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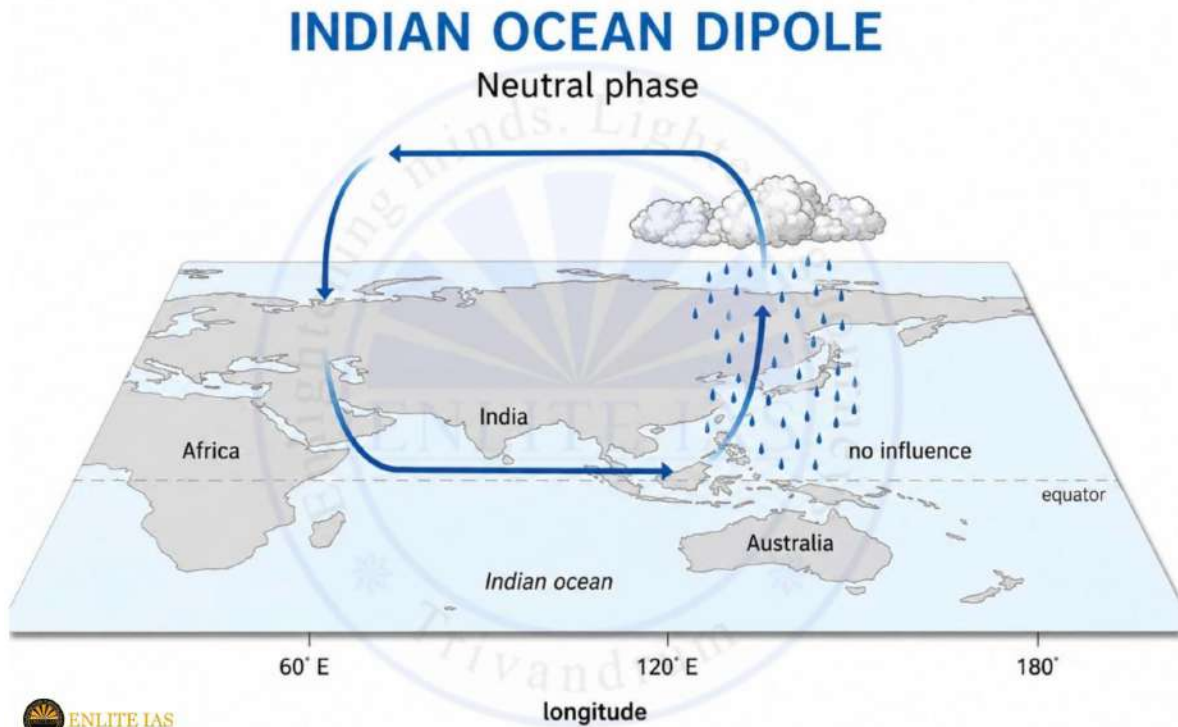
GEOGRAPHY

1. Indian Ocean Dipole (IOD) (Source: The Indian Express)

The Indian Ocean Dipole (IOD) is a climatic phenomenon in the Indian Ocean that influences the monsoon season in India. It refers to the difference in sea surface temperatures between the western and eastern parts of the Indian Ocean.

Impact

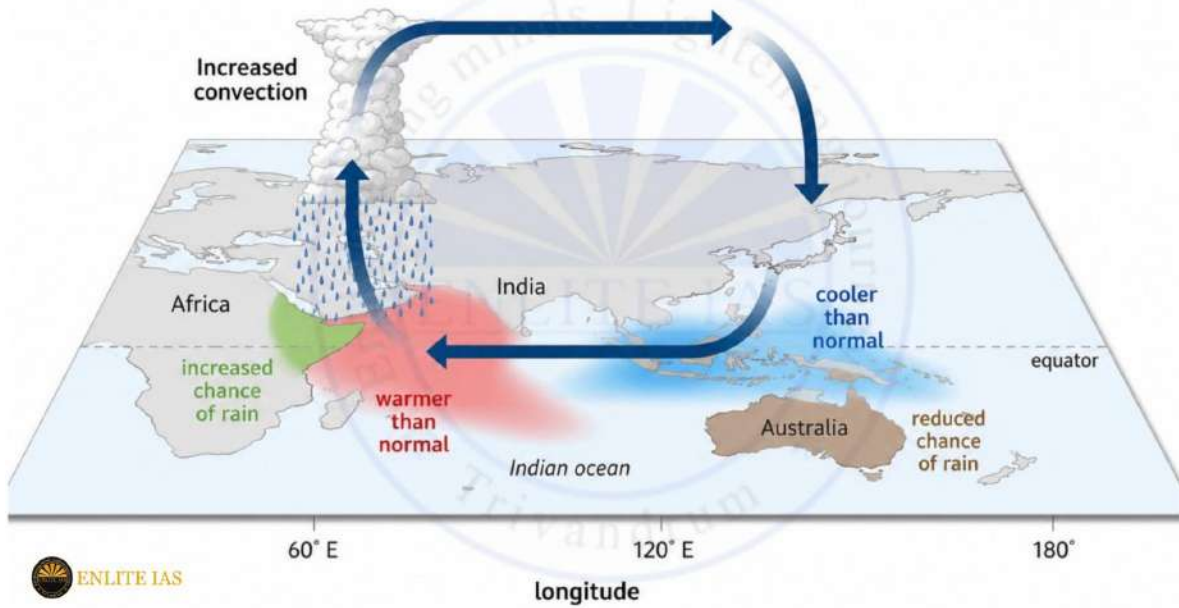
- **Positive IOD:**
 - Warmer western Indian Ocean, cooler eastern Indian Ocean.
 - Enhances monsoon rainfall over India.
 - Leads to stronger monsoon winds and better moisture supply.
 - Associated with above-average rainfall.
- **Negative IOD**
 - Cooler western Indian Ocean, warmer eastern Indian Ocean.
 - Weakens the monsoon and causes below-average rainfall.
 - Can lead to drought conditions in parts of India.



INDIAN OCEAN DIPOLE



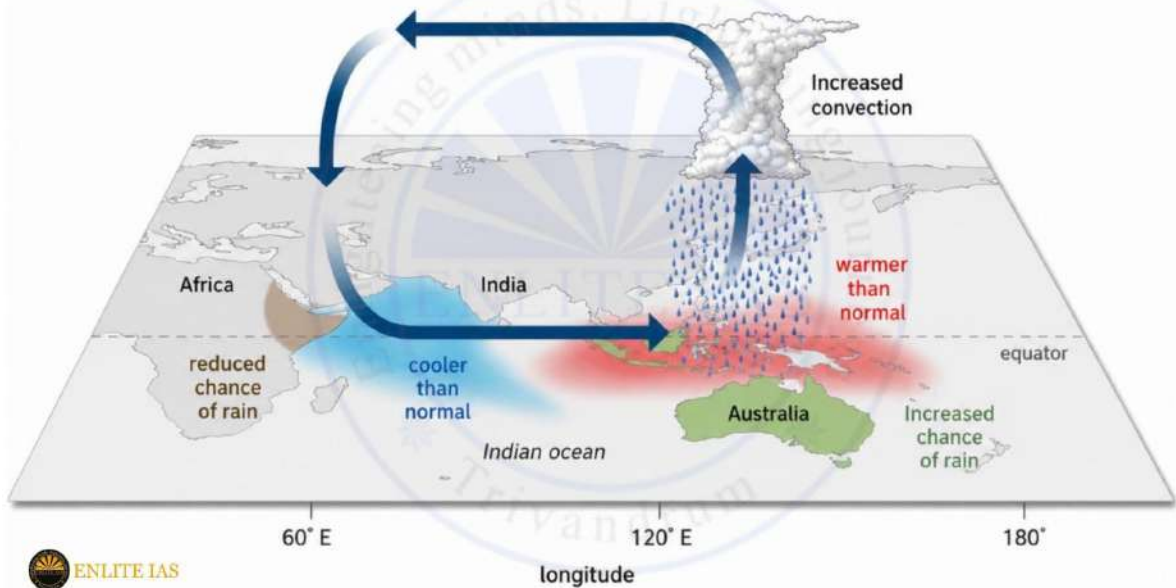
Positive phase



INDIAN OCEAN DIPOLE



Negative phase



2. Cloudburst (Source: The Hindu)

CLouDBURST

A Burst of Rain, A Flood of Impact

Cloudburst is a sudden, intense rainfall over a small area in a short duration, leading to flash floods and destruction.



WHAT IS A CLOUDBURST?



- Extremely heavy rainfall (>100 mm in 1 hour) over a very small area (10×10 km or less).
- Occurs suddenly and without much warning.

HOW DOES IT FORM?



Warm, moist air from the plains rises up the mountains.

The air cools rapidly at higher altitudes and condenses to form clouds.

When these clouds encounter favorable conditions, they release huge amounts of rain in a very short time.

This intense rainfall over a small area causes flash floods, landslides and severe damage.

KEY FEATURES

- Short Duration**
Heavy rain in 30 minutes to 2 hours
- Small Area**
Typically less than 10×10 km
- High Intensity**
More than 100 mm of rain in one hour
- Unpredictable**
Difficult to forecast even with modern technology

WHERE DOES IT OCCUR?



- Common in mountainous regions, especially in the Himalayas.
- Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Sikkim, Arunachal Pradesh, Darjeeling hills.
- Can occur in any region with favorable conditions.

IMPACTS



Flash floods



Landslides and mudslides



Damage to houses, roads, bridges and infrastructure



Loss of human and animal lives



Loss of crops and livelihoods

RECENT EXAMPLES IN INDIA

- Leh (Ladakh) – August 2010**
Over 250 mm of rain in less than 1 hour.
- Kedarnath (Uttarakhand) – June 2013**
Cloudburst triggered devastating floods and landslides.
- Jammu (J&K) – July 2021**
Heavy cloudburst caused urban flooding and loss of lives.
- Himachal Pradesh – August 2023**
Multiple cloudbursts led to flash floods, landslides and road blockages.

PREVENTION & MITIGATION

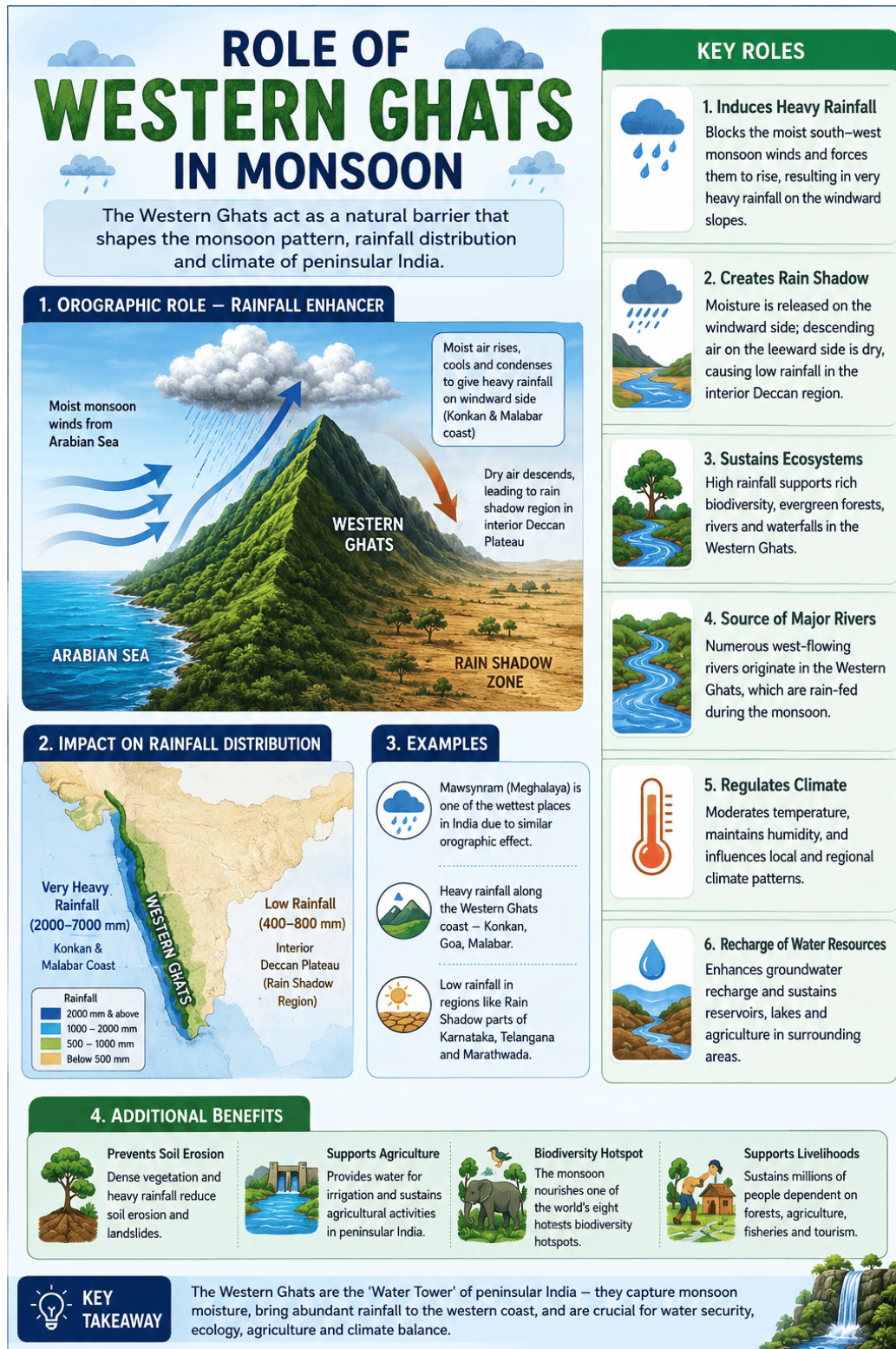
- Early Warning Systems:** Use of Doppler Radar, Satellite monitoring and AI-based prediction.
- Land Use Planning:** Avoid construction in vulnerable zones and floodplains.
- Afforestation:** Protect and restore forest cover in hilly regions.
- Drainage Management:** Keep natural drainage systems clean and unblocked.
- Community Awareness:** Educate local communities on risk and response.

WHAT CAN YOU DO?

-  Stay updated on weather forecasts
-  Follow alerts and instructions from authorities
-  Avoid rivers, streams and low-lying areas during heavy rain
-  Keep an emergency kit ready
-  Move to higher ground if you are in a vulnerable area
-  Help others and report any emergency

 **REMEMBER:** Cloudbursts may be short in duration, but their impact can last a lifetime. Stay alert, stay safe!

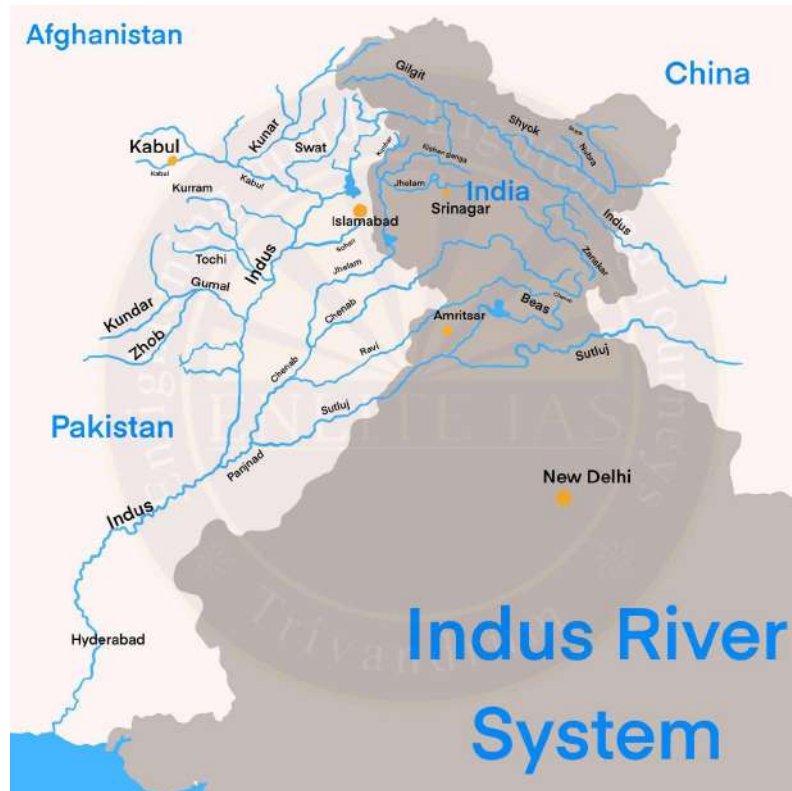
3. Role of Western Ghats in Monsoon (Source: The Indian Express)



4. Himalayan River Systems (Source: The Indian Express)

Indus River System (Sindhu River)

- One of the largest river basins spread over China(Tibet), India and Pakistan.
- *It originates from a glacier near Bokhar Chu in the Tibetan region in the Kailash Mountain range near the Mansarovar Lake.*
- River delta near Karachi , Pakistan.



Himalayan Tributaries of Indus River

1. Shyok River

- Rising from the Karakoram Range at Rimo Glacier. The river widens at the confluence with the Nubra River.

2. Nubra River

- It is the main tributary of the Shyok River. It originates from the Nubra Glacier.

3. Shigar River

- It rises from the Hispar Glacier. It joins the Indus at Skardu.

4. Hunza River

- It is an important left-bank tributary of the Gilgit River. It rises from a glacier north of the Karakoram Range in the northwestern part of Jammu and Kashmir.

Indus River Tributaries in the Plains

1. Chenab River

- The Chenab originates from near the Bara Lacha Pass in the Lahul-Spiti part of the Zaskar Range.
- Chenab river is formed by the confluence of the Chandra and Bhaga rivers.
- It flows through the Jammu region of Jammu and Kashmir into the plains of Punjab in Pakistan
- The waters of the Chenab are allocated to Pakistan under the terms of the Indus Water Treaty

2. Jhelum River

- It is a tributary of the Chenab River
- The river Jhelum rises from a spring at Verinag situated at the foot of the Pir Panjal range.
- The waters of the Jhelum are allocated to Pakistan under the terms of the Indus Water Treaty.
- It flows through the Wular Lake.
- The Kishenganga River is the largest tributary of the Jhelum.

3. Ravi River

- It rises west of Rohtang Pass in the Kullu hills of Himachal Pradesh.
- The waters of the Ravi River are allocated to India under the Indus Waters Treaty.
- The major multipurpose project built on the river is the Ranjit Sagar Dam.

4. Sutlej River

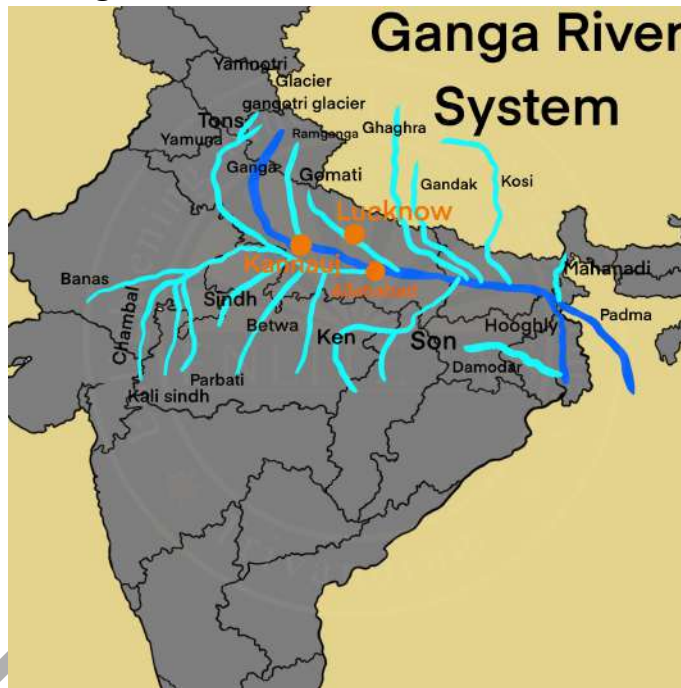
- It rises from beyond the Indian borders on the southern slopes of the Kailash Mountain from the Rakas lake, which is situated close to the Mansarovar Lake.
- It enters Himachal Pradesh through Shipki La and flows in the South-westerly direction.
- The world's highest gravity dam, Bhakra Nangal Dam, is built on this river.
- The waters of the Sutlej are allocated to India under the Indus Water Treaty.

5. Beas River

- Beas River emerges from Rohtang Pass in Himachal Pradesh.
- The tourist resorts of Manali are situated on the right bank of the River Beas.

Ganga River System

- The Ganga river system is spread over **India, Tibet, Nepal and Bangladesh.**
- *It is the largest river basin in India and accounts for one-fourth of the total area of the country.*
- Its basin covers the states of **Uttar Pradesh, Madhya Pradesh, Rajasthan, Bihar, West Bengal, Uttarakhand, Haryana, Chhattisgarh, Himachal Pradesh and the UT of Delhi.**
- Ganga River flows through the states of **Uttarakhand, Uttar Pradesh, Bihar, Jharkhand, and West Bengal.**
- The Bhagirathi, considered to be the source stream of Ganga, rises at the foot of the **Gangotri Glacier, at Gaumukh.**



Himalayan Tributaries of Ganga River

1. Alaknanda River

- It rises at the confluence and feet of the Satopanth and Bhagirath glaciers in Uttarakhand.
- It meets the Bhagirathi River at Devprayag, after which it is called the Ganga.
- Its main tributaries are the Mandakini, Nandakini, and Pindar rivers.
- The Hindu pilgrimage centre of Badrinath and the natural spring Tapt Kund lie along the banks of the Alaknanda River.

2. Bhagirathi River

- It rises at the foot of Gangotri Glacier, at Gaumukh, at an elevation of 3892m at Uttarakhand.

3. Dhauliganga River

- It originates from Vasundhara Tal, perhaps the largest glacial lake in Uttarakhand.
- Dhauliganga is joined by the Rishiganga River at Raini.
- It merges with the Alaknanda at Vishnuprayag
- Tapovan Vishnugad Hydro Power Project is being constructed on the Dhauliganga.

4. Rishiganga River

- It springs from the Uttari Nanda Devi Glacier on the Nanda Devi Mountain.
- It is also fed by the Dakshini Nanda Devi Glacier.
- It flows through the Nanda Devi National Park and merges into the Dhauliganga River

Tributaries of Ganga River in Plans

1. Ramganga River

- Ramganga River originates in the southern slopes of Dudhatoli Hill in Uttarakhand.
- It also flows through the dun valley of Corbett National Park.
- It meets the Ganga near Kannauj.

2. Gomati River

- It originates from Gomat Taal, Pilibhit in Uttar Pradesh.
- Meets the Ganges River in Ghazipur.
- At the Sangam of Gomti and Ganga, the famous Markandey Mahadeo temple is situated.

3. Ghaghariya River

- The Ghagra originates in the glaciers of Mapchachungo.
- It is a transboundary perennial river originating from the Tibetan plateau near Lake Mansarovar.
- It is a major left-bank tributary of the Ganga and joins it at Chhapra in Bihar.
- Rapti, Chhoti Gandak, Sharda, and Sarju are the major tributaries of this river.

4. Gandak River

- It is formed by the union of the Kali and Trisuli rivers, which rise in the Great Himalayan Range in Nepal.

- It enters the Ganga River opposite Patna in a place called Sonapur.
- 5. Burhi Gandak River**
- Originates from Chautarva Chaur near Bisambharpur in the district of West Champaran district of Bihar.
 - It flows parallel to and east of the Gandak River in an old channel.
- 6. Kosi River**
- Also called Saptakoshi for its 7 Himalayan tributaries.
 - It is an antecedent transboundary river flowing through Nepal and India.
 - The highest peak in the world, Mt. Everest, and Kanchenjunga are situated in the Kosi catchment.
 - It is also termed “The Sorrow of Bihar”.
- 7. Yamuna River**
- It originates from the Yamunotri Glacier on the southwestern slopes or Bandarpooch Peak in the Mussoorie range of the lower Himalayas.
 - Flows through the states of Uttarakhand, Himachal Pradesh, and Haryana. It then enters Delhi and merges with the Ganga near Prayagraj.
 - It is the largest tributary of the Ganga in the northern plains.
 - It creates the highly fertile alluvial Yamuna-Ganges Doab region between itself and the Ganges in the Indo-Gangetic plain.
 - The cities of Bhagpat, Delhi, Noida, Mathura, Agra, Firozabad, Etawah, Hamirpur, and Allahabad lie on its banks.
 - Major Tributaries are Chambal, Banas, Kali, Singh, Ken, Betwa, and Sindh rivers.
- 8. Son River**
- Originates near Amarkantak hills in Madhya Pradesh
 - It joins the Ganga near Patna in Bihar.

Brahmaputra River System

- **Origin:** Chemayungdung glacier in Tibet, China.
- *It flows as the Yarlung Tsangpo River across southern Tibet to break through the Himalayas in great gorges and into Arunachal Pradesh, where it is known as Dihang.*
- The first major tributary is the Raga Tsangpo meeting the Tsangpo near Lhatse Dzong.
- West of the town of Sadiya, the Dihang turns to the southwest and is joined by two mountain streams, the Lohit and the Dibang, and below the confluence, the river is known as the Brahmaputra.
- It flows through Bangladesh as the Jamuna, where it merges with the Ganga (Padma) to form a vast delta, the Sunderbans.

- The biggest and the smallest riverine islands in the world, Majuli and Umananda respectively, are situated in the river in the state of Assam.



Brahmaputra River System

Left Bank Tributaries

1. Dhansiri River

- It originates from the Naga Hills in Nagaland.

2. Lohit River

- The River Lohit originates in eastern Tibet.
- The river flows through the Mishmi hills to meet the Siang at the head of the Brahmaputra valley.
- The Lohit Valley is densely forested and features a mix of alpine and subtropical vegetation.

3. Dibang River

- Originates close to the Tibetan border at an altitude of more than 5000 m.
- The Mishmi hills are found along the upper course of the Dibang River.

Right Bank Tributaries

1. Subansiri River

- Also called the Gold River as it is famous for its gold dust.
- Flows through Arunachal Pradesh and is ideal for kayaking.

2. Kameng River

- Kameng River in the eastern Himalayan mountains originates in the Tawang district of Arunachal Pradesh.
- The Pakhui Wildlife Sanctuary and the Kaziranga National Park are located near the Kameng River.

3. Manas River

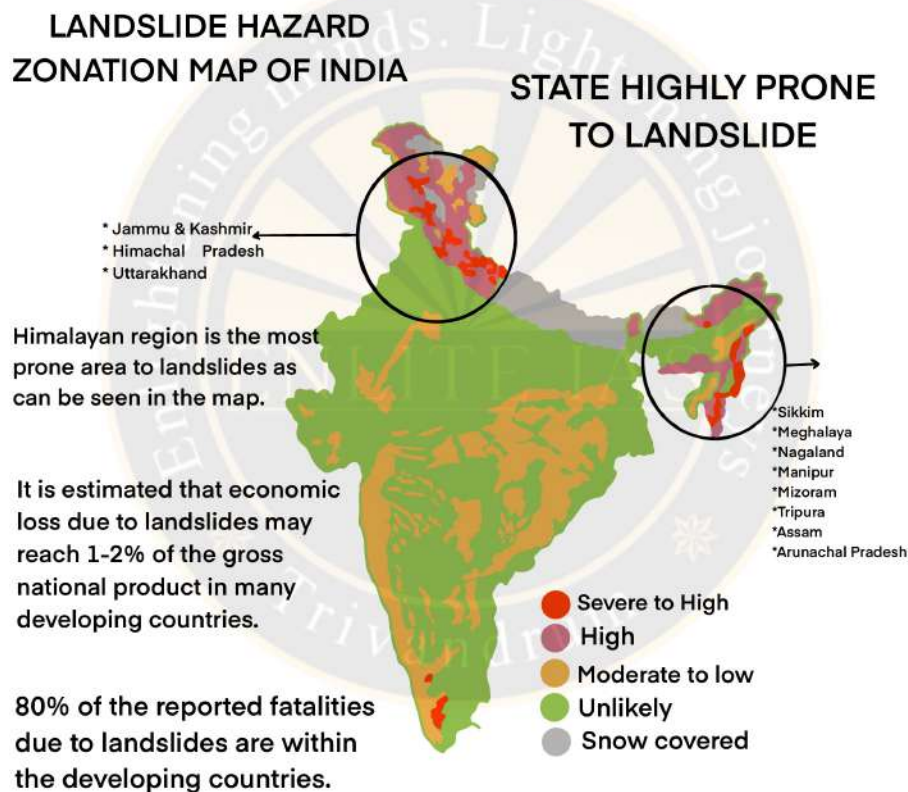
- Manas River is a transboundary river in the Himalayan foothills between southern Bhutan and India.
- It flows through Royal Manas National Park in Bhutan and its contiguous Manas Wildlife Sanctuary in India.

5. Landslides (Source: The Indian Express)

It is the movement of rock mass or debris down the slope, and it is a type of mass wasting.

Landslide Vulnerability Zones of India

- Around 12.6% of the land area, excluding snow-covered areas, is prone to landslide hazards.



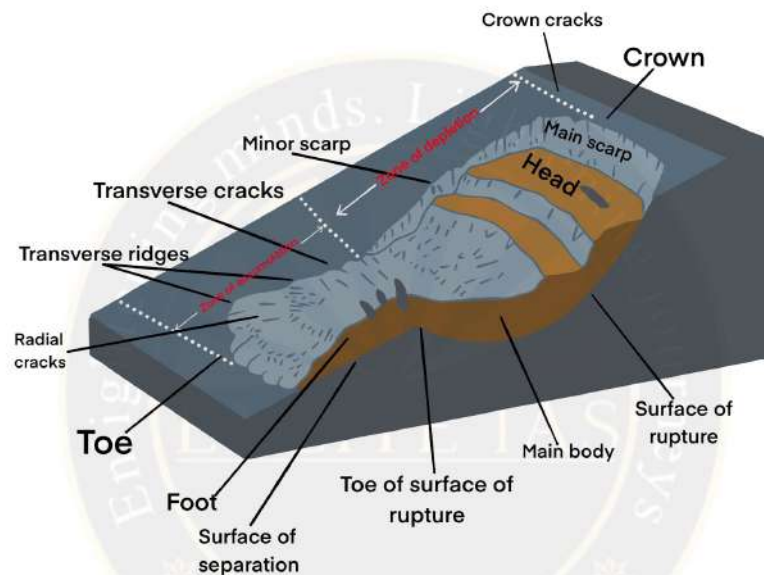
Zones	Explanation
Very High Vulnerability Zone	• Relatively young mountains in the Himalayas and Andaman and Nicobar Islands. • Western Ghats and Nilgiris • Northeastern regions
High Vulnerability Zone	• Himalayan states and the states of the northeastern regions except the plains of Assam.
Moderate to Low Vulnerability Zone	• Trans - Himalayan areas of Ladakh and Spiti, Aravalis, rain shadow areas in Western and Eastern Ghats, and Deccan Plateau.

Other Areas

- Rajasthan, Haryana, Uttar Pradesh, Bihar, West Bengal (except Darjeeling), Assam (except Karbi Anglong), and coastal regions of the southern regions.

Causes of Landslides

- **Natural Causes:** Heavy rainfall, earthquakes, volcanic eruptions, and the melting of glaciers.
- **Man-made Causes:** Deforestation, Mining operations, and Infrastructure development.



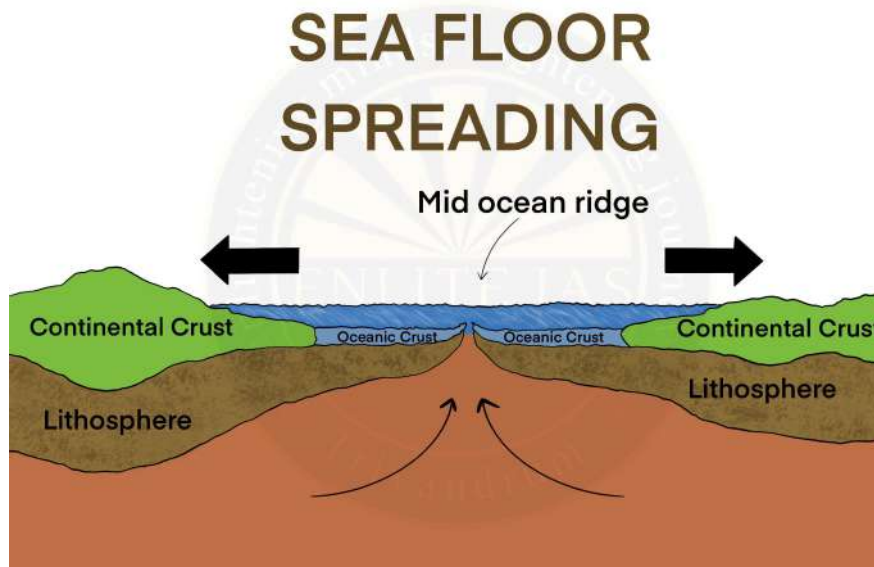
Landslides



6. Seafloor Spreading Theory (Source: The Hindu)

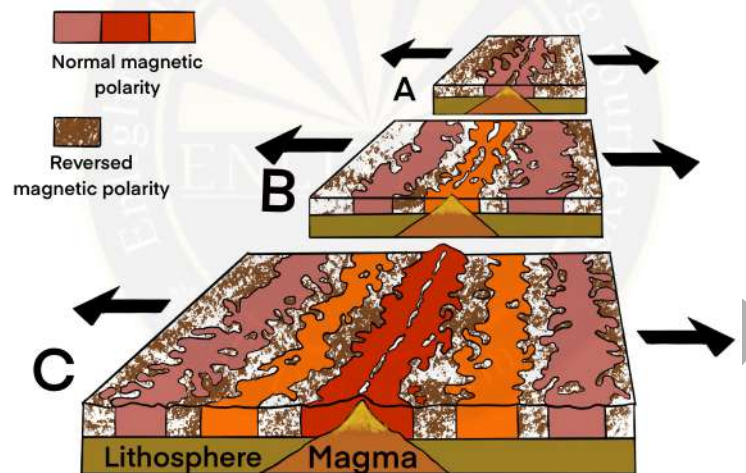
- *The hypothesis of seafloor spreading was put forward by H. Harry Hess in 1960.*
- *Seafloor spreading is a process that occurs at mid-ocean ridges, where new oceanic crust is formed through volcanic activity and then gradually moves away from the ridge.*
- When oceanic plates diverge, tensional stress causes fractures to occur in the lithosphere.
- Basaltic magma rises from the fractures and cools on the ocean floor to form new seafloor.

- The newly formed seafloor (oceanic crust) then gradually moves away from the ridge, and its place is taken by an even newer seafloor and the cycle repeats.
- With time, older rocks are spread farther away from the spreading zone while younger rocks will be found nearer to the spreading zone.



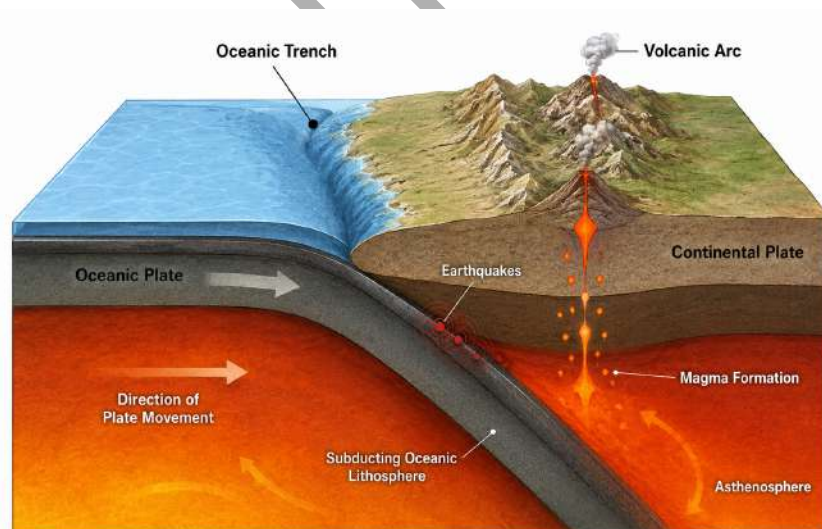
Evidences

- **Evidence from Molten Material**
 - Rocks shaped like pillows (rock pillows) show that molten material has erupted again and again from cracks along the mid-ocean ridge and cooled quickly.
- **Evidence from Magnetic Stripes**
 - Rocks that make up the ocean floor lies in a pattern of magnetising stripes that hold a record of the reversals in Earth's magnetic field.



- **Subduction**

- Process by which the ocean floor sinks beneath a deep-ocean trench and back into the mantle; allows part of the ocean floor to sink back into the mantle.



- **Evidence from Drilling Samples**

- Core samples from the ocean floor show that older rocks are found farther from the ridge; the youngest rocks are in the center of the ridge.

7. Difference Between Kharif and Rabi Seasons in India The Hindu)

(Source:

Kharif Season

- **Sowing:** June–July
- **Harvesting:** September–October
- **Climate:** Warm, humid, high rainfall
- **Other Name:** Also called Monsoon Crops
- **Major Crops:** Rice, Maize, Jowar, Bajra, Cotton, Soybean, Groundnut, Tur (Arhar), Sugarcane
- **Key States:** West Bengal, Uttar Pradesh, Punjab, Odisha, Telangana, Andhra Pradesh, Maharashtra

Rabi Season

- **Sowing:** October–December
- **Harvesting:** March–April
- **Climate:** Cool and dry
- **Other Name:** Also called Winter Season Crops
- **Major Crops:** Wheat, Barley, Gram, Mustard, Peas, Linseed
- **Key States:** Punjab, Haryana, Uttar Pradesh, Madhya Pradesh, Rajasthan, Bihar

8. Solar Storms (Source: The Hindu)

A solar storm is a disturbance in space weather caused by the Sun releasing large amounts of energy, radiation, and charged particles

Components of Solar Storms

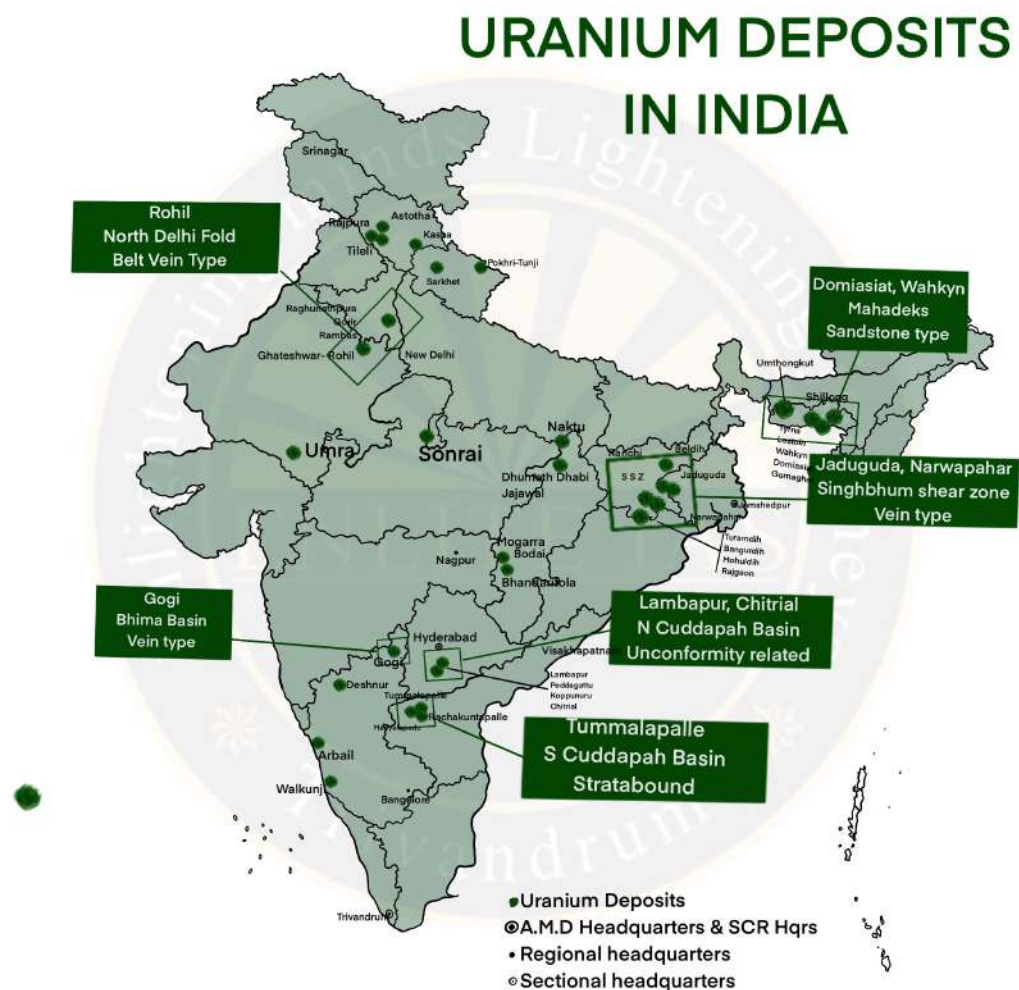
- **Solar Flare:** Sudden burst of electromagnetic radiation from the Sun. Travels at the speed of light.
- **Coronal Mass Ejection (CME):** Massive eruption of plasma and magnetic fields from the Sun. Takes 1–3 days to reach Earth. Main cause of severe geomagnetic storms.

Impact of Solar Storms

- **Satellites & Space Infrastructure:** Energetic particles damage sensitive electronic components. Furthermore, the radiation heats and expands Earth's upper atmosphere, increasing atmospheric drag. This causes Low Earth Orbit (LEO) satellites to lose altitude prematurely.
- **Navigation and Communication:** Disruptions to the ionosphere interfere with GPS signals, satellite TV, and mobile networks. It specifically halts high-frequency (HF) shortwave radio communication used by aircraft flying over polar regions.

- **Terrestrial Power Grids:** The changing magnetic field induces Geomagnetically Induced Currents (GICs) in the ground. These low-frequency currents flow into high-voltage transmission lines, causing power grid overloads, voltage instability, and catastrophic damage to transformers (e.g., the 1989 Hydro-Québec blackout).
- **Astronaut Safety:** Space weather exposes astronauts (e.g., on the ISS) and passengers on high-altitude polar flights to elevated levels of radiation.
- **Spectacular Auroras:** Charged particles colliding with atmospheric gases create intense Aurora Borealis and Australis, pushing them down to much lower latitudes than normal.

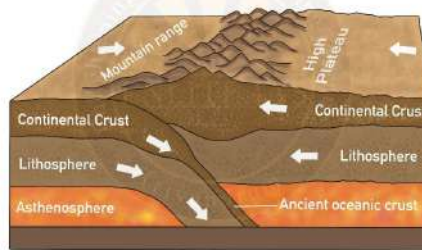
9. Uranium Deposits in India (Source: The Indian Express)



10. Aravalli Range (Source: The Indian Express)

- They are aligned in a north - east to south - west direction.
- They run for about 800 km between Delhi and Ahmedabad in Gujarat, with the width and the height decreasing from Gujarat to Delhi.
- They were formed during the Aravalli–Delhi Orogeny involving the collision of microplates which later became part of the Indian plate.

Continental- Continental Convergence



- They continue up to Haridwar and are buried under the alluvial Ganga plains.
- Aravallis have an average elevation in the range of 400- 600 m.
 - Mt. Gurushikhar (1722m) is the highest point of the Aravallis.
- Aravallis share the western border with the Thar Desert and the eastern border with the Mewar Plateau.

Significance

- Serves as a natural barrier against desertification and sandstorms.
- Source of important rivers such as Chambal, Sabarmati, and Luni.
- Provides essential resources like fuelwood, fodder, fruits, and commercial products.
- Helps in regulating precipitation through evapotranspiration.

11. Mekedatu Project (Source: The Hindu)

The Mekedatu project is a multi-purpose balancing reservoir and drinking water initiative proposed by Karnataka across the Cauvery River where it meets its tributary Arkavathi.

- **Key Objectives:** Supplying drinking water to Bengaluru and neighboring regions, and generating 400 MW of hydroelectric power.
- **Interstate Dispute:** Tamil Nadu strongly opposes the project, arguing that it compromises downstream water flow and violates the final award allocations of the Cauvery Water Disputes Tribunal.

HISTORY/ART & CULTURE

1. Santhal Rebellion (1855 - 56) (Source: The Indian Express)

The Santhal Rebellion (also called the Santhal Hul) was a tribal uprising by the Santhal people of the Rajmahal hills and neighbouring districts against the East India Company, zamindars, and exploitative moneylenders

Major Leaders

- Sidhu and Kanhu Murmu

Causes

- Exploitation by zamindars and moneylenders (dikus).
- Heavy taxes and land alienation under colonial revenue/land systems.
- Displacement of the traditional tribal economy and social distress.

Course and Tactics

- Began in June 1855, with Santhals rising against the East India Company.
- Adopted guerrilla warfare tactics.
- Rebellion spread across Jharkhand, Bengal, Bihar, and Odisha.
- Sidhu Murmu was executed in 1855; Kanhu Murmu in 1856; heavy suppression followed.

Outcome

- Creation of Santhal Parganas

2. Guru Ravidas (Source: The Indian Express)

Guru Ravidas was a 15th–16th century Bhakti saint (Nirguna Bhakti tradition), mystic poet, and social reformer.

- Born in Varanasi, Uttar Pradesh
- Traditionally regarded as a disciple of Ramananda and a contemporary of Kabir.

Philosophy and Teaching

- Emphasizing social equality and the rejection of caste discrimination.
- Rejected ritualism, superstition, and empty religious practices.
- He put forward the idea of Begumpura ("City without Sorrow").

Note

- 41 hymns of Guru Ravidas are included in the Guru Granth Sahib
- Meera Bai accepted Guru Ravidas as her spiritual guide (Guru).
- Many of his poems are also in the Panch Vani text of the Dadu Panthi tradition within Hinduism.

3. Chandrashekhar Azad (Source: PIB)

He was a revolutionary leader who was part of the second phase of the revolutionary movement during the freedom struggle.

- Born as Chandra Shekhar Tiwari in 1906 in Alirajpur (present-day Madhya Pradesh).
- Died at 27th February 1931 at Alfred Park in Allahabad.

Role in Freedom Movement

- *Inspired by Mahatma Gandhi's Non-Cooperation Movement (1921), he joined the freedom struggle at a young age.*
- The abrupt withdrawal of the Non-Cooperation Movement in 1922 pushed him away from Gandhian non-violence and towards militant, revolutionary nationalism.

- **Revolutionary Activities**

- Joined the **Hindustan Republican Association (HRA)**, led by Ram Prasad Bismil and Sachindranath Sanyal.
- Played a key role in the **Kakori Conspiracy (1925)** – a train robbery to fund revolutionary activities.
- Along with Bhagat Singh, he reorganized the revolutionary youth to establish the **Hindustan Socialist Republican Association (HSRA)** in 1928.
- Reorganized HSRA with Bhagat Singh, Rajguru, and Sukhdev.
- Planned the assassination of J.P. Saunders (1928) to avenge Lala Lajpat Rai's death.
- Supported Bhagat Singh & Batukeshwar Dutt in bombing the Central Legislative Assembly (1929).
- Stayed underground, providing leadership and financial support to HSRA members.

4. Harappa Settlement and Findings (Source: The Hindu)

Site	Location	Important Findings
Harappa	Situated on the banks of the river Ravi in Punjab (Pakistan).	• Sandstone statues of Human anatomy • Granaries • Bullock carts • Mother Goddess
Mohenjo-Daro (Also called Mound of the Dead) (UNESCO World Heritage Site)	Situated on the Banks of the River Indus in Punjab (Pakistan)	• Great bath • Granary • Bronze dancing girl • Seal of Pasupathi Mahadeva • Steatite statue of a bearded man • A piece of woven cotton
Suktagendor	In southwestern Balochistan province, Pakistan, on the Dast River	• A trade point between Harappa and Babylon
Chanhudaro	Sindh (Pakistan) on the banks of the Indus River	• Bead making • The footprint of a dog chasing a cat
Amri	Sindh is on the banks of the Indus River	• Evidence of Antelope
Kalibangan	Rajasthan on the banks of the Ghaggar River	• Fire altar • Camel bones • Wooden plough
Lothal	Gujarat is on the banks of the Bhogva River near the Gulf of Cambay	• Dockyard • Rice husk • Fire altars • Chess playing
Surkotada	Gujarat	• Bones of horses • Beads

Banawali	Haryana	● Beads ● Barley ● Evidence of both the pre-Harappan and Harappan cultures
Dholavira (UNESCO World Heritage Site)	Gujarat in the Rann of Kachchh	● Water harnessing system ● Water reservoir
Rakhigarhi	Haryana	● Granary ● Cemetery ● Drains ● Terracotta bricks
Ropar (The first site to be excavated after independence.)	On the banks of the River Sutlej in Punjab, India	● Dog buried with human in oval pit burials ● copper axe.
Alamgirpur	Meerut, Uttar Pradesh, on the banks of the Yamuna – Easternmost site of IVC.	● broken blade made of copper ● ceramic items ● Impression of a cloth on a trough
Mehrgarh	Pakistan	● Pottery ● copper tools
Kot Diji	Pakistan	● Statues of Bull
Daimabad (the southernmost site of IVC)	Maharashtra	● Bronze Chariot
Mand (Northernmost site)	Jammu and Kashmir	

Major IVC Sites



5. Lokmanya Bal Gangadhar Tilak (Source: PIB)

Freedom fighter and lawyer, Bal Gangadhar Tilak, is also known as Lokmanya Tilak.

- He was born on 23rd July 1856 in Ratnagiri, Maharashtra.
- He died on 1st August 1920.
- Referred to as the “Father of Indian Unrest” by British author Valentine Chirol in a book called *Indian Unrest*.

Ideology

- Stressed the need for self-rule and believed that without self-rule or swarajya, no progress was possible.
- **Slogan:** “Swaraj is my birthright, and I shall have it!”
- **Believed in Hindu revivalism**, but not communalism.
- Advocated Swadeshi, Boycott, and National Education.
- Focused on building Indian confidence and unity through cultural nationalism.

Role in Indian National Congress

- Leader of the Lal-Bal-Pal trio (Lala Lajpat Rai, Bal Gangadhar Tilak, Bipin Chandra Pal).
- Represented the extremist faction in the INC (split in 1907 Surat Session).
- Rejoined the INC in 1916 after the Lucknow Pact with the Muslim League.

All India Home Rule League

- Founded by Tilak in April 1916 at Belgaum.
- It worked in Maharashtra (except Bombay), the Central Provinces, Karnataka and Berar.

Editor & Journals Founded

- Kesari (Marathi)
- The Maratha (English)

Books

- Gita Rhasya and Arctic Home of the Vedas.

Social & Cultural Initiatives

- Started Ganesh Utsav and Shivaji Jayanti to unite people and invoke national pride.
- Opposed child marriage and supported education for all, especially women.

Role in Education

- Co-founded Deccan Education Society (1884) and Fergusson College (1885) in Pune.

6. Sarnath (Source: The Hindu)

It is a Buddhist heritage site located near Varanasi, Uttar Pradesh.

- **Recently, it became India's 45th UNESCO World Heritage Site**

Fact To Know

- *The location where Buddha delivered his first sermon.*
- Tied to the Mauryan period and the spread of Buddhism.
- *The Lion Capital of Sarnath pillar was adopted as the National emblem of India.*

Architectural Significance

- *Ashokan Pillar and its Lion Capital were erected here as a memorial for Buddha's first sermon by Ashoka.*
- The famous Gupta period (5th cent CE) sculpture of the Buddha Shakyamuni in the Dharmachakra Pravartana mudra was uncovered during the excavations at Sarnath
- The Dhamek Stupa is a huge stupa in Sarnath.

POLITY

1. Foreign Contribution Regulation Act (Source: The Hindu)

- The FCRA was passed in 1976 due to concerns that foreign governments were funding independent organizations to meddle in India's internal affairs.
- *The law aims to control foreign donations to organizations and people to ensure that they operate following the principles of a sovereign democratic republic.*
- FCRA registrations are granted to individuals or associations with definite cultural, economic, educational, religious, and social programs.
- **The FCRA requires every person or NGO seeking to receive foreign donations to be:**
 - Registered under the Act,
 - To open a bank account for the receipt of foreign funds in the State Bank of India, Delhi,
 - To utilize those funds only for the purpose for which they have been received and as stipulated in the Act.
- **Exceptions**
 - Under the FCRA, applicants must be genuine and cannot engage in forced or incentivized religious conversions.
 - They must not have been charged or convicted of inciting communal conflict.
 - The Act also prohibits political parties, public officials, journalists, media organizations, judges, government employees, and politically affiliated groups from accepting foreign donations.
- **Previous Amendments**
 - The FCRA was revised in 2010 to "consolidate the law" on the use of foreign funds and "to prohibit" their use for "any activities detrimental to the national interest."
 - The 2020 amendment strengthened government oversight and control over how foreign donations to NGOs are received and used.
- **FCRA Amendment Rules 2026**
 - NGOs must specify exact objectives and operational areas, with separate fees for each activity category and State/UT.
 - Foreign funds can be used for worship, religious education, heritage preservation, and community kitchens, but cannot be used for religious conversion.
 - Associations having foreign nationals (other than Persons of Indian Origin (PIOs)) as key functionaries will "ordinarily not be considered" for registration or prior permission to receive funds.

- NGOs must utilize at least 75% of previous funds before receiving further installments and spend at least Rs 10 lakh on approved activities over two years for renewal eligibility.
- Mandatory disclosure of the ultimate donor, official websites, social media accounts, and publications to strengthen accountability.

2. Overseas Citizen of India (OCI) (Source: The Hindu)

*The OCI scheme was introduced through an amendment to the **Citizenship Act, 1955**, in the year 2005, which allows foreign citizens of Indian origin to live, work, and travel freely in India without dual citizenship.*

Eligibility: Any foreign national, except a national of Pakistan or Bangladesh

- Were citizens of India on or after 26th January, 1950.
- Were eligible to become Indian citizens on 26th January, 1950.
- Belonging to a territory that became part of India after 15th August, 1947.
- Are children, grandchildren, or great-grandchildren of such persons
- Minor children of such individuals or those with one Indian parent.
- A foreign-origin spouse of an Indian citizen or an existing OCI cardholder is eligible if the marriage has been registered and has subsisted for at least two years preceding the application.

Ineligible Categories

- Individuals who are currently serving or have retired from foreign military services are not entitled to receive OCI status.

Benefits for OCIs

- Multiple-entry multi-purpose life-long visa to visit India
- Equality with NRIs in certain financial, economic, and educational matters, except for the acquisition of agricultural or plantation land, and in matters of inter-country adoption of Indian children.
- Eligible for grant of Indian citizenship under Section 5(1)(g) of the Citizenship Act, 1955, after completion of 5 years as an OCI cardholder, provided he has resided in India for one year out of 5 years before making the application.
- Eligible to enroll in the National Pension Scheme (NPS) for Non-Resident Indians.

Restrictions Related to OCI Cardholders

- OCI does not confer political rights to vote.
- Does not provide dual citizenship.
- Not eligible to hold Indian constitutional posts like President, Vice President, Judges of the Supreme Court, or High Court.

- Not eligible for being a member of the House of the People/Council of States/Legislative Assembly/Legislative Council.
- OCI cardholders cannot hold regular government jobs, except where specifically permitted by the Central Government via special notifications.
- Special permission is mandatory for research, mountaineering, missionary/journalistic work, and travel to Protected or Restricted Areas.

3. Joint Parliamentary Committee (JPC) (Source: The Hindu)

A JPC is an ad-hoc and bipartisan committee constituted to examine specific matters such as proposed legislation or policy issues in detail.

Facts To Know

- Formed under the Rules of Procedure and Conduct of Business in the Lok Sabha.
- The Lok Sabha Speaker constitutes the JPC, and members are drawn from both Houses of Parliament.
- The committee has 31 member ((21 from Lok Sabha and 10 from Rajya Sabha)

Functions

- Examines bills, policies, or specific issues referred to it.
- Consults stakeholders, experts, and officials for a comprehensive analysis.
- Can summon documents, witnesses, and experts for deliberations.
- The committee's recommendations are advisory and not mandatory for the government to follow.

4. Defence Acquisition Council (DAC) (Source: The Hindu)

The DAC is the highest decision-making body of the Defence Ministry on procurement.

- **Objective:** To ensure expeditious procurement of the approved requirements of the armed forces.
- **Formation:** It was formed after the Group of Ministers' recommendations on 'Reforming the National Security System', in 2001, post-Kargil War (1999).
- **Composition:**
 - The defence minister is the chairman of DAC.
 - Its members include the Chief of Defence Staff (CDS) and chiefs of the Army, Navy, and Air Force.

5. One Nation One Election (Source: The Hindu)

- *One Nation, One Election* refers to the proposal of conducting simultaneous elections for the Lok Sabha (the lower house of India's Parliament) and all state legislative assemblies.
- The idea seeks to synchronize the electoral calendar across India, ensuring elections are held at the same time across the country.

Historical Background

- Simultaneous elections were a common practice in India during the first two decades post-independence, with elections to both the Lok Sabha and state assemblies held together in 1952, 1957, 1962, and 1967.
- However, the cycle was disrupted due to the premature dissolution of certain state assemblies and the Lok Sabha in the late 1960s and 1970s.

Need for One Nation One Election

- **Cost and Resource Savings:** Simultaneous polls reduce repeated expenditure on administration, security, logistics and deployment of central forces.
- **Governance Continuity:** Fewer interruptions from frequent campaigning let elected governments prioritise policy implementation and long-term projects.
- **Reduced Administrative Fatigue:** bureaucrats avoid repeated election-related duties, improving public service delivery.

Arguments Against

- **Federalism and State Autonomy:** Synchronisation could weaken state governments' ability to call fresh elections responsive to local crises, concentrating scheduling leverage at the Centre.
- **Democratic Representation and Accountability:** Mid-term assemblies allow voters to pass judgment on state governments between general elections; removing this may reduce political responsiveness.
- **Practical and Logistical Challenges:** conducting simultaneous polls across India's size and diversity raises major ECI resource, staffing, and EVM/IT preparedness issues.
- **Impact on Regional Parties and Local Issues:** national campaigns could overshadow state or local concerns, disadvantaging smaller/regional players.

Constitutional and Legal Changes Required

- *Amendment needed for Article 83 and Article 172, Part XV, governing elections.*
- Amendment needed for the **Representation of the People Act**.
- A high-level committee was set up by the Union government under the chairmanship of the former President of India, Shri. Ram Nath Kovind.

6. Unlawful Activities (Prevention) Act (UAPA) (Source: The Hindu)

UNLAWFUL ACTIVITIES (PREVENTION) ACT (UAPA)

A Key Legislation to Prevent Terrorism and Activities Prejudicial to the Sovereignty, Integrity and Security of India

ABOUT UAPA

- Enacted in 1967; came into force in 1968.
- Re-enacted in 2004 with significant amendments to tackle terrorism more effectively.
- Amended in 2008, 2012, 2019 to address evolving threats.
- Applicable throughout India.
- Administered by NIA and State Police.

सत्यमेव जयते

OBJECTIVE

To prevent unlawful activities and associations and to deal with terrorist activities effectively for the security, sovereignty and integrity of India.

WHAT IS 'UNLAWFUL ACTIVITY'?

As per Section 2(o), an "unlawful activity" means an act intended:

- To provoke secession, armed rebellion or subversive activities against India.
- To threaten the unity, integrity, security, economic security or sovereignty of India.
- To strike terror in people or any section of people in India or foreign country.
- To disrupt essential services or incite communal disharmony.
- To support terrorist activities.

TERRORIST ACT (SECTION 15)

A "terrorist act" includes an act that:

- Involves violence or threat of violence.
- Causes or is likely to cause death, serious injury or damage to property.
- Is intended to strike terror or coerce the Government or people.
- Disrupts essential services.
- Endangers the unity, integrity, security, economic security or sovereignty of India.

PROHIBITED ACTIVITIES (SEC 3)

The Central Government may, by notification, declare an association or organisation as unlawful if it is involved in unlawful activities.

Punishment for membership:

- Up to 3 years imprisonment and fine.
- Up to 5 years imprisonment for continued membership.
- Up to 10 years imprisonment for membership of a terrorist organisation.

INVESTIGATION & AUTHORITIES

- NIA has exclusive jurisdiction over terrorism cases and offences under UAPA.
- State Police may investigate with prior approval of the Central Government.
- Director General of Police or above officer to investigate.

ARREST & DETENTION

- Police can arrest without warrant.
- Remand to be in judicial custody.
- Chargesheet to be filed within 90 days (extendable up to 180 days) with approval of Court.
- Individuals can be detained for up to 2 years under Section 35.

BAIL PROVISIONS (SECTION 43D(5))

Court shall not grant bail if it is of the opinion that:

- There are reasonable grounds for believing the accusation to be prima facie true; and
- The accused is likely to commit any offence while on bail.

PUNISHMENTS

- Terrorist Act (Sec 15) ----- Imprisonment for life (death penalty in rare cases).
- Raising funds for terrorist act (Sec 17) --- Up to life imprisonment.
- Conspiracy (Sec 18) ----- Up to life imprisonment.
- Harbouring terrorists (Sec 19) ----- Up to life imprisonment.
- False information (Sec 38) ----- Up to 2 years imprisonment and fine.

IMPORTANT AMENDMENTS

- 2008 - Inclusion of individuals as terrorists. Strengthened investigation and attachment of property.
- 2012 - Introduction of Section 43D(5) (stringent bail provision).
- 2019 - Expansion of NIA's powers. Inclusion of new offences (e.g., funding terrorism). Extended definition of terrorist act.

CRITICISMS

- Stringent bail provisions misused.
- Vague and overbroad definitions.
- Long periods of incarceration without trial.
- Potential misuse against dissent and civil society.

UAPA is a crucial tool in India's fight against terrorism. However, its stringent provisions need to be balanced with safeguards to protect civil liberties and ensure justice.

7. Right To Vote (Source: The Hindu)

It is a constitutional right that allows citizens to participate in the formation of the government through voting.

Constitutional Provisions Dealing with the Right to Vote

- **Article 326:** Mandates that elections to the Lok Sabha (House of the People) and the Legislative Assemblies of every State shall be based on adult suffrage.
- **Article 325:** No person can be excluded from the electoral roll only on grounds of religion, race, caste, or sex.
- **Article 324:** Gives the Election Commission of India the power of superintendence, direction, and control over elections.

Who can vote?

- Must be a citizen of India.
- Must be at least 18 years old (61st Amendment Act (1988) - reduced the voting age from 21 to 18 years)
- Must be registered in the electoral roll of the constituency where they ordinarily reside.

Who cannot vote?

- Non-citizens
- Unsound mind (declared by the court)
- Disqualified due to: Electoral offences, Corrupt practices
- Prisoners (except preventive detention)

Who gives the Right To Vote?

- The right is granted by the Constitution of India and regulated by Parliament under
 - **Representation of the People Act, 1950:** Deals with the preparation of electoral rolls and the qualification of voters.
 - **Representation of the People Act, 1951:** Deals with the actual conduct of elections and disqualifications.

8. National Food Security Act, 2013 (Source: The Hindu)

- **Objective:** To provide for food and nutritional security in the human life cycle approach, by ensuring access to adequate quantities of quality food at affordable prices to people to live a life with dignity.
- **Coverage:** It covers 75% of the rural population, and up to 50% of the urban population receives subsidized food grains under the Targeted Public Distribution System (TPDS). Overall, NFSA caters to 67% of the total population.
- **Eligibility:**

- Priority Households are to be covered under TPDS, according to guidelines by the State government.
- Households covered under the existing Antyodaya Anna Yojana.
- **Provisions:**
 - 5 Kg of foodgrains per person per month at Rs. 3/2/1 per Kg for rice/wheat/coarse grains.
 - The existing Antyodaya Anna Yojana household will continue to receive 35 Kg of foodgrains per household per month.
 - Meal and maternity benefits of not less than Rs. 6,000 to pregnant women and lactating mothers during pregnancy and six months after childbirth.
 - Meals for children up to 14 years of age.
 - Food security allowance to beneficiaries in case of non-supply of entitled foodgrains or meals.
 - Setting up grievance redressal mechanisms at the district and state levels.

9. Panchayat Extension to Scheduled Areas (PESA) Act, 1996 (Source: The Indian Express)

- *The PESA Act was enacted to provide for the extension of the provisions of Part IX of the Constitution relating to the Panchayats to the Scheduled Areas”.*
- *Part IX, comprising Articles 243-243ZT of the Constitution, contains provisions relating to municipalities and cooperative societies.*
 - Provision for rural bodies was added by the **73rd Amendment**.
- **Objectives**
 - To extend the provisions of Part IX of the Constitution relating to the panchayats to the scheduled areas with certain modifications
 - To provide self-rule for the bulk of the tribal population
 - To have village governance with participatory democracy and to make the gram sabha a nucleus of all activities
 - To evolve a suitable administrative framework consistent with traditional practices
 - To safeguard and to preserve the traditions and customs of tribal communities
 - To empower panchayats at the appropriate levels with specific powers conducive to tribal requirements.

INTERNATIONAL RELATIONS

1. World Bank Group (Source: The Hindu)

Aim

- To reduce global poverty and support sustainable development through financial and technical assistance.

Formation

- Established in 1944 at the Bretton Woods Conference alongside the International Monetary Fund (IMF)

Headquarters

- Washington, D.C., USA.

Key Activities

- Providing loans for projects that promote economic development and reduce poverty.
- Funding major infrastructure projects (e.g., roads, water systems, and schools).
- Offering technical expertise to developing nations.

Five Institutions of the World Bank Group

- **International Bank for Reconstruction and Development (IBRD):** The foundational arm of the bank. It provides loans, guarantees, and advisory services to middle-income and creditworthy low-income sovereign governments.
- **International Development Association (IDA):** Focuses exclusively on the world's poorest countries. It provides grants and "concessional" loans (credits with zero or ultra-low interest and long repayment periods).
- **International Finance Corporation (IFC):** The private-sector arm of the group. It promotes sustainable economic growth in developing countries by financing private sector investments, mobilizing capital in international financial markets, and providing advisory services to businesses and governments.
- **Multilateral Investment Guarantee Agency (MIGA):** Promotes foreign direct investment (FDI) into developing nations by offering political risk insurance (guarantees against non-commercial risks like war, terrorism, civil disturbance, and expropriation) to investors and lenders.
- **International Centre for Settlement of Investment Disputes (ICSID):** An autonomous international arbitration institution designed to facilitate the conciliation and arbitration of investment disputes between foreign investors and host states.

2. North Atlantic Treaty Organization (NATO) (Source: The Hindu)

NATO is a military alliance established by the North Atlantic Treaty (also called the Washington Treaty) in April 1949, with 32 member countries.

- It was set up to provide collective security against the Soviet Union.
- *Headquarters is located in Brussels, Belgium.*
- NATO's essential and enduring purpose is to safeguard the freedom and security of all its members by political and military means and collective defence under Article 5 of the treaty.
- Founding members are Belgium, Canada, Denmark, France, Iceland, Italy, Luxembourg, the Netherlands, Norway, Portugal, the United Kingdom, and the United States.
- Countries recently joined NATO are Finland (31st member in 2023), Sweden (32nd member in 2024).

3. Quadrilateral Security Dialogue (QUAD) (Source: The Hindu)

Informal strategic forum comprising the United States, Japan, India, and Australia.

- The first meeting of Quad officials took place during the ASEAN Regional Forum summit in the Philippines in May 2007.
- Quad partners engage regularly through Leaders, Foreign Ministers, Quad Sherpas, senior officials, and experts.

Aim

- Ensure a peaceful, stable, and prosperous Indo-Pacific region.
- Ensure maritime and transnational security, cybersecurity, harness critical and emerging technologies, and respond to regional emergencies.

4. Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Source: The Hindu)

It is the first and only legally binding international treaty to directly address the safety of handling nuclear waste and spent fuel on a global scale.

- *Came under the auspices of the International Atomic Energy Agency (IAEA) in 1997, it entered into force on June 18, 2001.*

Note

- The Convention applies to spent fuel resulting from the operation of civilian nuclear reactors and to radioactive waste resulting from civilian applications.
- It also applies to spent fuel and radioactive waste from military or defence programmes if such materials are transferred permanently to and managed

within exclusively civilian programmes, or when declared as spent fuel or radioactive waste for the Convention by the Contracting Party concerned.

- It covers planned and controlled releases into the environment of liquid or gaseous radioactive materials from regulated nuclear facilities.

5. Exercise Pitch Black 2026 (Source: The Hindu)

- *It is a premier multinational air combat exercise, held in Australia.*
- It aims to provide a platform for participating air forces to enhance operational interoperability, strengthen military cooperation, and refine air combat tactics in realistic and complex scenarios.
- Along with India, participating countries include Brunei, Canada, Fiji, Finland, France, Indonesia, Japan, Malaysia, New Zealand, Papua New Guinea, the Philippines, the Republic of Korea, Singapore, Spain, Sweden, Thailand, the United Kingdom, the United States, and host nation Australia.

Other India – Australia Exercise

- **AUSTRAHIND:** An annual bilateral army training exercise, hosted alternately by India and Australia.
- **AUSINDEX:** A biennial bilateral maritime exercise between the Indian Navy (IN) and the Royal Australian Navy (RAN).
- **Exercise Malabar:** The premier naval exercise featuring the Quad nations (India, Australia, the United States, and Japan), focusing on high-end tactical naval maneuvers.

6. International Criminal Court (ICC) (Source: The Hindu)

- **What is it?:** The International Criminal Court (ICC) is an intergovernmental organisation and international tribunal.
- **Formation**
 - It is the first international criminal court that is permanently established.
 - The Rome Statute, which served as its foundation document, became effective on July 1, 2002.
- **Headquartered:** The Hague, Netherlands

- **What they do?:** It looks into and prosecutes those accused of heinous offences such as genocide, crimes against humanity, war crimes, and acts of aggression.
- **Status of India:** India is not a member.

7. World Trade Organisation (WTO) (Source: The Hindu)

- **Establishment:** The World Trade Organization (WTO) was established on January 1, 1995, replacing the General Agreement on Tariffs and Trade (GATT) under the Marrakesh Agreement (1994)
- **Purpose:** The primary objective of the WTO is to facilitate smooth and free trade across the globe, ensuring that trade flows as smoothly, predictably, and freely as possible.
- **Headquarters:** Geneva, Switzerland.
- **Members:** 166 countries, representing 98% of global trade.
- **Key Bodies:**
 - Ministerial Conference (MC): Highest decision-making authority.
 - Dispute Settlement Body (DSB): DSB resolves trade disputes.

Core Functions

- The WTO provides a forum for negotiations among member countries to reduce barriers to trade and create agreements on various trade-related issues.
- The WTO has a robust dispute settlement mechanism to resolve trade disputes between members, ensuring that trade rules are respected and applied consistently.
- Regular reviews of member countries' trade policies are conducted to ensure transparency and understanding of trade policies and practices.
- The WTO assists developing countries in building their trade capacity through technical assistance and training programs.

Subsidies

- In WTO terminology, subsidies in general are identified by “Boxes” which are given the colours of traffic lights: green (permitted), amber (slow down — i.e. need to be reduced), red (forbidden).

Key Agreements

- **GATT:** The General Agreement on Tariffs and Trade, which focuses on reducing tariffs and other trade barriers.

- **GATS:** The General Agreement on Trade in Services, which governs international trade in services.
- **TRIPS:** The Agreement on Trade-Related Aspects of Intellectual Property Rights, which sets minimum standards for the protection of intellectual property.
- **TBT and SPS:** The Agreements on Technical Barriers to Trade and Sanitary and Phytosanitary Measures, which address regulations and standards to ensure they do not create unnecessary obstacles to trade.

ENLITE IAS

8. Association of Southeast Asian Nations (ASEAN) (Source: PIB)



ASSOCIATION OF SOUTHEAST ASIAN NATIONS (ASEAN)

One Vision, One Identity, One Community



ABOUT ASEAN

- ASEAN is a regional intergovernmental organization of Southeast Asian countries.
- Established on **8 August 1967** through the Bangkok Declaration (Bangkok, Thailand).
- Aims to promote regional peace, stability, economic growth, and socio-cultural development.
- ASEAN Secretariat is based in Jakarta, Indonesia.

MEMBER STATES (11)


Brunei Darussalam


Cambodia


Indonesia


Lao PDR


Malaysia


Myanmar


Philippines


Singapore


Thailand


Viet Nam


East Timor (Timor-Leste)

East Timor was officially admitted as the 11th member on 10 May 2025.

OBJECTIVES

-  To accelerate economic growth, social progress and cultural development.
-  To promote regional peace and stability.
-  To promote active collaboration and mutual assistance.
-  To provide assistance in education, research and training.
-  To enhance cooperation with external partners and international organizations.

ASEAN MAP



PILLARS OF ASEAN COMMUNITY



ASEAN POLITICAL-SECURITY COMMUNITY (APSC)
Promotes peace, stability, democracy, human rights and the rule of law.



ASEAN ECONOMIC COMMUNITY (AEC)
Aims for a single, integrated market and a highly competitive economic region.



ASEAN SOCIO-CULTURAL COMMUNITY (ASCC)
Promotes inclusive and sustainable development and a people-oriented ASEAN.

KEY ACHIEVEMENTS

-  Created one of the world's most dynamic regions with a combined GDP of over **US\$ 3.8 trillion** (2023 est.).
-  Established ASEAN Free Trade Area (AFTA) – one of the largest FTAs in the world.
-  Enhanced connectivity through infrastructure, transport and digital initiatives.
-  Promotes cooperation in disaster management, health, environment, and counter-terrorism.

IMPORTANT ASEAN FORUMS

ASEAN Summit | Highest decision-making body; held twice a year.

ASEAN Regional Forum (ARF) | Promotes political and security dialogue in the Asia-Pacific.

East Asia Summit (EAS) | Includes ASEAN countries and major partners (India, China, Japan, USA, Russia, etc.).

ASEAN Defence Ministers' Meeting (ADMM) | Enhances defence cooperation and strengthens trust among member states.

ASEAN DIALOGUE PARTNERS


China


Japan


Republic of Korea


India


Australia


New Zealand


United States


Russia


European Union (EU)


Canada


United Kingdom

...and more partners through sectoral dialogue and cooperation.

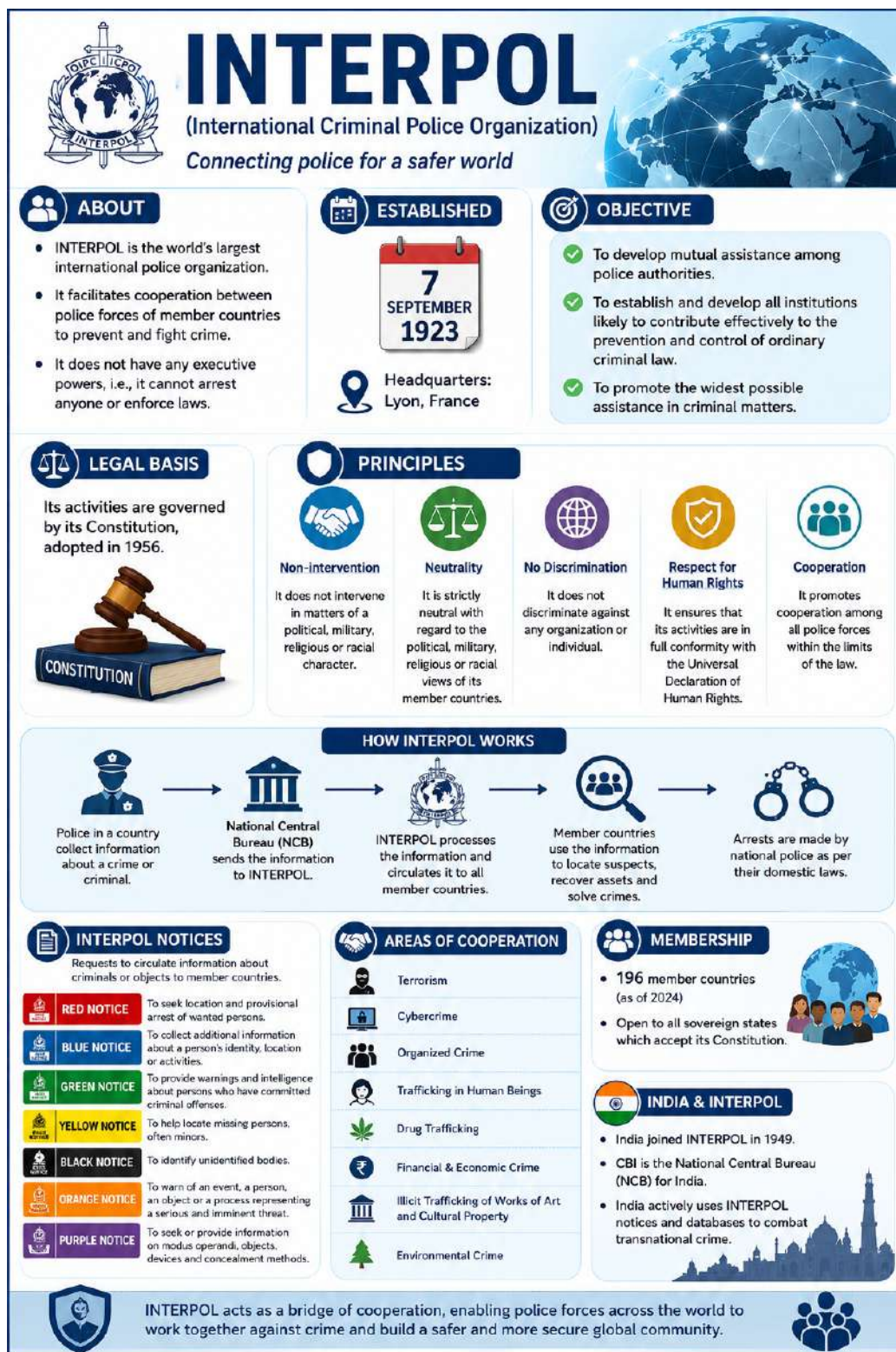
DID YOU KNOW?

ASEAN is home to over **680 million** people, diverse cultures, languages and traditions, working together towards a peaceful and prosperous Southeast Asia.

FACT BOX

	Established 8 August 1967		Member States 11		Population 680+ million		Combined GDP (2023 est.) US\$ 3.8 trillion+		Secretariat Jakarta, Indonesia
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9. International Police Organisation (Interpol) (Source: The Hindu)



ECONOMY

1. Trade Deficit (Source: The Hindu)

A Trade Deficit occurs when a country's total cost of imports exceeds its total earnings from exports over a given period. It is a key component of the Current Account Balance, which falls under the broader umbrella of the Balance of Payments (BoP).

- **Trade Deficit = Value of Imports – Value of Exports**

Causes of Trade Deficit

- Import of crude oil, gold, machinery, electronics, and fertilizers.
- Lower global demand or reduced competitiveness of domestic products.
- A stronger domestic currency makes imports cheaper and exports relatively expensive.
- Higher purchasing power increases demand for imported goods.
- Industries relying on imported inputs increase import bills.

Types

- Merchandise (goods) trade deficit: Gap between goods exports and goods imports.
- Services trade deficit/surplus: Gap between services exports and imports.
- Bilateral trade deficit: Deficit with a specific country.

Impacts

- **Positive Effects**
 - Availability of advanced technology and capital goods.
 - Access to cheaper imported products.
 - Supports industrial production where imports are essential.
- **Negative Effects**
 - Increases demand for foreign currency.
 - Can lead to depreciation of the domestic currency.
 - May widen the Current Account Deficit (CAD).
 - Reduces foreign exchange reserves if persistent.
 - Can hurt domestic industries due to import competition.

2. Windfall Tax (Source: The Hindu)

A windfall tax is a special tax that governments impose on industries or entities earning unexpected, above-average profits due to external factors like market surges or geopolitical events.

- It is commonly levied on industries such as oil, gas, and mining.

Need To Know

- Governments use it to capture excess profits for public revenue, fund welfare, or stabilize economies.
- India first implemented windfall profit taxes on 1st July 2022



3. Debentures (Source: The Hindu)

A debenture is a medium- to long-term debt security issued by a company as a means of borrowing money at a fixed interest rate.

Features

- Classified as borrowed funds or liabilities, making debenture holders creditors (not owners) of the company.
- Pay a fixed rate of interest (coupon rate) regularly, regardless of whether the company makes a profit or loss.
- Debenture holders have no voting rights in company management.

Types of Debentures

- **Convertible Debentures:** Can be changed into equity shares of the company after a set time.
- **Non-Convertible Debentures (NCDs):** Cannot be changed into shares and are repaid at maturity with higher interest rates.
- **Secured Debentures:** Secured debentures are backed by company assets.
- **Unsecured Debentures:** Unsecured debentures rely only on the general creditworthiness and reputation of the issuer.

4. Monetary Tools by the RBI to Control Inflation

The Hindu)

(Source:

Quantitative Tools: *Quantitative tools of monetary policy are aimed at controlling the cost and quantity of credit.*

- **Bank Rate or Discount Rate**
 - Bank Rate or Discount Rate is the rate at which the RBI is ready to buy or rediscount Bills of Exchange or other Commercial Papers from the Scheduled Commercial Banks (SCBs).
 - An increase in the Bank Rate results in a tightening of money supply and vice versa.
- **Cash Reserve Ratio (CRR)**
 - Cash Reserve Ratio (CRR) is the share of a bank's total deposit that is mandated by the Reserve Bank of India (RBI) to be maintained with the latter as reserves in the form of liquid cash.
 - The bank cannot use this amount for lending and investment purposes and does not get any interest from the RBI.
 - CRR applies to scheduled commercial banks, while the regional rural banks and NBFCs are excluded.
 - If the RBI increases the CRR, the commercial banks have to deposit more money with the RBI and are left with less money to lend to customers. Thus, the effect is reduced money supply in the economy.
 - If the RBI decreases the CRR, the commercial banks have to deposit less money with the RBI and are left with more money to lend to customers. Thus, the effect is increased money supply in the economy.
- **Statutory Liquidity Ratio (SLR)**
 - SLR is a minimum percentage of deposits that a commercial bank has to maintain in the form of liquid cash, gold or other securities.
 - It is basically the reserve requirement that banks are expected to keep before offering credit to customers.

- However, these deposits are maintained by the banks themselves and not with the RBI.
- The RBI fixes the SLR.
- **Liquidity Adjustment Facility**
 - A LAF is a monetary policy tool used in India by the RBI through which it injects or absorbs liquidity into or from the banking system.
 - It was introduced as a part of the outcome of the Narasimham Committee on Banking Sector Reforms of 1998.
 - LAF has two components - repo (repurchase agreement) and reverse repo.
 - **Repo Rate:** Repo Rate is the rate of interest at which the RBI provides short-term loans to SCBs against approved securities.
 - **Reverse Repo Rate:** Reverse Repo Rate is the rate of interest at which the RBI borrows funds from the SCBs.
- **Marginal Standing Facility (MSF)**
 - Marginal standing facility (MSF) is a window for banks to borrow from the Reserve Bank of India in an emergency situation when inter-bank liquidity dries up completely.
 - Banks borrow from the central bank by pledging government securities at a rate higher than the repo rate under liquidity adjustment facility or LAF in short.
 - The MSF rate is pegged 100 basis points or a percentage point above the repo rate.
 - Under MSF, banks can borrow funds up to one percentage of their net demand and time liabilities (NDTL).
- **Open Market Operations (OMOs)**
 - Open Market Operations (OMOs) refer to the buying and selling of government securities by RBI to regulate the short-term money supply.
 - If RBI wants to induce liquidity or more funds in the system, it will buy government securities and inject funds into the system.
- **Market Stabilization Scheme (MSS)**
 - Market Stabilization Scheme (MSS) refers to intervention by the RBI to withdraw excess liquidity by selling government securities in the economy.

Qualitative Credit Control

- **Margin Requirements:** Margin refers to the difference between the value of securities offered for loans and the value of loans actually granted.

- **Consumer Credit Regulation:** Credit made available by commercial banks (installments) for the purchase of consumer durables is known as consumer credit.
- **Moral Suasion:** Moral Suasion means persuasion and request. RBI makes the banks adhere to the policy and directives through persuasion or pressure to maintain a certain level of money supply in the economy.
- **Direct Action:** The RBI takes direct action such as refusing to rediscount the bills or charging penal interest rates, etc when a commercial bank does not co-operate with the central bank in achieving its desirable objectives.
- **Rationing of Credit or Credit Ceiling:** Under this, the RBI fixes a ceiling on the amount of loans that can be granted by SCBs. As a result, SCBs tighten in advancing loans to the public.

5. Basel Norms (Source: The Hindu)

- *Basel norms or Basel Accords are the international banking regulations issued by the Basel Committee on Banking Supervision.*
- The Basel norms are an effort to coordinate banking regulations across the globe to strengthen the international banking system.
- *It is the set of agreements by the Basel Committee on Banking Supervision that focuses on the risks to banks and the financial system.*

Need

- **Basel I Norms**
 - The first Basel Accord, known as Basel I, was issued in 1988
 - It focused on credit risks and defined capital and the structure of risk weights for banks
 - The minimum capital requirement was fixed at 8% of the Risk-Weighted Assets (RWA)
- **Basel II Norms**
 - It is the refined and reformed version of Basel I, which was published in 2004.
 - It defined 3 types of risks – Operational Risks, Credit Risks, and Market Risks.
 - Its 3 main pillars of Basel II were as follows:
- **Basel III Norms**
 - Basel III guidelines were released in December 2010 in the backdrop of the financial crisis of 2008.
 - The guidelines aim to promote a more resilient banking system by focusing on four vital banking parameters viz. capital, leverage, funding, and liquidity.

6. Inflation: Causes, Types (Sources: The Indian Express)



ENVIRONMENT

1. Ethanol Blending (Source: The Hindu)

Ethanol Blending involves mixing of ethanol with petrol to create cleaner, more sustainable fuel. Initially, the target was 5% blending, which has now been increased to 20% blending.

- The present target is E100 (pure ethanol). E100 needs flex-fuel vehicles that can run on varying ethanol blends.

Benefits

- Reduces hydrocarbon emissions, making the atmosphere cleaner (GHG emissions in the case of use of sugarcane- and maize-based ethanol are less by 65% and 50%, respectively, than those of petrol)
- Saves precious foreign exchange by reducing import demand.
- Ensures an alternate source of income for farmers.

Challenge

- It can lead to a food security crisis due to food crop diversion and water usage for sugarcane cultivation.

Ethanol Blended Petrol (EBP) Programme

- Aimed at mixing ethanol with standard motor petrol. Operating under the ambit of the National Biofuel Policy (NBP) 2018, the program is driven by the Ministry of Petroleum and Natural Gas.
- Its primary goals are to reduce India's heavy reliance on imported crude oil, cut greenhouse gas emissions, and boost farmers' incomes by creating a lucrative alternate market for agricultural produce.

Generation of Ethanol

- **1st Generation Ethanol:** It is made from food crops such as cereals (rice, wheat, barley, corn, and sorghum), sugarcane, sugar beet etc.
- **2nd Generation Ethanol:** It is made from ligno-cellulosic or woody biomass, or agricultural residues/waste such as wheat straw, corn stover, wood etc.
- **3rd Generation Ethanol:** It includes those derived from aquatic biomass such as algae.
- **4th Generation Ethanol:** It is derived from engineered plants and microorganisms

2. Ecological Significance of Vultures: Threats, Conservation Measures (Source: The Hindu)



VULTURES

Nature's Silent Protectors

Scavengers with a vital role in ecosystem health

ECOLOGICAL SIGNIFICANCE OF VULTURES

 Nature's Clean-up Crew Vultures consume carcasses, preventing buildup of dead animals in the environment.  Disease Control By quickly disposing of carcasses, vultures reduce the spread of diseases like anthrax, rabies, foot-and-mouth disease, cholera.  Nutrient Cycling They help in recycling nutrients back to the ecosystem, maintaining soil fertility.	 Public Health Guardians Vultures act as a natural barrier against zoonotic diseases, protecting human and animal health.  Economic Benefits They save costs of carcass disposal through man-made methods and reduce healthcare costs linked to disease control.  Indicator Species Vulture population reflects the overall health of the ecosystem.
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ENLITE IAS

THREATS TO VULTURES

 Diclofenac Poisoning Use of diclofenac (a veterinary painkiller) in livestock leads to kidney failure in vultures. This is the primary cause of drastic decline.	 Other Toxic Substances Carbofuran, ketoprofen, aceclofenac, lead poisoning and contaminated carcasses also pose serious risks.	 Habitat Loss & Disturbance Loss of nesting sites due to deforestation, urbanization, wind turbines and power lines.	 Food Scarcity Decline in availability of carcasses due to improved carcass disposal systems and reduced livestock populations.	 Breeding Challenges Vultures have low reproductive rates (1 egg/year) and disturbance at nesting sites affects breeding success.	 Persecution & Myths Myths and superstitions lead to persecution and killing of vultures.
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CONSERVATION MEASURES

 Ban on Harmful Drugs Diclofenac banned in veterinary use in India (2006). Promote safe alternatives like meloxicam.  Vulture Restaurants Setting up safe feeding stations with drug-free carcasses to ensure food availability.  Nest Protection Protect and monitor nesting sites to reduce disturbance and improve breeding success.		 Awareness & Community Involvement Educate communities about the ecological importance of vultures and involve them in conservation.  Monitoring & Research Regular population monitoring, tracking threats, and research on vulture biology and ecology.  Strong Policy & Enforcement Strict enforcement of wildlife protection laws and regulation of veterinary drug use.
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WILDLIFE PROTECTION ACT, 1972

	Legal Protection All four species of vultures in India are protected under Schedule I of the Act – highest level of protection. Hunting, capturing, poisoning, selling or trade in vultures or their body parts is strictly prohibited.	Penalties Violation of provisions related to Schedule I species is punishable with imprisonment up to 7 years and fine up to ₹1 lakh or both.	Key Provisions Used - Sections 9, 39, 49, 51 – Prohibit hunting, trade and transport. - Section 50 – Duty of citizens to protect wildlife. - Empowered authorities can seize illegal trade and take action.	Enforcement The Act empowers forest departments and wildlife authorities to take legal action against offenders and protect vulture populations and their habitats.
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CONSERVATION STATUS (IUCN)

- White-rumped Vulture – Critically Endangered
- Indian Vulture – Critically Endangered
- Slender-billed Vulture – Critically Endangered
- Red-headed Vulture – Critically Endangered

(All four species critically declined in South Asia)



WHY WE MUST SAVE VULTURES

Without vultures, carcasses decay, diseases spread, and ecosystems suffer. Saving vultures is saving ourselves.

LET'S PROTECT TODAY FOR A HEALTHY TOMORROW!

"Vultures are not just birds, they are nature's unsung heroes."

3. Asiatic Lions (Source: The Hindu)

- *Gir National Park and Wildlife Sanctuary (dry deciduous forests) is the only abode of the Asiatic lion.*
- **Protection Status**
 - **IUCN Red List:** Endangered
 - **CITES:** Appendix I
 - **Wildlife (Protection) Act 1972:** Schedule I
- **Associated Tribe:** Gir is often linked with "**Maldharis**" (pastoral communities in the region), who have survived through the ages by having a symbiotic relationship with the lion.

Project Lion

- **Aim:** It envisages landscape ecology-based conservation of the Asiatic Lion in Gujarat by integrating conservation and eco-development.

4. Great Indian Bustard (Source: The Indian Express)

Rajasthan's state bird, and it is one of the heaviest flying birds in the world.

Need To Know

- **Ecological Habitat:** Grasslands
- **Threats:** Electrocution with power transmission lines, hunting, and Habitat loss
- **Protection Status:**
 - **IUCN Status:** Critically Endangered
 - **CITES:** Appendix I
 - **Convention on Migratory Species (CMS):** Appendix I
 - **Wildlife (Protection) Act, 1972:** Schedule I

Desert National Park

- It is located in the Thar Desert and is one of the key habitats of the Great Indian Bustard
- It is one of the largest national parks in India.

5. Invasive Alien Species (Source: The Hindu)

An invasive alien species is a species that is non-native (exotic) to a specific ecosystem and whose introduction causes, or is likely to cause, economic or environmental harm or harm to human health.

- **Key Characteristics:** High growth rate, rapid reproduction, high dispersal ability, and a lack of natural predators in the new environment.

Key Invasive Species in India

- **Flora:** Lantana camara, Water Hyacinth, Prosopis juliflora etc.
- **Fauna:** African Apple Snail, Fall Armyworm, African Catfish, etc.

Impact of Invasive Alien Species

- **Biodiversity Loss:** Outcompetes native species for food and space, leading to localized extinctions. Altered forest structures lead to a decline in herbivores (e.g., Chital, Elephant).
- **Economic Loss:** Damages agricultural yield, increases management costs, and affects livelihoods dependent on forest produce and fisheries.
- **Disruption of Food Webs:** Degrades the natural prey base in protected reserves, forcing predators like tigers and leopards into fringe villages.
- **Health Risks:** Species like Parthenium induce dermatological and respiratory issues, while stagnant water trapped by water hyacinth breeds disease vectors like mosquitoes.

Global Initiative to Control Invasive Species

- **Convention on Biological Diversity (CBD):** Calls on contracting parties to prevent the introduction of, control, or eradicate alien species that threaten ecosystems.
 - **Kunming-Montreal Global Biodiversity Framework:** Specifically aims to eliminate or reduce the impacts of invasive alien species by at least 50% by 2030.

National Initiative to Control Invasive Species

- **Biological Diversity Act, 2002:** Empowers the National Biodiversity Authority (NBA) to regulate and advise the Central Government on managing risks associated with exotic species.
- **Wildlife Protection (Amendment) Act, 2022:** Introduces provisions allowing the Central Government to regulate or ban the import, possession, and proliferation of invasive alien species.

6. Indicator Species (Source: Down To Earth)

An indicator species (or bioindicator) is an organism whose presence, absence, or population size reflects the overall health and specific environmental conditions of an ecosystem.

Significance

- They act as early warning systems, alerting ecologists to pollution, habitat degradation, or climate change long before the broader ecosystem collapses.

Key Characteristics

- They react quickly to minor changes in environmental variables (like pH, temperature, or toxicity).
- They survive only within a limited set of parameters.

Example

- Pelicans for wetlands
- Lichens for air pollution
- Gangetic River Dolphin for Ganga - Brahmaputra river system

7. Corporate Average Fuel Efficiency Norms (Source: The Hindu)

- Corporate Average Fuel Efficiency (CAFE) Norms were first introduced in 2017 under the **Energy Conservation Act, 2001**, with the aim of curbing fossil fuel dependence and air pollution from road transport.
- Issued by the **Bureau of Energy Efficiency (BEE)**.
- *The regulations set limits on corporate average fuel consumption, measured in litres per 100 kilometres, based on the average weight of vehicles sold by an automaker during a financial year.*
- *The rules aim to reduce carbon intensity by pushing companies to improve the efficiency of their overall fleet.*
- **Phases**
 - **CAFÉ 1:** implemented in 2017–18, capped average fuel consumption at 5.5 litres/100 km and emissions at <130 gm CO₂/km.
 - **CAFÉ 2:** in force since 2022–23, tightened this to 4.78 litres/100 km and <113 gm CO₂/km.
 - **CAFE III (or CAFE 2027):** Proposes to reduce permissible fuel consumption to a range of 3.72–3.01 litres/100 km, with emissions expected to fall below 91.7 gm CO₂/km.

8. White-bellied Heron (Source: The Hindu)

The White-bellied Heron, also known as the imperial heron or great white-bellied heron, is a large species of heron.

- **Habitat:** Strictly dependent on free-flowing, fast-flowing eastern Himalayan riverine habitats with low human disturbance.
- **Distribution:** Distributed across Himalayan freshwater ecosystems spanning Bhutan, India, Myanmar, China, and Bangladesh.
- **Major Threats:** Hydropower dams (habitat fragmentation, altered river flows), habitat loss, hunting, and anthropogenic disturbances.
- **Conservation Status**
 - **IUCN Status:** Critically Endangered
 - **Wildlife Protection Act, 1972:** Schedule-I

9. Critical Species as per IUCN (Source: The Hindu)

Critical Mammals

- **Pygmy Hog:** The world's smallest wild pig; indicator of grassland health; found mainly in Assam (Manas National Park).
- **Namdapha Flying Squirrel:** Endemic to a single valley in the Namdapha National Park, Arunachal Pradesh.
- **Kolar Leaf-nosed Bat:** Restricted to a single cave location in Kolar, Karnataka.
- **Malabar Civet:** Endemic to the Western Ghats, threatened by severe habitat loss.

Critical Birds

- **Great Indian Bustard:** Grassland bird heavily impacted by overhead power line collisions in Rajasthan and Gujarat.
- **Bengal Florican:** Grassland specialist facing agricultural conversion in the Terai region.
- **White-bellied Heron:** Found near remote rivers in the eastern Himalayas and foothills.
- **Vulture Species** (Indian Vulture, Red-headed Vulture, White-rumped Vulture, Slender-billed Vulture): Decimated historically by the veterinary drug diclofenac

Critical Reptiles

- **Gharial:** Fish-eating crocodilian with populations restricted mainly to the Chambal River system.
- **Red-crowned Roofed Turtle:** Freshwater turtle native to the Ganga River basin

10. Tigers Outside Tiger Reserves Project (Source: The Hindu)

The Tigers Outside Tiger Reserves (TOTR) is an initiative by the Ministry of Environment, Forest and Climate Change (MoEFCC) and the National Tiger Conservation Authority (NTCA).

- The project will be implemented over 2025–28

Objectives

- To reduce human–tiger conflicts in non-reserve landscapes by ensuring safe coexistence between people and dispersing tigers.
- To protect tigers that move beyond reserve boundaries due to habitat fragmentation, growing populations, and shrinking corridors.
- To foster a landscape-level conservation approach, balancing ecological sustainability with human safety and livelihoods.

Features

- **Geographical Spread:** Spans 80 forest divisions across 17 tiger-range states (including Madhya Pradesh, Maharashtra, Karnataka, Uttarakhand, Kerala, and Tamil Nadu).
- **Smart Surveillance:** Deployment of AI-powered early warning tools, GPS tracking, and camera traps in non-reserve corridors.
- **Rapid Response Teams (RRTs):** Local youth trained and equipped with rescue units and tranquilization gear to handle sudden conflict events.
- **Community Outreach:** Introduction of the "Bagh Mitra" (Tiger Friends) public program and eco-awareness modules to secure local habitats

11. Biofuel (Source: The Hindu)



12. Eco-Sensitive Zone (Source: The Hindu)

As per the National Wildlife Action Plan (2002-2016), issued by MoEFCC, land within 10 km of the boundaries of national parks and wildlife sanctuaries is to be notified as eco-fragile zones or Eco-Sensitive Zones (ESZ)

- They act as a transition zone from areas of high protection to areas involving lesser protection.
- It is notified under the **Environment Protection Act 1986** by the Ministry of Environment.

Regulation of Human Activities

- **Prohibited Activities:** Commercial mining, saw mills, commercial use of wood, etc., apart from regulated activities like felling of trees
- **Regulated Activities:** Felling of trees, establishment of hotels and resorts, commercial use of natural water, erection of electrical cables, drastic change of agricultural system, e.g., adoption of heavy technology, pesticides, etc, widening of roads.
- **Permitted Activities:** Ongoing agricultural or horticultural practices, rainwater harvesting, and organic farming, among others

13. Carbon Trading and Carbon Credit Trading Scheme (Source: Down To Earth)

Carbon Trading

- Carbon trading is a market-based mechanism designed to reduce global greenhouse gas (GHG) emissions by placing a financial value on carbon.
- The fundamental premise is that 1 carbon credit or permit equals 1 metric ton of CO₂ (or its equivalent in other GHGs) reduced, avoided, or removed from the atmosphere.

Carbon Credit Trading Scheme

- The **Carbon Credits Trading Scheme (CCTS)** is a market-based mechanism to reduce greenhouse gas (GHG) emissions by creating a national carbon market.
- It enables industries to trade carbon credits, thereby encouraging cost-effective emission reductions.
- CCTS is notified under **Energy Conservation (Amendment) Act, 2022**.
- Implemented By: Bureau of Energy Efficiency (**BEE**) – Ministry of Power and Ministry of Environment, Forest and Climate Change (**MoEFCC**).

SCIENCE AND TECHNOLOGY

1. Human Papillomavirus (HPV) (Source: The Hindu)

- *HPV is a **DNA virus** that spreads via sexual contact and causes cervical cancer and can affect other areas like the throat, skin, etc.*
- *No specific cure is available, but the vaccine exists.*

Few Steps Taken to Counter HPV

- **WHO: '90-70-90'** targets for 2030 to combat cervical cancer.
- The Union government has proposed to add the HPV vaccine under the **Universal Immunisation Programme.**
- **India's development of the indigenous quadrivalent vaccine, Cervavac**
 - The vaccine has to be administered in adolescent girls before they are sexually active between the ages of 9 and 14 years. This is because the vaccine can only prevent the entry of the virus.
 - Screening from the age of 30 can detect cervical disease, which when treated, also prevents cervical cancer.

Other Sexually Transmitted Diseases: AIDS, Hepatitis

2. CAR-T Cell Therapy (Source: The Hindu)

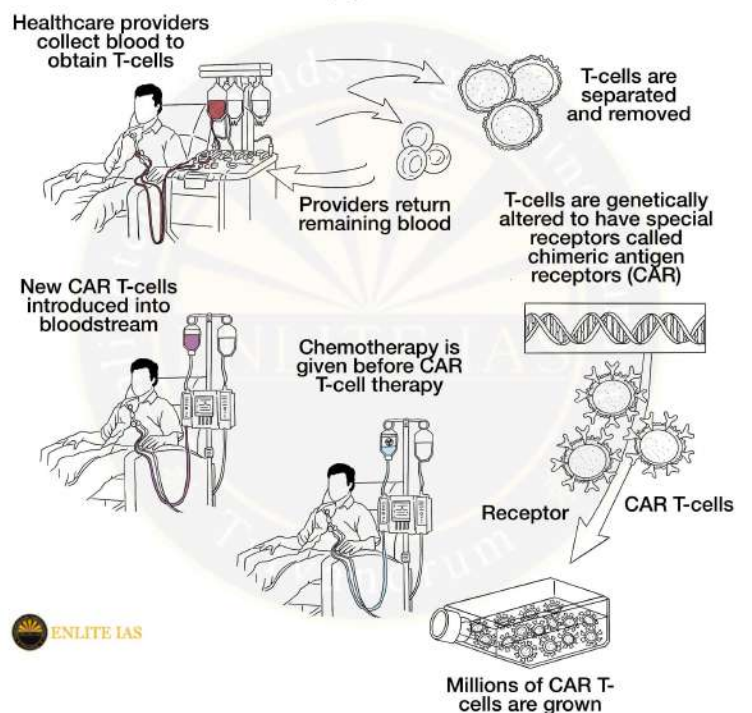
CAR-T cell therapy, also known as chimeric antigen receptor T-cell therapy, is a type of immunotherapy that uses a patient's own immune system to fight cancer.

- **Currently, it is approved for treating leukaemias and lymphomas.**

Procedure for the Therapy

- **Collecting T cells:** T cells, a type of white blood cell that helps fight infection, are extracted from the patient's blood through a process known as Apheresis.
- **Genetic Engineering:** In the laboratory, the T cells are genetically modified to express a special protein called a chimeric antigen receptor (CAR) on their surface.
- **Expansion:** The engineered T cells are multiplied in large numbers in the lab.
- **Infusion:** The expanded CAR-T cells are then infused back into the patient's bloodstream, where they can identify and attack cancer cells that express the targeted antigen

How CAR T-cell therapy is used to treat cancer



3. Gaganyaan Mission (Source: The Hindu)

Gaganyaan Mission is the manned space mission of India.

Fact To Know

- The crewed spaceflight plans to place humans to Low Earth Orbit (LEO) in the initial missions.
- Will help India gain practical knowledge and experience in launching future space exploration missions.
- The first uncrewed mission with a robot called Vyom-Mitra will help in assessing the preparedness of ISRO in manned missions.

Manned Space Exploration Across the World

- Project Apollo of the USA- Moon
- Artemis Programme of the USA- Moon
- Tiangong space station of China

4. OptoSAR Satellite Technology (Source: The Hindu)

OptoSAR is a hybrid satellite imaging technology that combines optical imaging and synthetic aperture radar (SAR) on one platform to capture Earth's surface

- It is associated with GalaxEye's Mission Drishti, described as the world's first OptoSAR satellite.

Features

- Optical sensors give clear, color-rich images, but they are affected by clouds and darkness.
- SAR can image through clouds and at night, but its output is harder to interpret.
- OptoSAR fuses both data streams to produce more usable, analysis-ready imagery.

Significance

- It enables day-and-night, all-weather Earth observation.
- It is useful for disaster response, flood mapping, agriculture monitoring, border surveillance, coastal monitoring, and infrastructure planning.
- The fusion approach reduces the gap between visual clarity and weather independence

5. Coal Gasification (Source: PIB)

Coal gasification is a process that transforms Coal into a Synthetic gas (Syngas), consisting of a mixture of gases such as Carbon monoxide (CO), Hydrogen (H₂), Carbon dioxide (CO₂), Methane (CH₄), and Water vapor (H₂O).

- Syngas can be used to produce a wide range of Fertilizers, Fuels, solvents and synthetic materials.

Process

- **Preparation:** Coal is crushed into a fine powder to increase its surface area and enhance the chemical reactions during the process.
- **Gasification Reactor:** The crushed coal is introduced into a high-temperature and high-pressure reactor along with limited oxygen or air and steam.
- **Chemical Reactions:** In the absence of sufficient oxygen for complete combustion, the coal undergoes a series of complex chemical reactions.
- **Gas Cleaning:** The raw syngas produced from the reactor contains impurities like tar, sulfur, and dust. These impurities need to be removed through a gas cleaning process before the syngas can be used further.

Advantages

- Gasification boosts efficiency to 50%+ in integrated gasification combined cycle (IGCC) plants versus 30–40% in traditional coal plants, via gas turbine plus steam recovery.
- It cuts local pollutants (sulfur, particulates) through pre-use cleaning and enables >90% CO₂ capture potential.
- Applications include power, hydrogen, liquids (CTL), and chemicals, reducing oil import reliance

6. Ebola (Source: The Hindu)

- **Origin of Name:** The virus is named after the Ebola river (Republic of Congo) first outbreak in 1976.
- **Cause:** Ebola virus
- **Symptoms:**
 - **Early:** Fever, headache, muscle pain, sore throat.
 - **Advanced:** Vomiting, diarrhea, rash, organ failure, and internal/external bleeding.
 - **Incubation period:** 2-21 days.
- **Diagnosis:** Blood tests (PCR, ELISA) and differential diagnosis to rule out similar diseases.
- **Treatment:**
 - Supportive care (rehydration, symptom management).
 - Monoclonal antibodies (e.g., Inmazeb, Ebanga) and experimental antivirals.
- **Prevention:**
 - Vaccination with Ervebo.
 - Use of PPE, safe burial practices, and public health awareness.

7. Defence Systems in News (Source: The Hindu)

Astra Missile

- **Developed by** - Defence Research and Development Organization (DRDO)
- **Technology:** It works on the Beyond Visual Range Air-to-Air Missile (BVRAAM) technology.
- **Features**
 - **Speed:** 4.5 Mach
 - **Range:** over 70 km
 - **Electronic Counter-Countermeasures or ECCM Feature:** Enables the Astra missile to overcome defensive measures put forth for the target by the enemy.

Pinaka Rocket System

- **What is it?:** It is a Multi Barrel Rocket Launcher (MBRL) system.
- **Developed by:** DRDO
- **Naming:** Named after God Shiva's bow.
- **First Use:** In the Kargil War (1999).
- **Features**
 - **Firing Power:** It can fire 12 rockets over a period of 44 seconds
 - **Strike Range:** 60 - 75 km
 - **Guidance:** It is guided by the Indian Regional Navigation Satellite System (IRNSS).

8. International Space Station (ISS) (Source: The Hindu)

The International Space Station (ISS) is a modular laboratory in low Earth orbit.

Key Features

- ISS is a joint project between NASA, Roscosmos, ESA, JAXA, and CSA.
- November 2025 marked 25 years of continuous human presence aboard the International Space Station.
- The primary Mission Control centers are in the US and Russia, and several ancillary control centers in Canada, Japan, and Europe also have a role in managing each nation's elements and crew members.
- The station will continue to be a working laboratory and outpost in orbit until at least 2030.
- The International Space Station is the largest human-made object ever to orbit Earth.
- Supplies to the station have been provided by the Space Shuttle, Russian Progress and Soyuz, Japanese H-II Transfer Vehicle (HTV), European Automated Transfer Vehicle (ATV), and commercial Dragon, Cygnus, and Starliner vehicles.

9. Various Parts of Nuclear Plant and Its Uses (Source: The Hindu)

Nuclear Reactor

- Use: Generates thermal energy for electricity production.

Fuel Rods

- Use: Provide the fuel required for the fission reaction.

Control Rods

- Use: Control the rate of fission and safely shut down the reactor when required.

Moderator

- Use: Increases the efficiency of the nuclear chain reaction.

Coolant

- Use: Prevents overheating and carries heat to the steam generator.

Steam Generator (Heat Exchanger)

- Use: Supplies steam to drive the turbine.

Steam Turbine

- Use: Drives the electric generator.

Electric Generator

- Use: Produces electricity for transmission to the power grid.

Condenser

- Use: Enables water to be reused, improving plant efficiency.

Cooling Tower

- **Use:** Maintains the cooling cycle and prevents thermal pollution.

Containment Building

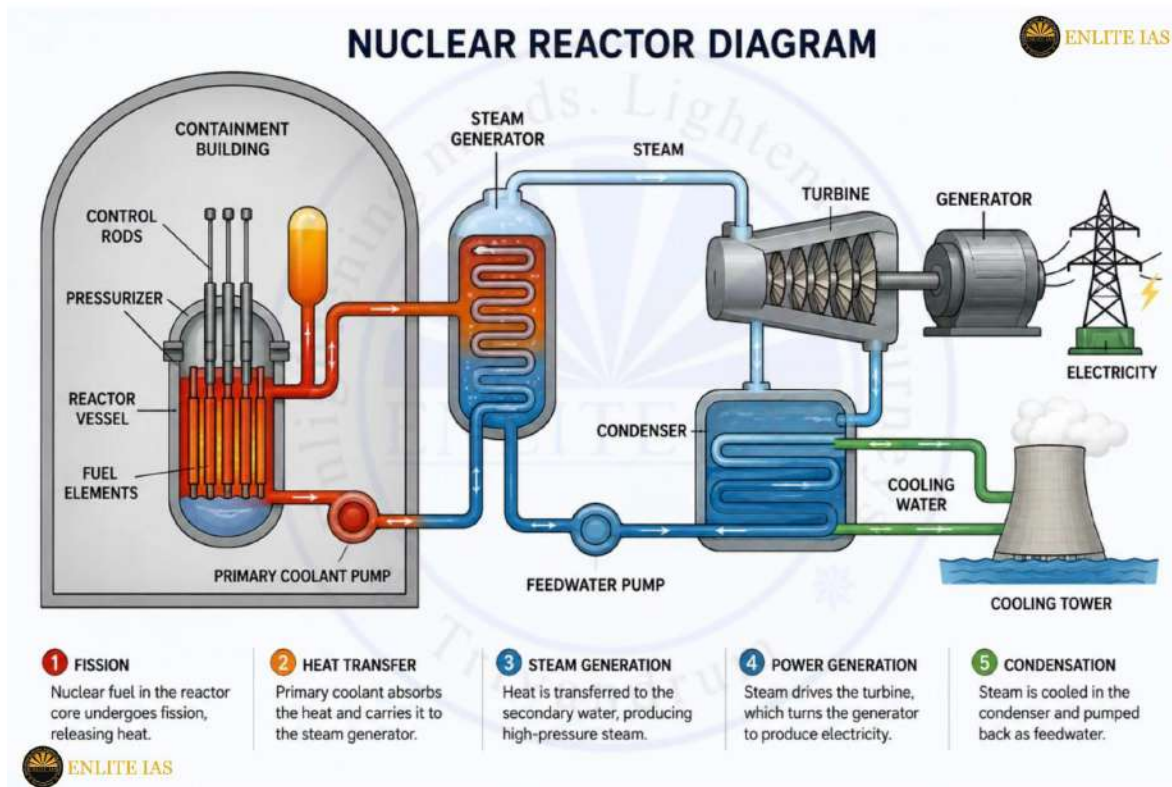
- **Use:** Prevents leakage of radioactive materials into the environment.

Shielding

- **Use:** Protects workers and the environment from harmful radiation.

Transformer

- **Use:** Enables efficient long-distance transmission through power lines.



10.Private Participation in Space Sector and Mission Aagaman (Source: The Hindu)

PRIVATE PARTICIPATION IN SPACE SECTOR IN INDIA

PARTNERS IN INDIA'S SPACE-POWERED FUTURE

India's space sector is opening new frontiers with private innovation, investment and entrepreneurship working hand-in-hand with ISRO for a self-reliant, globally competitive space ecosystem.

WHY PRIVATE PARTICIPATION?

- ✓ Boosts innovation and competition
- ✓ Brings in investment and new technologies
- ✓ Increases production capacity and reduces costs
- ✓ Creates jobs and builds skilled talent
- ✓ Expands applications and global presence

POLICY & REFORMS ENABLING GROWTH

- ✓ IN-SPaCe (Indian National Space Promotion and Authorization Centre) – Single window, handholding support
- ✓ Space Activities Authorization and supervision
- ✓ Indian Space Policy 2023 – Open, inclusive and future-ready
- ✓ Easier norms for FDI (up to 100% under automatic route)

KEY AREAS OF PRIVATE PARTICIPATION

- Launch Vehicles**
Development of small launch vehicles to meet rising demand.
- Satellites & Components**
Design, manufacturing and supply of satellites and sub-systems.
- Ground Segment & Data Services**
Ground stations, data processing, analytics and downstream services.
- Space Applications**
Solutions in communication, navigation, agriculture, disaster management, monitoring and more.
- Emerging Areas**
Space situational awareness, space exploration technologies, reusable systems and more.

GROWING PRIVATE ECOSYSTEM

- ✓ 200+ SpaceTech startups recognized by DPIIT (2024)
- ✓ Companies like Skyroot Aerospace, Agnikul Cosmos, Pixxel, Dhruva Space, Bellatrix Aerospace and many more leading the change
- ✓ Increasing private investments and VC funding
- ✓ Collaborations with ISRO, NSIL and global space agencies

IMPACT ON INDIA

- ✓ Atmanirbhar Bharat in Space
- ✓ Affordable access to space
- ✓ Global competitiveness
- ✓ Socio-economic benefits through space-based services

SUCCESS STORIES

SKYROOT AEROSPACE	Vikram Series launch vehicles
AGNIKUL COSMOS	3D-printed engines & launch vehicles
PIXXEL	High-resolution Earth observation satellites
DHRUVA SPACE	Satellite platforms & space tech solutions
BELLATRIX AEROSPACE	Propulsion systems & components

THE ROAD AHEAD

- ✓ Strengthen R&D and innovation
- ✓ Create a level playing field
- ✓ Develop infrastructure and test facilities
- ✓ Promote industry-academia collaboration
- ✓ Prepare for future opportunities in NewSpace economy

“Space is no longer the final frontier. It is the next frontier of opportunity.”

TOGETHER, LET'S BUILD A VIBRANT SPACE ECOSYSTEM
Innovate. Collaborate. Transform.
Building New India Beyond the Sky.

Mission Aagaman

- Mission Aagaman was a historic orbital spaceflight executed by Hyderabad-based startup Skyroot Aerospace.
- It featured Vikram-1, India's first privately developed orbital-class rocket, successfully lifting off from the Satish Dhawan Space Centre in Sriharikota.

11.Dengue (Source: The Hindu)

Dengue is a mosquito-borne tropical disease caused by the dengue virus.

Transmission

- Transmitted by several species of female mosquitoes within the genus Aedes, principally Aedes aegypti.

Symptoms

- Sudden high fever, severe headaches, pain behind the eyes, severe bone, joint, and muscle pain, etc.

Diagnosis and Treatment

- Diagnosis of dengue infection is done with a blood test.
- There is no specific medicine to treat dengue infection.

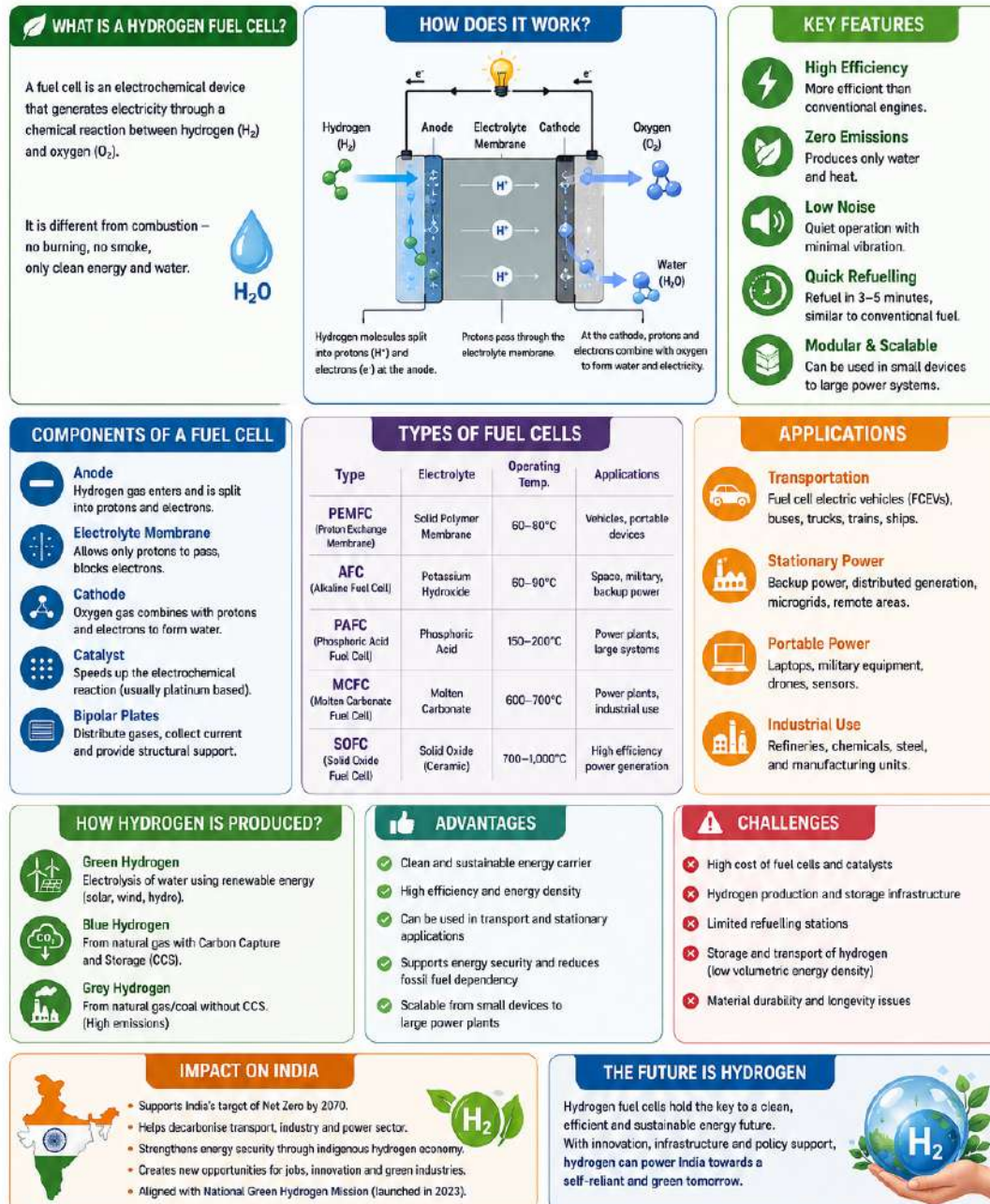
Note

- The Drug Controller General of India (DCGI) has granted market authorisation to Takeda Biopharmaceuticals India's QDENG (TAK-003), making it the first dengue vaccine to be approved in the country

12.Brain-Eating Amoeba (Naegleria) (Source: The Hindu)

- It is a free-living amoeba (a single-celled living organism)
- It was first discovered in Australia (1965).
- It is commonly found in warm freshwater bodies (hot springs, rivers and lakes).
- It enters the human body through the nose.
- The infection caused by this amoeba is PAM (Primary Amebic Meningoencephalitis), which destroys brain tissues.
- It has a very high mortality rate.
- No vaccine is available, but PAM can be treated with proper drug combinations.

13. Hydrogen Fuel Cell (Source: The Hindu)



"Hydrogen today, for a cleaner tomorrow."



14. Navigation with Indian Constellation (NavIC) (The Indian Express)

(Source:

NAVIGATION WITH INDIAN CONSTELLATION (NaviC)

India's Own Navigation – For Viksit Bharat

NavIC (Navigation with Indian Constellation) is India's independent satellite navigation system developed by ISRO to provide accurate **Position, Navigation and Timing (PNT)** services for India and a region around it.

ACCURATE POSITIONING
 RELIABLE NAVIGATION
 PRECISE TIMING
 STRATEGIC INDEPENDENCE

WHAT IS NavIC?

- Independent regional navigation satellite system by India.
- Provides accurate PNT (Position, Navigation and Timing) services.
- Designed for strategic, civilian and commercial applications.
- Operates in L5 and S band frequencies for reliable service.

THE NavIC CONSTELLATION

- 7 Satellites in total
- 3 Geostationary Satellites (GEO)
 - Positioned at 32.5°E, 83°E and 131.5°E
- 4 Geosynchronous Satellites (IGSO)
 - Inclined at 29° to the equator
- Designed for continuous visibility over India and a region ~1500 km beyond Indian mainland.

GLOBAL NAVIGATION SYSTEMS

	GPS (Global Positioning System)	USA (Global)
	GLONASS (Global Navigation Satellite System)	Russia (Global)
	GALILEO (Global Navigation Satellite System)	European Union (Global)
	BEIDOU (BeiDou Navigation Satellite System)	China (Global)
	QZSS (Quasi-Zenith Satellite System)	Japan (Regional)
	NavIC (Navigation with Indian Constellation)	India (Regional)

NavIC SERVICES

Standard Positioning Service (SPS)

- For civilian users
- Open and free service for general navigation needs
- Accuracy: Better than 20 meters

Restricted Service (RS)

- For authorized users
- Encrypted service for strategic and military applications
- Accuracy: Better than 5 meters

APPLICATIONS OF NavIC

Land Navigation	Maritime Navigation	Aviation Navigation	Personal Navigation
Precision Agriculture	Disaster Management	Fleet & Asset Tracking	Surveying & Geospatial Applications

KEY ADVANTAGES

- India's independent navigation system – reduces dependence on foreign systems.
- Accurate and reliable services in challenging environments.
- Critical for national security and strategic autonomy.
- Supports economic growth, digital navigation and technology development.
- Complementary to global systems like GPS, GLONASS, Galileo and BeiDou.

ATMANIRBHAR NAVIGATION. ACCURATE. SECURE.
NavIC – Powering India's Progress on Land, Sea, Air and Beyond.

SCHEMES

1. Nuclear Energy Mission (NEM) (Source: PIB)

The Nuclear Energy Mission (NEM) was launched under the Union Budget 2025–26 to fast-track India's nuclear energy capacity and technological self-reliance.

Target

- It targets 100 GW of nuclear power by 2047, aligning with India's Viksit Bharat and Net Zero by 2070 goals

Objectives

- **Develop Indigenous Small Modular Reactors (SMRs):** At least five SMRs to be operational by 2033.
- **Private Sector Participation:** Proposed changes to the Atomic Energy Act, 1962, and the Civil Liability for Nuclear Damage Act, 2010, aim to encourage private sector involvement in nuclear energy projects.
- **Boost Nuclear Capacity:** From the current ~8.78 GW (2026) to 22 GW by 2031–32, and ultimately 100 GW by 2047.
- **Indigenous Technology Development:** The mission emphasizes the development of BSRs, which are compact 220 MW Pressurized Heavy Water Reactors (PHWRs) designed for captive use.

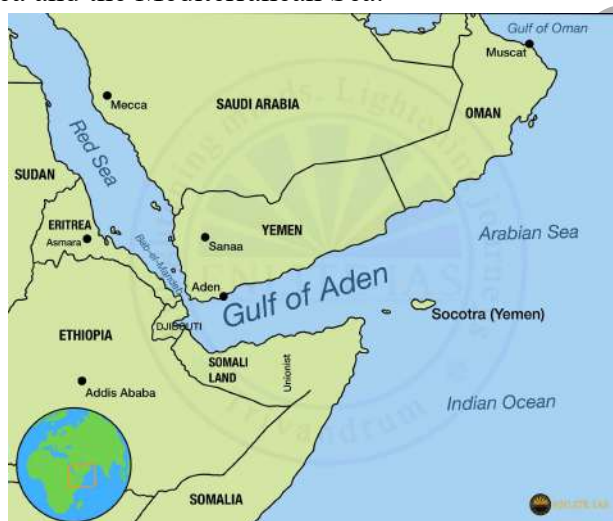
2. India Semiconductor Mission 2.0 (Source: The Hindu)



PLACES IN NEWS

1. Gulf of Aden (Source: The Hindu)

- *It is an extension of the Indian Ocean between the Arabian Peninsula and the African continent.*
- Borders by Somalia, Yemen, and Djibouti.
- *The Gulf is connected to the Somali Sea by the Guardafui Channel and to the Red Sea by the Strait of Bab el-Mandeb.*
- It is also a critical part of the **Suez Canal** shipping route, which connects the Red Sea and the Mediterranean Sea.



2. Norwegian Sea (Source: The Hindu)

- *Marginal sea of the North Atlantic Ocean.*
- Gateway between the North Atlantic and the Arctic.
- *Border countries like Norway, Iceland, and Denmark*
- Connects the North Atlantic with the Arctic Ocean
- The deepest point is Molloy Deep (~5,550 m).
- **Ocean Currents in the region**
 - **Norwegian Atlantic Current (Warm):**
 - Extension of the North Atlantic Drift.
 - Brings warm saline water northward.
 - **East Greenland Current (Cold):**
 - Carries cold Arctic water and sea ice southward.
- Major resources in the region are fish, oil, and natural gas.



3. South China Sea (Source: The Hindu)

- **Location:** An arm of the western Pacific Ocean that borders the Southeast Asian mainland.
- **Border Countries:** Brunei, Cambodia, China, Indonesia, Malaysia, the Philippines, Singapore, Taiwan, Thailand and Vietnam.
- **Straits**
 - **Taiwan Strait:** South China Sea and East China Sea
 - **Luzon Strait:** South China Sea and Philippine Sea
- **Disputed Islands**
 - **Spratly Islands:** This archipelago is claimed in whole or in part by China, Vietnam, the Philippines, Malaysia, and Brunei.
 - **Paracel Islands:** China claims these islands, as does Vietnam and Taiwan.
 - **Scarborough Shoal:** Both China and the Philippines claim this feature.



4. Falkland Islands (Source: The Indian Express)

- *The Falkland Islands, also called the Malvinas Islands or the Spanish Islas Malvinas, are an internally self-governing overseas territory of the United Kingdom in the South Atlantic Ocean.*
- *The territory consists of two main islands—East Falkland and West Falkland—and several hundred smaller islands and islets.*
- *Lies about 300 miles Northeast of the southern tip of South America.*
- **Capital:** Stanley on East Falkland
- **Features:** Several scattered small settlements, as well as a Royal Air Force Base that is located at Mount Pleasant.
- *The island is disputed between Britain and Argentina, which resulted in the Falkland War (1982). It ended with the surrender of the Argentine forces at Stanley to British troops.*



5. Bab el-Mandeb Strait and Red Sea (Source: The Hindu)

Bab el-Mandeb Strait

- *It is a strait between Arabia (northeast) and Africa (southwest) that connects the Red Sea (northwest) with the Gulf of Aden and the Indian Ocean (southeast).*
- It forms a vital strategic link in the maritime trade route between the Mediterranean Sea and the Indian Ocean via the Red Sea and the Suez Canal.
- *Yemen borders it on the Arabian Peninsula and Djibouti and Eritrea on the African coast.*

Red Sea

- **Location:** The Red Sea is a seawater inlet of the Indian Ocean, lying between Africa and Asia.
- **Connects:** The Red Sea is connected to the Indian ocean through the Bab el Mandeb Strait and the Gulf of Aden in the south.
- **Features:**
 - To the north lie the Sinai Peninsula, the Gulf of Aqaba, and the Gulf of Suez (leading to the Suez Canal).
 - The sea is underlain by the Red Sea Rift, which is part of the Great Rift Valley.

- Red Sea is bordered by Djibouti, Egypt, Eritrea, Saudi Arabia, Sudan, Yemen, Somalia, Israel, and Jordan



6. Black Sea (Source: The Hindu)

- **Location:** Between Eastern Europe and Western Asia
- **Bordering Mountain Ranges:** Pontic, Caucasus, and Crimean Mountains.
- **Connecting Straits**
 - **Dardanelles Strait:** Connects the Sea of Marmara with the Aegean and Mediterranean seas
 - **Bosporus Strait:** Connects the Black Sea to the Sea of Marmara
 - **Strait of Kerch:** Connects Black Sea to the Sea of Azov
- **Bordering Countries:** Russia, Ukraine, Georgia, Turkey, Bulgaria, and Romania.



7. Chabahar Port (Source: The Indian Express)

- *It is a deep-water port located in Iran's Sistan-Baluchistan province.*
- *It is on the Gulf of Oman at the mouth of the Strait of Hormuz.*
- *It is the only Iranian port having direct access to the Indian Ocean.*
- *It is a key transit hub on the International North South Transport Corridor (INSTC)*
- *It is a joint initiative of India and Iran.*

International North South Transport Corridor (INSTC)

- INSTC is a multi-modal transportation route linking the Indian Ocean and the Persian Gulf to the Caspian Sea via Iran, and onward to northern Europe via Saint Petersburg in Russia.

8. Caspian Sea (Source: The Hindu)

- **Fact:** It is the world's largest inland body of water.
- **Location:** Between Asia and Europe.
- **Bordering Geographical Features:** It lies east of the Caucasus Mountains and west of Central Asia's vast steppe.
- **Bordering Countries:** Russia, Azerbaijan, Kazakhstan, Turkmenistan, and Iran.
- **Major Rivers:** Volga, Ural, and Terek



9. Sudan (Source: The Hindu)

- **Location:** Sudan is an East African country.
- **Capital:** Khartoum
- **Border Countries:** Central African Republic, Chad, Egypt, Red Sea, Eritrea, Ethiopia, Libya, South Sudan.
- **Bordering Waterbodies:** Red Sea, Lake Nubia on the Sudanese-Egyptian border.
- **Rivers:** The Blue Nile and White Nile rivers meet in Khartoum to form the Nile, which flows northwards through Egypt to the Mediterranean Sea.
- **Climate:** Savannah Climate



10.Syria (Source: The Hindu)

- **Location:** Syria is a Western Asian country located in the Eastern Mediterranean and the Levant.
- **Capital:** Damascus
- **Bordering Countries:** Turkey, Iraq, Jordan, Israel, and Lebanon.
- **Maritime Border Countries:** Cyprus lies to the west across the Mediterranean Sea
- **Major Rivers in Syria:** Euphrates, Tigris
- **Disputed Territories:** Golan Heights with Israel

