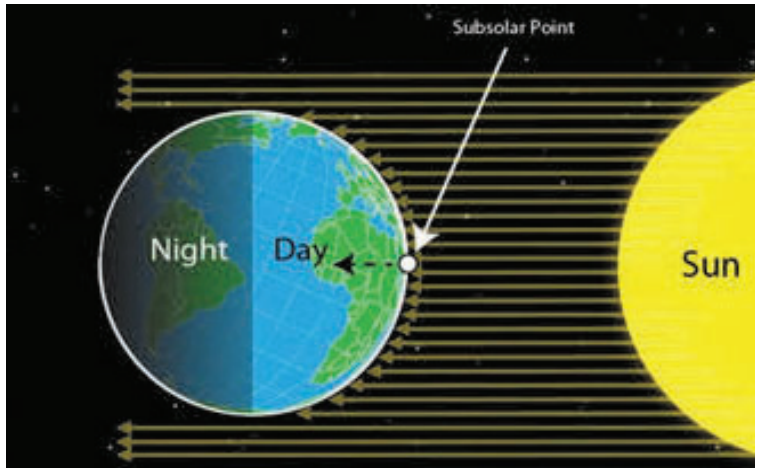



*Fig. 2.19 : Day and Night on the Earth*

- The **rotation of the earth on its axis** causes day and night cycles.
- The **length of day and night varies** depending on the latitude and time of year.
- At the **equator, day and night are approximately 12 hours** long throughout the year. At higher latitudes, day/night can be longer than night/day, and **at the poles, day/night last for several months.** This happens **due to the axial tilt and the revolution** around the sun.
- **Subsolar point:** It is the place where the **sun is directly overhead.**
- **Sun's declination:** Declination is the **latitude of the subsolar point.** Since there is no subsolar point beyond the tropics, the migration of declination is said to **be confined within $47^0$ of latitudes** between the tropics **($23.5^0$ N to $23.5^0$ S)** annually.

## Coriolis Effect

- The **rotation** of the earth causes **different parts of the earth to move at different speeds** (See Fig 2.16). This results in Coriolis Effect.
- Coriolis Effect is a natural phenomenon that **causes moving objects to curve to the right in the northern hemisphere, and to the left in the southern hemisphere.**
- It has a significant **impact on atmospheric and oceanic circulation patterns (Refer Chapters 9 and 12).**
- Coriolis force is **zero at the equator.**

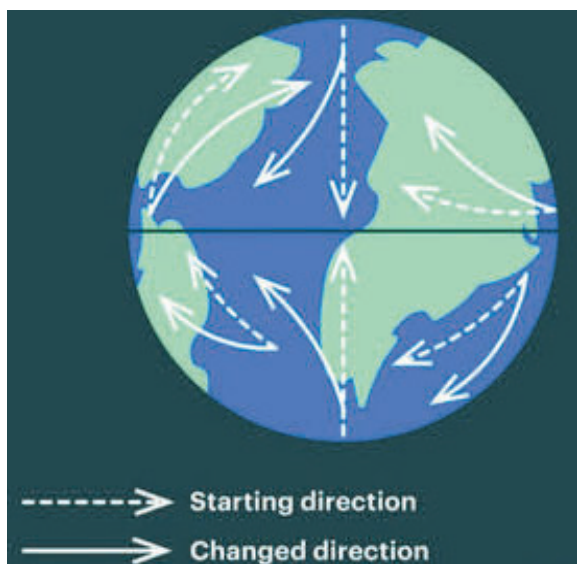



*Fig. 2.20 : Coriolis Effect*

## Seasons

- Seasons on the earth are created by its **axial tilt and the revolution** around the sun (explained in detail in the coming section of this chapter).

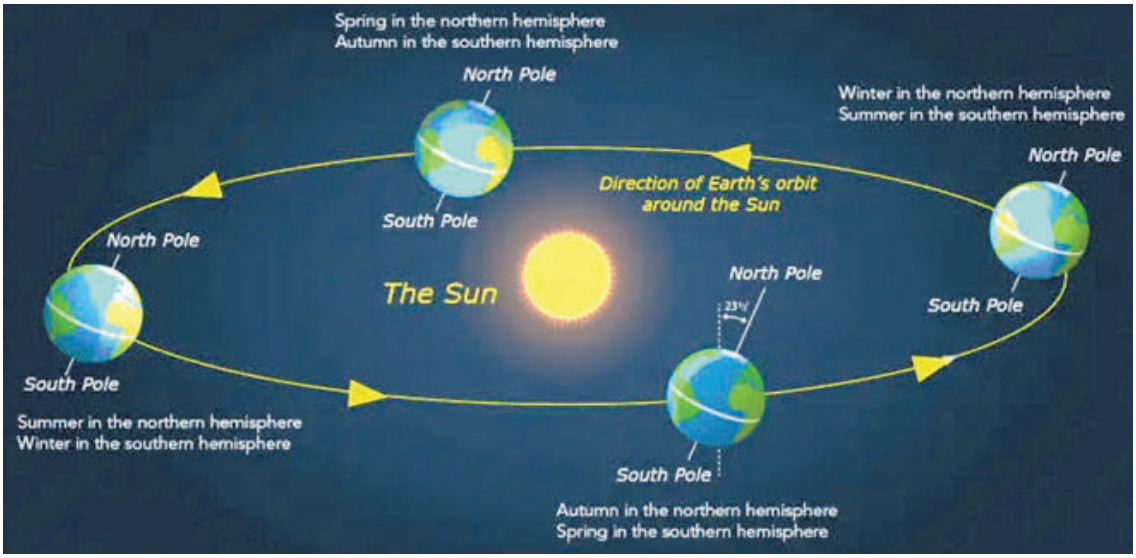



*Fig. 2.21 : Major Seasons on the Earth*

## Climate and Weather Patterns

- The **combination of the earth's revolution and rotation** influences the climate and weather patterns.
- The **rotation causes changes in temperature, pressure and wind patterns** that create different weather conditions in different regions.
- The **seasonal changes created by revolution affect temperature variations** and weather patterns on the earth.

## Dawn, dusk and twilight

Dawn, dusk and twilight are different stages of natural light cycle that occure before sunrise and after sunset.

- **Dawn**
  - It is the time of the day **just before sunrise when the sky begins to lighten up** with soft orange and pink hues.
  - The **sun is still below the horizon** (the apparent line where the earth and the sky seem to meet each other) at this time.
- **Dusk**
  - It is the time of the day **just after sunset when the sky begins to darken.**
  - Sun is below the horizon at this time.

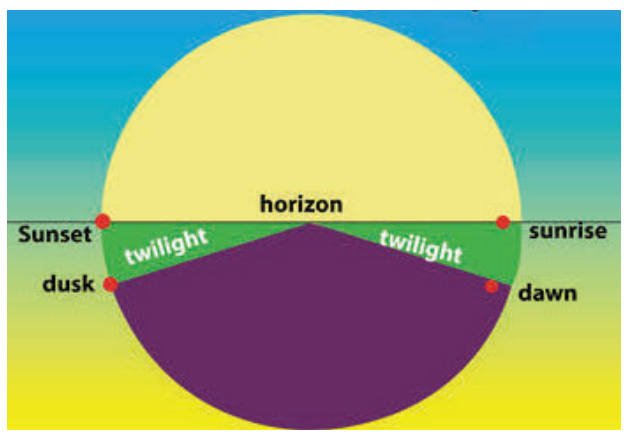



*Fig. 2.22 : Dawn, Dusk and Twilight*

- **Twilight**
  - Twilight is the **time period between dawn and sunrise, or between sunset and dusk.**
  - It is the **illumination of the atmosphere** when the **Sun itself is below the horizon.**
  - It is produced by the **scattering of sunlight in the atmosphere.**
  - The duration of twilight **increases progressively from lower to higher latitudes.**
  - At the **equator**, dawn and twilight are limited to **30-35 minutes** each, these durations increase to **2 hours at 40$^0$ latitudes** and **upward from 2.5 hours beyond 60$^0$ latitudes,** with little true night in summer.
  - The **poles** experience about **7 weeks of a dawn and about 7 weeks of dusk**, leaving only about 2.5 months of near darkness during the 6 months when sun is completely below the horizon.

| Name of the phenomenon | Dawn | Sunrise | Sunset | Dusk | Twilight |
|---|---|---|---|---|---|
| **Observable time** | Morning | Morning | Evening | Evening | Both in the morning and in the evening |
| **Description** | Beginning of twilight in the morning | Follows dawn | Precedes dusk | End of twilight – tending to darkness in the evening | Period between dawn & sunrise, and sunset & dusk |

***Table 2.5 :*** *Dawn, Dusk and Twilight*

## SEASONALITY

Seasonality refers to the **seasonal variations in the sun's position above the horizon and the changing day lengths during the year.** Seasons are periods of the year characterized by **distinct weather patterns** and changes in the length of day and night.

### *Major Seasons*

- The prevalent seasons on the earth are spring, summer, autumn and winter.
- However, such distinctive seasonal changes are **observable only in the temperate region. In the tropics, they are almost indistinguishable** due to a more or less overhead position of the sun at noon.

| Season | Spring | Summer | Autumn | Winter |
|---|---|---|---|---|
| **Period of Occurrence** | March-May | June-August | September-November | December-February |
| **Position in the Year** | The season between winter and summer | The season between spring and autumn | Between summer and winter | Between autumn and spring |
| **Length of Day** | Days become longer | Longest days of the year | Shorter days | Shortest days of the year |
| **Temperature** | Starts to rise | Highest | Starts to decrease | Lowest |
| **Other Distinctive Characteristics** | Plants begin to bloom | Many areas experience thunderstorms and heavy rainfall | Trees begin to shed their leaves | Many areas experience snowfall and ice |

***Table 2.6 :*** *Major Seasons on the Earth (with reference to Northern hemisphere)*

## Reasons for Seasons

The major reasons for the occurrence of various seasons on earth include spherical shape of the earth, revolution and rotation of the earth, inclination of earth's axis and axial parallelism.

- **Spherical Shape of the earth:** The **curved surface of the earth** provides a continually varied angle to the incoming sunrays. This **latitudinal variation in the angle made by solar rays** results in an **uneven global distribution of solar radiation.**
- **Rotation:** Rotation produces **diurnal pattern of day and night** on the globe.
- **Revolution:** The revolution of the earth around the sun **distributes seasonal variations amongst different latitudes** all over the globe, i.e., if it was not for the revolution, different latitudes on the earth would have experienced fixed seasons (like, permanent summer in the northern hemisphere and permanent winter in the southern hemisphere, or vice versa).
- **Axial tilt:** The **revolution of the earth on a tilted axis** is the **primary reason for the variations in the length of day and night across the seasons.** Without the axial tilt, all parts of the globe would have had equal days and nights throughout the year.

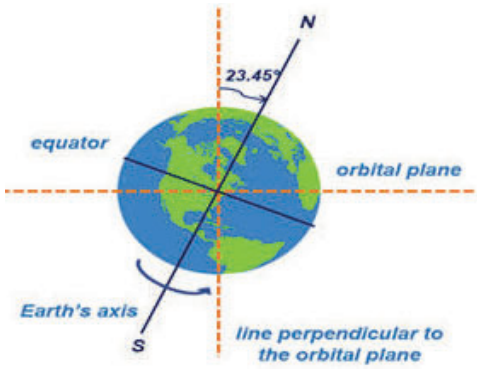



*Fig. 2.23 : Axial Tilt of the Earth*

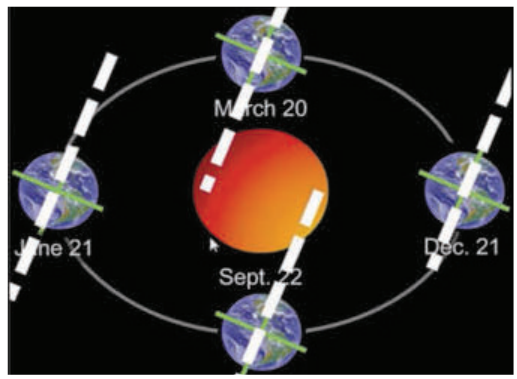



*Fig. 2.24 : Axial Parallelism of the Earth*

- **Axial Parallelism:** The axis of the earth **maintains the same alignment relative to the ecliptic plane, throughout the annual journey** around the sun, i.e., the axis is **parallel to itself** at any position during the course of revolution.

## Notable seasonal positions of the earth

The key seasonal anniversary positions of the earth are the vernal equinox, the summer solstice, the autumnal equinox and the winter solstice.

**Equinoxes**

- Equinoxes are the **only time when both the northern and the southern hemispheres experience roughly equal lengths of day and night.**

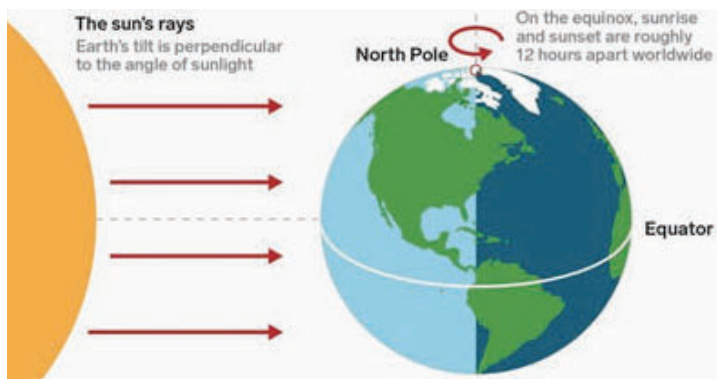



*Fig. 2.25 : The Earth During Equinoxes*

- They occur **twice each year, 6 months apart,** and are termed as vernal equinox and autumnal equinox.
- The **circle of illumination always bisects the equator**, and therefore, the equator always experiences **equal length of day and night. All other parallels** experience **uneven day lengths** throughout the year **except for two days (the two equinoxes).**

### Summer solstice (in northern hemisphere)

- It marks **the day of longest daylight in the northern hemisphere and shortest daylight in the southern hemisphere.**
- Summer solstice occur when the **tilt of the earth's north pole towards the sun is maximum.**
- **Midnight Sun:** The **region north to the Arctic Circle receives 24 hours of daylight** on the day of summer solstice. This is because the **circle of illumination now includes the north pole region.**
- **The region south to Antarctic Circle is in 24 hours of darkness.** This is because the **circle of illumination now excludes the south pole region.**

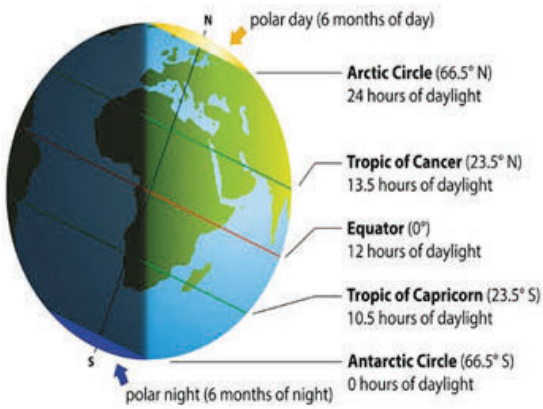



*Fig. 2.26* : *Summer Solstice in the Northern Hemisphere*

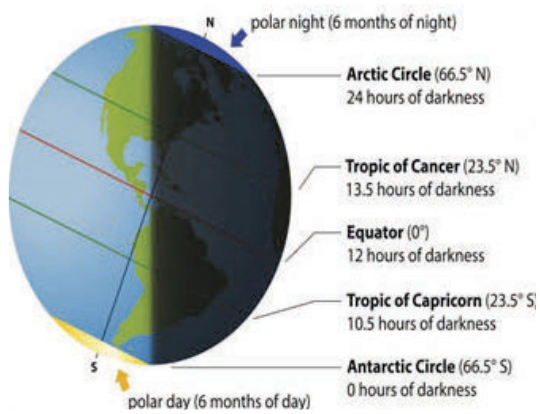



*Fig. 2.27* : *Winter Solstice in the Northern Hemisphere*

### Winter solstice (in northern hemisphere)

- It marks **the day of shortest daylight in the northern hemisphere and longest daylight in the southern hemisphere.**
- Winter solstice occur when the **tilt of the earth's south pole towards the sun is maximum.**
- The **region south to the Antarctic Circle receives 24 hours of daylight** on this day. This is because the **circle of illumination now includes the south pole region.**
- **The region north to Arctic Circle is in 24 hours of darkness.** This is because the **circle of illumination now excludes the north pole region.**

| Name of the Event | | Equinox | | Summer Solstice | Winter Solstice |
|---|---|---|---|---|---|
| | | Vernal Equinox | Autumnal Equinox | | |
| Date of Incidence | In Northern Hemisphere | March 20-21 | September 22-23 | June 20-21 | December 21-22 |
| | In Southern Hemisphere | September 22-23 | March 20-21 | December 21-22 | June 20-21 |
| Subsolar Point Passes Through | | Equator | | Tropic of Cancer | Tropic of Capricorn |
| Sun's Declination | | $0^0$ | | $23.5^0$ N | $23.5^0$ S |
| Circle of Illumination Passes Through | | Both the poles | | Arctic Circle and Antarctic Circle | Arctic Circle and Antarctic Circle |
| Length of Day and Night | In Tropical and Temperate Regions | Equal | | Longest day | Longest night |
| | In Arctic and Antarctic Regions (regions north to $66.5^0$ N and south to $66.5^0$ S) | Equal | | Midnight sun in Arctic region, and sun below the horizon for 24 hours in Antarctic region | Midnight sun in Antarctic region, and sun below the horizon for 24 hours in Arctic region |
| Sun's position at the North Pole | | Sun peaks above the horizon for the first time in 6 months | Sun starts setting for the first time in 6 months | Midnight sun since the last equinox | Below the horizon since the last equinox |
| Sun's position at the South Pole | | Sun starts setting for the first time in 6 months | Sun peaks above the horizon for the first time in 6 months | Below the horizon since the last equinox | Midnight sun since the last equinox |

***Table 2.7*** **:** *The Equinoxes and the Solstices*

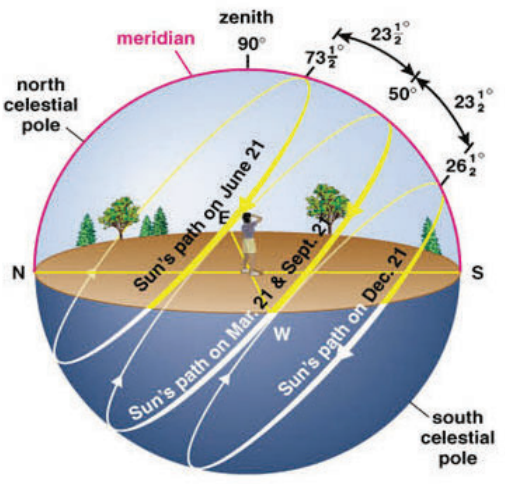



***Fig. 2.28*** **:** *Sun's Path During Solstices and Equinoxes*

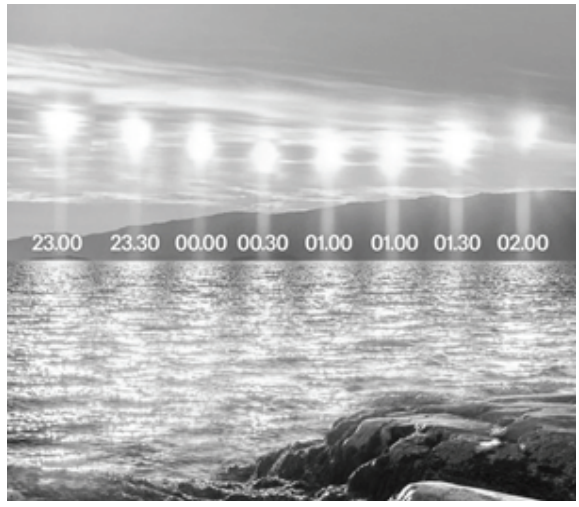



***Fig. 2.29*** **:** *Midnight Sun/Polar Day*

## DAYLIGHT SAVING TIME (DST)

- DST **takes advantage of the extra daylight hours in summers.**
- **Clocks are put forward by 1 hour,** thus borrowing daylight from mornings and giving it to evenings **as a means of conserving energy resources.**
- In the Northern hemisphere, many countries like the UK begin daylight saving time by 10th of March and resume standard time by 10th of October (the dates differ for different regions).
- **In the tropical belt**, the lengths of the **day and night change very little seasonally and there is not much twilight.** The DST thus would offer little or **no savings for tropical region.**

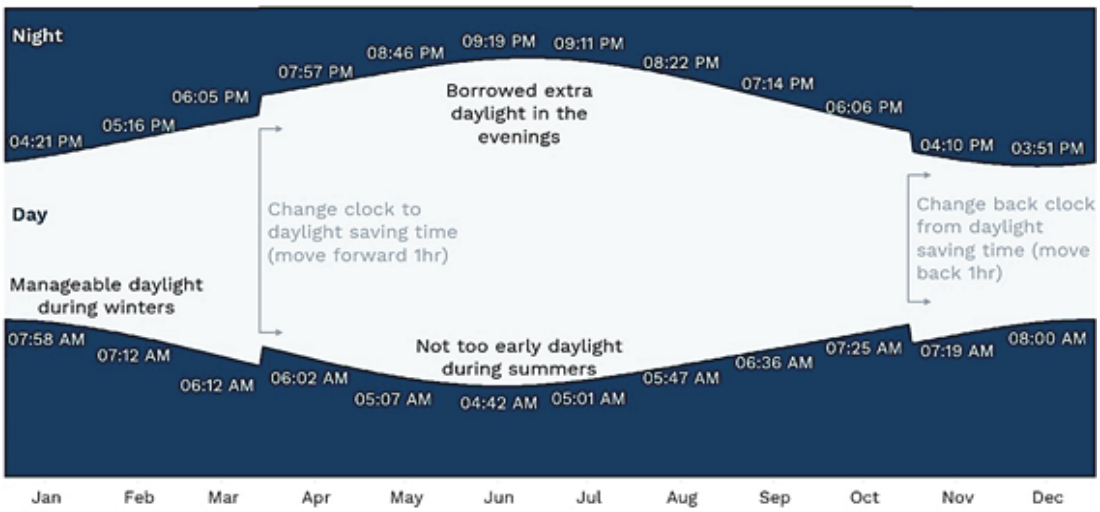



***Fig. 2.30** : Daylight Saving Time (DST)*

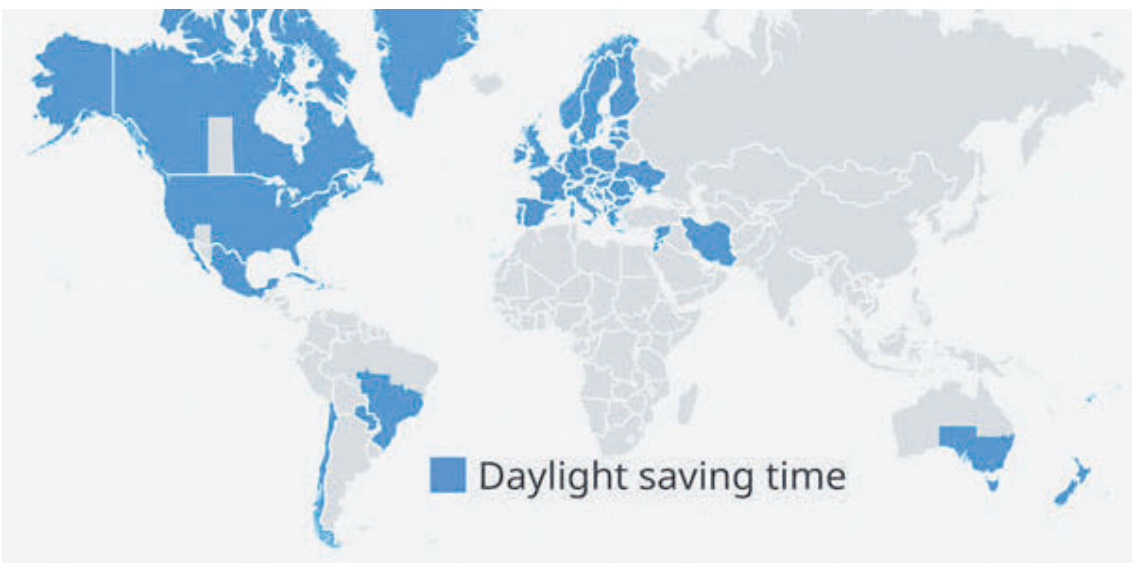



***Fig. 2.31** : Countries Where Daylight Saving Time is Practiced*

## JET LAG

- It is the **effect of sudden switch of time zones in air travel**, resulting in **tiredness** and gastrointestinal disorders.
- Jet lag occurs **due to the alteration of the circadian rhythm** (the metabolic rhythm found in most organisms, which regulates our wake-sleep pattern, and generally coincides with 24 hours of a day).

## PREVIOUS YEAR QUESTION (PYQs)

**1.** On June 21 every year, which of the following latitude(s) experience(s) a sunlight of more than 12 hours? **(2024)**

1. Equator
2. Tropic of Cancer
3. Tropic of Capricorn
4. Arctic Circle

Select the correct answer using the code given below:

(a) 1 only (b) 2 only (c) 3 and 4 (d) 2 and 4

**2.** On 21st June the sun **(2019)**

(a) Does not set below the horizon at the Arctic circle

(b) Does not set below the horizon at the Antarctic circle

(c) Shines vertically overhead at noon on the Equator

(d) Shines vertically overhead at the tropic of Capricorn

## ANSWER KEYS

**1.** (d) **1.** (a)

*Scan QR code For Solved Mains PYQs*

4

CHAPTER

# Inflation

Inflation refers to the **general rise in price levels** (not just the prices of individual items) or an **increase in the money supply,** either of which can cause a **decline in the purchasing power of a currency.** From a consumer's perspective, inflation is seen vis-à-vis prices, i.e., an increase in the **cost of consumer goods and services** across economic sectors.

Inflation is measured as the **rate of change** (increase/decrease) **of the prices** of goods & services over a given period, **expressed in percentage (%).** In general, inflation rate is the pace at which the overall price level is increasing and is given by the following formula.

$$\textit{Inflation Rate}\ (\%) = \frac{\textit{Price (Current Year)} - \textit{Price (Previous Year)}}{\textit{Price (Previous Year)}} \times 100$$

## TYPES OF INFLATION

Inflation can be categorized into different types based on various criteria, such as the underlying factors that cause inflation, or the speed/severity of the price increases.

### CLASSIFICATION BASED ON THE CAUSES OF INFLATION

There are three main types of inflation based on the causes, viz., demand-pull inflation, cost-push inflation, and built-in inflation.

#### *Demand-pull inflation*

Demand-pull inflation refers to a situation where the **aggregate demand exceeds the aggregate supply** of goods & services, causing their prices to increase. In other words, there are **not enough goods or services being produced to keep up with demand** (too much money chasing too few goods). The excess demand puts upward pressure on prices, thus pulling the inflation higher.

- An increase in the aggregate demand can be **because of an increase in spending** by consumers/businesses/government, or an **increase in net exports** (foreign demand for a country's goods & services).

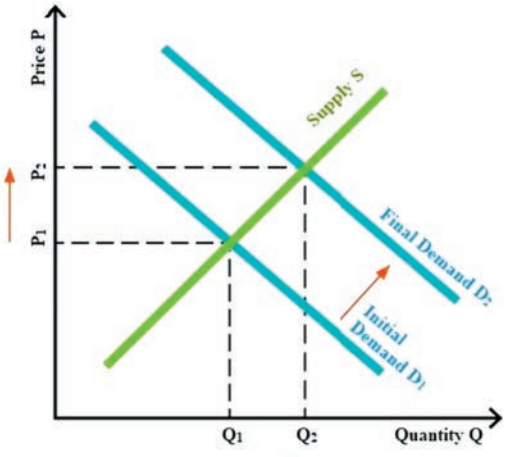



*Fig 4.1 : Demand-Pull Inflation*

- Increased demand for goods & services gives firms the **opportunity to raise prices.**
- Additionally, in order to meet the higher demand, firms will attempt **to increase production,** which involves **hiring more workers** and consequently leads to an **increased demand for labour.** Consequently, firms might **have to offer higher wages.**
- More jobs and higher wages **increase household incomes** and lead to a rise in **consumer spending, further increasing aggregate demand** and the scope for firms to increase the prices of goods & services. This creates a feedback loop.

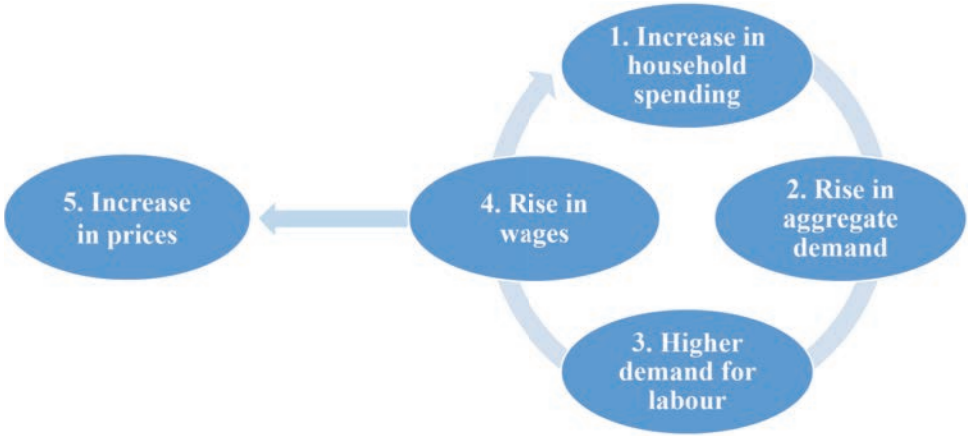



***Fig 4.2 :*** *Schematic Explanation of Demand-Pull*

- **When aggregate demand falls,** the opposite happens. Demand for labour decreases, causing firms **either to stop hiring or dismissing the existing staff.** The firms can now offer lower wages, thereby **reducing household income and consumer spending,** further lowering aggregate demand. This ultimately diminishes the prices of goods & services.

## *Cost-push inflation*

Cost-push inflation occurs when the **aggregate supply in the economy falls without any change in the aggregate demand** for goods & services, forcing businesses to raise their prices. A decrease in supply is often **caused by an increase in the cost of producing** goods & services, thus pushing inflation higher.

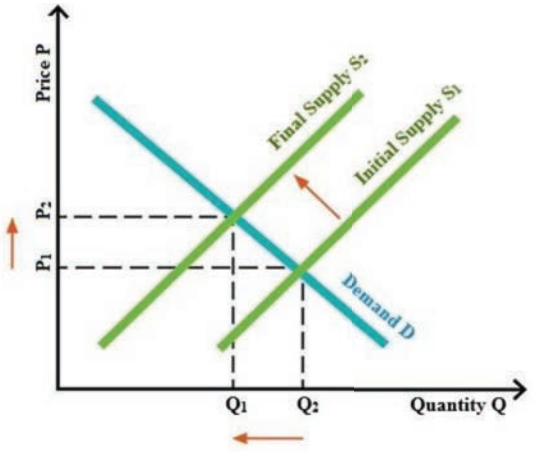



***Fig 4.3 :*** *Cost-Push Inflation*

- An **increase in the price of inputs or raw materials** can push up production costs, causing firms **to produce a lower level of output followed by raising the prices** of their output. This can have follow-on effects by pushing up the prices of other goods & services.
  - **Example**: An increase in **petrol price** will also make the **transport of goods more expensive,** resulting in increased prices for items like groceries.

- Cost-push inflation can **also arise due to supply disruptions** in specific industries.
  - **Example: Unusual weather or natural disasters** that damage agriculture can push the prices of not just the raw agricultural produces, but also that of processed food and restaurant meals, resulting in temporary periods of higher inflation.

### *Built-in inflation / Wage-price inflation / Self-perpetuating inflation*

This type of inflation occurs when **workers demand higher wages to keep up with the increase in the costs of living.** Following wage hikes, firms increase the prices of goods & services in order to maintain profit margins.

- It leads to a **self-reinforcing loop of wages and price-increases,** where wages and prices continually increase, even in the absence of external factors driving inflation.
- It is a type of inflation that **results from past events** and persists in the present. In other words, the built-in inflation **originates from demand-pull or cost-push inflation** in the past.
- Built-in inflation **results from the expectations of inflation** becoming embedded in the behavior of workers and businesses.

## OTHER CAUSES OF INFLATION

- **Increased money supply:** More money in the hands of consumers **stimulates spending,** i.e., there is now more money chasing fewer goods, **increasing aggregate demand,** thus causing the prices to go up. **Any factor that can cause an increase** in the money supply (Refer Chapter 5) can thus contribute to inflation.
- **Inflation expectations:** Inflation expectations represent the **beliefs held by households and businesses** regarding **future price increases.**
  - **If businesses anticipate higher future inflation,** they may accelerate price hikes for their goods & services.
  - **When workers** expect future inflation to rise, they might **demand higher wages** to compensate against a potential fall in their purchasing power.
- **Imported inflation:** It refers to the increase in domestic prices of goods & services as a **result of rising prices for imported products or raw materials,** such as crude oil. Fluctuations in **international trade conditions, exchange rates, or global supply disruptions** can influence the prices of imported goods & services. Imported inflation is particularly pronounced if the country heavily relies on imports.
- **Following monetary policies: Accommodative** monetary policy (Refer Chapter 5), **devaluation** of currency (Refer Chapter 20), etc. by the **central bank** of a country can drive inflation up.
- **Following fiscal policies:** Expansionary policies of **governments,** such as increased government **spending,** or **higher borrowing (or debt)** to finance budget deficits, can contribute to inflationary pressures. Additionally, increases in **indirect taxes** or the **removal of subsidies** can directly raise prices of goods & services.

- **External Shocks:** Unforeseen events, such as **natural disasters, wars, political instability,** or global economic disruptions, can **disrupt production, supply chains,** or cause fluctuations in commodity prices, all of which can contribute to inflationary pressures.
- **All other factors that increase the aggregate demand:** Increase in money supply, cheap monetary policy, increase in public expenditure, decrease in tax thereby increase in disposable income, repayment of public debt by the government to the people, etc. leave people with more money, thus increasing demand, eventually increasing inflation rate.
- **All other factors that decrease the aggregate supply:** Shortage of factors of production, industrial disputes, natural calamities, artificial scarcities like hoarding, increase in exports, etc. reduce the supply of goods & services in the market, thus pushing the costs up.

## CLASSIFICATION BASED ON THE SPEED/RATE OF INFLATION

Based on the rate and magnitude of price increases, inflation is classified mainly into creeping inflation, walking inflation, running inflation, galloping inflation and hyperinflation.

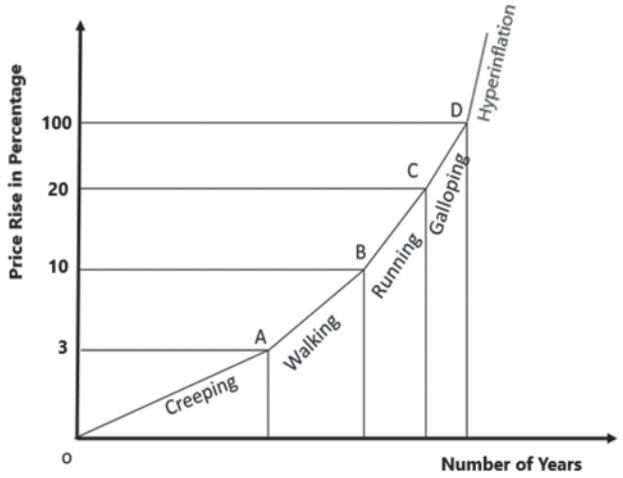



*Fig 4.4 : Inflation Classification Based on Rates*

| | Creeping Inflation | Walking Inflation | Running Inflation | Galloping/ Jumping Inflation | Hyperinflation |
|---|---|---|---|---|---|
| **Nature** | A **slow and steady** increase in the general price level **over a long period of time** | **Prices rise moderately,** and annual inflation rate is a **single digit** | **Double digit** annual inflation, indicating a faster rise in prices | Develops at a rapid pace, possibly for a short period | **Triple digit** range, accelerating, and **out-of-control,** within a short period |

| | | | | | |
|---|---|---|---|---|---|
| **Threshold** | **Mild** inflation rates –**less than 3% annually** | **Moderate** inflation rate **– 3% to less than 10%** annually or an equivalent lower monthly rate. | **10% to 20%** annually | **20% to 50%** - sometimes there are other limits (20–100%) | Inflation rate **exceeding 100%,** sometimes reaching even 1000% |
| **Effect** | **Manageable,** and **beneficial** for economic growth, as it can **encourage spending and investment,** while allowing for gradual adjustments in wages and prices. | Erodes purchasing power over time. Consumers **start stocking goods** fearing future rise in prices, causing excess demand and further rise in prices. Inflation of this rate is **a warning signal for the government** to control it before it turns into running inflation. | Can impose significant costs on the economy and could easily start to creep higher. This type of inflation has tremendous **adverse. effects on the poor and middle class.** Its control requires **strong monetary and fiscal measures.** | Leads to a **significant decrease in the purchasing power** of the currency, causing economic **instability and uncertainty,** and will be challenging to bring under control. Mostly affects the middle and low-income classes. It can **trigger an economic depression.** | **Erodes the value of a currency rapidly,** leading to a loss of confidence in the monetary system. **Prices can double or even triple within a day or less.**<br>• **Example:** Venezuela had an inflation rate of **10,00,000%** in 2019. |

***Table 4.1 :*** *Inflation Classification Based on Rates*

## GROWTH-INFLATION DYNAMICS

According to economist Coulbourn, inflation can be defined as 'too much money chasing too few goods. In other words, the **more goods that are produced,** the **lower the prices** of goods. This correlation also holds for the **rate of change of production** (economic growth rate) and the **rate of change of prices** (inflation rate), i.e., higher economic **growth often contributes to higher inflation,** while reduced growth often results in lower inflation.

## ECONOMIC CYCLE / BUSINESS CYCLE

An economic/business cycle comprises of alternating phases/intervals of expansion and contraction in aggregate economic activity of a country. It is a cycle of fluctuations in the GDP around its long-term natural growth rate.

## *The phases of business cycle*

A business cycle has **four phases,** namely, expansion, peak, contraction and trough.

- **Expansion/Growth/Prosperity:** The upswing of the business cycle **towards a peak** is called an economic expansion.
  - This phase is associated with **increase in economic activity, increase in production of goods & services, decrease in unemployment, increase in wages, and increase in consumer spending.**
  - It is a period of positive economic growth and **typically follows a recession** or trough.
  - **Boom:** A boom is an **extreme phase of expansion** characterized by rapid economic growth, businesses operating at full capacity or above capacity, high investment, very high levels of income and production, rapid growth in prices, and very low unemployment rate.
  - Economic growth is a **virtuous cycle,** with rising production fuelling employment, incomes and consumption, which in turn cause even higher production. This domino effect disperses the advantages across the economy, resulting in a **sustained economic expansion.**
- **Peak:** The peak marks the **highest point** in a business cycle. It is the moment when the economy reaches its **maximum output and employment** levels. After a peak, economic growth **starts to slow down.**
- **Contraction/Recession:** The downswing of the business cycle **towards a trough** is called an economic contraction.
  - This phase is characterised by **decrease in economic activity, decrease in the production of goods and services, increase in unemployment, decrease in wages, and decrease in consumer spending.**

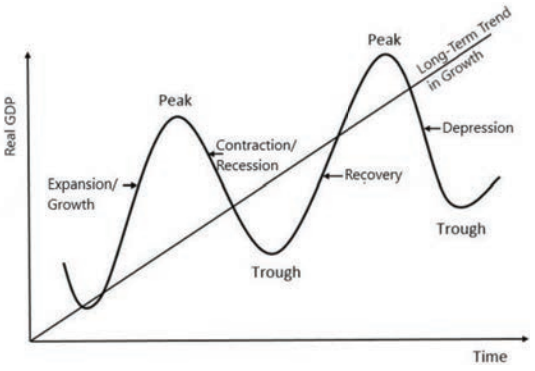



***Fig 4.5 :*** *Phases of a Business Cycle*

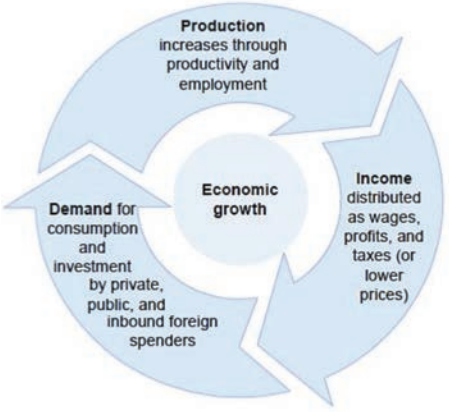



***Fig 4.6 :*** *Virtuous Cycle of Growth*


***Fig 4.7 :*** *Vicious Cycle of Recessio*

- It is a period of economic decline, which **typically follows an expansion** or peak.
- **Depression:** A depression is a **very severe recession** characterized by extremely high unemployment rates, significant reductions in production leading to large contraction in the economy, and widespread financial distress.
- A recession is a **vicious cycle, with cascading declines** in production, employment, income and consumption, that in turn yields further decline in production. This domino effect spreads recessionary weakness across sectors, steering the persistence of the recession in the economy.

- **Trough:** The trough is the **lowest point** in the business cycle, indicating the **end of a recession or depression.** It is the phase where economic activity **starts to stabilize and gradually turns upward.**
- **Recovery:** It is the expansion/growth phase that **follows the trough**. Recovery represents a period of economic healing and growth as the **economy rebounds from a recession.** It begins when the recessionary **vicious cycle reverses and becomes a virtuous cycle.**

## *Inflation and the business cycle*

- **During an expansion:** As **consumers demand more** goods and services, businesses produce more to meet this increased demand, eventually reaching their productive capacity. There will be more demand for their output than the actual supply of output. This **pulls prices up.**
- **During a contraction:** As consumers **demand less,** businesses produce less output. Some businesses even **lower their prices to increase sales.** This leads to disinflation or **deflation.**

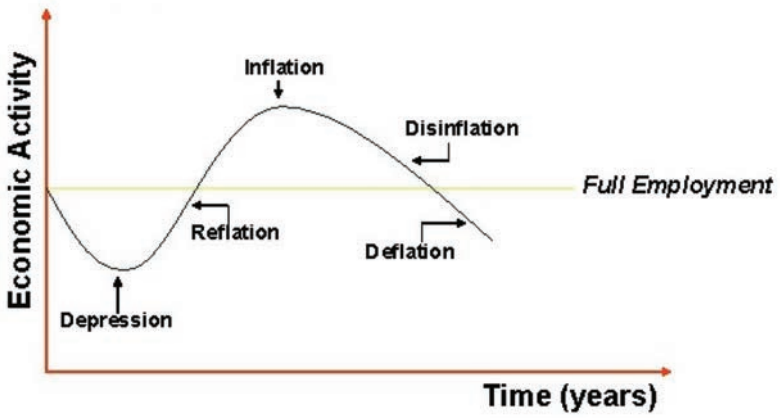



***Fig 4.8 :*** *Inflation and Business Cycle*

## EXPLAINER

- **Deflation:** It is a **decrease in the general price level** of goods & services. Deflation occurs when the **inflation rate falls below 0%.** It **increases the value of currency,** increasing the purchasing power of consumers. It is the **opposite of inflation** and can be considered bad for an economy as it **can lead to a recession.**

**Disinflation:** Disinflation is a **decrease in the rate** of inflation, or a temporary **slowing of the pace of price rise.** Unlike inflation and deflation, which refer to the direction of prices, disinflation refers to **the direction of rate of inflation**.

- **Example:** Inflation rate in the current year being just 6%, compared to a 7% rate in the previous year. The general price level is still on the rise.

- **Reflation:** Reflation is the **opposite of disinflation.** It refers to the **increase in prices after a contraction** in the economy. Prices are raised deliberately so that the **prices return** to a previous rate of inflation. It is done by **stimulating the economy by increasing the money supply** (Refer Chapter 5) **or by reducing taxes** (Refer Chapter 12).
- Stagflation
  - Stagflation is a situation in which **slow economic growth (stagnation)** and a **high unemployment rate** accompany **high inflation.**
  - The **real incomes decrease** as wages struggle to keep pace with rising prices.
  - Stagflation is often triggered by a surge in commodity prices, such as oil.
    - **Example:** The 1970s stagflation followed a threefold increase in oil prices.
  - At this point, economic policy-making becomes difficult, as the **measures intended to correct one of the factors can exacerbate another.**
    - **Example:** The central bank can either raise interest rates to combat inflation, or reduce them to address unemployment, eventually intensifying the other.
  - Stagflation is also known as **inflationary recession.**
- **Skewflation:** It is an economic situation in which **some sectors face high inflation,** while some others face **zero inflation** and a few other face **deflation,** implying a **skewness of inflation among different sectors** of the economy. The term was first used in the aftermath of the 2009-2011 financial crisis.
- **Shrinkflation:** This type of inflation is said to exist when the **price remains the same while firms reduce the size of the product,** effectively increasing the price per unit.

## MEASUREMENT OF INFLATION

The primary purpose of measuring inflation is to assess how the **purchasing power of a country's currency is affected** by price rise, while it also helps to monitor overall price stability in the economy. Inflation is generally measured using specific gauges known as inflation indices.

### TIME PERIOD FOR INFLATION CALCULATION

Year-on-year inflation and month-on-month inflation are two commonly used approaches for tracking changes in the price level over different time periods.

| Inflation Type | Year-on-Year Inflation (YoY) | Month-on-Month Inflation (MoM) |
|---|---|---|
| **Description** | Compares the average price level of goods & services in a month/quarter of the current year to the average price level in the **same month/ quarter of the previous year.** | Compares the average price level of goods & services in the current month to the average price level in the **previous month.** |
| **Time Period** | It shows the percentage change in prices over a **one-year period.** | It shows the percentage change in prices over a **one-month period.** |
| **Use** | For understanding **long-term trends** in inflation, and for having a **broader perspective** on price changes. | For understanding **short-term price dynamics** and capturing more immediate changes in prices. |
| **Example** | If the YoY inflation for January 2023 is 3%, it means that the average price level in January 2023 is 3% higher than the average price level in January 2022. | If the MoM inflation for February 2023 is 0.5%, it means that the average price level in February 2023 is 0.5% higher than the average price level in January 2023. |

***Table 4.2 :*** *Year-on-Year Vs Month-on-Month Inflation*

## INFLATION INDICES

An inflation index or a price index is a tool for assessing the rate of inflation within an economy or a specific sector.

- Inflation indices are used to **track changes in the overall price level of** a particular combination of goods & services, called **a basket of goods & services,** that are commonly used by a **specific group, such as consumers, producers or wholesalers** over time.
- In a basket of goods & services, **some items are given higher weight** compared to others, based on criteria that are unique to the index in consideration. As a result, a change in prices of these items have a **higher influence on inflation** than that of items having lower weight.
- Inflation rate is expressed as a **percentage increase/decrease** relative to a **base year,** which serves as a reference point. To make computations easier, prices in the base year are **assumed to be 100.**
- Some important inflation indices include the **Consumer Price Index (CPI), Wholesale Price Index (WPI), Producer Price Index (PPI).**
- **WPI the CPI** are the primary indices used **in India** for evaluating inflationary trends.
- In addition to the aforesaid indices, the **GDP deflator** (Refer Chapter 2) also serves as an implicit economy-wide inflation estimate.

### *Wholesale Price Index (WPI)*

WPI is the price of a typical **basket of wholesale items.** It measures fluctuations in the **wholesale prices of goods,** providing valuable information about price shifts at the **initial stages of the supply chain.**

- WPI is prepared and published by the **Office of Economic Affairs,** an attached office of

the Department for Promotion of Industry and Internal Trade **(DPIIT), the Ministry of Commerce and Industry.**

- The Reserve Bank of India, **until 2014,** primarily used WPI inflation for the formulation of monetary policy under monetary targeting framework as well as under Multiple Indicator Approach (MIA).
- Following the **Urjit Patel Committee** recommendations, the RBI Act has been amended, **and Flexible Inflation Targeting (FIT)** approach (Refer Chapter 5) has been put in place. Under the FIT, the RBI has been mandated to achieve price stability measured **in terms of CPI inflation.**
- The **weight of an item** in the WPI basket is based on the **net traded value** of the item in the base year (2011-12). The net traded value is the value of output of the item in the base year adjusted for net imports.

| Items | Weight (%) |
|---|---|
| Manufactured Products | 64.2 |
| Primary Articles | 22.6 |
| Fuel and Power | 13.2 |

***Table 4.3 :*** *WPI Basket*

- Broad categories in the WPI basket
  - **Manufactured products:** These are commodities manufactured in industries like textiles, chemicals and stainless steel.
  - **Primary articles:** This category includes **food and non-food articles,** such as fruits, vegetables and minerals.
  - **Fuel and power:** These are **energy-related** products such as coal, petrol, electricity and LPG.
- None of the categories in WPI basket have services as a sub-component, i.e., the WPI **does not take changes in the prices of services** into consideration.

## *Consumer Price Index (CPI)*

The CPI is a measure of **price change at the retail level,** based on a basket of goods & **services** consumed by **households.** It considers inflation at the **final stage of the supply chain.**

The value of YoY CPI is given by the following formula.

$$CPI\ (YoY) = \frac{Value\ of\ the\ Basket\ in\ Current\ Year}{Value\ of\ the\ Basket\ in\ Previous\ Year} \times 100$$

- In India, CPI is compiled by the **National Statistical Office (NSO),** Ministry of Statistics and Programme Implementation (MoSPI) for the **whole of India,** as well as for **each state.** It also calculates **rural, urban and combined (rural + urban) CPI numbers** [i.e., CPI (rural), CPI (urban) and CPI (combined) respectively] separately and **publishes the data every month.**

- **Labour Bureau** also prepares **two CPIs** for specific **socio-economic groups,** namely, the CPI for Industrial Workers (CPI-IW), and CPI for Agricultural Labourers (CPI-AL).
- From 2014 onwards, the Reserve Bank of India relies on the **All India headline CPI (combined)** inflation as as the target rate of inflation under its new **inflation targeting monetary policy framework,** as this index **reflects the prices of essential consumption goods** providing more clarity on the effects of inflation on the overall economy.
- In CPI basket, items on which **consumers spend a larger portion of their money** are given higher weightage. The values are derived from Consumer Expenditure Surveys.

| Group of Items | Weight (%) | | |
|---|---|---|---|
| | Rural | Urban | Combined |
| **Food and Beverages** | 54.18 | 36.29 | 45.86 |
| **Pan, Tobacco and Intoxicants** | 3.26 | 1.36 | 2.38 |
| **Clothing and Footwear** | 7.36 | 5.57 | 6.53 |
| **Housing** | -- | 21.67 | 10.07 |
| **Fuel and Light** | 7.94 | 5.58 | 6.84 |
| **Miscellaneous** | 27.26 | 29.53 | 28.32 |

***Table 4.4 :** CPI Basket*

- The **miscellaneous** category includes household goods & services, health, education, and transport & communication. Thus, the **CPI includes services** unlike the WPI.
- There are **two separate indices for rural and urban inflation,** as rural and urban people lead different lives in India. As **lifestyle affects consumption pattern,** it has a significant role in **determining the weight** of items in the CPI basket.
  - **Food and beverages:** The higher weight given to this category in rural CPI basket can be explained using **Engel's Law.**
  - **Housing:** The weight given to Housing is **zero in rural basket,** as money spent on housing by rural Indians is very low compared to their urban counterparts. This can be attributed to **lower cost of living in rural areas.**

## ENGEL'S LAW

- The law states that **lower-income households spend a larger portion of their budget on food** than wealthier ones.
- As income rises, **spending on food** constitute a **smaller proportion** of the household budget, and spending on other goods & services increases. The amount that a family spends on food doesn't go up at the same rate as their income.While the quality of food and the **absolute amount of**

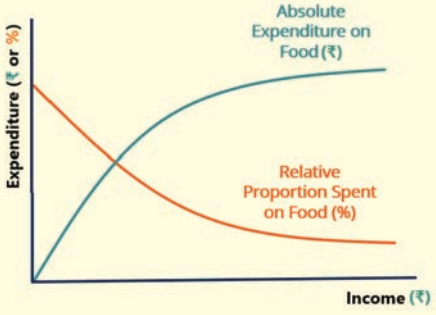



***Fig 4.9 :** Engel's Law*

**money spent on food increases** with income, the overall proportion of the budget devoted to food spending becomes smaller.

- At the lowest income levels, income has to be spent on things that sustain life, i.e., most of it will be spent on food.
- Engel's Law is commonly used to evaluate a country's standard of living.

- **Applications of the CPI**
  - CPI is used to calculate the Dearness Allowance (DA) for government employees.
  - Consumer Price Index (CPI) is used to measure the purchasing power of money. This purchasing power of money is actually the reciprocal of a consumer price index.
  - CPI is also used to determine the 'real wages' using deflation, wherein Real wages = (Nominal wages / CPI in the base year) X CPI in the current year.
  - The Consumer Price Index (CPI) enables the government to know whether any change in monetary policy is required.
- **Limitations of the CPI**
  - Consumer Price Index is inapplicable to every population group.
  - CPI is a **conditional cost-of-living metric,** which does not measure every aspect affecting the living standards.
    - **Example:** Environmental and social factors are beyond the scope of the CPI.
  - CPI tends to overstate the actual inflation rate.
    - **Example:** When the price of a good goes up, people might replace it with a less expensive **substitute.** However, the **CPI considers a fixed basket of goods,** making it appear that people still buy the same quantity of the former.
  - While the CPI considers changes in quantity, it **fails to account for changes in quality.**
    - **Example:** A newer edition of a smartphone costs more because of the additional features that it has compared to the older model. The CPI treats these models as identical, which overstates the true rate of inflation.

## EXPLAINER

- **Headline inflation:** It is the overall rate of change in prices of **all goods and services** in a consumer basket.
- **Core inflation:** It is the inflation rate obtained after the **highly volatile items 'food & beverages' and 'fuel & light' are excluded** from the CPI basket. It is more stable than headline inflation due to the absence of these commodities that can show high volatility **(frequent and unpredictable fluctuations**

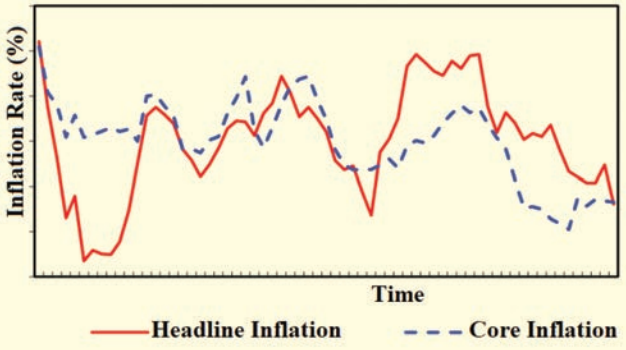



*Fig 4.10 : Headline Inflation Vs Core Inflation*

**in prices)** from month to month. Thus, it gives a better indication of the long-term inflation trend.

- **Super-core inflation:** It is the measure of inflation that excludes **gold and silver price inflation** from core inflation. This measure seeks to exclude sectors that distort the broader inflation figure.
- **Refined core inflation:** It omits the volatile items within the 'miscellaneous' category of the CPI basket, namely, **'petrol for vehicles', 'diesel for vehicles' and 'lubricants & other fuels for vehicles',** in addition to 'food & beverages' and 'fuel & light', while calculating inflation.
- **Trimmed Mean Inflation:** This approach calculates inflation by **trimming away a certain percentage of the highest and lowest price changes** in the basket of goods & services, aiming to provide a more stable measure of underlying inflation.

## *Comparison Between WPI and CPI*

| Aspect | Wholesale Price Index (WPI) | Consumer Price Index (CPI) |
|---|---|---|
| **Description** | Measures fluctuations in the prices of **goods sold in bulk** within the wholesale markets | Evaluates changes in the prices of **goods & services that households use** |
| **Focus** | Reflects **changes in wholesale prices** traded between businesses | Reflects **changes in retail prices** paid by consumers |
| **Composition** | A fixed **basket of goods** that are distributed between manufacturers and wholesalers | Fixed basket of items that include **both goods & services** that households consume |
| **Items Covered** | Fuel, power, manufactured products, etc. | Food, clothing, housing, education, transportation & communication, healthcare, etc. |
| **Weight Distribution** | **Weights** are allotted to different categories according to their **production/ trade value** | Weights are allocated according to household **consumption patterns** |
| **Highest Weight** | Manufactured goods | Food and beverages |
| **Importance** | Relevant for assessing **cost movements in the production process** | Relevant for assessing the impact of inflation on **households and the broader economy** |
| **Application** | Used to covert the nominal GDP/GVA to the real GDP/GVA, to calculate **GDP deflator** | Used for **adjusting wages, pensions,** and social security benefits, and for making **monetary policy** decisions |

*Table 4.5 : WPI vs CPI*

| Inflation Index | | Base Year | Measuring Authority |
|---|---|---|---|
| **Wholesale Price Index (WPI)** | | 2011-12 | Office of Economic Advisor, Ministry of Commerce and Industry |
| **Consumer Price Index (CPI) and Consumer Food Price Index (CFPI) for:** | **Rural** | 2011-12 | National Statistical Office (NSO), Ministry of Statistics and Programme Implementation (MoSPI) |
| | **Urban** | | |
| | **Combined** | | |

| | | | |
|---|---|---|---|
| **Consumer Price Index (CPI) for:** | **Industrial Workers** | 2016 | Labour Bureau, Ministry of Labour |
| | **Agricultural Workers** | 1986-87 | |

***Table 4.6 :*** *Inflation Indices - Summary*

## *Producer Price Index (PPI)*

PPI is an inflation index that monitors the overall change in prices of **goods & services** from the **perspective of the producer.**

- The government of India had constituted a committee in 2014 under the chairmanship of **Professor B.N Goldar** to suggest the methodology and framework for the introduction of PPI in India. Though the PPI is **currently not being used in India, Niti Aayog has created a roadmap** to introduce it soon.
- Unlike the CPI, which focuses on prices paid by consumers, the **PPI reflects fluctuations in prices received by producers** for their goods & services.
- The PPI measures the price changes that businesses face either as the goods & services leave the place of production **(Output PPI),** or as they enter the production process **(Input PPI).**
- **Weight** of items in PPI basket is determined based on **Supply Use Table** (a table that describes the supply of products which are either produced domestically or imported).
- The PPI addresses the inflation before it is passed on to the consumers. It **does not include taxes, trade margins, or transportation-related expenses** incurred by consumers. Instead, it **reflects fluctuations in production costs.**
- The PPI captures fluctuations in the **prices of inputs / raw materials, semi-finished products, and finished goods & services,** i.e., the products **sold to the intermediate and the final consumer.**
- When input prices increase, the costs of semi-finished and finished goods also rise. **Producers bear only a portion of this cost,** passing the rest to final consumers, ultimately affecting consumer prices. Thus, PPI is a good indicator of overall inflationary pressures in the economy.
- The PPI is composed of different **sub-indices that represent different sectors,** such as manufacturing, mining, agriculture and services. Each sub-index reflects the price changes experienced by producers within that sector.
- **Applications of the PPI:** In addition to being an indicator of inflation at the producer level, the PPI has other uses, which include the following.
  - PPI helps to **compare** the price difference between **inputs and outputs.**
  - It provides a measure of inflation for **specific industries/commodities.**
  - PPI **assists policymakers** in identifying price fluctuations at the producer level and implementing necessary adjustments.
  - It aids in **adjusting nominal GDP for inflation,** to reflect the genuine growth of an economy.
  - The PPI can **track economic activity.** When the PPI is on the rise, it suggests that businesses are **producing more goods & services,** and when the PPI is falling, businesses are producing fewer goods & services.

- The PPI can be used by businesses to set prices for their products & services.
- Governments can use the PPI to make economic policy decisions.
- In commercial contracts, the PPI (or WPI) is used for indexing. It either maintains a stable relative price between two or more goods/services, or a stable real price of a good/service relative to the purchasing power of a currency unit.

- **WPI Vs PPI**
  - **WPI** may include some taxes and distribution costs incurred up to the wholesale transaction stages. On the other hand, **PPI excludes indirect taxes.**
  - The aggregate basket of **WPI, without appropriate segregation** of intermediate and final products, involves **multiple counting** which can lead to bias in measurement of inflation, an inherent drawback of it. **PPI removes this multiple counting bias.**
  - WPI does not cover services and whereas **PPI includes services.**
  - **WPI** measures the price of goods sold by the **wholesaler to the retailer,** whereas **PPI** measures the price of goods sold by the **producer to the wholesaler.**

## INFLATION IMPACTS AND SOLUTIONS

While high and unpredictable inflation is harmful, and too low or negative inflation (deflation) is a far more serious issue than inflation, a level of inflation that is **neither too high nor too low is** considered **desirable, or even necessary for economic growth.**

### POSITIVE IMPACTS OF INFLATION

- **Stimulates economic activity:** Mild inflation (up to 4% in developing economies) can **stimulate economic activity** through the following.
  - **By incentivizing consumer spending:** Inflation makes **savings costlier** than spending, as inflation **erodes the purchasing power of savings** over time. The optimal inflation rate encourages people to **spend now rather than to save for later.**
  - **By encouraging businesses to invest:** Firms **expect prices to rise in the future and** invest more.
- **Promotes economic growth:** Controlled inflation is associated with **increased demand for goods & services and promotes production** and hence economic growth.
- **Favours debtors/ borrowers/ bond issuers:** Inflation makes it easier for borrowers to repay the debt because the real **value of their debt decreases** over time, and they can **repay the loan in inflated currency.** This effectively **reduces the real burden** of the debt.
- **Increase in nominal wages:** Nominal wage increases associated with inflation can **benefit workers in the short term.**
- **Helps property owners:** Inflation can be advantageous for real estate investors, as it can lead to **higher rental income** and an **increase in the value of existing real estate assets.** The rise in property value is partly driven by the increased costs of construction materials. In general terms, inflation offers **higher resale value of assets.**
- **Allows for more flexible monetary policy:** A mild inflation can serve as a **buffer against deflationary pressures** and allow central banks to use **inflation targeting as a tool to control economic conditions,** such as stimulating economic growth or managing unemployment.

## NEGATIVE IMPACTS OF INFLATION

- **Reduced purchasing power:** As prices rise, the **value of money diminishes,** which can lead to reduced purchasing power and a **decrease in the standard of living** for consumers.
- **Disproportionate impact on low-middle class:** Consumers with lower incomes typically spend a **greater proportion of their income on basic necessities** compared to those with higher income. As a result, they possess a **smaller buffer against the erosion of purchasing power** associated with inflation.
- **High inflation feeds itself:** This is part of a **vicious cycle** of inflation.
- **Discourages businesses from investing:** Higher levels of inflation lead to an increase in the price of raw materials, causing firms to invest less.
- **Distorts economic indicators:** High inflation can introduce distortions in the value of economic indicators, such as Gross Domestic Product **(GDP), Interest Rates,** and **Exchange Rates.** This makes it important to account for inflation effects (by using real values instead of nominal values) when interpreting economic data.
    - **Example:** Inflation can make **GDP appear higher than it actually** is because nominal GDP includes the current market prices of goods and services, which can be influenced by inflation. However, this doesn't necessarily indicate a corresponding increase in the actual quantity of goods and services produced. Thus, inflation can **create the illusion of economic growth** when, in reality, it may r**esult from price increases rather than increased production,** making it challenging to accurately gauge changes in economic output over time. This makes it necessary to consider real GDP, which adjusts for inflation, to obtain a more accurate representation of actual economic growth.
- **Increases uncertainty and planning difficulties:** High or unpredictable inflation can make financial planning and long-term decision-making challenging for individuals and businesses.
- **Erodes savings:** Inflation can **diminish the real value of savings** and fixed-income investments, such as pensions or bonds.
- **Impacts creditors/ lenders/ bondholders:** Lenders, such as **banks or bondholders,** experience a **loss in the purchasing power** of the money they have lent.
- **Distorts price signals:** Rapid price increases can distort market signals, making it **difficult to determine the real supply and demand conditions.**
- **Economic recession and instability:** Hyperinflation can **undermine confidence in a currency,** disrupt economic activity, and lead to economic crises and instability.

## MEASURES TO CONTROL INFLATION

It is important for the inflation in an economy to be managed, in order to maintain a low and steady rate of inflation. Generally, any measure that can effectively **address the underlying cause** of inflation can control extreme price changes. This requires a combination of monetary, fiscal and structural measures.

- **Monetary policy:** Monetary policy comprises a set of **actions taken by a nation's monetary authority** (central bank, or RBI, to be specific) **to control the money supply** with the aim of achieving broader goals such as **price stability, full employment and economic growth.**

- **Measures to reduce money supply and borrowing (Refer Chapter 5):** These are adopted to **bring down aggregate demand** and reduce inflationary pressures.
- **Inflation targeting:** Inflation targeting is a monetary policy where the central bank explicitly commits to **maintaining a specific medium-term inflation rate target** (typically a range, with a rate of X% plus or minus).
  - **Example:** The RBI has set an inflation target of 4% with a tolerance band of plus or minus 2% for India (i.e., from 2% lower tolerance level to 6% upper tolerance level).
- **Anchoring of inflation expectations:** The inflation expectations of households and businesses are said to be **anchored to the central bank's inflation target,** when they anticipate that inflation will eventually return to the target. Here, inflation is more likely to eventually return to the target, as they adjust their behavior accordingly. In the same way, if the inflation expectations become unanchored, a period of higher inflation can persist. So, anchoring is a necessary condition for central banks to maintain price stability.

- **Fiscal policy:** It is a policy in which the **government** utilizes tools such as **taxation, public spending and borrowing** to achieve sustainable growth and reduced inflation.
  - **Supply-side policies:** These policies **address supply-side constraints that contribute to inflation. These constitute enhancing the productivity** of the economy through **investments in infrastructure, education & technology,** thereby **boosting aggregate supply.**
  - **Incentivising production:** This can be done through **tax concessions, subsidies** and other institutional support.
    - **Example:** Schemes like **Minimum Support Price (MSP)** incentivize production and thereby enhance availability of food items.
  - **Ensuring stock availability at reasonable prices:** This is ensured by imposing stock limits for wholesalers and retailers, so that they can maintain stocks only below a permissible quantity.
    - **Example:** Essential Commodities Act, 1952 prevents hoarding by imposing stock limits.
  - **Raising the rate of direct tax / income tax:** Higher income tax can **reduce disposable income,** and hence spending, resulting in lesser demand and inflationary pressures.
  - **Export restrictions and import ease:** Limiting exports while facilitating imports contribute to **enhancing the domestic supply** of vital commodities, which in turn, can assist in mitigating price hikes.
  - **Exchange rate policy:** Governments can adjust exchange rates **to influence import and export prices (Refer Chapter 20),** which can impact domestic inflation.
  - **Structural Reforms:** These can **address underlying factors** contributing to inflation. The reforms may include measures to **enhance competition, improve productivity, liberalize markets, reduce production costs, and remove regulatory barriers** that inhibit economic efficiency. Increasing the competitiveness and efficiency of markets can help **reduce inflationary pressures in the long run.**
  - **Wage and price controls:** In **extreme cases,** governments may **set limits** on the amount by which wages and prices can increase, to directly manage inflation. While such measures

can **have short-term effects,** they may also lead to unintended consequences, and are generally not considered a long-term solution.

However, there is constant clash between promoting **economic growth that can bring down unemployment,** and preserving **price stability that controls inflation.** Striking the right balance between addressing inflation and maintaining sustainable economic growth is a complex task that requires careful policy formulation and implementation.

## PHILLIPS CURVE

- William Phillips, the New Zealand economist, observed an economic **relationship between unemployment rates and wage changes.** He noted a **rapid increase in wages as unemployment decreased** in the economy. From his findings, he developed something known as the Phillips curve, which illustrates an **inverse correlation between inflation and unemployment.**

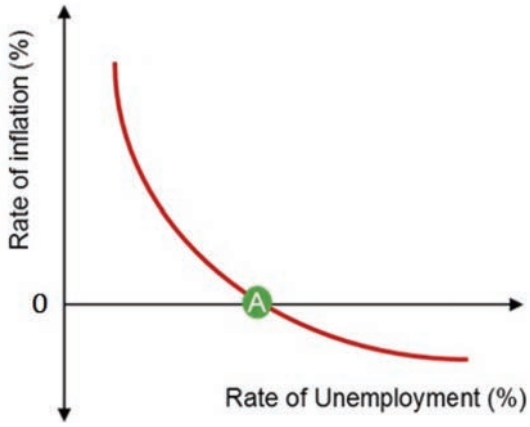



*Fig 4.11 : Phillips Curve*

- In periods of **low unemployment** (i.e., when most of the people are employed), companies **offer higher wages to attract top-quality employees** away from competing firms, or workers request higher wages, leading to **wage inflation.** In addition, firms can **raise the prices of their goods/services** in response to heightened demand, further intensifying inflation.

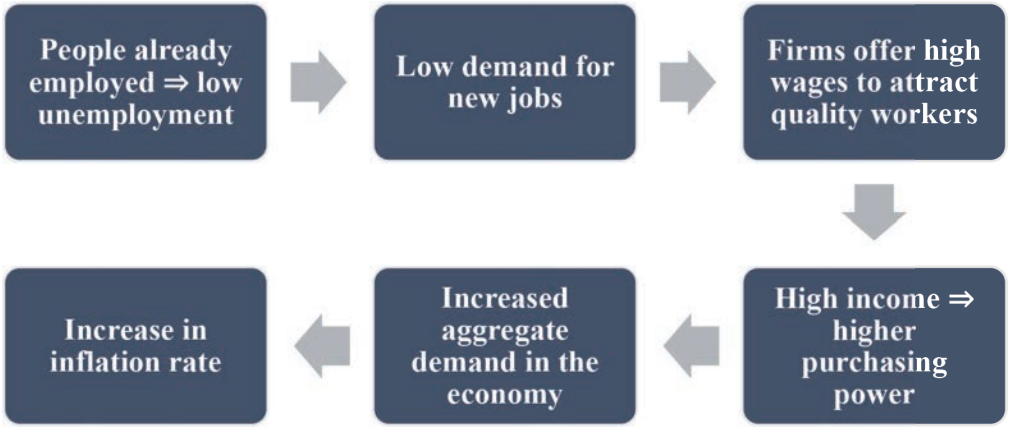



*Fig 4.12 : Schematic Explanation of Inflation-Unemployment Dynamics*

- On the contrary, during times of **higher unemployment,** companies face **less pressure to offer competitive salaries,** resulting in slower wage growth.

- This implies that **policymakers can prioritize** either high inflation or high unemployment over the other, depending on the situation.
  - **Example:** During periods of **high unemployment and low inflation,** policymakers may adopt **policies to boost aggregate demand,** which would alleviate unemployment but **result in higher inflation.**
- Therefore, according to the Phillips curve, sustaining **low unemployment along with low inflation may prove challenging** in the long term.
- Extreme situations like economic **recession or stagflation can cause the breakdown** of the Phillips Curve.
  - **Example: Stagflation in the 1970s** witnessed both **higher unemployment and higher inflation** coexisting in the economy. The **2008 recession,** on the other hand, had a significant **rise in unemployment, accompanied by a deflation.**

## PREVIOUS YEAR QUESTIONS (PYQs)

**1** With reference to the Indian economy, demand-pull inflation can be caused/ increased by which of the following? **(2021)**

1. Expansionary policies
2. Fiscal stimulus
3. Inflation-indexing wages
4. Higher purchasing power
5. Rising interest rates

Select the correct answer using the code given below.

(a) 1, 2 and 4 only
(b) 3, 4 and 5 only
(c) 1, 2, 3 and 5 only
(d) 1, 2, 3, 4 and 5

**2** Which one of the following is likely to be the most inflationary in its effects? **(2021)**

(a) Repayment of public debt
(b) Borrowing from the public to finance a budget deficit
(c) Borrowing from the banks to finance a budget deficit
(d) Creation of new money to finance a budget deficit

**3** Consider the following statements: **(2020)**

1. The weightage of food in Consumer Price Index (CPI) is higher than that in Wholesale Price Index (WPI).
2. The WPI does not capture changes in the prices of services, which CPI does.
3. Reserve Bank of India has now adopted WPI as its key measure of inflation and to decide on changing the key policy rates.

Which of the statements given above is/are correct?

(a) 1 and 2 only
(b) 2 only
(c) 3 only
(d) 1, 2 and 3

**4** Which reference to inflation in India, which of the following statements is correct? **(2015)**

(a) Controlling inflation in India is the responsibility of the Government of India only.
(b) The Reserve Bank of India has no role in controlling inflation.
(c) Decreased money circulation helps in controlling inflation.
(d) Increased money circulation helps in controlling inflation.

**5** Which of the following brings out the 'Consumer Price Index Number for the Industrial Workers'? **(2013)**
(a) The Reserve Bank of India
(b) The Department of Economic Affairs
(c) The Labour Bureau
(d) The Department of Personnel and Training

**6.** Consider the following statements: **(2013)**
1. Inflation benefits the debtors.
2. Inflation benefits the bond-holders.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

**7.** Which one of the following is likely to be the most inflationary in its effect? **(2013)**
(a) Repayment of public debt
(b) Borrowing from the public to finance a budget deficit
(c) Borrowing from banks to finance a budget deficit
(d) Creating new money to finance a budget deficit

**8.** A rise in general level of prices may be caused by **(2013)**
1. an increase in the money supply
2. a decrease in the aggregate level of output
3. an increase in the effective demand

Select the correct answer using the code given below:

(a) 1 only
(b) 1 and 2 only
(c) 2 and 3 only
(d) 1, 2 and 3

## ANSWER KEYS

1. (a) 2. (d) 3. (a) 4. (c)
5. (c) 6. (a) 7. (d)
8. (d)

*Scan QR code For Solved Mains PYQs*

# INDIAN FREEDOM STRUGGLE

## COMPLETE UPSC CHRONOLOGY (1700–1947)

### PHASE 1

COLONIAL CONTROL & EARLY RESISTANCE (1700–1857)

*British established an economic + administrative base*

**1707 — Death of Aurangzeb**

End of Mughal expansion.

**1717 — Magna Carta of the Company**

Farukh Siyar issued a farman granting the EIC extensive trade concessions.

**1757 — Battle of Plassey**

EIC gains political control, marking the start of colonial rule.

**1763 — Sanyasi and Fakir Rebellion**

Armed resistance by Hindu sannyasis and Muslim fakirs against the EIC

**1764 — Battle of Buxar**

Decisive victory of the EIC over the combined force of the Mughal Empire.

**Treaty of Allahabad**

Resulted in Dual Government; EIC got **Diwani rights** (revenue) & Nawab of Bengal got **Nizamat rights** (administrative)

1765

1773

**Regulating Act**

1st British Parliamentary control over EIC & the Governor General of Bengal post created.

**Act of Settlement**

It removed the Supreme Court's jurisdiction over revenue matters.

1781

**Pitt's India Act**

Dual Control of EIC: **Board of Control** managed political and administrative affairs & **Court of Directors** oversaw the commercial operations.

1784

1793

**Permanent Settlement by Lord Cornwallis**

Fixed revenue system in Bengal, granting zamindars hereditary land rights.

**Subsidiary Alliance by Lord Wellesley.**

Indian rulers were required to host British troops and accept British control over their foreign affairs.

1803


**Vellore Mutiny**

Early military revolt; precursor to 1857

1806

**Charter Act**

Ended EIC's monopoly on trade (except tea & trade with China).

1813

1820

**Ryotwari settlement by Thomas Munro**

Ryots were granted ownership of their land and had to pay revenue directly to the British authorities.

**Bangabhasha Prakashika Sabha**

First organised Indian political association in Bengal by associates of Raja Rammohan Roy.

1836

1835

**Macaulay Minute**

Westernisation of the Indian education system

1833

**Charter Act**

Ended EIC's remaining trade monopoly & made the post of Governor-General of Bengal to the **Governor-General of India.**

1829

**Abolition of Sati**

Lord Bentinck banned Sati in Bengal.

**Zamindari Association**

First organised body of landholders raising fiscal grievances.

1838

1843

**Bengal British India Society**

Early reformist association for administrative change.

**Doctrine of Lapse by Dalhousie**

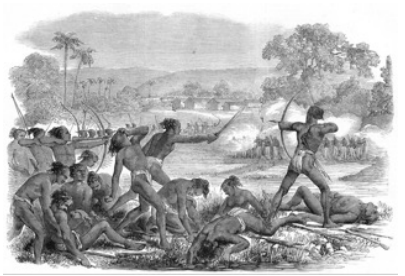
Policy to annex states without a natural heir (Satara -1ST state to annex).

1848

1850

**Lex Loci Act**

Allowed converts to inherit ancestral property



**Santhal Uprising** (Sidhu & Kanhu)

Tribal rebellion against exploitation by landlords and colonial authorities.

1855–56

1856


**Widow Remarriage Act**

Legalised widow remarriage under the influence of Ishwara Chandra Vidya Sagar.

1854

**Woods Despatch**

Laid the foundation of modern education in India.

1851

**British Indian Association**

Demanded Indian participation in governance and constitutional change.

**Revolt of 1857**

The first nationwide revolt marked the end of Company rule

1857

## PHASE 2
### RISE OF NATIONALISM (1858–1905)
*Political awakening, early organisations*

**Civil Service Reform**

Introduced competitive exams in England for the ICS, creating an early professional bureaucracy in India.

1862

**Queen's Proclamation**

Marked the start of direct British Crown rule in India and pledged non-interference in religion

1858

1861

**Indian Councils Act**

Allowed limited legislative and advisory participation for Indians.

**Deoband Movement**

Promoted orthodox Islamic education against Western influence.

1866

**Poona Sarvajanik Sabha**

Catalysed political awareness among the educated middle class in western India.

1870

1866

**East India Association**
(Dadabhai Naoroji)

First Indian based association in London, influencing British public opinion on Indian issues.

**Indian Association**
(S.N. Banerjee)

First attempt to unite Indians for nationalist agitation.

1876

1876

1875


**Queen Victoria declared Empress of India**

Symbolic consolidation of British authority over India.

**India League**
(Sisir Kumar Ghosh)

To promote political education and nationalism among the middle class.

**Strachey Commission**

It laid the foundation for Famine Code and state-led relief measures.

1878

1878

**Hunter Commission**

Reviewed the progress of education in India since Woods Despatch of 1854.

1882

**Vernacular Press Act**

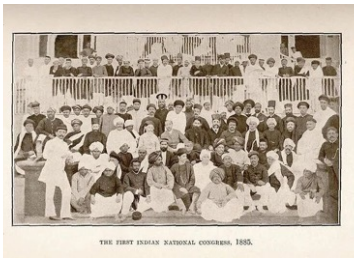
Imposed Press censorship for vernacular publications.

**Ilbert Bill Controversy**

It was a legislative act that empowered Indian judges with the power to try Europeans at the session court.

1885

1883



THE FIRST INDIAN NATIONAL CONGRESS, 1885.

**Formation of Indian National Congress**

Created a unified **political platform** to demand political & administrative reforms.

**Frazer Commission**

Reviewed police administration & Recommended creation of Criminal Investigation Departments (CIDs).

1902 — 1902 — 1904

**Formation of Anushilan Samiti (Pramathanath**

Revolutionary organisation in Bengal to overthrow British rule.

**Indian Universities Act**

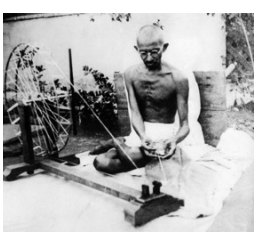
Imposed stricter control over universities, based on the recommendation of the Raleigh commission.

## PHASE 3

### SWADESHI ERA & REVOLUTIONARY NATIONALISM (1905–1919)

*Mass agitation + revolutionary underground groups*

1905-July — 7th Aug 1905

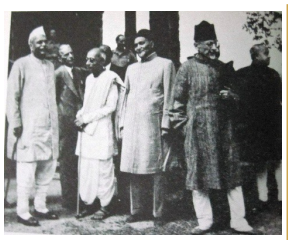


**Swadeshi Movement**

Promoted self-reliance, indigenous industries, and national education.

**Partition of Bengal**

Divided Bengal on religious lines by Lord Curzon to weaken nationalism.



**Shimla Deputation**

Muslim leaders met Viceroy Lord Minto & demanded separate political representation.

1906
Oct

**Surat Split**

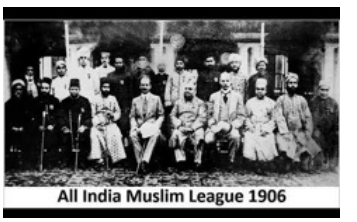
Division of Congress into Moderates and Extremists.

1906
Dec

1907

**Muslim League formed**

Created a separate communal political identity for Muslims




**Morley–Minto Reforms**

Introduced separate electorates for muslims.

1910

1909

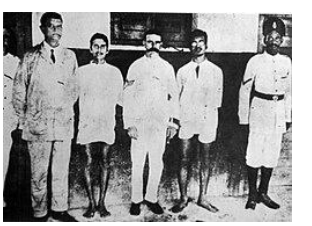
1908

**Howrah-Sibpur Conspiracy Case**

Trial of 47 revolutionaries following the murder of Inspector Shamsul Alam.

**Alipore Bomb Case**

Exposed Bengal revolutionary networks after a failed assassination attempt on Judge Kingsford



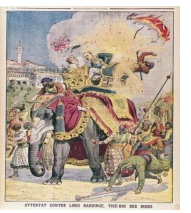
**Annulment of Bengal Partition**

Reunited Bengal and shifted the capital to Delhi under Lord Hardinge to appease nationalist agitation.


**Ghadar Movement**

Indian expatriates planned an armed revolt against the British during WWI.

1911 — 1912 — 1913



**Delhi Conspiracy Case**

Rashbehari Bose & Sachin Sanyal attempted to assassinate Viceroy Hardinge.

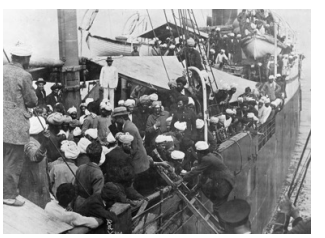
**Gandhi returns to India**

Marked the start of mass politics in the national movement.

1916 April — 1915 — 1914

**Home Rule Movement – Tilak (Maharashtra)**

Demanding self-government marked the revival of nationalism before Gandhi's era.



**Komagata Maru Incident**

Japanese ship Komagata Maru, carrying Indian passengers, was denied entry into Canada due to racist laws and forced back to India.

**Home Rule Movement – Annie Besant (Madras)**

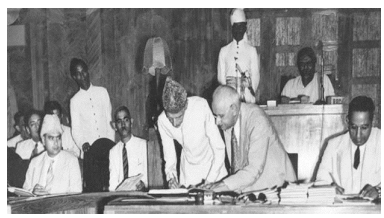
Spread the Home Rule movement to southern India.

1916 Sept

1916 Dec

**Lucknow Pact**

Congress–League cooperation and Moderates and extremists reconciled.



1917

**Sadler Commission**

Recommended revamping universities & linking schools to higher education.

**August Declaration**

British promise of responsible government in India — basis for 1919 Act.

1917-Aug

1917-Apr

**Champaran Satyagraha**

Gandhi's first mass civil disobedience campaign against the oppressive indigo cultivation.

GERMANY PLOTS AGAINST THE U. S.

THE ZIMMERMAN LETTER

JAPAN AND MEXICO SOUGHT AS ALLIES IN TEUTON SCHEME

Document Bearing Instructions to Von Eckhardt in Mexico City is Intercepted; Has Been in Possession of U.S. Government for Some Time; Sinister Sequence of Events Explained; Big Concessions Offered as Bait

1917-Mar

**Zimmerman Plan**

A German-backed plot during WW1 to incite an all-India insurrection against the British.

**Ahmedabad Mill Strike**

Gandhi's first hunger strike to support the textile mill workers in their fight for fair wages.

1918 - Feb


PASSIVE RESISTANCE AGAINST THE BLACK BILLS

BENGAL'S SUPPORT TO THE MOVEMENT.

PLEDGE TO DISOBEY LAWS.

The Satyagraha Vow.

SIGNATORIES TO THE PLEDGE.

1918 - Mar

**Rowlatt Act**

Repressive legislation allowed detention without trial.

1919 - Mar

**Kheda Satyagraha**

Gandhi led peasants in non-payment of taxes due to crop failure - marked 1st NCM.

**Hunter Committee (Disorder inquiry committee)**

Investigated the Jallianwala Bagh massacre and the atrocities committed by the British.

1919- Dec

**Government of India Act, 1919.**

Introduced dyarchy in provinces, giving limited self-government to Indians.

1919 -Oct

1919 -April

**Jallianwala Bagh Massacre**

General Dyer ordered the firing on unarmed civilians protesting the Rowlatt Act in Amritsar.

# PHASE 4

## MASS MOVEMENTS & CONSTITUTIONAL DIALOGUE (1920–1942)

*Gandhi's mass mobilisation + constitutional proposals*

### *A) Mass Movements*

**Khilafat Movement**

Pan-Islamic protest to restore the Ottoman Caliph, later merged with NCM.

1919

1920 Aug

**Launch of Non-Cooperation Movement**

First nationwide mass movement for Independence - Boycotted schools, courts, etc to resist British rule.

**Chauri Chaura Incident**

Mob burnt a police station; Gandhi suspended NCM due to violence.

1922 – Feb

1922 - Feb

**Bardoli Resolution**

NCM officially repealed, shifting focus to constructive work.

1923

**Formation of the Swaraj Party** (C.R. Das & Motilal Nehru)

Due to disagreement over suspending the NCM & they aimed to enter the legislatures to fight the British from within.

**Formation of Hindustan Republican Association (HRA)**

A revolutionary organisation by Ram Prasad Bismil to organise armed resistance.

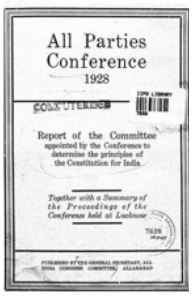
1924

1925 Feb


**Kakori Conspiracy**

HRA looted a train near Lucknow to fund revolutionary activities.

1925 Aug


All Parties Conference
1928

Report of the Committee appointed by the Conference to determine the principles of the Constitution for India

Together with a Summary of the Proceedings of the Conference held at Lucknow

**All Parties Conference**

It was a response to the challenge of Lord Brikenhead to draft a constitution by the Indians.

**Simon commission**

An All-British commission to review India's constitutional progress.

1927 Dec

1927 Nov

1925 Dec

**Delhi Proposals**

Put forward by the Muslim League, sought to secure joint electorates with reserved seats.

**Commonwealth of India Bill**

An unofficial effort to draft a new constitution by Annie Besant and her associates.

**Bardoli Satyagraha**

Sardar Patel led a farmers' protest against an unjust tax hike.

1928
Feb

1928
Aug


**Lathi charge on Simon Commission protest.**

Lala Lajpat Rai was injured and later died from injuries.

1928
Oct

**Nehru report**

The first Indian constitutional draft, which demanded Dominion Status.

**Jinnah's 14 Points**

Muslim League's response to the Nehru Report.

1929
Mar

1929
Jul


**Lahore Conspiracy Case**

Trial of Bhagat Singh & others for the assassination of British Police Officer Saunders.

1928
Dec

**Saunders' Assassination**

Bhagat Singh & associates retaliated for Lajpat Rai's death.

**Central Assembly Bombing (Delhi)**

Bhagat Singh & Batukeshwar Dutt threw bombs in the Central Legislative Assembly.

1929
Apr

BLAST FOLLOWING SHARP PARLIAMENTARY CRISIS CAUSES INJURY TO MANY

Sir George Schuster, Finance Member of Governor General's Executive Cabinet, Among Those Wounded by Explosion

SIR JOHN SIMON ESCAPES UNHURT

Socialist Literature Hurled With Bombs Into Crowded Chamber; Two Men Arrested Are Said to Have Confessed to Outrage

1929
Oct

**Deepavali Declaration**

A declaration by Lord Irwin to clarify that the British govt intended to facilitate dominion status to India in future.

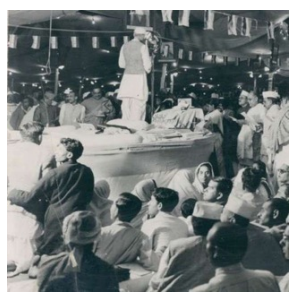
**Delhi Manifesto**

A statement issued by Indian leaders that outlined certain conditions for attending Round Table Conferences.

1929
Nov

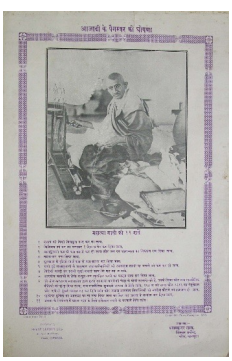
**Poorna Swaraj Resolution**

INC declared Complete Independence as its goal, fixing January 26, 1930, as Independence Day.



1929
Dec

1930
Jan



**Gandhi's 11 Demands**

Addressed to Lord Irwin as preconditions to avoid the Civil Disobedience Movement.

**Dandi March - Civil Disobedience Movement**

Gandhi led non-violent mass defiance against the salt law, starting from Sabarmati Ashram to Dandi.

12 March 1930

1930 Apr

**Chittagong Armoury Raid**

Led by Surya Sen, revolutionaries attempted to seize British arms and cut communications.

***B) Round Table Conferences and other movements***

**1st Round Table Conference**

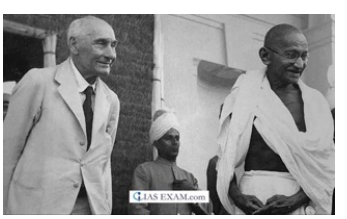
To discuss constitutional reforms of India, but the INC boycotted it.

1930

1931 Mar

**Gandhi–Irwin Pact**

Agreement to suspend CDM & facilitated participation of INC in 2nd round table conference.



**Execution of Bhagat Singh, Rajguru & Sukhdev**

Revolutionary leaders were hanged in Lahore jail for their involvement in the Lahore conspiracy case.

1931
Mar

1931
Sept

**2nd Round Table Conference**

Only RTC attended by INC (Gandhi). But failed due to non-consensus on a communal issue.

**Communal Award**

Granted separate electorates to depressed classes, Sikhs, Muslims, etc.

1932
Feb

1932
Aug

1932
Sept

**Rajah Moonje Pact**

First-ever agreement on reservation & joint electorate between Hindu leaders & Congress.

**Poona Pact**

An agreement between Gandhi and Ambedkar replacing separate electorates with reserved seats for depressed classes in joint electorates.

**3rd Round Table Conference**

It led to the formulation of the Government of India Act, 1935.

1932
Nov

### *C) Constitutional Developments*

**Government of India Act**

Introduced provincial autonomy & it served as a base for the future Constitution.

1935

1937–39

**Congress Provincial Ministries**

Congress gained administrative experience at the provincial level.

**CWC Meeting at Wardha**

To discuss Congress's response to WW2.

1939 Sept

1939

**Congress Ministry Resigned**

Resigned in protest against the British's unilateral decision to involve India in WW2.

**Day of deliverance**

Muslim League under Jinnah celebrated after Congress ministries' resignation.

1939 Dec


**August Offer**

Promised Dominion status after WW2 for the 1st time.

1940 Aug

1940 Mar

**Pakistan resolution**

Demanded independent Muslim states – laid the foundation for Pakistan.

**Individual satyagraha**

Symbolic protest affirming freedom of speech - Vinoba Bhave first satyagrahi.

1941
Oct

1942
Mar

**Cripps Mission**

Offered post-war Dominion status and constitutional reforms to gain Indian support in WW2.

**Operation Zero Hour**

A secret operation by the British Government to arrest the leaders of QIM.


Indian Express

MAHATMA GANDHI, MAULANA AZAD AND NEHRU ARRESTED

1942
Aug

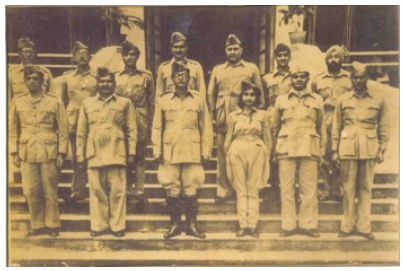
8th Aug
1942

**Quit India Movement**

Largest mass uprising for independence; Gandhi called for "Do or Die".

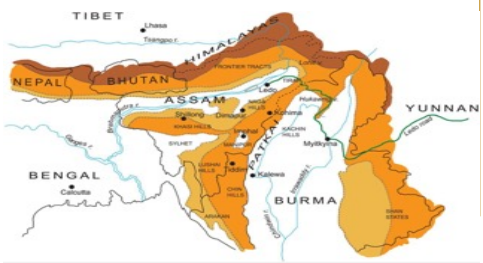
**Indian National Army**

Formed under Captain Mohan Singh with Indian prisoners of war.



1942

1942
Sept




**Coupland Plan**

Proposed Crown colony including NE tribal areas & part of Burma, kept separate from independent India.

## PHASE 5

### FINAL NEGOTIATION & TRANSFER OF POWER (1943–1947)

*Struggle shifts from mass street agitation → constitutional bargaining*

1944
Nov

1944
Mar

**Sapru Committee**

It was headed by Tej Bahadur Sapru to examine the communal question in India after the failure of Gandhi Gandhi-Jinnah talks.


The Sind Observer

Rajaji's Pact Bid With Jinnah

**C Rajagopalachari Formula.**

1st proposal accepting the possibility of Partition.

**Desai–Liaqat Pact**

Informal agreement to end political deadlock by forming an interim govt.

1945

**General Elections**

Congress wins in the centre; League sweeps the Muslim seats – leading to polarisation.

1945–46

1945 June

**Wavell Plan / Simla Conference**

Proposed formation of an interim government, but failed due to the Muslim League's demand for sole Muslim representation.

**Royal Indian Navy (RIN) Mutiny**

Revolt by Indian sailors in Bombay and Karachi for discriminatory treatment.


Hindusthan Standard

INDIAN SAILORS IN REVOLT

SIX HOURS BATTLE WITH BRITISH TROOPS

GRAVE TURN IN R. I. N. MEN'S STRIKE IN BOMBAY

TWENTY SHIPS CAPTURED

Govt. Rushing Strong Naval And Air Reinforcements

"CEASE FIRE" ON BOTH SIDES AFTER CONCLUSION OF TRUCE

SARDAR SARDUL SINGH India Govt. Orders Release

POLICE OPEN FIRE ON CROWDS Trouble In Kulladevi And Girgaum Area

FIRING ON STRIKERS AT KARACHI

INDIANS RETALIATE WITH NAVAL GUNS

ONE KILLED AND 11 INJURED IN THE DUEL

ULTIMATUM FOR WITHDRAWAL OF MILITARY

THE BATTLE ENDS Sit-Down Strike Continues

1945

1946 Feb

**INA Trials**

The Red Fort trials in 1945-46 involved the prosecution of Indian National Army (INA) officers, notably Shah Nawaz Khan, Prem Sahgal, and Gurbaksh Singh Dhillon.


The Hindustan Times

I.N.A. TRIAL OPENS IN RED FORT

I.N.A.'s WOMEN WARRIORS

SHAH NAWAZ

DHILLON

SAHGAL

DEFENCE COUNSEL

NIGHT OF GUN BATTLES IN BATAVIA

BRITISH WARN ANNAMITES OF REPRISALS

CHARGES OF MURDER AND WAGING WAR AGAINST KING

DEFENCE ASKS FOR THREE WEEKS' ADJOURNMENT

Syria A Potential Trouble Spot In Mid-East

**Cabinet Mission Plan**

The British proposed a peaceful transfer of power by avoiding partition, but failed.

1946
May

1946
Aug


**Direct Action Day**

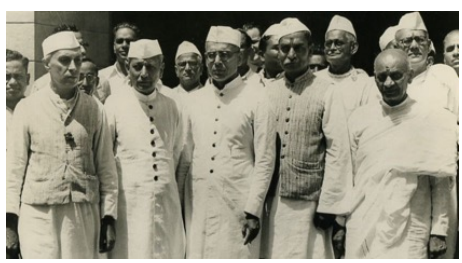
Communal violence erupted in Calcutta & the Partition became likely to happen.

**Constituent Assembly Convenes**

First meeting of the body to draft India's Constitution.

1946
Sept

Dec 9
1946



**Interim Government**

First instance of Indians exercising full administrative power.

**Objective Resolution**

Prepared by Nehru, which laid down the philosophy of the constitution.

Dec 13 1946

1947 Feb

**Attlee's Declaration**

Clement Attlee announced Britain's decision to transfer power by June 1948.

1947 May

**Suhrawardi Sarath Pact**

A proposal by Suhrawardi (CM of Bengal) & Sarat Bose for an independent, undivided Bengal free from both India & Pakistan.

**Bannu Resolution (Khan Abdul Ghaffar Khan)**

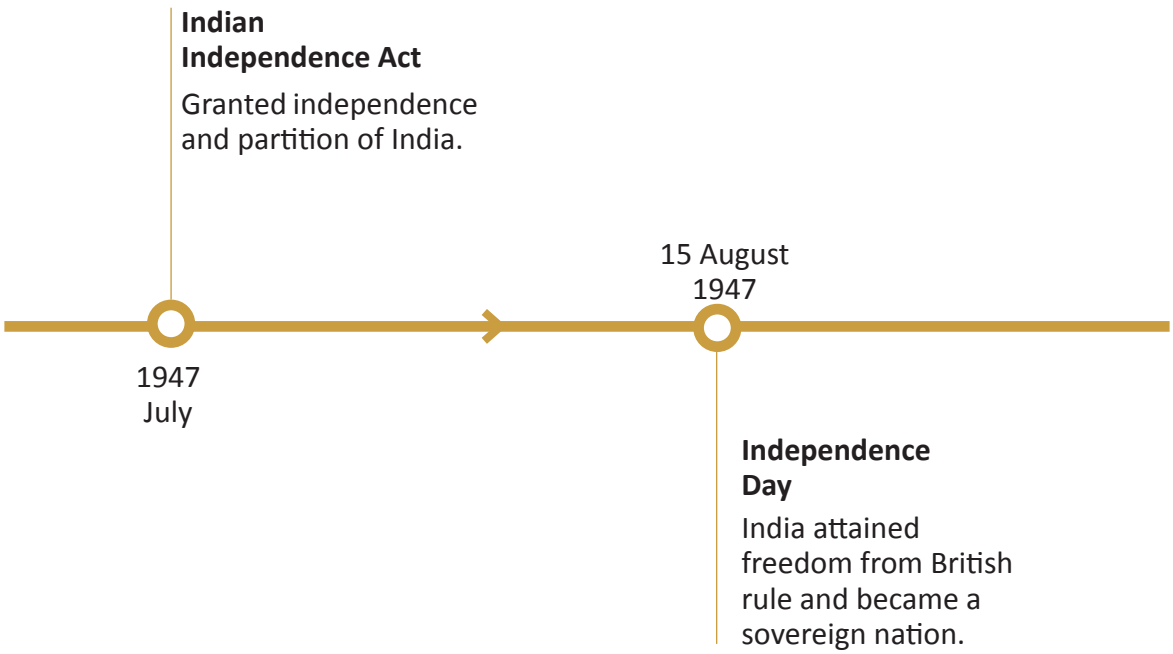
Demanded an independent state of Pashtunistan.

1947 June

**Mountbatten Plan**

Partition was formally accepted into two separate dominions.

1947 June


Indian
Independence Act
Granted independence
and partition of India.
15 August
1947
1947
July
Independence
Day
India attained
freedom from British
rule and became a
sovereign nation.