



Environment (PART-1)

Current Affairs

Compilation

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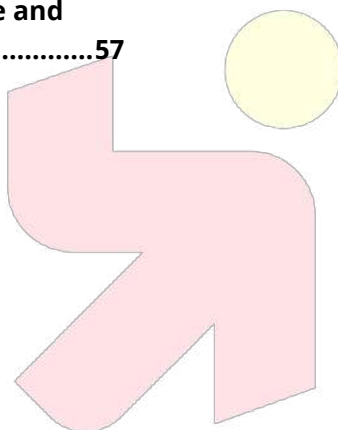


Table of Contents

1. Biodiversity	1	Cali Fund.....	12
COP15 to the Ramsar Convention	1	Wallace line.....	12
United Nations Environment Assembly	1	Context:	12
Global Wetland Outlook (GWO) 2025	1	Wallace Line vs. Weber Line	13
Global Forest resource assessment Report-2025	1	Dolphin Census.....	13
Context:	1	Context:	13
Food and Agriculture Organisation (FAO)	1	Green status assessment	13
India's Key Initiatives Related to Forest Conservation:	2	Context:	13
Sacred Groves	2	First Green Status Assessment of Lions:	14
Context:	2	Integrated development of wildlife habitats scheme	14
Sacred Groves:	3	Context:	14
Sacred Groves Across India: -	3	3rd UN Oceans Conference (UNOC)	14
IUCN World Conservation congress	3	INC-5	15
Context:	3	Global treaty on plastic pollution	15
Outcomes: -	4	Microplastics	16
National Red List Assessment (NRLA) Initiative:	4	Initiatives Against Microplastics	16
International Union for the conservation of Nature (IUCN).....	4	India	16
Great Wall Initiative	4	Environmentally friendly plastics: -	16
Context:	4	International Maritime Organisation.....	17
Aravalli Green Wall Project	5	CITES (Convention on International Trade in Endangered Species).....	17
Aravali Safari Project	5	World Wildlife Day.....	17
Context:	5	Convention on International Trade in Endangered Species:	17
National Biodiversity Authority	6	UN High Seas Treaty	18
Context:	6	Institutional Arrangement.....	19
What is the People's Biodiversity Register? ...	7	Achievement of '30x30'	19
Biological Diversity Act, 2002	7	United Nations Convention on Law of the Sea (UNCLOS)	19
Biological Diversity (Access and Benefit Sharing) Regulation 2025	8	Green Climate Fund	20
Context:	8	Global Environment Facility	20
COP 16 of Convention on Biological Diversity.9		United Nations Environment Programme (UNEP)	20
United Nations Convention on Biological Diversity (CBD)	9	Eco-Sensitive Zones.....	21
COP15	9	Eco-Sensitive Zone:	21
Major outcomes of COP15.....	9	Vanashakti judgment	22
Post-2020 Global Biodiversity Framework	9	International Big Cat Alliance (IBCA)	23
Digital sequence information (DSI).....	10	National Board for Wildlife	23
Convention on Biological Diversity (CBD)-Basics	10	National Board for Wildlife	24
PYQ.....	11	Bhaskaracharya National Institute for Space Applications and Geo-informatics (BISAG-N).....	24

Carbon Border Adjustment Mechanism	24	Elephants.....	39
Mangroves Conservation	25	Walrus.....	39
Initiatives for Mangrove Conservation:.....	25	Project Circular Bharat.....	39
Sundarbans Aquaculture Model.....	26	Atal Innovation Mission:	39
Guneri's Inland Mangrove	27	United Nations Development Programme	
Coral Larvae Cryobank	27	(UNDP).....	39
Coral Triangle	27	Jaipur Declaration	40
Coral Bleaching	27	TAC in India.....	40
Coral reefs.....	28	Mercury	40
Types of Corals.....	28	Minamata Convention: -	40
Classification of Coral Reefs based on their		Minamata Disease:	41
location.....	29	Heavy Metal Diseases.....	41
Cold Water Corals/Deep water Corals.....	29	Definition of Forests	41
Azooxanthellate Corals	30	Why so much confusion?	41
Initiative to Save Corals.....	30	Problems in Rules	41
Artificial Reefs	31	Forest (Conservation) Act of 1980	42
Chilika Lake	31	Community Reserves.....	42
PM Matsya Sampada Yojana	32	Forest Rights Act, 2006 (FRA 2006)	43
CAFE Norms	32	Critical Wildlife Habitats	44
BEE	33	Critical 'tiger' habitats (CTHs).....	44
Blue Flag Beaches	33	Right to Fair Compensation and Transparency	
Do you know?.....	33	in Land Acquisition, Rehabilitation and	
Foundation for Environment Education (FEE)		Resettlement Act 2013 (LARR Act)	44
.....	34	Particularly Vulnerable Tribal Group (PVTG). 45	
Globally Important Agricultural Heritage		Relocating Villages from Tiger Reserves	45
Systems	34	AviList.....	46
Food and Agriculture Organisation (FAO)	34	BirdLife International	46
Wildlife Transportation in India	35	India's First Wildlife Biobank.....	46
Vantara.....	35	Kavaru	46
Wildlife (Protection) Amendment Act, 2022..35		Pokkali Rice	46
Amendments Proposed in Wild Life		Vembanad-Kol Wetland	46
(Protection) Amendment Act, 2022.....	35	Animal Welfare Board of India	47
Wild Life (Protection) Act of 1972 (WPA, 1972)		PYQ.....	47
.....	36	Solidification Technology	47
National Tiger Conservation Authority (NTCA)		Bioformulation	47
.....	36	Vermin	48
National Board for Wildlife.....	37	Biomass Pellets	48
Wildlife Advisory Board (State Board for		Banni Grasslands.....	48
Wildlife – SBWL).....	37	Sustainable Aviation Fuel (SAF)	49
Central Zoo Authority (CZA)	37	Elephant Census, 2023	50
Various Schedule in WPA 1972.....	38	Planetary Boundaries	50
Geoparks	39	What are Planetary Boundaries?	51
Unique Sleeping Patterns of Animals	39	GLO:	51
Dolphins	39		

Bugun Community Reserve	51	Green Credits Programme (GCP)	57
Bugun Tribe	51	Eco mark.....	58
India State of Forest Report 2023	52	NDCs	58
Key terms to understand Forest survey:	52	Updated INDC.....	59
Findings of ISFR 2023: -	53	The Maastricht Principles: A Framework for Future Generations' Rights	60
2. Climate Change.....	55	Humboldt Glacier	60
COP30 Summit	55	International Cryosphere Climate Initiative:	60
UNCED or Earth Summit 1992, Rio De Janeiro		Environmental Performance Index (EPI), 2024	61
Brazil	55		
United Nations Framework Convention on Climate Change (UNFCCC)	55	EU's Nature Restoration Plan (NRP)	61
Key Outcomes of COP30	55	Teal Carbon	61
Paris Agreement (COP 21).....	56		
ARISE Programme	57		
Integrated Forum on Climate Change and Trade.....	57		



PRAYAAS

1. Biodiversity

COP15 to the Ramsar Convention

Context: -

- India's resolution on the '**Promoting Sustainable Lifestyles for the Wise Use of Wetlands**' was **adopted at the 15th** Conference of the Contracting Parties (COP15) to the Ramsar Convention on Wetlands, **held at Victoria Falls, Zimbabwe**.

India's Resolution on the Wise Use of Wetlands:

- India's resolution builds upon **UN Environment Assembly Resolution 6/8 on 'Promoting Sustainable Lifestyles'** adopted in 2024 and promotes a whole-of-society approach to wetlands conservation.

Key Provisions:

- Alignment with Global Frameworks:** India's resolution aligns with Resolution XIV.8. It also supports the 10-Year Framework on Sustainable Consumption and Production (10YFP).
- Resolution XIV.8, adopted at the COP14** of the Ramsar Convention on Wetlands, outlines a "**new CEPA approach**", which focuses on **Communication, Education, Participation, and Awareness (CEPA)** for wetland conservation and wise use.

United Nations Environment Assembly

- It is the governing body of the **UN Environment Programme (UNEP)**.
- It is the **world's highest-level decision-making body** on the environment.
- The Assembly is **made up of the 193 UN Member States** and convenes every two years to advance global environmental governance.
- It was **created in June 2012**, during the United Nations Conference on Sustainable Development, also referred to as RIO+20.

Global Wetland Outlook (GWO) 2025

- It is **released by the Secretariat of the Ramsar Convention** (1971), highlights that Africa's wetlands are among the most degraded in the world.
- The Ramsar Convention **Secretariat is based in Gland, Switzerland**.
- The **International Union for Conservation of Nature (IUCN)** supports its operations by providing administrative services to the Convention's member countries.

Global Forest resource assessment Report-2025

Context:

- India has secured the **9th position globally in terms of total forest area**, as per the latest Global Forest Resources Assessment (GFRA) 2025 **released by the Food and Agriculture Organization (FAO)**. India also retained its 3rd position worldwide in annual forest area gain.
- Link for reference:** [Down To Earth January 16-31 2025.pdf](#)

About:

- The GFRA, **conducted every 5 years by the FAO**, assesses global forest resources based on official national data.
- This data is vital for policymaking, international conventions and promoting sustainable forest management globally.

Food and Agriculture Organisation (FAO)

- It is a UN body.
- It leads international efforts to defeat hunger.
- Established: 1945

- **HQ:** Rome, Italy
- In theory, acts as a neutral forum where all nations meet as equals to negotiate agreements and debate policy.
- FAO is also a source of knowledge and information and helps developing countries and countries in transition modernize and improve agriculture, forestry and fisheries practices, ensuring good nutrition and food security for all.
- India is a member of FAO.

Reports published by FAO:

- World State of Forest Report
- State of World Fisheries and Aquaculture (SOFIA).
- State of Food Security and Nutrition in the World (SOFI), etc
- **Treaty:** FAO is the depository body of the International Treaty on Plant Genetic Resources for Food and Agriculture.

Initiatives of FAO:

- **Globally Important Agricultural Heritage Systems (GIAHS).**

The three GIAHS in India are:

1. Koraput Traditional Agriculture, Odisha.
2. Kuttanad Below Sea Level Farming System, Kerala.
3. Pampore Saffron Heritage, Jammu & Kashmir.

- Codex Alimentarius Commission or CAC
- Tree Cities of the World programme among others.

India's Key Initiatives Related to Forest Conservation:

- **Forest (Conservation) Act, 1980:** It restricts the diversion of forest land for non-forest purposes.
- **Wildlife (Protection) Act, 1972:** It provides legal protection to wildlife species and their habitats and establishes National Parks, Wildlife Sanctuaries, and Conservation Reserves.
- **National Forest Policy, 1988:** It sets the goal of **bringing 33% of India's total land area under forest and tree cover.**
- **Forest Rights Act, 2006:** It recognizes the rights of traditional forest dwellers and tribal communities and empowers them to manage, conserve, and protect forest resources sustainably.

Other Key Initiatives:

- **National Mission for a Green India (GIM):** GIM is part of the National Action Plan on Climate Change (NAPCC) aiming to enhance ecosystem services and carbon sequestration.
- **Compensatory Afforestation Fund Management and Planning Authority (CAMPA):** CAMPA utilizes funds from diverted forest land for compensatory plantation.
- **Ek Ped Maa Ke Naam Initiative:** Ek Ped Maa Ke Naam Initiative is a national campaign encouraging citizens to plant a tree in honour of their mothers.

Sacred Groves

Context:

- On December 18, 2024, the Supreme Court directed the Forest Department of Rajasthan to map on the ground and via satellite every 'sacred grove' in detail.
- **Link for reference:** [What is the Supreme Court directive on sacred groves? | Explained - The Hindu](#)

About:-

- Sacred groves to be mapped and **classified as 'forests.'**
- Management shifted from communities to state authorities.



- Protection under Wildlife Protection Act (WLPA).

Key Supreme Court Cases Related to Forests-

- **T.N. Godavarman v. Union of India (1996)**: Expanded the definition of forests.
- **Niyamgiri Case (2013)**: Recognized tribal rights over forests.

Sacred Groves:

- Sacred Groves are forested **patches preserved by local communities due to cultural and religious beliefs**.
- **Wildlife (Protection) Act, 1972 empowers the State Government to declare any private or community land as a community reserve** for protecting fauna, flora and traditional or cultural conservation values and practices.
- **Ecological significance**: They serve as biodiversity hotspots, regulate local climates & prevent soil erosion.
- **Cultural significance**: These are integral to community rituals, symbolising respect for nature.

Sacred Groves Across India: -

State	Sacred Groves	Key Features
Tamil Nadu	Puthupet Sacred Grove	Revered for its native flora and rituals for local deities.
Kerala	Kavus (e.g., Iringole Kavu)	Home to native biodiversity; linked with Theyyam rituals .
Karnataka	Devara Kadu	Maintained by communities for forest deities and habitats for rare wildlife.
Maharashtra	Devrais (e.g., Amboli Devrai)	Biodiversity hubs with medicinal plants are linked to the worship of local gods .
Rajasthan	Orans (e.g., Khejarli)	Serve as grazing grounds and water sources, associated with Bishnoi community conservation ethos.
Himachal Pradesh	Dev Van	Associated with the worship of local deities, it protects unique Himalayan flora.
Meghalaya	Law Kyntang	Sacred spaces preserved by Khasi tribes are central to local animistic traditions.
Odisha	Jahera	Worshipped as abodes of village deities, ensuring community-based protection.

IUCN World Conservation congress

Context:

- Recently, India **unveiled its National Red List Roadmap** and Vision 2025-2030 at the IUCN World Conservation Congress 2025.
- **Link for reference**: <https://www.thehindu.com/sci-tech/energy-and-environment/indias-first-dugong-reserve-in-palk-bay-gains-global-recognition-at-iucn-congress/article70092524>.

About:

- The IUCN World Conservation Congress (WCC) is a **quadrennial (every 4 year)** global summit **organised by** the International Union for Conservation of Nature (IUCN).
- It brings **together governments, civil society, scientists, indigenous groups**, and private sector leaders to decide global priorities for nature conservation, climate action, and sustainable development.
- It is regarded as the world's largest and most influential conservation policy forum.
- **Host Country**: Abu Dhabi, United Arab Emirates

- **Theme of IUCN Congress 2025:** Under the theme “**Powering transformative conservation**”.
- The **last congress held in Marseille, France, in 2021**, adopted the Marseille Manifesto, focusing on post COVID recovery, the biodiversity crisis, and the climate emergency.

Outcomes: -

National level ‘Red List’ roadmap for India (2025 2030):

- India unveiled a **five-year plan to produce a “National Red List”** to assess extinction risk for ~11,000 species (≈ 7,000 flora + 4,000 fauna).

India’s first Dugong Conservation Reserve:

- A **motion recognized** a conservation reserve **for dugongs in Palk Bay, Tamil Nadu**.

Abu Dhabi Call to Action 2025 & long-term vision:

- IUCN unveiled a **20-year strategic vision to shape global conservation**. Along with that, it approved a 4-year programme (2026-29) called **“Nature 2030: One nature, one future,”** charting implementation priorities.

First-ever World Summit of Indigenous Peoples and Nature:

- For the first time, IUCN jointly convened a Summit (with Indigenous peoples’ organisations) recognising **Indigenous Peoples as key stake holders** and stewards of biodiversity — marking a shift towards inclusive conservation governance.

National Red List Assessment (NRLA) Initiative:

- NRLA initiative is India’s first comprehensive framework to create a nationally coordinated, science-based system for assessing and documenting the conservation status of native species.
- **Objective:** To publish National Red Data Books for both flora and fauna by 2030.
- **Target:** To conduct a comprehensive threat assessment for at least 11,000 Indian species by 2030.
- **Nodal Agencies:** **Botanical Survey of India (BSI) and Zoological Survey of India (ZSI).**

International Union for the conservation of Nature (IUCN)

- Originally founded as the **International Union for the Protection of Nature in October 1948** in Fontainebleau, France, is the world’s leading membership-based environmental network.
- **Encourage and assist societies throughout the world to conserve the integrity and diversity of nature.**
- **Headquarter:** Gland, Switzerland.
- **Membership:** composed of both government and civil society organisations.
- IUCN Members include national and subnational governments and government agencies as well as non-governmental and indigenous peoples’ organisations from over 160 countries.
- **India became a State Member of IUCN in 1969**, through the Ministry of Environment, Forest and Climate Change (MoEFCC).
- It holds **observer and consultative status** at the United Nations.
- It played a founding role in establishing the **World-Wide Fund for Nature (WWF) and the World Conservation Monitoring Centre (WCMC)**, now part of UNEP.

Great Wall Initiative

Context:

- The **Great Green Wall initiative, launched by the African Union in 2007**, aims to restore 100 million hectares of degraded land **across the Sahel region by 2030**. However, recent satellite imagery reveals that in Senegal, only one of 36 planted areas shows increased vegetation, indicating limited progress.
- **Link for reference:** [Stalled Progress: Senegal's Struggles with Africa's Great Green Wall](#)

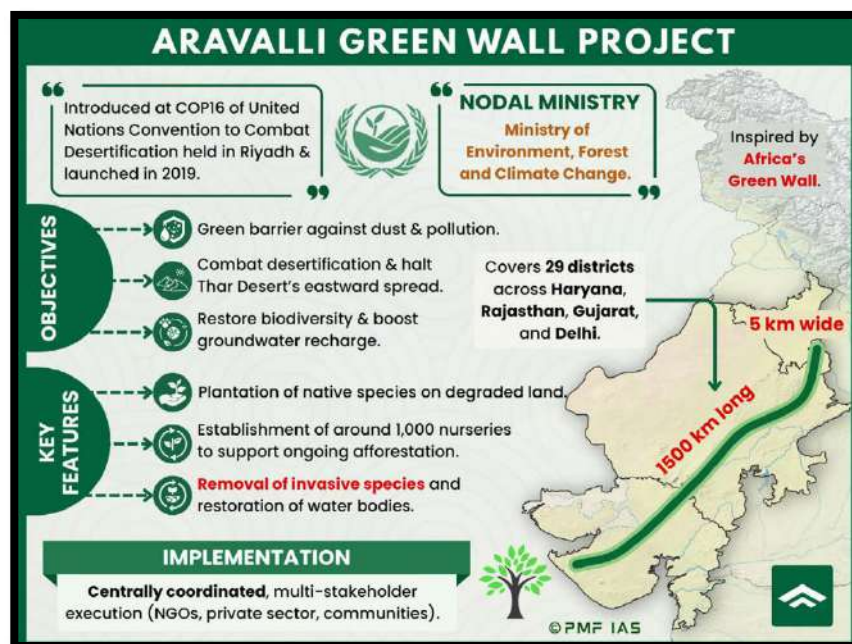
About:

- The **Great Green Wall aims to combat environmental challenges** by restoring degraded landscapes and promoting sustainable livelihoods.
- It was launched by the **African Union in 2007**.

- It covers an 8,000 km stretch across Africa.
- **The project involves 22 African countries.**
- It is **implemented under the leadership** of the Pan-African Agency of the Great Green Wall (PAAGGW).
- Over USD 19 billion has been raised for its implementation.
- The awareness campaign **“Growing a World Wonder”** is led by the United Nations Convention to Combat Desertification (UNCCD).

Its main goals for 2030 are:

- To restore 100 million hectares of degraded land.
- To sequester 250 million tons of carbon from the atmosphere.
- To create 10 million green jobs across rural Africa.



Aravalli Green Wall Project

- India has launched the **Aravalli Green Wall Project**, a **1,400 km** long and **5 km** wide afforestation belt spanning **Gujarat, Rajasthan, Haryana, and Delhi** to combat this. Inspired by **Africa's Great Green Wall**, this initiative aims to restore degraded land, improve biodiversity, and mitigate climate change.
- Plant 50 million native trees (Arjuna, Dhau, Khejri, Banyan) to restore biodiversity and carbon sequestration.
- Engages 10,000+ farmers and SHGs in agroforestry, sustainable livelihoods, and eco-tourism, promoting economic resilience.
- Acts as a windbreak against dust storms, **reducing 40% of Delhi's PM2.5 pollution**, mitigating heat island effects, and strengthening climate adaptation.

Aravali Safari Project

Context:

- The Haryana government's ambitious 3,858-hectare Aravali safari park project spread across Gurugram and Nuh.
- **Link for reference:** [What is the Aravali safari park project? | Explained - The Hindu](#)

About:

- It is envisioned as the **world's largest safari park (approx. 10,000 acres)** and aims to support eco-tourism and compensatory afforestation.
- **Inspired by UAE's Sharjah Park**, it is planned for compensatory afforestation to mitigate the loss of 26,000 acres of tropical forests in Great Nicobar.
- It will only be developed in **areas where forest density is less than 40%.**
- **Forest (Conservation) Act, 1980** was amended in 2023 to bring it under the 'forest' activity, and allowing zoos to be built in forest areas.

About Aravalis:

- It is the **oldest fold mountain range in the world and runs diagonally** (northeast to southwest) across Gujarat, Rajasthan, Delhi, and Haryana for about 690 km.
- It plays a crucial **role in preventing desertification eastwards** and recharging groundwater.

- The hidden limb of the Aravallis, extending from Delhi to Haridwar, separates the drainage of the Ganga and Indus rivers.
- Its **highest peak is Guru Shikhar on Mount Abu (Rajasthan)** at 1,722 metres.

National Biodiversity Authority

Context:

- National Biodiversity Authority (NBA) released ₹39.84 crore to Andhra Pradesh (₹38.36 crore to the Forest Department for the protection and conservation of **red sanders**. (**Covered in Species document**)
- **Link for reference:** [Protection of red sanders: National Biodiversity Board releases ₹39.84 crore to Andhra Pradesh - The Hindu](#)

About:

- NBA is a **statutory body** established under the **Biological Diversity Act, 2002**.
- It was formally set up in 2003.
- **Headquarter:** Chennai, Tamil Nadu.
- NBA performs facilitative, regulatory, and advisory functions for the Government of India, particularly on matters related to the **conservation of biodiversity, sustainable use of biological resources** (one of the pillars of evil quartet), and **the fair and equitable sharing of benefits derived from them**.

Functions of the NBA

- Advising the central government, regulating activities, and issuing guidelines for access to biological resources and for fair and equitable benefit sharing in accordance with the Biological Diversity Act, 2002.
- Taking necessary measures to oppose the grant of intellectual property rights in any country outside India on any biological resource obtained from India or knowledge associated with such biological resources derived from India illegally.
- Advising the State Governments in the selection of areas of biodiversity importance to be notified as heritage sites and suggest measures for their management.

State Biodiversity Boards (SBBs)

- The SBBs are established by the State Governments in accordance with Section 22 of the Act.

Functions of SBBs

- Advise the State Government, subject to any guidelines issued by the Central Government, on matters relating to the conservation, sustainable use or sharing equitable benefits.
- **Regulate by granting approvals or otherwise requests** for commercial utilisation or bio-survey and bio-utilisation of any biological resource by people.

Note:

- There are no State Biodiversity Boards constituted for Union territories.
- The National Biodiversity Authority exercises the powers and performs the functions of a State Biodiversity Board for the UTs.

Biodiversity Management Committees (BMCs)

- According to **Section 41 of the Act, every local body shall constitute the BMC within its area** for the purpose of promoting conservation, sustainable use and documentation of biological diversity including:

Structure

- It shall consist of a **chairperson and not more than six persons nominated by the local body**.
- Out of total members of a BMC, **not less than one third should be women and not less than 18% should belong to the Scheduled Castes/ Scheduled Tribes**.

- The **Chairperson** of the Biodiversity Management Committee shall be elected from amongst the members of the committee in a meeting to be chaired by the Chairperson of the local body.
- The chairperson of the local body shall have the casting votes in case of a tie.

Functions

- The main function of the BMC is to **prepare People's Biodiversity Register in consultation with the local people.**
- The register shall contain comprehensive information on availability and knowledge of local biological resources, their medicinal or any other use or any other.

What is the People's Biodiversity Register?

- **Local bodies** in the states and union territories constitute **BMCs**, which are **entrusted with the preparation of People's Biodiversity Registers** in consultation with local communities.
- The PBRs focus on participatory documentation of local biodiversity, traditional knowledge, and practices.
- They are seen as **key legal documents** in ascertaining the rights of local people over the biological resources and associated traditional knowledge.

Biological Diversity Act, 2002

About: -

- It was born out of India's attempt to realise the **objectives enshrined in the United Nations Convention on Biological Diversity (CBD) 1992** which recognizes the sovereign rights of states to use their own Biological Resources.
- Act was enacted in 2002, it aims at the **conservation of biological resources, managing its sustainable use and enabling fair and equitable sharing benefits** arising out of the use and knowledge of biological resources with the local communities.

Salient Features of the Act: -

- The Act **prohibits the following activities without the prior approval** from the **National Biodiversity Authority**:
 - **Any person or organisation (either based in India or not) obtaining** any biological resource occurring in India for its research or commercial utilisation.
 - The transfer of the results of any research relating to any biological resources occurring in, or obtained from, India.
 - The **claim of any intellectual property rights** on any invention based on the research made on the biological resources obtained from India.
- Act envisaged a **three-tier structure to regulate the access** to biological resources:
 - The National Biodiversity Authority (NBA)
 - The State Biodiversity Boards (SBBs)
 - The Biodiversity Management Committees (BMCs) (at local level)
- Act provides **these authorities with special funds and a separate budget** in order to carry out any research project dealing with the biological natural resources of the country.
- Under this act, the **Central Government in consultation with the NBA**
- Shall notify threatened species and prohibit or regulate their collection, rehabilitation, and conservation.
- Designate institutions as repositories for different categories of biological resources
- Act stipulates all offences under it as **cognizable and non-bailable.**
- Any grievances related to the determination of benefit sharing or order of the National Biodiversity Authority or a State Biodiversity Board under this Act, **shall be taken to the National Green Tribunal (NGT).**

Exemptions from the Act

- Act excludes Indian biological resources that are **normally traded as commodities**.
- Such exemption holds only so far, the biological resources are **used as commodities and for no other purpose**.
- Act also **excludes traditional uses** of Indian biological resources and associated knowledge and when they are used in collaborative research projects between Indian and foreign institutions with the approval of the central government.
- **Uses by cultivators and breeds, e.g. farmers, livestock keepers and beekeepers and traditional healers** e.g. vaidas and hakims are also **exempted**.

Biological Diversity (Access and Benefit Sharing) Regulation 2025

Context:

- The National Biodiversity Authority (NBA) has released new rules to regulate access to biological resources and ensure fair and equitable benefit sharing, as approved by the Central Government.

About Access and Benefit Sharing Rules: -

New Regulation:

- Replaces the 2014 ABS Guidelines.

Turnover-Based Slabs:

- No benefit sharing for turnover **up to ₹5 crore**.
- 0.2% for ₹5–50 crore.
- 0.4% for ₹50–250 crore.
- 0.6% for above ₹250 crore of annual gross ex-factory sales (excluding taxes).

Exemption Clause:

- **Cultivated medicinal plants** are exempted from benefit-sharing obligations.

Mandatory Reporting:

- All users with turnover exceeding ₹1 crore must submit annual usage details.

Regulatory Consistency:

- Aligns with **the Biological Diversity (Amendment) Act, 2023**, which promoted cultivation and removed approval requirements for Indian medicine practitioners.

High-Value Species Provision:

- Red sanders, sandalwood, agarwood and species listed under Section 38 of the Biological Diversity Act, 2002 require at least 5% benefit sharing, which may exceed 20% for commercial use.

Blended Product Handling:

- Products combining cultivated and wild-sourced ingredients may be exempted from sharing if identified by MoEFCC in consultation with the Ministry of AYUSH.

Digital Sequence Information (DSI):

- Explicitly brought under Access and Benefit Sharing (ABS) obligations, correcting a key omission from the 2014 guidelines.

Research and IP Compliance:

- Researchers and Intellectual Property applicants must follow Access and Benefit Sharing (ABS) rules before pursuing intellectual property rights.

Benefit Allocation:

- 10–15% of the benefits are retained by the National Biodiversity Authority (NBA), with the rest distributed to rightful claimants. **NBA is the Central authority for regulation, retention and disbursal of shared benefits.**

COP 16 of Convention on Biological Diversity

Context: -

- The **Sixteenth meeting of the Conference of the Parties** to the Convention on Biological Diversity (CBD COP 16) **will be held in Cali, Colombia.**
- 15th Conference of Parties (COP15) of the Convention on Biological Diversity **concluded in Montreal, Canada.**

United Nations Convention on Biological Diversity (CBD)

COP15

- The COP15 was **chaired by** China and hosted by Canada.
- COP 15 was **held in two phases**:
 - Phase one took place virtually in Kunming, China, in October 2021 and
 - Phase two was recently held in Montreal, Canada.
- CBD COP15 **adopted the Kunming-Montreal Global Biodiversity Framework** (Post-2020 Global Biodiversity Framework) which will **replace the Aichi Biodiversity Targets that expired in 2020.**
- GBF and its underlying documents are **not legally binding.**
- It sets out four global goals to achieve by 2050, as well as 23 global targets by 2030.
- A **new Global Biodiversity Framework Fund** will be established under the Global Environment Facility. It targets **at least USD 200 billion annually by 2030.**

Major outcomes of COP15

- Adoption of Kunming-Montreal Global Biodiversity Framework (GBF)**
- framework has four long-term goals for 2050 related to the 2050 Vision for Biodiversity and 23 action oriented global targets for urgent action over the decade to 2030
- Dedicated and accessible GBF Fund:** The Global Environment Facility has been requested to establish a Special Trust Fund in 2023, and until 2030, to support the implementation of the Global Biodiversity Framework

Post-2020 Global Biodiversity Framework

4 Global Goals by 2050

- Reducing the **extinction rate** and **risk of all species tenfold** (by 2050).
- Biodiversity is **sustainably used** for achieving sustainable development.
- Substantially **increase fair and equitable benefit-sharing from utilising genetic resources.**
- Adequate finance and technology to implement the Kunming-Montreal Global Biodiversity Framework**, progressively closing the **biodiversity finance gap of 700 billion \$ annually.**

23 Global Targets By 2030

- The targets are divided into three broad categories:

1) Reducing threats to biodiversity (by 2030) – 8 Targets

- Bring biodiversity loss in areas of high biodiversity close to zero.
- 30×30 Pledge:** Restore at least 30% of areas of degraded ecosystems (terrestrial, inland water, coastal, marine).
- Conserve at least 30% of ecosystems (terrestrial, coastal, marine), especially areas of high biodiversity.
- Halt human-induced extinction of known threatened species and significantly reduce extinction risk.
- Ensure that the harvesting/trade of wild species is sustainable and safe (reducing pathogen spill-over).
- Reduce invasive alien species by at least 50%.**
- Reduce pollution risks, by 2030, to levels that are not harmful to biodiversity and reduce the nutrients lost and overall risk from pesticides and hazardous chemicals by 50%.
- Minimize the impact of climate change and ocean acidification on biodiversity.

2) Meeting people's needs through sustainable use and benefit-sharing (by 2030) – 5 Targets

- Sustainable use of wild species.
- Ensure that areas under agriculture, aquaculture, fisheries, and forestry are managed sustainably.
- Enhance ecosystem functions and services —pollination, disaster protection, etc.
- Sustainable urbanisation by increasing green and blue spaces (trees and water bodies).
- Ensure fair and equitable benefit-sharing for utilising genetic resources and information.

3) Tools and solutions for implementation and mainstreaming (by 2030) – 10 Targets

- Ensure the full integration of biodiversity into policies, planning, national accounting, etc.
- Take measures to encourage corporations to reduce negative impacts on biodiversity.
- Ensure sustainable consumption choices and reduce overconsumption, food waste, etc.
- Strengthen the handling of biotechnology and biosafety measures in CBD.
- Phase out subsidies harmful to biodiversity and reduce them by at least USD 500 billion annually.
- Increase finance by 2030 by mobilising at least 200 billion \$ per year. Wealthier countries should contribute at least 20 billion \$ of this annually by 2025 and at least 30 billion \$ annually by 2030.
- Ensure the transfer of technology and scientific cooperation.
- Ensure the best available data, information, and knowledge for decision-makers.
- Ensure social and gender-responsive representation and participation in decision-making.
- Ensure gender equality in the implementation of the framework

Digital sequence information (DSI)

- Under the UN CBD, negotiations on how to regulate the use of digital sequence information (DSI) of genetic resources could further delay the process.

Why Developing countries opposing DSI?

- Developing countries which are rich in biodiversity feel DSI provides a loophole through which developed countries can circumvent CBD.

Convention on Biological Diversity (CBD)- Basics

- The UN Convention on Biological Diversity (CBD) is a **legally binding multilateral treaty.**
- It was opened for signature at the Earth Summit in Rio de Janeiro in 1992 and entered into force in 1993.
- All UN member states — **except the United States** — have ratified the treat
- India plays an active part in this treaty.
- **India is a party to convention.**
- Secretariat: The CBD Secretariat is **based in Montreal, Canada,** and it operates under the United Nations Environment Programme.
- Parties to the Convention: 196
- In 2000, a supplementary agreement to the Convention known as the **Cartagena Protocol on Biosafety** was adopted. It came into force on 11th September 2003.
- The **Nagoya Protocol** on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS) was adopted **in 2010 in Nagoya,** Japan at COP10. It entered into force on 12th October 2014.
- The COP-10 also adopted a ten-year framework for action by all countries to save biodiversity. Officially known as “Strategic Plan for Biodiversity 2011-2020”, it provided a set of 20 ambitious yet achievable targets collectively known as the **Aichi Targets for biodiversity.**
- India enacted Biological Diversity Act in 2002 for giving effect to the provisions of the CBD.

Convention has 3 main goals:

- Conservation of biological diversity

- Sustainable use of its components; and
- Fair and equitable sharing of benefits arising from genetic resources

Cartagena Protocol on Biosafety

- The Cartagena Protocol on Biosafety to the Convention on Biological Diversity (CBD) is an international agreement adopted in 2000.
- It entered into force in 2003 and covers the field of biotechnology.
- It currently has 173 parties. India has ratified CBD and its Cartagena Protocol (signed in Cartagena, Colombia).
- Cartagena Protocol aims to **ensure the safe handling, transport, and use of living modified organisms (LMOs)** resulting from modern biotechnology.
- It addresses technology development and transfer, benefit-sharing and biosafety issues.

Nagoya Protocol on Access and Benefit-sharing

- At the 10th Conference of Parties (COP10 2010) to the Convention on Biological Diversity in Nagoya, Japan, the Nagoya Protocol was adopted.
- It is the second Protocol (supplementary agreement) to the CBD.
- It entered into force in 2014. It presently has 137 parties, including India.
- Nagoya Protocol is about "Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization", one of the three objectives of the CBD.

International Treaty on Plant Genetic Resources for Food and Agriculture (PGRFA)

- PGRFA is popularly known as the **International Seed Treaty**.
- It is an international agreement in harmony with CBD.
- It aims at guaranteeing food security through the conservation, exchange, and sustainable use of the world's plant genetic resources for food and agriculture, as well as the fair and equitable benefit sharing arising from its use.

Aichi Biodiversity Targets

- At **CBD COP 12 (2014)**, parties discussed the implementation of the Strategic Plan for Biodiversity 2011-2020 & its Aichi Biodiversity Targets — to be achieved before 2020
- **None** of the 20 'Aichi Biodiversity Targets' agreed on by national governments through the CBD has been met, according to CBD's Global Biodiversity Outlook 5 report

PYQ

Q. Consider the following statements: (2023)

1. In India, the Biodiversity Management Committees are key to the realization of the objectives of the Nagoya Protocol.
2. The Biodiversity Management Committees have important functions in determining access and benefit sharing, including the power to levy collection fees on the access of biological resources within its jurisdiction.

Which of the statements given above is/are correct?

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

Q. Consider the following pairs: (2016)

Terms sometimes in the news

1. Annex-I Countries → Cartagena Protocol

2. Certified Emissions Reductions → Nagoya Protocol
3. Clean Development Mechanism → Kyoto Protocol

Which of the pairs given above is/are correctly matched?

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

Consider the following international agreements: (2014)

1. The International Treaty on Plant Genetic Resources for Food and Agriculture
2. The United Nations Convention to Combat Desertification
3. The World Heritage Convention

Which of the above has/have a bearing on the biodiversity?

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

Cali Fund

- Cali Fund was launched at 16th COP (COP16) to the UNCBD in Rome to boost biodiversity finance.
- **Administered by UNDP and UNEP with the Multi Partner Trust Fund Office (MPTFO).**
- Supports biodiversity conservation by mobilising **funds from private businesses** using genetic data.
- First Biodiversity Fund under the UN to receive direct corporate contributions.
- **Fair Benefit Sharing:** Companies benefiting from Digital Sequence Information (DSI) are now required to contribute to the Cali Fund to support biodiversity initiatives.
- **Supports Kunming-Montreal Global Biodiversity Framework:** Aids in achieving goal of halting and reversing biodiversity loss by 2030.
- **Community Support:** At least 50% of resources from the Cali fund will be allocated to indigenous peoples and local communities for biodiversity protection.

Wallace line

Context:

- Kangaroos and cockatoos are synonymous with Australia and tigers and orangutans with Asia. Both these continents boast rich biodiversity that is also very unique. A simple yet popular way to understand these 'separate greatness's' has taken the shape of the Wallace line.
- **Link for reference:** [How the Wallace line explains the difference in species across continents - The Hindu](#)

About:

- Identified by **Alfred Russel Wallace in 1863**, it runs between Bali and Lombok and continues north through the Makassar Strait between Borneo and Sulawesi.
- A biogeographical boundary that **separates the eco-zones of Asia and Australia.**
- Runs through the **Lombok Strait (Bali-Lombok) and the Makassar Strait** (Borneo-Sulawesi).

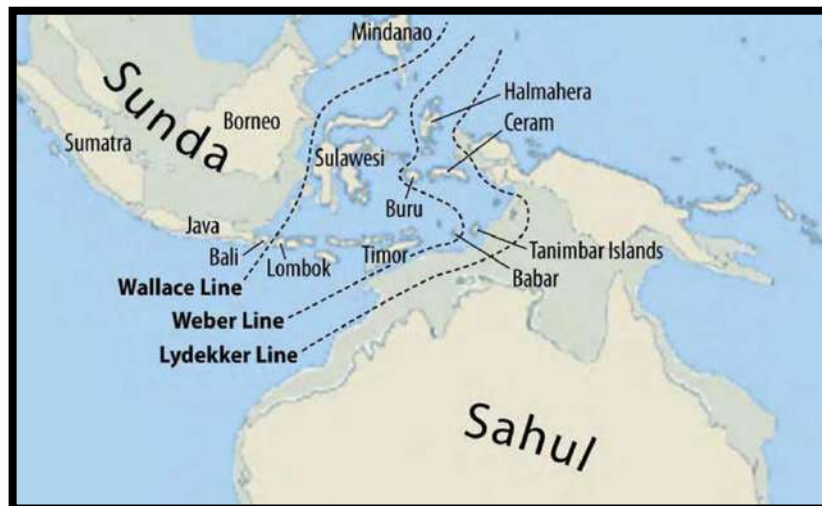
Significance of the Wallace Line:

- Supports the theory of evolution by showing how geographical barriers drive species diversification.

Uniqueness of the Wallace Line:

- **Sharp distinction in species:** To the west, Asiatic species like tigers and elephants dominate, while to the east, Australian fauna such as kangaroos and marsupials thrive.

- **Narrow geographical divide:** Despite being just 20 km apart, islands on either side have distinct biodiversity. Birds and mammals are heavily influenced, with few species crossing the line, while marine species remain unaffected due to the high connectivity of ocean ecosystems.



Wallace Line vs. Weber Line

- Wallace Line: A sharp faunal divide.
- Weber Line: A more balanced midpoint of Asian and Australian species influence.

Dolphin Census

Context:

- The first ever census of Gangetic dolphins, the only riverine dolphins in India, which began four years ago, has found 6,327 of the species in the river Ganga and its tributaries.
- **Link for reference:** [How is a census of river dolphins carried out? | Explained - The Hindu](#)

About:

- **Conducted By:** Ministry of Environment, Forest & Climate Change (MoEFCC) under Project Dolphin (2020).
- Conducted with support from Wildlife Institute of India (WII) and various state forest departments.

Survey Coverage:

- Covered 28 rivers across eight states, spanning 8,507 km.
- **Major river basins:** Ganga, Brahmaputra, and Indus.

Key Findings:

- Total Dolphins: 6,327 (6,324 Gangetic dolphins + 3 Indus dolphins).
- **State-wise estimates:** 1) Uttar Pradesh 2) Bihar 3) West Bengal 4) Assam 5) Jharkhand

Methodology:

- **Visual Surveys**
 - Double Observer Method (for deep and wide channels): Two teams positioned on different decks scan both sides of the vessel. The boat travels at 8-10 km/hour to prevent double counting.
- **Tandem Method (for channels <600m wide, <3m deep).**
- **Single Boat Method (for channels <300m wide, <2m deep).**
- **Acoustic Surveys:** Uses underwater microphones (hydrophones) to detect dolphin echolocation clicks.

Green status assessment

Context:

- The International Union for Conservation of Nature (IUCN) published its first Green Status assessment, a relatively new global standard of measurement envisioned to complement the IUCN Red List of Threatened Species.
- **Link for reference:** [‘A viable population of lions can easily be established in the space available at Kuno’ - The Hindu](#)

About:

- **Purpose:** Complements the Red List by focusing on species recovery and conservation success, rather than extinction risk alone.
- Helps assess how species can recover and outlines conservation actions needed.
- Highlights that conservation isn't only about preventing extinction but also about restoring species to ecological functionality.
- **Categories (8):** Extinct in the Wild, Critically Depleted, Largely Depleted, Moderately Depleted, Slightly Depleted, Fully Recovered, Non-Depleted, Indeterminate
- **Species Recovery:** A species is deemed fully recovered if it exists across its historical range, even in human-impacted areas.
- **Green Score:** Species are assigned a recovery score (0–100%) to measure progress toward full recovery.

First Green Status Assessment of Lions:

- Lions are “**Largely Depleted**” under the **Green Status** while remaining “Vulnerable” on the IUCN Red List.
- Human activities hinder lions from being ecologically functional across their range.
- **Extinct Regions** – Lions are extinct in **North Africa and Southwest Asia**.
- **Conservation Success** – Recovery efforts in parts of **India, West and Southern Central Africa**, and **South Africa** have prevented likely extinctions.

Integrated development of wildlife habitats scheme

Context:

- The Union Cabinet approved the continuation of the Centrally Sponsored Scheme of Integrated Development of Wildlife Habitats (IDWH) for the 15th Finance Commission cycle (2021-26).
- **Link for reference:** [Uttarakhand must restore Corbett Tiger Reserve: Supreme Court - The Hindu](#)

About:

- It aims to enhance the protection and management of wildlife habitats across India.
- It encompasses various activities like **habitat restoration, community involvement in conservation**.
- **Components of the Scheme:**
 - Support to Protected Areas (National Parks, Wildlife Sanctuaries, Conservation Reserves and Community Reserves).
 - Protection of wildlife outside protected areas.
 - Recovery programmes for saving critically endangered species and habitats.
- **Subcomponents of IDWH:**
 - **Project Tiger:** It was launched in India in **1973** with the primary objective to protect and conserve tiger populations in their natural habitats to prevent extinction.
 - **Project Elephant:** It was launched in **1992** to address the decline in the elephant population due to habitat loss and poaching.
 - **Development of Wildlife Habitat:** It focuses on creating and enhancing habitats to support wildlife conservation and biodiversity.
 - Project Dolphin and Project Lion are under this subcomponent.
 - **Conservation of Keystone Species:** The scheme focuses on keystone species such as tigers, elephants, cheetahs, and lions, which are indicators of ecosystem health.
 - It also supports lesser-known species identified under the Species Recovery Programme within the Development of Wildlife Habitat component.
 - 16 terrestrial and 6 aquatic species have been identified for saving critically endangered species/ecosystems.

3rd UN Oceans Conference (UNOC)

- **Held in Nice, France.**
- **Host Countries:** France and Costa Rica.

- **Theme:** “Accelerating action and mobilising all actors to conserve and sustainably use the ocean.”
- **Objectives:** Address governance, financing, scientific knowledge, and climate adaptation.
- **Reinforce SDG 14:** Life Below Water—focus on sustainable fisheries, pollution control, and marine conservation.
- **India’s Engagement:** India advocated for marine diplomacy, sustainable fisheries, and open data.
- Concluded with the **adoption of the Nice Ocean Action Plan & launch of the Nice Ocean Agreements.**

Outcomes of 3rd UNOC:

- **Blue NDC Challenge** → Launched by: Brazil and France
 - Urges countries **to incorporate ocean-focused climate measures** into their Nationally Determined Contributions (NDCs) **ahead of the COP30 to the UNFCCC in Belem, Brazil.**
- **Nice Wake-up Call for an Ambitious Plastics Treaty:** Push for a strong, **legally binding** global plastics treaty.
- The Nice Wake-Up Call has 96 signatories (**India not a Signatory**) and remains open for others to join.

About UNOC

- It is the main United Nations conference supporting SDG-14 (Life Below Water).
- It **operates under the UN Convention on the Law of the Sea (UNCLOS).**
- Held in — 2017 (New York)
 - 2022 (Lisbon),
 - 2025 (Nice)
 - Next in 2028 (Chile & South Korea).
- **Multi-Stakeholder:** Involves states, UN agencies, scientists, the private sector, and civil society.

INC-5

Context (DTE):

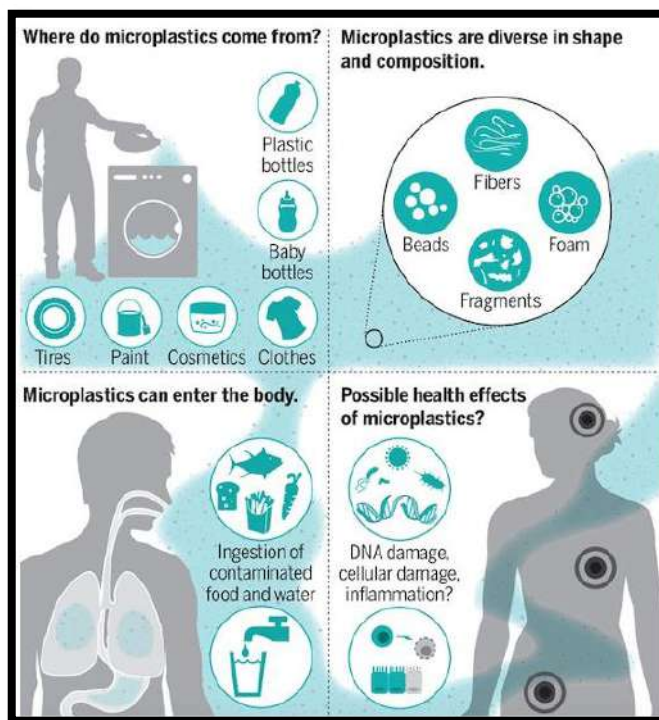
- The **fifth Intergovernmental Negotiating Committee (INC) meeting in Busan (South Korea) concluded without reaching a treaty** to combat global plastic pollution.

Global treaty on plastic pollution

- On March 2, 2022, the **United Nations Environment Assembly (UNEA) voted to formulate an international legally binding instrument by 2024** to end plastic pollution.
- 175 countries have agreed to a global treaty to end the plastic pollution crisis by tackling the material’s entire supply chain.
- It focuses on the need to undertake measures throughout the lifecycle of plastics in order to efficiently reduce their negative impact.
- **It is a legally binding treaty.**
- Treaty will come into force from 2024. (still not in force)
- **UNEA resolution to end plastic pollution establishes an intergovernmental negotiating committee (INC) which is expected** to submit its draft agreement by 2024

Microplastics

- Microplastics are defined as **plastics less than 5mm in diameter**.
- There are two categories of microplastics.
 - Primary microplastics**: tiny particles designed for commercial use, such as in cosmetics or textiles.
 - Secondary microplastics**: tiny particles that are a product of the breakdown of larger plastic items due to exposure to environmental factors such as the sun's radiation or ocean waves.
- An average human consumes at least 50,000 microplastic particles annually due to contamination of the food chain, potable water, and air.
- Microplastics contain a number of toxic chemicals which pose severe risks to human health. The biggest health risk associated is with the **chemical Bisphenol A (BPA), which is used to harden plastic**.
- BPA causes alterations in liver function, insulin resistance, foetus development in pregnant women, the reproductive system, and brain function.



Initiatives Against Microplastics

International Convention for the Prevention of Pollution from Ships (MARPOL)

- It is a **global treaty developed by the International Maritime Organization** (IMO) to prevent pollution of the marine environment by ships from operational or accidental causes.
- MARPOL sets standards/regulations for preventing/controlling various types of ship-generated pollution.

Plastics Pact

- It brings together businesses, governments and NGOs to reduce, reuse, and recycle plastics in their value chain.
- U.K. is the first country to launch Plastics Pact.
- India is the first Asian country** to launch Plastics Pact.

India

- The Union government has **banned single-use plastics in 2022** in order to eliminate single-use plastics.
- Plastic Waste Management Rules 2016, Plastic Waste Management (Amendment) Rules 2018, and Plastic Waste Management (Amendment) Rules 202.

Environmentally friendly plastics: -

Bioplastics

- It is made from natural materials such as corn starch.
- Bioplastics generally do not produce a net increase in carbon dioxide gas when they break down.
- Good thing about bioplastics is that **they're compostable**.
- They decay into natural materials that blend harmlessly with soil.

Biodegradable plastics

- It is made from **traditional petrochemicals**, which are **engineered to break down more quickly**.
- They contain additives that cause them to decay more rapidly in the presence of light and oxygen
- Unlike bioplastics, biodegradable plastics are made of normal (petrochemical) plastics and **don't always break down into harmless substances**
- Sometimes they leave behind a toxic residue and that makes them generally (but not always) unsuitable for composting.

Recycled plastics

- These are simply plastics made from recycled plastic materials rather than raw petrochemicals.

International Maritime Organisation

- It is a **specialized agency of the United Nations** responsible for regulating shipping.
- Established in 1948 (Came into force in 1959; First meeting)
- **HQ : London, UK**
- **India was one of the earliest members** of the IMO and had joined it as a member-state in 1959.
- The IMO's primary purpose is to develop and maintain a comprehensive regulatory framework for shipping and its remit today includes safety, environmental concerns, legal matters, technical co-operation, maritime security and the efficiency of shipping.
- IMO is governed by an assembly of members and is financially administered by a council of members elected from the assembly.
- IMO Council consists of 40 member countries who are elected by IMO Assembly.
- It plays a crucial role in deciding various matters related to global shipping industry.

CITES (Convention on International Trade in Endangered Species)

- CITES marked its **50th anniversary at CoP20 in Samarkand, Uzbekistan**.
- It was the **first CITES Conference of the Parties (CoP) held in Central Asia**.
- The CoP is the **main decision-making body**, convening every 2 to 3 years to evaluate progress and update the Appendices, which determine the protection level for species.

World Wildlife Day

- The World Wildlife Day was **observed on March 3**.

About: -

- **Theme of World Wildlife Day 2025:** 'Wildlife Conservation Finance: Investing in People and Planet.'
- In 2013, the United Nations General Assembly (UNGA) proclaimed **March 3** as the UN World Wildlife Day to celebrate and raise awareness of protecting the world's wild animals and plants.
- This marked the day in 1973 when the **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was signed**.

Key Outcomes:

- The convention added 77 species to the CITES Appendices, inclusion of major **up listings for sharks and iguanas**.
- The meeting **enhanced trade safeguards for several bird groups**, including **African hornbills, vultures, and threatened songbirds**.
- Members approved an independent reporting system to support evidence-based decisions on species.

Convention on International Trade in Endangered Species:

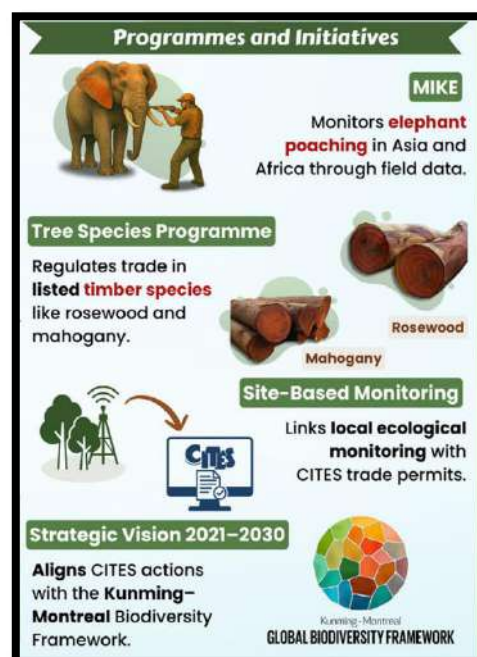
About-

- It is also known as **Washington Convention**.
- It is a multilateral Treaty.

- **Participation is voluntary.**
- India is a party to CITES **since 1976.**
- It is **legally binding** on the Parties, but it *does not take the place of national laws.*
- Opened for sign: 1973
- Parties: 185 (EU also)
- Aims to protect endangered plants and animals.
- Member must **enact domestic law** for implementing it.
- CITES **Secretariat functions under UNEP**, based in Geneva, Switzerland.
- Its **aim is to ensure that** international trade in specimens of wild animals and plants does not threaten the survival of the species in the wild, and it accords varying degrees of protection to more than 35,000 species of animals and plants.

It classifies plants and animals according to three categories, or appendices, based on how threatened:

- **Appendix I:** It lists species that are in danger of extinction. It **prohibits commercial trade** of these plants and animals except in extraordinary situations for scientific or educational reasons.
- **Appendix II:** They are those that are not threatened with extinction but that might suffer a serious decline in number if trade is not restricted. Their trade is regulated by permit.
- **Appendix III:** They are protected in at least one country that is a CITES member states and that has petitioned others for help in controlling international trade in that species.
- In addition, CITES also restricts trade in items made from such plants and animals, such as food, clothing, medicine, and souvenirs



UN High Seas Treaty

- **Morocco** became the 60th country to ratify the UN High Seas Treaty, **enabling its global enforcement from January 2026.**

About High Seas Treaty: -

- Formally known as the **Agreement on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction (BBNJ Agreement)**, it was adopted in 2023 under UNCLOS.
- BBNJ Treaty is referred to as the **'Paris Agreement for the Ocean'**.
- It became the **third agreement approved** under the United Nations Convention on the Law of the Sea (UNCLOS) after the 1994 and 1995 treaties, which established the International Seabed Authority and the Fish Stocks Agreement.
- **Objective:** To conserve and sustainably use marine biodiversity in areas beyond national jurisdiction, **covering 2/3rd of the world's oceans and nearly 1/2 of Earth's surface.**
- It is the **first legally binding global framework to regulate overfishing, deep-sea mining, benefit sharing, and marine protected areas in international waters.**
- **India signed the treaty in 2024.**
- USA, China, Russia, and Japan have **not yet ratified the treaty.**

Key Provisions:

- **Marine Protected Areas:** Countries **can designate protected zones** in **international waters to conserve biodiversity** and reduce human impacts.
- **Polluter pays principle, whereby responsibility** is on polluters to manage and bear the costs of their pollution.
- **Benefits from marine genetic resources (MGRs) recognised** as the **common heritage** of humankind & must be shared fairly among countries.
- The treaty **provides for technology transfer**, financial aid, and scientific cooperation to help developing countries participate effectively in ocean conservation.
- **Environmental Impact Assessments (EIAs)** **mandatory** for any activity that may cause transboundary or cumulative ecological damage.

Exceptions to the Agreement: -

- **Not apply to any warship, military aircraft or naval auxiliary.**
- **Not apply to fishing & fishing-related** activities regulated under other relevant international law.
- Obligations concerning utilization of MGRs and their digital sequence information do not apply to a Party's military activities but do apply to a Party's non-military activities.

Institutional Arrangement

- **Conference of Parties (COP):** Main decision-making body (except for certain matters on environmental impact assessments).
- **Clearing House Mechanism:** For fair sharing of scientific information and monetary benefits.
- **Scientific and Technical Body (STB):** Provide scientific and technical advice to COP.
- **Subject-Matter Committees:** Access and Benefit Sharing Committee, Capacity-Building and Transfer of Marine Technology Committee, Finance Committee, & Implementation and Compliance Committee.

Achievement of '30×30'

- 30×30' is a **worldwide initiative for governments to designate 30% of Earth's land and ocean area as protected areas by 2030.**
- It was **launched by the High Ambition Coalition for Nature and People in 2020**, which now has more than 100 countries, **including India**, the US, and the UK.
- 30 by 30 was agreed at the COP15 meeting of the Convention on Biological Diversity and became a target of the Kunming-Montreal Global Biodiversity Framework.

United Nations Convention on Law of the Sea (UNCLOS)

- UNCLOS (Law of the Sea Treaty) is an **international agreement that came into force in 1994.**
- It establishes the legal framework for marine and maritime activities.
- **UNCLOS establishes general obligations for safeguarding** the marine environment and protecting the freedom of scientific research on the high seas.
- It can hold **states liable for damage caused by the violation of their international obligations through its three institutions:**
 - International Tribunal for the Law of the Sea,
 - International Seabed Authority (ISA), and
 - Commission on the Limits of the Continental Shelf.
- The convention **gives a clear definition** of Internal Waters, Territorial Waters, Contiguous Zone, Exclusive Economic Zone and Continental Shelf.
- It provides rights to landlocked states for access to and from the sea without taxation of traffic through transit states.
- **Members:** It has 167 member states and the European Union. **India is a member.**

Green Climate Fund

- Green Climate Fund (GCF) **has approved \$200 million** for the India Green Finance Facility (IGFF), marking the ADB's first partnership with GCF in India.
- **Focus Areas:** It covers solar parks, battery storage, electric mobility, and resilient agriculture.

IGFF:

- It is a **climate finance program launched jointly by ADB and GCF** to support the country's transition to low-carbon, climate-resilient infra structure.

About Green Climate Fund:

- It is a fund within the framework of UNFCCC- UN backed fund.
- It is founded to assist developing countries in adaptation and mitigation practices to counter climate change.
- Formed in 2010
- Formally in CoP-16 at Cancun
- **WB is chosen as a temporary trustee** of the fund.
- **HQ: Incheon, South Korea (Songdo)**

Global Environment Facility

- It is an independently operating financial organization
- GEF is multilateral financial mechanism that provides grants to developing countries for projects that benefit global environment and promote sustainable livelihoods in local communities.
- It was setup as a fund under World Bank in 1991
- In 1992, at the Rio Earth Summit, the GEF was restructured and moved out of the World Bank system to become a **permanent, separate institution**.
- Since 1994, however, the World Bank has served as the Trustee of the GEF Trust Fund and provided administrative services.
- **HQ: -Washington DC, United States.**
- It addresses six designated focal areas: biodiversity, climate change, international waters, ozone depletion, land degradation and **Persistent Organic Pollutants**.
- GEF serves as financial mechanism for:
 - Convention on Biological Diversity (CBD)
 - United Nations Framework Convention on Climate Change (UNFCCC)
 - UN Convention to Combat Desertification (UNCCD)
 - Stockholm Convention on Persistent Organic Pollutants (POPs)
 - Minamata Convention on Mercury
- **India is both donor and recipient of GEF.**

Funds under Global Environment Facility

- **Special Climate Change Fund (SCCF), 2001:** - It was created in 2001 to address the specific needs of developing countries under the UNFCCC to adapt to the impact of climate change and increase resilience.
- **Strategic Priority on Adaptation:** -Fund is now closed
- **Least Developed Countries Fund:** -It was established at the 7th Conference of the Parties in 2001 (COP7) to meet the adaptation needs of least developed countries (LDCs).

United Nations Environment Programme (UNEP)

- It is an **UN agency**.
- It coordinates UN's environmental activities, assisting developing countries in implementing environmentally sound policies and practices.

- It was founded because of the UN Conference on the Human Environment (Stockholm Conference) in 1972
- **HQ: Nairobi, Kenya**
- UNEP has also been active in funding and implementing environment related development projects.
- UNEP has aided in the formulation of guidelines and treaties on issues such as the international trade in potentially harmful chemicals, transboundary air pollution, and contamination of international waterways.
- UNEP is also one of several Implementing Agencies for the Global Environment Facility (GEF) and the Multilateral Fund for the Implementation of the Montreal Protocol

Major Reports:

- 1) Emission Gap Report
- 2) Adaptation Gap Report
- 3) Production Gap report
- 4) Global Environment Outlook
- 5) Global Chemical outlook
- 6) Frontiers
- 7) Invest into Healthy Planet

Major Campaigns:

- 1) Beat Pollution
- 2) UN75
- 3) World Environment Day
- 4) Wild for Life

Eco-Sensitive Zones

Context:

- Standing Committee of the National Board for Wildlife (SC-NBWL) has suggested **revising the 'Guidelines for declaration of ESZ, 2011 issued by the Ministry of Environment, Forest and Climate Change (MoEFCC).**
- SC-NBWL, **chaired by Union Environment Minister**, appraises projects and frames wildlife conservation policy, including guidelines on Eco-Sensitive Zones.
- **Supreme Court modified its judgment to have mandatory eco-sensitive zones (ESZ) of a minimum of one kilometre** around protected forests, national parks and wildlife sanctuaries across the country.
- In 2022, the court had ordered the one km buffer zone for protected areas to act as a "shock absorber".

Recent Modification of the Judgment:

- **ESZs to be Protected Area Specific:** The Court reasoned that ESZ cannot be uniform across the country and has to be "protected area specific".
- **Balancing Protection and Day-to-Day Activities:** The court said "the purpose of declaring ESZs is not to hamper the day- to- day activities of the citizens.
- **Impact on Man-Animal Conflict:** The court said a stringent observance of the June 2022 judgment would cause more harm than good. Man--animal conflict would only increase rather than abate.
- **Prohibition of Mining within National Parks and Wildlife Sanctuaries:** However, the court made it clear that mining within the national park and wildlife sanctuary and within an area of one kilometre from the boundary of such national park and wildlife sanctuary shall not be permissible.

Eco-Sensitive Zone:

- It is created to **act as a buffer for further protection in an area within 10 kms around Protected Areas (PAs)** such as National Parks and Wildlife sanctuaries.

- In case of places with sensitive corridors, connectivity and ecologically important patches, crucial for landscape linkage, **even areas beyond 10 km width can be included in the eco-sensitive zone.**
- **National Wildlife Action Plan (2002-2016)**, of the Ministry of Environment, Forest and Climate Change stipulated that **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).**
- National Wildlife Action Plan (2002-2016) **advised state governments** to designate land within 10 km of protected area boundaries as eco-sensitive zones.
- **Central Government can notify ESZs extending beyond 10 km** if the area includes critical wildlife corridors or ecological features.
- Activities around such areas are regulated and managed so as to protect the environment.
- **ESZ is notified under Section 3 of the Environment (Protection) Act, 1986 by the Union Ministry of Environment and Forest.**

ESZ Guidelines classify activities under three categories:

- **Prohibited:** Commercial Mining, Setting of Sawmill, setting of industries causing pollution, establishment of major hydroelectric projects etc. It also bans tourism activities like flying over protected areas in an aircraft or hot air balloon and discharge of effluents and solid waste in water bodies or terrestrial areas.
- **Regulated: Felling of Trees,** Establishment of hotels and resorts, erection of electrical cables, drastic change of agricultural systems etc.
- **Permitted:** Ongoing agriculture and horticulture practices by local communities, rainwater harvesting, organic farming etc.
- Many states are opposed to ESZ because of presence of minerals and resources side by side.
- Local people in many areas are also opposed to ESZ for loss of livelihood due to restriction placed by it on various activities.

Legal Status

- The Environment (Protection) Act, 1986 **does not mention the word “Eco-Sensitive Zones”.**
- The act only states that GOI can restrict areas in which any industries, operations, or processes shall or shall not be carried out subject to certain safeguards.
- **Rule 5 empowers the Central Government** to restrict or prohibit activities in environmentally fragile areas.
- Besides, the Environment Rules, 1986 also states that GOI can prohibit or restrict the location of industries. The government has effectively used these two rules to declare ESZs or EFAs.

Vanashakti judgment

- Supreme Court (2:1 majority) recalled its Vanashakti judgment (May 2025).
- Vanashakti judgment declared **retrospective environmental clearances (ECs) a “gross illegality” & “anathema” to environmental law** & held that allowing violators to regularise illegal construction under mines the EPA 1986.

About: -

- **Legal Basis:** Environmental Impact Assessment **(EIA) Notification, 2006, issued under the Environment (Protection) Act, 1986,** governs prior environmental clearance (EC).
- The 2006 EIA Notification **mandates prior environmental clearance** for projects likely to impact environment, human health, and social infrastructure.
- **Government’s 2017 Notification:** Allowed **post facto EC applications** within a limited **six-month** window for projects that began or expanded operations without prior clearance.

Two-Level Clearance:

- Category A: Appraised by MoEFCC (Central level).

- Category B: Appraised by State Environment Impact Assessment Authorities (SEIAA).
- EAC/SEAC Role: Expert Appraisal Committees (Central) and State Expert Appraisal Committees evaluate EIA reports before recommending EC.
- **Public Hearing: Mandatory for Category A & B1 projects**, except strategic, defence, and small projects.
- MoEFCC **exempted** mining projects involving Atomic, Critical, and Strategic minerals (like Rare Earth Elements) from Public Consultation under the Environmental Impact Assessment (EIA), 2006.
- **Validity**: EC validity varies for mining (30 years), river valley (10 years), industry/infrastructure (7 years).

International Big Cat Alliance (IBCA)

Context: -

- Union Cabinet approved the proposal of India to become a member of IBCA by signing and ratification of the Framework Agreement.
- The **1st assembly of the IBCA convened in New Delhi**, endorsed the India's Union Minister of Environment, Forest & Climate Change as the President of IBCA.

About IBCA

- Launched: By India on 50th years of India's Project Tiger in 2023.
- Apart from India, Nicaragua, Eswatini and Somalia have also joined.
- **HQ: India**
- **Aim**: Strengthen global cooperation for the conservation of seven big cat species (tiger, lion, leopard, snow leopard, cheetah, jaguar and puma) and their habitats.
- India inhabits all cats except Puma and Jaguar.
- **Multi-country and multi-agency coalition**: Participants consist of 95 big cat range countries, non-range countries interested in big cat conservation, conservation partners and related scientific organizations.
- All UN member countries are eligible for becoming the member of IBCA.
- **Nine International Organizations** have also consented to be partner organization.
- **Funding**: Support of Rs. 150 crores for five years from 2023-24 to 2027-28.

Conservation Status of Big Cats in India: -

- **IUCN Status**: Endangered (Tiger), **Vulnerable** (Lion, Cheetah, Snow Leopard, Leopard), Near Threatened (Jaguar) and Least concern (Puma)
- All five big cats in India are listed in Schedule 1 and 4 of Wildlife Protection Act and CITES Appendix
- India will be **hosting the Global Big Cats Summit in New Delhi** in 2026 (announced at COP30 in Belém).
- The summit will be **organised under the framework** of International Big Cat Alliance (IBCA).
- **India is home to five of the seven big cat species recognised by the IBCA**: the tiger, lion, leopard, snow leopard, and cheetah; the Jaguar and Puma are not native to India.

National Board for Wildlife

Context: -

- The National Board for Wildlife (NBWL) approved infrastructure projects in sensitive wild-life habitats, including transmission lines and highway widening.
- **PM chaired 7th National Board for Wildlife (NBWL) meeting at Gir National Park.**

Transmission Lines in Flamingo Habitat and Goa's Mollem Forest: -

- The NBWL cleared a 400 kV transmission line over 27 hectares of **Bhagwan Mahaveer Sanctuary and Mollem National Park despite intense public protests** under the '**Save Mollem**' movement.

Gujarat Projects: Impact on Avian Species: -

- Two major transmission lines were approved in Gujarat, including a 765 kV D/C line in the **Wild Ass Sanctuary in Little Rann of Kutch, affecting 100 hectares.**

Tiger Corridors: Highway Widening Projects: -

- The NBWL approved widening NH 46 through the tiger corridor **between Satpura and Melghat tiger reserves**, covering 101 hectares of forest.

National Board for Wildlife

- The National Board for Wildlife has 47 members **with the Prime Minister in the Chair.**
- Highest Wildlife Advisory Body:** Established under Section 5A of the Wildlife (Protection) Act, 1972.
- Reconstituted in 2022: Replaced the Indian Board for Wildlife (1952).**
- Composition: **47 members, including the PM (Chairperson).** MoEFCC Minister (Vice-Chairperson), army chief, bureaucrats, MPs, NGOs, and environmentalists.
- Standing Committee: Reviews projects affecting wildlife habitats and protected areas.
- Made under **WPA act through 2002 amendment.**
- The Additional Director General of Forests (WL) & Director, Wildlife Preservation is the Member-Secretary.
- Other members include three Members of Parliament (two from Lok Sabha and one from Rajya Sabha), five NGOs and 10 eminent ecologists, conservationists, and environmentalists.
- The **board is advisory in nature** and advises the GOI in conservation and development of wildlife & forests.
- It has power to review all wildlife-related matters and approve projects in and around national parks and sanctuaries.
- No alternation of boundaries** in national parks and wildlife sanctuaries can be done without approval of the National Board for Wildlife.

Key decision: -

- Asiatic Lion Population Estimation 2025: **16th census** to track lion numbers, with a **focus on Barda Wildlife Sanctuary expansion.**
- Centre for Human-Animal Conflict Mitigation:** Set up at Salim Ali Centre for Ornithology and Natural History, Coimbatore, for rapid response strategies and tracking systems.
- New Conservation Projects Launched: Project Gharial, Great Indian Bustard Conservation Plan, and Tiger Conservation outside reserves.**
- BISAG-N & WII collaboration** for AI-driven tracking, geospatial mapping, and forest fire monitoring.

Bhaskaracharya National Institute for Space Applications and Geo-informatics (BISAG-N)

- Autonomous Scientific Society registered under the Societies Registration Act, 1860 **under the Ministry of Electronics and Information Technology (Meity).**
- Function:** To undertake technology development & management, R&D, facilitate national & international cooperation, capacity building and support technology transfer & entrepreneurship development in area of geo-spatial technology.
- Three Main Domain Areas: Satellite Communication, Geo-informatics and Geo-spatial technology.

Carbon Border Adjustment Mechanism

- Carbon Border Adjustment Mechanism (CBAM) is **the EU's carbon border tax (Import duty) imposed on goods from countries with greater emissions than European industries are allowed.**
- It is operational from 2026 & aims to promote and incentivise cleaner industrial production worldwide.

- Applies initially to **carbon-intensive goods such as iron, steel, cement, aluminium**, fertilisers, and electricity, which are at risk of carbon leakage.
- Companies in countries with a domestic carbon pricing regime equivalent to the EU's will be able to export to the EU **without buying CBAM certificates**.

Mangroves Conservation

Context: -

- Recently, the IUCN Red List of Mangroves Ecosystems has indicated that about 50% of the ecosystems examined were classified as vulnerable, endangered, or critically endangered.

About: -

- IUCN Red List of Mangroves Ecosystems assessed 36 regions across 44 countries with experts from organizations like the **Global Mangrove Alliance**.
- The mangrove ecosystems of south India, Sri Lanka, the Maldives and Northwest Atlantic were identified as critically endangered.
- **Nearly 33 per cent** of the mangrove systems on the planet are threatened by the impacts of climate change.

Initiatives for Mangrove Conservation:

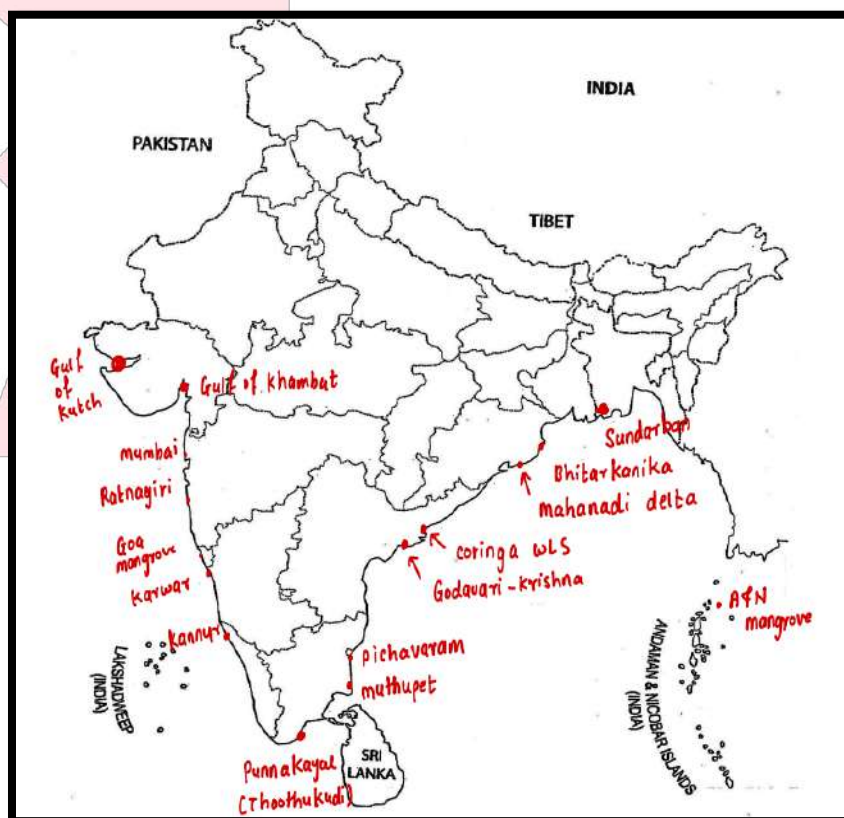
Mangrove Alliance for Climate (MAC)

Context-

- **India participated** at Mangrove Alliance for Climate Ministerial Meeting at COP-28
- **UAE in partnership with Indonesia launched MAC at the COP27 Summit** in Egypt to scale up and accelerate the conservation and restoration of the mangrove forests.

About-

- **India joins** mangrove alliance for climate (mac) at cop27 summit
- It is **launched by UAE in partnership with Indonesia**
- MAC aims to scale up and accelerate conservation and restoration of the mangrove forests.
- Australia, Japan, Spain and Sri Lanka are other members.
- It aims to raise awareness on role of mangroves as a nature-based solution to climate change
- As part of this alliance, an **international mangrove research centre will be established in Indonesia** which will conduct studies on mangrove ecosystem services such as carbon sequestration and ecotourism.



Mangroves in India

Global Mangrove Alliance (GMA)

- It is **launched in 2018 at the World Ocean Summit by Conservation International** (CI), the International Union for Conservation of Nature (**IUCN**), The Nature Conservancy (TNC), Wetlands International, and World Wildlife Fund (WWF)
- Today, the alliance includes more than 30 organizations.
- GMA Goal: To increase the global area of mangrove habitat through conservation, restoration and equitable management
- It runs a number of initiatives for Mangroves such as '**Mangroves for the Future**' (MFF) - a unique partner-led initiative to promote investment in coastal ecosystem conservation for sustainable development.

Mangroves for the Future (MFF)

- It is a distinctive, partnership-led initiative that encourages financial support for the preservation of coastal ecosystems for sustainable development.
- The MFF, which is co-chaired by the IUCN and UNDP, offers a forum for cooperation among **several organizations, industries, and nations tackling problems with coastal ecosystems and livelihoods.**
- The objective is to advance an integrated ocean-wide strategy for coastal management and to strengthen the resilience of coastal populations that depend on ecosystems
- **MFF covers Bangladesh, Cambodia, India, Indonesia, Maldives, Myanmar, Pakistan, Seychelles, Sri Lanka, Thailand and Vietnam.**
- Multiple partners, including government organizations, non-governmental organizations (NGOs), research institutes, UN agencies, and other multilateral organizations, are working together on the project.

International Day for the Conservation of the Mangrove Ecosystem

- **UNESCO** celebrates this day on **July 26**
- The aim of raising awareness about mangrove ecosystems and to promote their sustainable management and conservation.

Mangrove Initiative for Shoreline Habitats and Tangible Incomes (MISHTI) Programme

- MISHTI Programme, announced in the 2023-24 Budget, is an initiative for mangrove plantations along the coastline and on salt pan lands.
- **By Ministry of Environment, Forest and Climate Change**
- The Union Government launched it on World Environment Day on June 5th, 2023.
- Aim: **Planting mangroves in 540 sq km of coastline**, spanning 11 states and two union territories.
- Under MISHTI, the mangroves will be planted through initiatives under the Compensatory Afforestation Fund Management and Planning Authority (CAMPA), Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and public-private partnership.

Sustainable Aquaculture In Mangrove Ecosystem (SAIME) initiative:

- Building aquaculture farms that use sustainable IMA (integrated mangrove aquaculture) systems.
- Started in 2019, the community-based initiative of sustainable shrimp cultivation is being conceived by NGOs- Nature Environment and Wildlife Society (NEWS) and Global Nature Fund (GNF), Naturland, Bangladesh Environment and Development Society (BEDS).

Sundarbans Aquaculture Model

- **Food and Agriculture Organisation (FAO) has awarded** Global Technical Recognition to the Sustainable Aquaculture in Mangrove Ecosystems (SAIME) **from the Sundarbans.**

Magical Mangroves campaign:

- **WWF India has enjoined citizens** in nine coastal states on mangrove conservation.

Guneri's Inland Mangrove

Context: -

- **Gujarat** has declared the inland mangrove site in **Guneri village, Kutch, as its first BHS**.

Biodiversity Heritage Site (BHS): -

- Biodiversity Heritage Sites are **well-defined areas that are unique and ecologically fragile ecosystems** (terrestrial, coastal, marine, inland waters) having rich biodiversity comprising of any one or more of
- **Under Section 37 of the Biodiversity Act, 2002**, the **State Government in consultation with local bodies may notify areas of biodiversity importance as Biodiversity Heritage Sites (BHS)**.
- Declaration of an area as BHS **does not put any restriction on the prevailing practices and usages of the local communities**. Because the purpose of BHS is to enhance the quality of life of the local communities through conservation measures.

Guneri's Inland Mangrove

- Situated 45 km from the Arabian Sea and **4 km from Kori Creek**.
- **No seawater inflow**, unique compared to coastal mangroves.
- **Only one of eight inland mangrove sites globally, and the last of its kind in India**.
- Spread over 32.78 hectares in Kutch district, it houses 20 migratory and 25 resident avifaunal species.
- **Situated on limestone deposits**, sustaining groundwater flow vital for mangrove survival.

Coral Larvae Cryobank

- **Philippines to host Southeast Asia's first coral larvae cryobank** to freeze and preserve coral larvae for reef restoration.
- The initiative involves research institutions from Philippines, Taiwan, Indonesia, Malaysia, & Thailand.

Coral Triangle

- **Covers six countries:** Indonesia, Malaysia, the Philippines, Papua New Guinea, Solomon Islands, and Timor-Leste.
- Known as the "Amazon of the seas,"
- It harbours 76% of all coral species.
- **Coral Triangle Initiative (CTI) advances sustainable fisheries, marine protection, and climate adaptation.**
- The **Coral Triangle Initiative (CTI-CFF) is a partnership among six nations**—Indonesia, Malaysia, the Philippines, Papua New Guinea, the Solomon Islands, and Timor-Leste—that promotes marine biodiversity, climate resilience, and food security.



Coral Bleaching

Context: -

- Recently, widespread coral bleaching has been seen along the Indian coast largely affecting Lakshadweep, Gulf of Munnar, Palk Bay and Andaman and Nicobar Islands.

Instances of bleaching

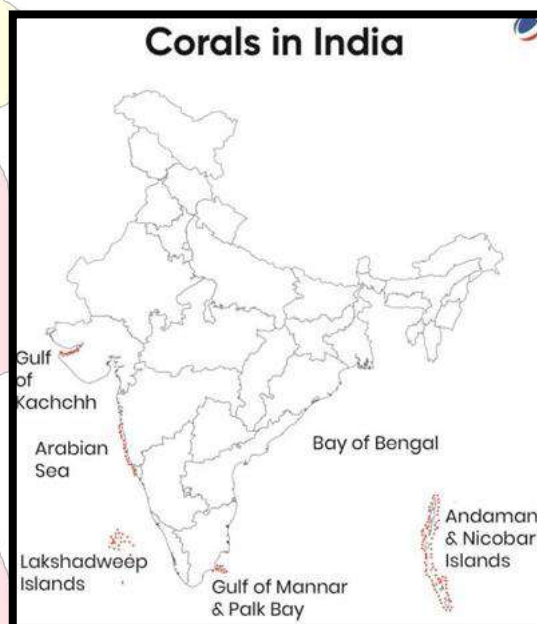
- Lakshadweep Islands: Bleaching is seen across almost all **species like *Acropora muricata* and *Porites cylindrica* in the Kavaratti Islands.**
- Species that are often more stress-tolerant, such as ***Porites lutea* and *Pavona varians*** have also begun to bleach in Lakshadweep.
- **Goa**: Coral bleaching has started but is limited to **one species, *Goniopora*.**

Coral reefs

- Coral reefs are one of the most productive, sustainable and pristine ecosystems of world's oceans, especially in shallow coastal waters so also known as **tropical rainforest of the Oceans**
- They are invertebrate animals belonging to **Cnidaria** and live in **symbiotic relationship with algae zooxanthellae**.
- They are **protected under Schedule I of Wildlife Protection Act (WPA), 1972.**
- The cycle is repeated for over millions of years leading to accumulation of layers of corals.
- The shallow layers of corals created by the depositions of corals is called a coral reef.
- Coral reefs over a period of time transform or evolve into coral islands (e.g., Lakshadweep)

Understanding Symbiotic Relationship between Coral (Polyp) and Algae

- Microscopic Algae Zooxanthellae assist coral in nutrient production through the photosynthesis activities.
- They thus provide corals with fixed carbon compounds for energy, nutrition and enhance calcification.
- As much as 90% of the material that the algae prepare through photosynthesis is transferred to the host Coral tissues.
- Corals provide the algae a protected environment to live within and a steady supply of Carbon dioxide for photosynthesis purpose.
- **Coral → Phylum Cnidaria**
- **Zooxanthellae → Phylum Dinoflagellata**



Other Source of Nutrition for Corals

- In addition to the symbiotic relation with algae, **most corals capture and consume live prey ranging from microscopic zoo-planktons to small fish, depending on the Coral size**

Types of Corals

Hard Coral

- Only hard corals form reef. They produce rock-like skeleton made up of calcium carbonate. These skeletons contribute towards making reefs. They rely on algae(zooxanthellae) living within their tissues for nutrition and energy to build their skeleton. They therefore live in shallow clear water to allow sunlight to reach the algae.

Soft Corals

- Such as sea fans and sea whips, look like colourful plants or graceful trees and are not reef building as they don't form hard calcified skeleton of many reef building corals. But they produce small amount of calcium carbonate which help them remain in shape. They may or may not be in symbiotic relations with zooxanthellae.

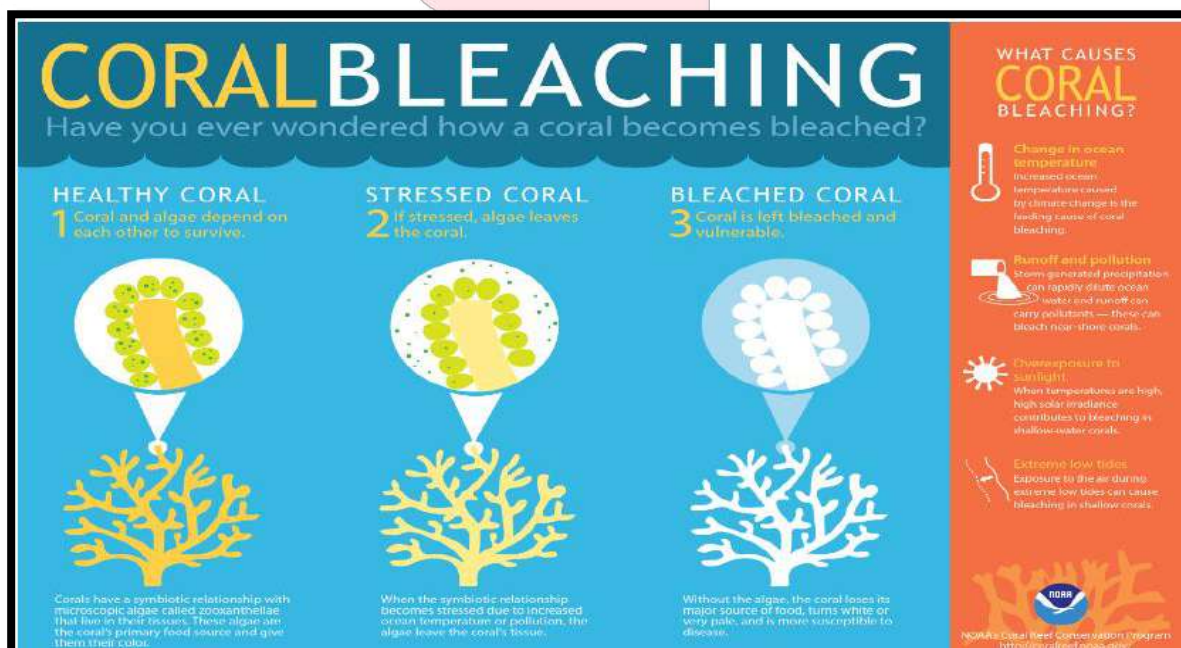
Classification of Coral Reefs based on their location

1. **Fringing Reefs**- It grow near the coastline around islands and continents. They are separated from the shore by narrow, shallow lagoons. They are the most common types of reefs that we see. E.g. reefs of Andamans
2. **Barrier Reefs** – These are also parallel to coastline by are separated by deeper, wider lagoons. At their shallowest point, they can reach the water's surface forming a 'barrier' to navigation. The great barrier reef of Australia is the largest and the most famous of the barrier reefs. E.g. in reefs in Nicobar and Lakshadweep.
3. **Atolls**- Rings of corals that create protected lagoons and are usually located in the middle of the sea. They are generally formed when islands surrounded by fringing reefs sink into the sea or the sea level rises around them. The fringing reefs continue to grow and eventually form circles with lagoons inside. Atolls are like circular barrier reefs but without their central land mass. E.g. Atolls of Lakshadweep and Nicobar



Where are Coral Reefs located?

- Coral reefs are found in more than 100 countries of the world. Most of these reefs are located between the Tropic of Cancer and Tropic of Capricorn.
- **Gulf of Mannar, Palk-bay, Gulf of Kutch, A&N Islands and Lakshadweep islands** have major reef formations in India.



Cold Water Corals/Deep water Corals

- Though majority of coral reefs are found in tropical and sub-tropical waters, there **are also deep water corals in colder regions.**
- They are mostly stony (hard) corals but can also include soft corals like sea fans.
- Like tropical corals, **they provide habitat to other species but don't require zooxanthellae to survive and don't have symbiotic algae living with them.**
- They feed solely by capturing food particles from the surrounding water.
- Very few deep-water species develop reefs.
- They generally form aggregations called patches. These aggregations are also sometimes referred as reefs but differ structurally.

Azooxanthellate Corals

About-

- For the first time, Zoological Survey of India (ZSI) recorded four species of azooxanthellate corals from waters of **Andaman and Nicobar (A&N) Islands**

What are Azooxanthellate Corals?

- Azooxanthellate corals are a group of hard corals.
- They **do not contain zooxanthellae and derive nourishment not from the sun but from capturing different forms of planktons**.
- They are deep-sea representatives with the majority of species being reported from depths between 200 meters and 1,000 meters.
- They are also reported from shallow waters, unlike zooxanthellate corals that are restricted to shallow waters

Initiative to Save Corals

Technology

- Cyromesh:** Storage of the coral larvae at (-196°C) and it can be later reintroduced to the wild
- Biorock:** Creating artificial reefs on which coral can grow rapidly
- Super corals:** Ex-situ breeding of high temperature-resistant corals with the help of the process known as 'human assisted evolution'.

Mineral Accretion Technology

Context-

- Zoological Survey of India (ZSI), with help from **Gujarat's forest department, is attempting for the first time** a process to restore coral reefs using biorock or mineral accretion technology.

About-

- Also called '**Biorock Technology**'.
- It is a method that **applies safe, low voltage electrical currents through seawater, causing dissolved minerals to crystallize on structures, growing into a white limestone (CaCO₃)** similar to that which naturally makes up coral reefs and tropical white sand beaches.
- Biorock, also known as Seacrete or Seament, refers to the substance formed by electro-accumulation of minerals dissolved in seawater.

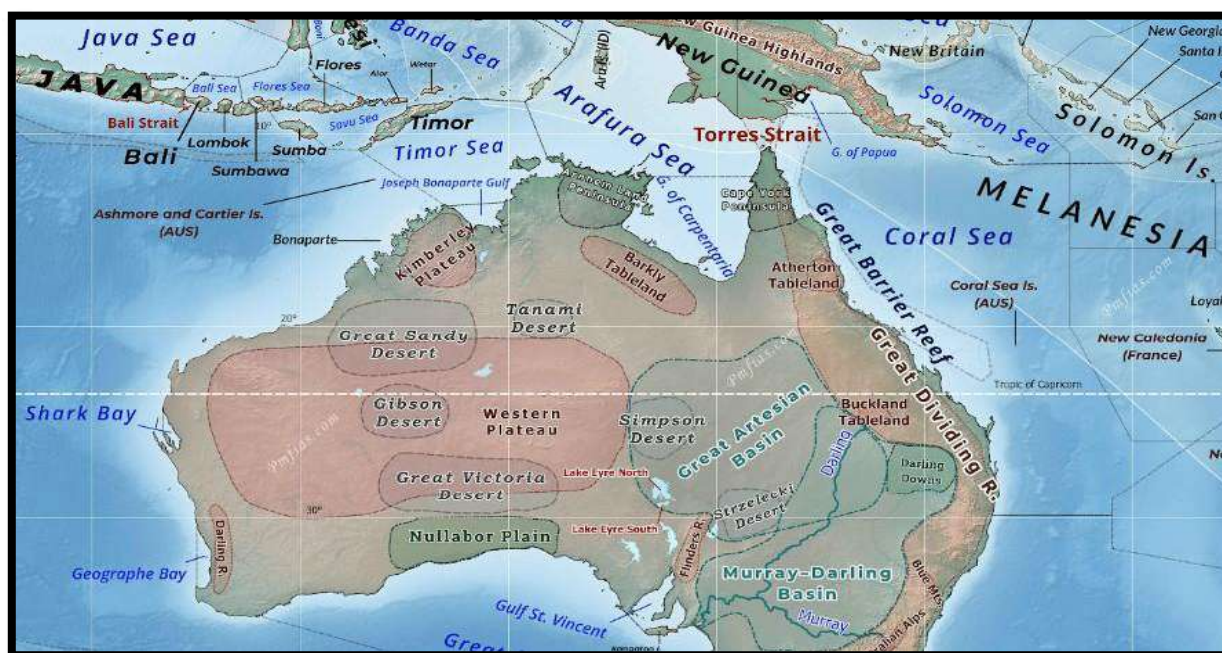
International Coral Reef Initiative

- It is an **informal partnership between Nations and organizations which strives to preserve coral reefs** and related ecosystems around the world.
- Its decisions are **not binding** on its members.
- Initiative was **founded in 1994 by eight governments:** Australia, France, Japan, Jamaica, the Philippines, Sweden, the United Kingdom, and the United States of America.
- It was announced at the First Conference of the Parties of the Convention on Biological Diversity in December 1994, and at the high-level segment of the Intersessional Meeting of the U.N. Commission on Sustainable Development in April 1995.
- ICRI now have 101 members **including India**.

Great Barrier Reef

- It is the world's largest collection of coral reefs & comprises of some 2,500 individual reefs and 900 islands. It is **designated as a UNESCO World Heritage site in 1981**.

- Located in the Coral Sea, off the **northeastern** coast of Australia, it extends in a **north-south** direction, roughly parallel to the mainland and **south of the Torres Strait**.



Artificial Reefs

Context (DTE):

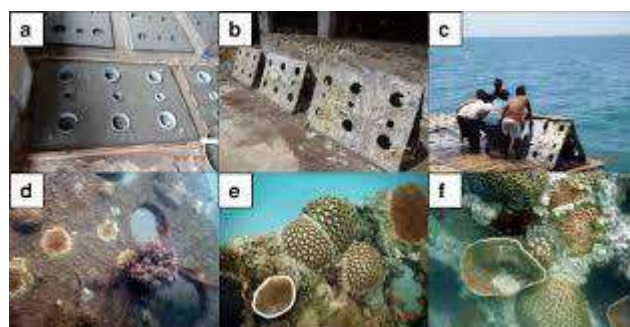
- **Odisha's first artificial reef is launched in Chilika** to restore aquatic ecosystems.

About: -

- Artificial reefs are submerged structures placed along coastal areas to create habitats for reef-dwelling organisms. While they **cannot fully replicate the biological functions of natural coral reefs, such as nitrogen fixation and carbon cycle regulation**, they provide crucial structural functions.
- These include offering shelter and space to reproduce various fish, prawn, and crab species. Artificial reefs can help break strong sea waves, creating more favourable conditions for the growth of seaweed, seagrasses, and marine plants that serve as food sources for other organisms.
- Not all artificial reefs are specially designed. In some places, pre-existing objects and debris from shipwrecks serve the purpose effectively. E.g. Redbird Reef in Delaware.

Artificial Reefs Across India: -

- The **Indian Council of Agricultural Research-Central Marine Fisheries Institute (ICAR-CMFRI)** conducted the earliest experiments in Lakshadweep and Tuticorin.
- The **Union government's Pradhan Mantri Matsya Sampada Yojana** includes plans to introduce artificial reefs in 3,477 coastal villages.



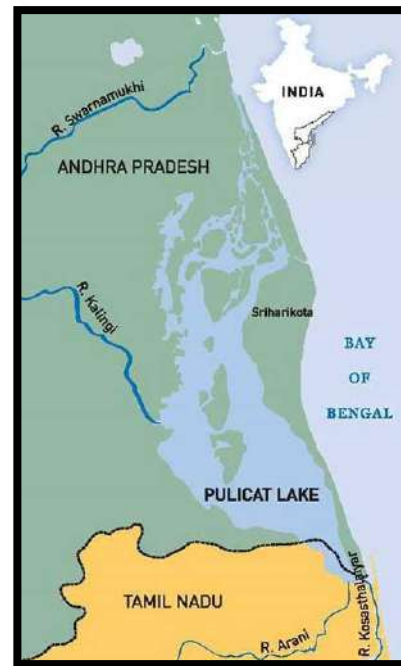
Chilika Lake

- Chilika is **Asia's largest and world's second-largest lagoon**.
- It lies on the east coast of India in the state of Odisha, separated from the mighty Bay of Bengal by a small strip of sand.

- It is the largest wintering ground for migratory birds on the Indian sub-continent and is home to a number of threatened species of plants and animals.
- In 1981, **Chilika Lake was designated the first** Indian wetland of international importance under the Ramsar Convention.
- The major attraction at Chilika is **Irrawaddy dolphins which are often spotted off Satpada Island**.
- The large **Nalabana Island** (Forest of Reeds) covering about 16 sq km in the lagoon area was declared a bird sanctuary in 1987.
- Kalijai Temple is located on an island in the Chilika Lake.

Pulicat Lagoon

- Pulicat is a vast, shallow, brackish-water lagoon covering an area of 759 sq km along the coast of the Bay of Bengal.
- It is the **second largest brackish water lagoon** in India after Odisha's Chilika Lake
- The lake receives its water from the Arani River at its southern tip, the Kalangi River from the Northwest, and the Swarnamukhi River at the northern end.
- The lake runs parallel to the Bay of Bengal and has a sand bar, making it a lagoon of its own kind.
- The barrier island of Sriharikota separates the lake from the Bay of Bengal.
- **Sriharikota** is renowned as India's rocket launch pad and is home to Satish Dhawan Space Centre.
- It supports the largest congregation of Flamingoes in Andhra Pradesh.
- The lake has 16 island villages and 30 villages adjoining the lake. The people depend on the lake for their livelihood.



PM Matsya Sampada Yojana

- **Ministry:** Ministry of Fishing, Animal Husbandry and Dairies
- Aims to enhance fish production to 220 LMT with an investment of over Rs.20,000 crores in next five years

Scheme:

- The PMMSY aims to **bring about the Blue Revolution through sustainable and responsible development of the fisheries sector in India.**
- It has an estimated investment of Rs. 20,050 crores for its implementation during a period of 5 years from FY 2020-21 to FY 2024-25 in all States/UTs, as a part of Aatma Nirbhar Bharat Package.
- PMMSY aims at enhancing fish production and this increasing fisheries export earnings to Rs.1,00,000 crore by 2024-25.
- Thus, it aims doubling of incomes of fishers and fish farmers, reducing post-harvest losses from 20-25% to about 10% and generation of gainful employment opportunities in the sector.

CAFE Norms

- **Bureau of Energy Efficiency (BEE) has released the draft Corporate Average Fuel Efficiency (CAFE) norms to align India's vehicle emission regulations** with international standards.

About: -

- CAFE **specifies average fuel efficiency targets** for all passenger vehicles sold by a manufacturer.
- These **rules apply to M1 passenger cars**, which have up to nine seats and weigh no more than 3,500 kilo grams.

- **Nodal Agency:** Bureau of Energy Efficiency (BEE) enforces compliance under the Energy Conservation Act, 2001.
- It **was first notified in 2017**.
- **Objective:** The norms aim to **decrease India's oil imports and lower carbon emissions** while promoting the use of electric, hybrid, and **flex-fuel vehicles**.
- **Credit System:** Manufacturers can earn, trade, or carry forward CAFE credits to meet emission targets.

BEE

- It was set up in 2002 **under the Energy Conservation Act, 2001**.
- As a **statutory body under the Ministry of Power**, it promotes energy efficiency policies, labels, and standards to reduce energy in intensity.

Blue Flag Beaches

Context:-

- **Five beaches in Maharashtra have recently** been awarded the international Blue Flag certification.
- Certified Beaches: Shrivardhan and Nagaon (Raigad), Parnaka (Palghar), and Guhagar and Ladghar (Ratnagiri) have received the certification.
- Last year, the Blue Flag certification has been **accorded to two new beaches - Minicoy Thundi Beach and Kadmat Beach- both in Lakshadweep**.
- This takes the number of beaches certified under the Blue Flag certification to **17**.

Blue Flag Certification

- 'Blue Flag' certification is an **eco-label certification** that a beach, marina, or sustainable boating tourism operator can obtain.
- It was **started in France** in 1985 & in areas out of Europe in 2001.
- It is **awarded by Denmark based Foundation for Environment Education (FEE)**.
- **Chandrabhaga beach** (or the Golden beach) in **Odisha** is the **first beach** in India as well as in Asia to win the Blue Flag certification.

Do you know?

- India launched its **own eco-label, Beach Environment and Aesthetics Management Services (BEAMS)**, in 2018 under the Integrated Coastal Zone Management (ICZM) project.

Blue Flag Beaches:

- Blue Flag Beaches are selected based on 33 stringent parameters. These criterias are divided into 4 major heads namely,
 - Water quality
 - Environmental management
 - Environmental Education
 - Safety
- The jury that selects Blue Flag beaches comprises members of the:
 - United Nations Environment Programme (UNEP)
 - United Nations World Tourism Organization (UNWTO)
 - Foundation for Environmental Education (FEE)
 - International Union for Conservation of Nature (IUCN)
- This certification is **awarded each year**.



- **Spain** has the highest number of Blue Flag beaches (729 sites).

Foundation for Environment Education (FEE)

- FEE was established in 1981.
- It is headquartered in Copenhagen, Denmark.
- It currently has 77 member nations.

Globally Important Agricultural Heritage Systems

- Six new sites have been **added to Globally Important Agricultural Heritage Systems (GIAHS) Programme.**

About: -

- GIAHS is a **programme of Food and Agriculture Organization (FAO)**, launched in **2002** at **the World Summit on Sustainable Development**.
- **Purpose:** The program works to identify, support, and safeguard agricultural systems that preserve genetic diversity, support rural livelihoods, and maintain cultural landscapes.

The recent additions include:

- A traditional agroforestry system for Erva mate plant in Brazil.
- Specialised farming systems in China for pearl mussels (a mollusc), white tea, and pears
- Ancestral system preserving vital food crops and biodiversity in Mexico
- A distinctive farming system in the volcanic landscape of Lanzarote island, Spain

India currently hosts three GIAHS:

- Koraput region in Odisha,
- Kuttanad farming system in Kerala,
- Saffron Heritage of Kashmir.

Food and Agriculture Organisation (FAO)

- It is a UN body.
- It leads international efforts to defeat hunger.
- Established: 1945
- HQ: Rome, Italy
- In theory, acts as a neutral forum where all nations meet as equals to negotiate agreements and debate policy.
- FAO is also a source of knowledge and information and helps developing countries and countries in transition modernize and improve agriculture, forestry and fisheries practices, ensuring good nutrition and food security for all.
- India is a member of FAO.

Reports published by FAO:

- World State of Forest Report
- State of World Fisheries and Aquaculture (SOFIA).
- State of Food Security and Nutrition in the World (SOFI), etc
- **Treaty:** FAO is the depository body of the International Treaty on Plant Genetic Resources for Food and Agriculture.

Initiatives of FAO:

- Codex Alimentarius Commission or CAC
- Tree Cities of the World programme among others.

Wildlife Transportation in India

- SC upheld the relocation order of Mahadevi, a temple elephant from Kolhapur Jain math.
- **Section 48A of WPA, 1972 prohibits transport** that **harms** protected species or conservation efforts.
- Wildlife transport needs prior approval of the Chief Wildlife Warden of the concerned state.
- **Captive Inclusion:** It covers both wild-caught and legally held captive Schedule-listed animals.
- **Penalties:** Breach of Section 48A attracts up to 7 years in jail and a fine of ₹50,000 or both.

Vantara

Context:

- PM inaugurated Vantara, the **world's largest animal rescue** and conservation centre.

About: -

- Vantara: Located in Jamnagar, **Gujarat**.
- Being run by: Radhe Krishna Temple Elephant Welfare Trust, Greens Zoological and Reliance.
- Animal Welfare: Vantara houses over 1.5 lakh rescued and endangered animals.
- Vantara houses some of the world's rarest species, including a two-headed snake, a two-headed turtle, Tapirs, Seals, Giant Otters, and Bongo antelopes.
- **Elephant Care:** It also hosts the world's largest elephant hospital.

Wildlife (Protection) Amendment Act, 2022

Context:-

- The Wildlife (Protection) Amendment Act, 2022 was enacted to amend the WLPA, 1972 to incorporate more species protected under the law.

Objectives of the Wild Life (Protection) Amendment Act, 2022

- Give effect to India's obligations under the **Convention on Endangered Species of Wild Fauna and Flora (CITES)** (it requires countries to regulate the trade of all listed specimens through permits)
- Rationalise schedules which list out species under the Wildlife Protection Act, 1972 (WPA, 1972)
- Strengthen the protection of species (esp. endangered species)
- Conserve and protect wildlife through better management of protected areas
- Benefit the local tribal communities

Amendments Proposed in Wild Life (Protection) Amendment Act, 2022

- The **Act reduces the number of schedules to four** which involves the removal of schedule for vermin species and insertion of a new schedule for specimens under CITES.
- The WPA, 1972 has six schedules – for specially protected animals (Schedule I, II, III, IV), vermin species (Schedule V) and specially protected plants (Schedule VI)
- The **act empowers the central government** to regulate or prohibit the import, trade, possession or proliferation of **invasive alien species**
- It provides for **any person to voluntarily surrender any captive animals** or animal products to the **Chief Wild Life Warden**. No compensation will be paid to the person for surrendering and surrendered items will become the state's property.
- It **empowers the Central government** to declare areas adjacent to National Parks and Wild Life Sanctuaries as Conservation Reserves for protecting flora and fauna, and their habitat.
 - Under the WPA, 1972, this power was **entrusted only to state governments**.

	Schedule-I Animal Species with highest level of protection.		Schedule-II Animal Species with lesser level of protection.
	Schedule-III Protected plant species.		Schedule-IV Specimen listed in the Appendices under CITES.

- It specifies that the Chief Warden must act according to the management plans for the sanctuary which are prepared as per guidelines of the Central government and as approved by the Chief Warden.
- It seeks **to amend Section 43 of the WPA, 1972 to permit transfer or transport of a captive elephant (a Schedule I animal)** for 'religious or any other purpose' by a person having a valid certificate of ownership.
- It inserts Section 49E to enable Central government to appoint a Management Authority to grant export or import permits for trade of specimens. It also inserts Section 49F to empower Central government to appoint a Scientific Authority to advice on impact on the survival of the specimens being traded.
- It also enhances the penalties for violation of provisions of the WPA

Wild Life (Protection) Act of 1972 (WPA, 1972)

- In 1972, Parliament enacted the Wild Life Act (Protection) Act.
- Originally extended to whole of India except J&K but after abrogation of Art 370, it covers J&K also.
- Wildlife wardens and their staff administer the act.
- **State government may appoint** Chief Wildlife Warden.
- Central government may appoint directors & assistant directors.
- **Declaration of Sanctuary/NP:** State Government by Notification (no need to pass any law)
- Establishment of sanctuaries & national parks,
- Regulations for trade in wild animals, animal products & trophies, &
- **Management of Zoo's**
- Judicially imposed penalties for violating the Act.

Delineation of Powers under the Act

- No human activity is permitted inside a National Park **except** for ones permitted by Chief Wildlife Warden of State.
- **Chief Wild Life Warden may permit hunting** of any wild animal if it has become dangerous to human life or is so disabled or diseased as to be beyond recovery.
- **Both State & Central Governments can notify** National Parks & Wildlife Sanctuaries under the act.
- **Alteration of boundaries can be done by State Government only with prior approval of National Board for Wildlife.**
- **Central government** may, by notification, declare any wild animal other than those specified in Schedule I & II to be Vermin.

Previous Amendments

WPA amendment 1982:

- Introduced a provision permitting the capture and transportation of wild animals for the scientific management of animal population.

WPA amendment 2002:

- It made punishment & penalty more stringent.
- Provision for National Board for Wildlife.

WPA amendment 2006:

- National Tiger Conservation Authority
- Wildlife Crime Control Bureau

National Tiger Conservation Authority (NTCA)

- NTCA was established in December 2005 following a recommendation of the Tiger Task Force.
- Wild Life (Protection) Amendment Act, 2006 provides for creating:
 - National Tiger Conservation Authority and

- Tiger and Other Endangered Species Crime Control Bureau (**Wildlife Crime Control Bureau**).
- It administers Project Tiger.
- Tiger reserves in India are administered by field directors as mandated by NTCA.
- No alteration in the boundaries of a tiger reserve shall be made except on a recommendation of the NTCA and the approval of the National Board for Wild Life.
- No State Government shall de-notify a tiger reserve, except in public interest with the approval of the NTCA and the approval of the National Board for Wild Life

NTCA members

- NTCA was set up under the **Chairmanship of the Minister for Environment and Forests**.
- The Authority will have
 - a) eight experts having qualifications in wildlife conservation and welfare tribals,
 - b) 3 MPs,
 - c) The Inspector-General of Forests, in charge of project Tiger, will be ex-officio Member Secretary
 - d) Others

Functions of NTCA

- Authority lays down standards, guidelines for tiger conservation in the Tiger Reserves, National Parks and Sanctuaries.
- Authority would be required to prepare an Annual Report, which would be laid in the Parliament along with the Audit Report.
- **State level Steering Committees will be set up in the Tiger States under the Chairmanship of respective Chief Ministers.**

National Board for Wildlife

- The National Board for Wildlife has 47 members **with the Prime Minister in the Chair.**

Wildlife Advisory Board (State Board for Wildlife – SBWL)

- Wildlife Advisory Board is a **statutory body** of the state (UT) government.
- The Wildlife (Protection) Act, 1972 mandates the State (UT) Government to constitute a Wildlife Advisory Board
- **Minister in charge of Forest in the State** (UT) is the **Chairman** (Chief Secretary will be the chairman if the minister's post is vacant).

Central Zoo Authority (CZA)

- WPA, 1972 provided for constitution of Central Zoo Authority **by central government.**
- Authority shall consist of: **Chairperson (Environment Minister)**
 - Such numbers of members not exceeding 10 (appointed by central government) | Member secretary

Functions:

- It can **recognise or derecognise any zoo in country.**
- No zoo shall be operated without being recognised by the Authority.
- It **lays down guidelines** and prescribes rules under which animals may be transferred/exchanged among zoos nationally and internationally
- It identifies endangered species of wild animals for purposes of captive breeding and assigning responsibility in this regard to a zoo.
- Standards and norms for housing, upkeep, health care and overall management of animals in zoos has been laid down under the Recognition of Zoo Rules, 1992.
- CZA is an **affiliate member of the World Association of Zoos and Aquariums (WAZA)**

The World Association of Zoos and Aquariums (WAZA)

- It is the "umbrella" organization for the world zoo and aquarium community.
- Its mission is to provide leadership and support for zoos, aquariums, and partner organizations of the world in animal care, welfare & conservation.
- Founded in 1935 at Basel, Switzerland.

Various Schedule in WPA 1972

- Harming endangered species listed in **Schedule I** of the Act is prohibited throughout India.
- Hunting species, like those requiring special protection (Schedule II), big game (Schedule III), and small game (Schedule IV), is regulated through licensing.
- A few species classified as **vermin (Schedule V)**, may be hunted without restrictions.
- **Schedule VI** which provides plant protections was added by amendment of 1991.
- No person is allowed to cultivate a specified plant mentioned in Schedule VI, except with a **licence granted by the Chief Wildlife Warden**.
- Schedule VI of the Act lists all 6 plants of Indian origin included in CITES appendices.
 - 1) Beddome's cycad
 - 2) Blue Vanda
 - 3) Kuth
 - 4) Ladies slipper orchids
 - 5) Pitcher plant
 - 6) Red Vanda
- WPA, 1972 is **against taxidermy** (preservation of dead wild animals as trophy or in the form of skins, antlers, horns, eggs, teeth or nails)

Q. If a particular plant species is placed under Schedule VI of The Wildlife Protection Act, 1972, what is the implication? (2020)

- a) A licence is required to cultivate that plant.
- b) Such a plant cannot be cultivated under any circumstances.
- c) It is a Genetically Modified crop plant.
- d) Such a plant is invasive and harmful to the ecosystem.

Q. In India, if a species of tortoise is declared protected under Schedule I of the Wildlife (Protection) Act, 1972, what does it imply? (2017)

- a) It enjoys the same level of protection as the tiger.
- b) It no longer exists in the wild, a few individuals are under captive protection; and now it is impossible to prevent its extinction.
- c) It is endemic to a particular region of India.
- d) Both (b) & (c) are correct in this context.

Q. According to the Wildlife (Protection) Act, 1972, which of the following animals cannot be hunted by any person except under some provisions provided by law? (2017)

- 1) Gharial
- 2) Indian wild ass
- 3) Wild buffalo

Select the correct answer using the code given below:

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

Geoparks

Context: -

- **UNESCO** endorsed the addition of 16 new Geoparks to the Global Geoparks Network (GGN).

About: -

- Uberaba (Brazil): Its tag line 'Land of the Giants' refers to its rich palaeontological heritage is latest addition.
- No geopark in India.
- In a historic first, **North Korea joined the network, while Saudi Arabia** made its debut with two newly designated geoparks.
- In 2025, **UNESCO marked the 10th anniversary of its International Geoscience and Geoparks Programme**, a key Earth Sciences initiative.

Global Geoparks Network (GGN): -

- It is a non-profit International Association officially established in 2014.
- GGN was founded as an international partnership developed under the umbrella of UNESCO.

Unique Sleeping Patterns of Animals

Dolphins

- Dolphins **shut down half of their brain, which rests, while the other half is alert** and looking out for any potential hazards.
- During this time, **dolphins often float motionless at the surface in a behaviour known as "logging"**, because they resemble a floating log.

Elephants

- Among the **lightest sleepers in the animal kingdom**. In the wild, they average just two hours of sleep daily, usually split into short naps.
- Most of their rest happens while standing. They occasionally lie down for deeper sleep.

Walrus

- Ability to sleep just about anywhere, even in the ocean.

Project Circular Bharat

- **Atal Innovation Mission and Hindustan Unilever Limited (HUL) launched** a national programme under Project Circular Bharat to scale circular-economy start-ups.
- Project Circular Bharat is a **national initiative by HUL to shift India from linear to circular waste systems**, starting with plastics.
- It drives **plastics circularity through Material Recovery Facilities** and inclusion of waste workers in **partnership with the UN Development Programme (UNDP)** and local governments.

Atal Innovation Mission:

- **NITI Aayog initiative launched in 2016** to promote nationwide innovation and entrepreneurship through incubators, start-up support and school tinkering labs.

United Nations Development Programme (UNDP)

- The UNDP is a United Nations agency tasked with helping countries eliminate poverty and achieve sustainable economic growth and human development.
- UNDP was **established in 1966 by the General Assembly of the United Nations**.
- Funding – It is funded entirely by voluntary contributions from member nations.

- **Headquarters** – New York, USA

UNDP's work is concentrated in three focus areas –

- Sustainable development,
- Democratic governance and peace building, and
- Climate and disaster resilience.

Mission & Vision –

- UNDP's mandate is to end poverty, build democratic governance, rule of law, and inclusive institutions.
- It advocates for change, and connect countries to knowledge, experience and resources to help people build a better life.

Reports published by UNDP:

- Human Development Index
- Sustainable Development Goals
- Gender Inequality Index

Jaipur Declaration

- Adopted in 2025, the **declaration sets a roadmap for Asia-Pacific nations** to achieve a circular economy by 2035, emphasizing the 3R principles—Reduce, Reuse, Recycle.
- Aligns with global **frameworks, including the Sustainable Development Goals (SDGs)**, Paris Agreement, and Kunming-Montreal Biodiversity Framework, to combat climate change, environmental pollution, and biodiversity degradation.
- **Builds on the Hanoi 3R Declaration (2013-2023)**, which established 33 voluntary goals for sustainable waste management and resource efficiency.

TAC in India

- India imposes a **monsoon fishing ban, equivalent to a TAC of zero for 61 days every year** in its exclusive economic zone (EEZ), from April 15 to June 14 on the east coast and June 1 to July 31 on the west coast.
- The Total Allowable Catch (TAC) is a **limit on the total quantity of fish** that fishers can catch in a particular area.
- **Governments and regulatory bodies impose TACs in oceans, seas, and inland water bodies** to prevent overfishing and allow fish populations to maintain a minimum viable size for self-replenishment.
- TACs are essential so that the **fish population in a water body can maintain a minimum** size every year that allows it to sustain itself.

Mercury

- Signatory **nations to the Minamata Convention on Mercury** have agreed to **phase out mercury-based dental amalgams by 2034.**

Minamata Convention: -

- It is first global **legally binding** treaty to protect human health and environment from adverse effects of mercury.
- It was agreed at the fifth session of the Intergovernmental Negotiating Committee in Geneva, Switzerland 2013.
- Controlling the **anthropogenic releases** of mercury throughout its lifecycle is one of the key obligations under the Convention.
- It came into force in 2017.
- Presently, there are 144 Parties and 128 Signatories to it.

- **India ratified it in 2018 with flexibility for continued use** of mercury-based products and processes involving mercury compounds up to 2025.
- **Implementing Agency:** United Nations Environment Programme (UNEP).

Minamata Disease:

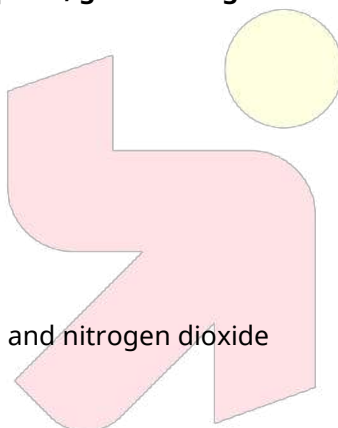
- A disorder caused by **methylmercury poisoning that was first described in the inhabitants of Minamata Bay, Japan** and resulted from their eating fish contaminated with mercury industrial waste.
- The disease is characterized by peripheral sensory loss, tremors, and both hearing and visual loss.
- **Methylmercury is very different from ethyl mercury.**
- Ethyl mercury is used as a preservative in some vaccines and does not pose a health risk

Mercury

- It is a naturally occurring element that is found in air, water and soil
- It may have toxic effects on nervous system, thyroid, kidneys, lungs, immune system, eyes, gums and skin.
- It is considered by WHO as one of the top ten chemicals of major public health concern.
- **Source of mercury- Volcanic eruption, gold mining and Non-ferrous metal production.**

Heavy Metal Diseases

- Cadmium: Itai Itai
- Lead: Anemia, Neural Issues
- Mercury: Minamata
- Nitrates: Blue Baby Syndrome
- Arsenic: Black Foot Disease
- Asbestos: Asbestosis, Silicosis
- Yokkaichi asthma: Sulphur dioxide and nitrogen dioxide



Definition of Forests

- Haryana government officially defined the **“dictionary meaning of forest”** following the SC’s directive.

Why so much confusion?

- India lacks a uniform legal definition, **leaving states to interpret the 1996 Godavarman ruling.**
- **FCA 1980:** Defines Forest land as areas **recorded as forest, including reserved and protected lands.**
- **FSI:** **Any land over 1 hectare with at least 10% canopy cover is forest**, regardless of ownership.
- **T.N. Godavarman Case:** Forest includes all government-recorded forest areas, regardless of ownership.
- **FCA 2023 Amendment:** Law **limited to notified and recorded forests**, narrowing Godavarman’s scope.

Problems in Rules

Context-

- Recently, the National Commission for Scheduled Tribes (NCST) Chairperson said that the **ST body’s position on the Forest (Conservation) Rules 2023 being violative of the Forest Rights Act, 2006 “will be the same”** even as the Environment Ministry has dismissed these concerns.

Problems Rise by ST Body

- Tribal rights: Rules states that **only the state government will now be responsible to ensure that the rights of the forest dwellers are secured, that too after the union government has given its final approval.**

- **Rules goes against the Gram Sabha's decision** under the Forest Rights Act 2006 who is the authority to initiate the process for determining the nature and extent of individual or community forest rights and issuing certificate that the forest rights recognition process is complete.
- **Lack of proper scrutiny:** Rules seek to simplify and shorten the process of appraising any infrastructure or other development project involving the diversion of forest land.
- However, **rules don't scrutinise the impacts** of projects for **less than 5 hectares**.

Forest (Conservation) Act of 1980

- It came into force to **address deforestation**. Though the **Indian Forest Act has been in force since 1927**, it was geared to allow the colonial British administration to control the extraction of timber
- It was enacted to consolidate the law related to forest; to control unchecked deforestation, the transit of forest produces and the **duty liveable** on timber and other forest produce.
- Forest officers and their staff administer the Forest Act.
- Under the provisions of this Act, **prior approval of the Central Government** is required for **diversion of forestlands for non-forest purposes**.
- An Advisory Committee constituted under the Act advises the Centre on these approvals.
- The Act deals with the four categories of the forests, namely
 - Reserved forests
 - Village forests
 - Protected forests & private forests.

1992 Amendment:

- It provisioned for allowing some non-forest activities in forests, without cutting trees or limited cutting with **prior approval of Central Govt.**

Forests that are not notified under forest act.. are covered?

- Yes
- By SC Order of 1996 in **TN Godavarman vs the Union of India case**
- SC said that "the provisions made for the conservation of forests must apply to all forests irrespective of the nature of ownership or classification thereof."
- SC said that the Forest (Conservation) Act, 1980, **was brought in to prevent deforestation** and goes on to add that its nature of land classification doesn't matter
- Court had also said that forests will not just be areas recorded as forest land in government records, but all areas which are similar to the dictionary definition of a forest.

Community Reserves

- Conservation reserves & community reserves in India are terms denoting protected areas of India.
- These typically act as buffer zones, connectors, and migration corridors between established national parks, wildlife sanctuaries, and reserved and protected forests in India.
- Such areas are **designated as conservation reserves** if they are uninhabited and **completely owned by the GOI but** used for subsistence by communities.
- Such areas are **designated as community reserves** if part of the **land is privately owned**.
- A community reserve is usually formed by the local village council and the forest department signing a memorandum of understanding (MoU).
- After a forest has been made into a community reserve, people cannot hunt there, nor can they use it for agricultural practices, leave alone jhum.
- These protected were **introduced in the Wildlife (Protection) Amendment Act of 2002**.
- The provisions of the WLPA apply to an area once it has been declared a community reserve.

Forest Rights Act, 2006 (FRA 2006)

- Forest Rights Act, 2006 provides for the **restitution** of deprived forest rights across India.
- Formal name- Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.

Forest Rights Act recognizes and secures:

- Community Rights in **addition** to their Individual Rights
- Right to protect, regenerate or conserve or manage any community forest resource which the communities have been traditionally protecting and conserving for sustainable use.
- Right to intellectual property & traditional knowledge related to biodiversity and cultural diversity.
- Rights of displaced communities & rights over developmental activities

Features of act

- Act is applicable for Tribal and Other Traditional Forest Dwelling Communities.
- Act recognizes the **right of ownership** access to collect, use, and dispose of **minor forest produce by tribals**.
- Section 2 of FRA: Defines Minor Forest Produce (MFP — includes non-timber forest produce of plant origin).
- FRA only recognises pre-existing rights which are already being exercised by eligible persons in NP & Sanctuaries.
- Also, it secures tenure of existing forest dwellers, but **no new rights** are being created.
- Rights conferred under the Act shall be heritable but not alienable or transferable.
- **Nodal Agency for the implementation** - Ministry of Tribal Affairs (MoTA)

Rights under the Act:

- **Title rights** – Ownership to land that is being farmed by tribals or forest dwellers subject to a **maximum of 4 hectares**; ownership is only for land that is actually being cultivated by the concerned family, meaning that no new lands are granted.
- **Use rights** – Minor Forest produce (also including ownership), to grazing areas, to pastoralist routes, etc.
- **Relief and development rights** – To rehabilitation in case of illegal eviction or forced displacement; and to basic amenities, subject to restrictions for forest protection.
- **Forest management rights** – To protect forests and wildlife.

Criteria to claim rights under FRA: -

Criteria & evidence for Forest Dwelling Scheduled Tribes (FDST) to claim rights under FRA:

- He or she Must be **ST** in an area.
- Primarily resided in forest or land prior to December 2005
- **Depend** on forest or forest land for livelihood needs

Criteria for other Traditional Forest Dweller (OFTD):

- It **must** be primarily resided in forest for **3 generation** (75 years) prior to December 2005.
- It must be **depended** on forest for livelihood needs

Rights of Gram Sabha under act

- **Gram Sabha** has been designated as the competent authority for initiating the process of determining the nature and extent of individual or community forest rights.
- Decision of the Gram Sabha is final?
- No

- 1st appeal: Divisional Level Committee or Sub-Divisional Level Committee
- 2nd appeal: Before the courts

Critical Wildlife Habitats

About-

- It has been **envisaged** in Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.
- This act defines the CWH as the “areas of national parks and sanctuaries where it has been specifically and clearly established, **case by case**, on the basis of scientific and objective criteria, that such areas are required to be **kept as inviolate** for the purposes of wildlife conservation...”.
- Above definition makes it very clear that the Critical Wildlife Habitats are **absolutely free of human presence**.
- But the same act duly recognizes the traditional rights of the Forest dwellers.
- As per the sec 2(b) of FRA, 2006, the **Ministry of Environment and Forests** (MOEF) has been identified as the agency to **determine and notify** Critical Wildlife Habitats
- Power to notify the rules to designate a CWH rests with Ministry of Environment and Forests.
- **State Government are needed to initiate the process for notification of a critical wildlife habitat by submitting an application** on a case-by-case basis, to the Ministry of Environment and Forests, which is the nodal agency under the said Act.
- Critical Wildlife Habitats are thus, **declared by Central Government ONLY**.
- But **Habitat Rights of the PVTGs under CWH are recognized by The Ministry of Tribal Affairs**.
- Government Guidelines have **replaced prior consent of the gram sabha** with a public hearing of all stakeholders.

Critical 'tiger' habitats (CTHs)

- Critical 'tiger' habitats (CTHs) are also known as core areas of tiger reserves.
- They are identified **under the Wildlife Protection Act (WLPA), 1972** (Section 38V) based on scientific evidence that "such areas are required to be kept as inviolate for the purpose of tiger conservation without affecting the rights of the Scheduled Tribes or such other forest dwellers".
- Notification of CTH is **done by the state government** in consultation with the expert committee constituted for the purpose.

Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013 (LARR Act)

- The Act mandates that Adivasis shall be provided land equivalent to land acquired, or two and a half acres, whichever is **lower**.
- Therefore, the Adivasis with no other lands except podu patta (community rights) land are **entitled to seek land-to-land compensation**.
- The Act also requires that community forest rights recognised under FRA be **quantified in monetary terms**, and the amount should be paid to the individual concerned in proportion to his share in such community rights.

IMP facts for Prelims:

- **Baiga community**, a Particularly Vulnerable Tribal Group (PVTG), became the second PVTG to get habitat rights in Chhattisgarh, after the Kamar tribal group.
- **Odisha** was the first state in India to **declare Critical Wildlife Habitat (CWH) rights**.

Habitat Rights

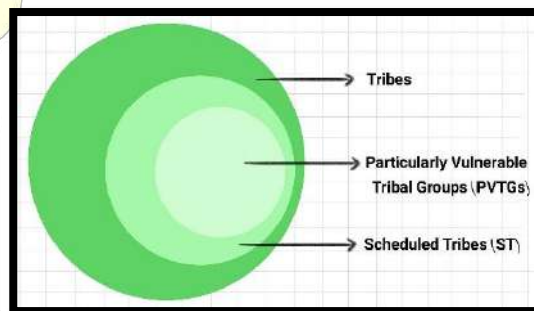
- Habitat rights recognition **grants communities** the right to their traditional territory, socio-cultural practices, livelihoods, ecological and traditional knowledge, and the protection of their natural and cultural heritage. (**Habitat rights don't grant ownership to property**).
- Habitat rights are given to PVTGs under **section 3(1) (e)** of The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 or Forest Rights Act (FRA).
- According to FRA**, "Habitat comprises the customary habitat and such other habitats in reserved forests and protected forests of primitive tribal groups and pre-agricultural communities and other forest dwelling Scheduled Tribes."

How the Government Fixes a Habitat

- The procedure is based on **guidelines** from the Ministry of Tribal Affairs (MoTA) in 2014.
- The **tribal leaders** are consulted about the extent of their culture, traditions, and occupation.
- The government corroborates it, and then a habitat is declared.
- The **United Nations Development Programme (UNDP)** provides technical assistance to the administration to implement the habitat rights law.
- Four state-level departments**, i.e., Forest, Revenue, Tribal, and Panchayati Raj, coordinate with the UNDP team to ascertain habitats.

Particularly Vulnerable Tribal Group (PVTG)

- PVTG (previously known as a Primitive Tribal Group) is a sub-classification of Scheduled Tribes considered more vulnerable among the tribal groups.
- Dhebar Commission** (or Tribal Panchsheel Committee) recommended the creation of Primitive Tribal Groups (PTGs). Based on this, the Indian Government created PTGs in 1975.
- In 2006, PTGs were renamed as PVTGs.
- At present, there are 75 PVTGs out of 705 Scheduled Tribes.
- Odisha** has the highest number of PVTGs.



Criteria followed for identification of PVTGs are:

- Pre-agricultural level of technology
- Low level of literacy
- Economic backwardness
- A declining or stagnant population
- In India, the tribal population makes up 8.6% of the total population. Tribal people live in about 15% of the country's geographical area.

PVTGs with Habitat Rights

- Only three PVTGs have habitat rights.
- Bharia Tribe (Madhya Pradesh): 1st PVTG to get habitat right.
- Kamar Tribe (Chhattisgarh)
- Baiga Tribe (Chhattisgarh)

Relocating Villages from Tiger Reserves

- Ministry of Tribal Affairs has directed states to compile data on families and villages inside tiger reserves following complaints of alleged evictions from **reserves like Tadoba, Durgavati and Buxa**.

AviList

- AviList is the **first-ever unified global checklist** of bird species.
- **Developed by:** Working Group on Avian Checklists, **comprising BirdLife International**, Cornell Lab of Ornithology, Avibase, AOU & IOU.
- It replaces existing lists such as the IOC & Clements Checklists, creating one global standard.

BirdLife International

- It is a non-profit global conservation group & **the official Red List Authority for birds**.
- It is world's largest conservation partnerships for conservation of birds and their habitats.
- Its global office is in UK with 6 regional offices – Africa, the Americas, Asia, Europe and Central Asia, the Middle East and the Pacific.
- **Mission-** To conserve birds, their habitats & global biodiversity, working with people toward sustainability in using natural resources.
- Bombay Natural History Society (BNHS), Mumbai is BirdLife International partner from India.
- **BNHS & Birdlife International identify Important Bird Areas (IBAs) in India.**
- IBA programme of Birdlife International aims to identify, monitor & protect a global network of IBAs for the conservation of the world's birds & associated biodiversity
- It publishes a **quarterly magazine, World Birdwatch**, which contains recent news and authoritative articles about birds, their habitats, and their conservation around the world.
- It also published important bird areas (IBA) inventory.

India's First Wildlife Biobank

- **Padmaja Naidu Himalayan Zoological Park** (Darjee ling Zoo) **now hosts India's first biobank**, set up in collaboration with the Centre for Cellular and Molecular Biology (CCMB).
- **Purpose:** To support conservation breeding, genetic research, and future species restoration efforts

Kavaru

- **Undrained Pokkali rice fields** and **Vembanad** back waters witness 'Kavaru'.
- Kavaru refers to **bioluminescence, a natural emission of light by microbes** (bacteria, algae, fungi) in water. •
- **Trigger Conditions:** High salinity, stirring of water and movement of fish activate the blue glow.

Pokkali Rice

- Pokkali is a **traditional rice variety** grown in Kerala's water-logged coastal regions, known for its **ability to withstand saline water**.
- **June to November** – Rice cultivation when salinity is low; November to April – Prawn farming when salinity rises.
- **Geographical Indication (GI) Tag:** Recognised for its unique cultivation **method** and heritage.

Vembanad-Kol Wetland

- **Second-largest Ramsar Site** in India after Sundarbans.
- It is also the **longest lake in India**.
- **Largest brackish lake in Kerala**, spanning across the Alappuzha, Kottayam, and Ernakulam districts.
- It is **below sea level and comprises paddy fields like Pokkali, Kayal, and Kole wetlands** used for farming and aquaculture that are below sea level.

Periyar River

- **Location:** Originates from Sivagiri Hills of Western Ghats. Flows through **Periyar National Park & into Vembanad Lake and** then empties into the Arabian Sea.
- **Tributaries:** Muthirapuzha, Mullayar, Cheruthoni, Perinjankutti.

- **Significance:** The **longest and largest discharge potential river in Kerala**. It is a perennial river. It generates significant electrical power **via the Idukki Dam**. 25% of Kerala's industries are along its banks.
- **History:** Kochi, a major port city in Kerala, was formed in 1341 due to the flooding of the Periyar River.
- The **Idukki Dam** is constructed across the Periyar River.
- The **Mullai Periyar Dam** is located on the confluence of the Mullayar and Periyar rivers.

Animal Welfare Board of India

- Animal Welfare Board of India (AWBI) has **issued a standard operating procedure (SOP) for municipal authorities to remove stray dogs** from public institutional premises.

About: -

- AWBI is a **statutory advisory body that promotes compliance** with animal-welfare laws.
- Established in 1962 under Section 4 of the Prevention of Cruelty to Animals Act, 1960.
- It functions **under the Ministry of Fisheries, Animal Husbandry and Dairying**.
- **Composition:** Consists of 28 members, with a three-year term of office.
- **Headquarters:** Ballabgarh, Haryana.
- **First Chairperson:** Renowned dancer and philanthropist Smt. Rukmini Devi Arundale.
- Its **mandate is to prevent unnecessary pain or suffering to animals** and advise central and state governments on animal-welfare matters.
- It is empowered to authorise individuals to inspect premises & seize animals where cruelty is suspected.

PYQ

Q. Consider the following statements: (2014)

- 1) Animal Welfare Board of India is established under the Environment (Protection) Act, 1986.
- 2) National Tiger Conservation Authority is a statutory body.
- 3) National Ganga River Basin Authority is chaired by the Prime Minister.

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

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

PRAYAAS

Solidification Technology

- Researchers in **Rajasthan have used 'solidification' technology** to cultivate wheat on desert land.
- Solidification is a scientific method **that transforms desert sand into fertile, crop-supporting soil using bioformulations of natural polymers**.
- These **polymers stabilise sand particles by cross-linking them into a soil-like material** that traps water, retains nutrients and promotes microbial activity, thereby enhancing soil fertility.
- **Significance:** Solidification technology enables farming on barren deserts, conserves water, improves yields, and offers scalable solutions for other arid ecosystems to combat desertification.

Bioformulation

- It is a mixture of natural polymers and beneficial microorganisms that improves soil structure, enhances fertility, and supports sustain able crop growth.

Vermin

- Kerala Forest Ministry requested the Centre to declare Wild Boar as vermin
- In villages identified as “conflict hotspots” — for six months to deal with rising human-wildlife conflict and crop damage.

Who are Vermins?

- Animals considered harmful or nuisance-causing due to damage to crops, threats to livestock, or risks to human life and property.
- **Common Examples:** Rats, mice, common crows, fruit bats.
- **Legal Impact:** Classified vermin lose legal protection and are exempt from wildlife conservation laws.

Process of Declaring Vermin:

- State Initiation: The respective state government **submits a formal request to the Ministry of Environment, Forest and Climate Change (MoEFCC).**
- Central Declaration: Upon verification, the Centre issues a notification declaring the species as vermin for a specified region and duration.
- **Temporary Nature:** The vermin status is temporary and limited to the stated area and period.
- **Current Provision:** Section 11(1)(A) **allows the Chief Wildlife Warden (CWLW) to permit the hunting/killing of wild animals** that pose a threat to human life or are diseased/disabled.

Biomass Pellets

- Minister for New and Renewable Energy (MNRE) inaugurated a biomass pellet plant in Haryana.

About:

- Solid renewable fuel made from compressed organic material such as agricultural residue, energy crops, industrial waste and untreated wood.
- **Torrefaction:** Biomass heated at 250-350°C **without oxygen**, producing hydrophobic, high-energy pellets with better storability but higher processing cost.
- Non-torrefied biomass is shredded and pelletized with binders (e.g., sawdust, molasses); cheaper to produce but lower durability and moisture resistance.
- **Usage:** Thermal power plants **must blend 5-10% biomass pellets** with coal, using refined pellets with coal-like calorific value as **part of the mandated fuel mix.**
- **Reduce air pollution** due to lower NO_x, SO_x and Volatile Organic Compounds (VOC) emissions, but associated with fine particulate pollution during combustion.

Banni Grasslands

Context: -

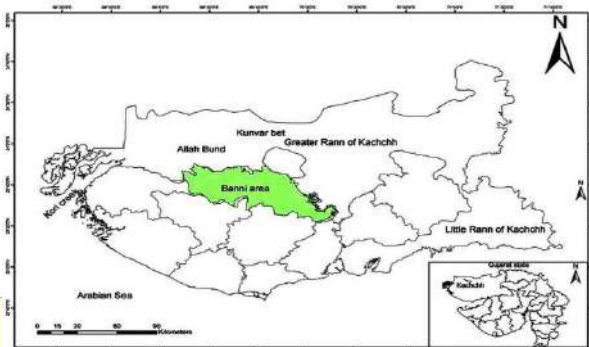
- A recent study assesses the suitability of different areas of the Banni grasslands for sustainable restoration.
- **Banni Grassland in Gujarat is now fully prepared** for cheetah reintroduction.

Grasslands

- They are found mainly in semiarid and arid regions and includes savannahs, grassy shrublands, and open grasslands and support unique species.
- They **provide ecosystem services like carbon storage, climate mitigation, and pollination.**
- Currently as much as 49% of grassland areas worldwide are estimated to be experiencing degradation.
- In India, they cover approximately 8 lakh sq. km, **about 24% of India's land area.**

Banni grasslands -

- Banni is the largest grassland of Asia once covering 3,800 sq. km, now shrunk to about 2,600 sq. km. situated **near the Great Rann of Kutch in Gujarat.**
- Asia's largest tropical savanna.**
- Banni grasslands are natural grasslands spanning 2,617 sq km in the Kutch region.
- Two ecosystems, wetlands and grasslands, are mixed side by side in Banni.
- Conservation areas **include the Desert Wildlife Sanctuary and Chhari Dhand Conservation Reserve.**
- It is a **salt-tolerant grassland**, which means that it can survive and thrive in saline and arid conditions.
- Banni grasslands used to be one of the finest natural grasslands in India.
- Fauna:** Hosts Nilgai, Chinkara, Blackbuck, Wild Boar, Golden Jackal, Indian Hare, Indian Wolf, Caracal, Asiatic Wildcat, Desert Fox, and serves as a breeding ground for Banni buffalo and Kankrej cows.
- Overgrazing, droughts, salinity ingress, invasion by Prosopis juliflora shrub and encroachment for agricultural activities have destroyed the grasslands.
- In 1955, the court notified that the grassland will be a reserve forest (the most restricted forests classified according to Indian Forest Act 1927).
- Wildlife Institute of India has identified Banni as one of the last remaining habitats of the cheetah in India.
- Indian Wild Ass (NT)** population, which had become confined to nearby Little Rann of Kutch, has been increasing in numbers and has started spilling over into adjoining areas, including Banni Grasslands



Maldhari Tribe:

- Maldharis are a tribal herdsmen community in Gujarat.
- The literal meaning of Maldhari is a keeper (dhari) of the animal stock (mal).
- The Maldharis have lived in the Gir National Park, in the Banni Grasslands Reserve area, for the past thousand years.
- They have co-existed with the lions which the Gir National Park was created to preserve, for these thousand years.
- Maldhari community breeds Banni Buffaloes, a species endemic to the region. The buffaloes are adaptive to Kutch's hot weather condition.

Sustainable Aviation Fuel (SAF)

- Indian Oil's Panipat refinery has **become the first in India to be certified to produce Sustainable Aviation Fuel from used cooking oil.**

About: -

- Sustainable Aviation Fuel (SAF), also **known as 'aviation biofuel'**, shares similar chemical and physical characteristics with Aviation Turbine Fuel (ATF).
- It can be **sourced from municipal solid waste, oils and fats (such as oilseeds and algae oils), agricultural residues (including Sugarcane bagasse, husk, and corn), and wood wastes.**
- It can also be **produced artificially using a method** that collects carbon out of the air.
- High Cost:** Production cost of SAF is double that of the conventional fuel.
- India is a part of CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation) Programme and launched the Global Biofuel Alliance** at the G20 in 2023 to expedite the adoption of biofuels and SAF
- National Policy:** Instead of following global goals, India has its own nationally determined targets that it is progressively implementing. e.g., the **SAF blending target of 5% by 2030 and up to 15% by 2040.**

CORSIA- Carbon Offsetting and Reduction Scheme for International Aviation

- CORSIA offers a harmonised way to reduce emissions from international aviation, **minimising market distortion**, while respecting special circumstances and respective capabilities of ICAO Member States.
- CORSIA is implemented in three phases - a pilot phase (2021-2023), a first phase (2024-2026), and a second phase (2027-2035).
- Participation is voluntary for first two phases.
- CORSIA is **applicable only to** flights originating from one country to another i.e., international flights.
- CORSIA will mitigate around 2.5 billion tonnes of CO₂ between 2021 and 2035, which is an annual average of 164 million tonnes of CO₂.

LTAG- Long-Term Aspirational Goals

- 41st ICAO Assembly adopted LTAG for international aviation of net-zero carbon emissions by 2050 in support of UNFCCC Paris Agreement.
- LTAG **does not attribute specific obligations or commitments** in form of emissions reduction goals to individual States, but each state will contribute within its own national timeframe and circumstances.

ICAO: -

- **HQ:** Montreal, Canada
- It was established in 1947 under Convention on International Civil Aviation (**Chicago Convention**), which was drafted in 1944 by 54 nations.
- It helps 193 countries to cooperate and share their skies to their mutual benefit.
- **Membership:** 193 members including India.
- ICAO is **not an international aviation regulator**.
- It is a **specialized agency** of United Nations.
- Its vision is to achieve sustainable growth of global civil aviation system.

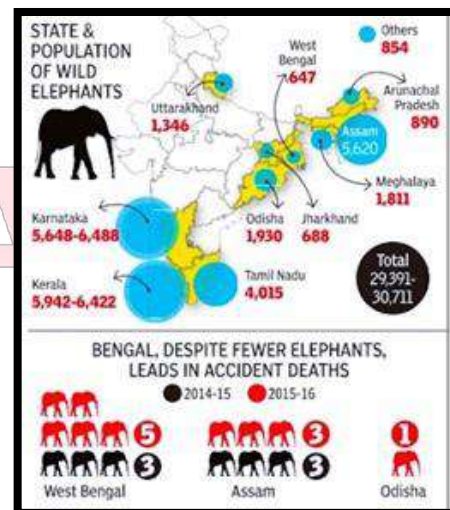
Elephant Census, 2023

Context: -

- Recently, synchronized elephant population census 2023 has been done in the Southern States.

Key Findings: -

- **Karnataka** tops among the Southern States with over 6000 elephants.
- High death rate (40%) among Juvenile elephants (aged 10 and below) attributed to the **Elephant Endotheliotropic Herpesviruses (EEHVs)**.
- Elephant census in India, conducted in 2017, estimated the wild elephant population at 27,312. **Karnataka has the highest number of elephants, followed by Assam and Kerala**. The 2017 census showed Karnataka with 6,049 elephants, Assam with 5,719, and Kerala with 5,706



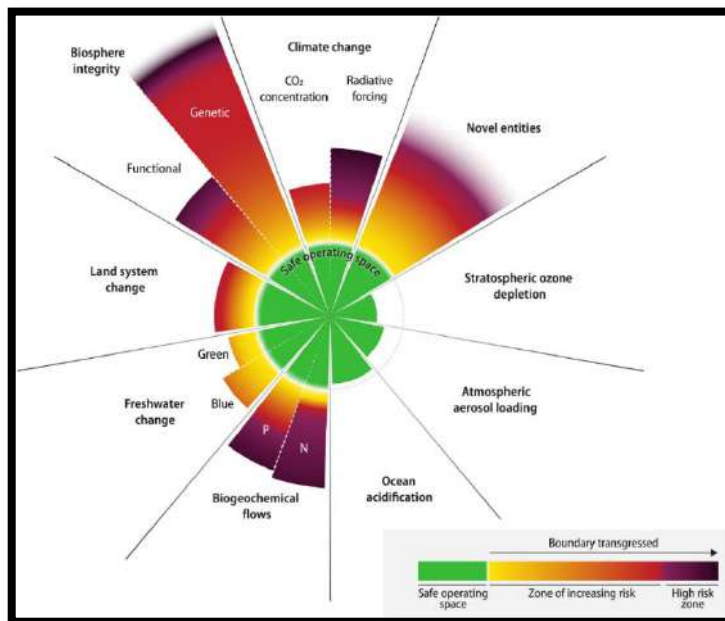
Planetary Boundaries

Context:

- Humans have **breached six out of nine planetary boundaries**, the second edition of the **Global Land Outlook report**.

What are Planetary Boundaries?

- In 2009, 28 internationally renowned researchers identified and quantified a set of nine planetary boundaries within which humanity can continue to develop and feel good in the future.
- Planetary boundaries are the thresholds of environmental limits that define a **"safe operating space for humanity"**.
- If we cross these limits, abrupt or irreversible environmental changes can occur with serious consequences for humankind.



GLO:

- It is a **United Nations Convention to Combat Desertification's (UNCCD) flagship publication**, whose 1st edition was launched in 2017 at the UNCCD COP13 (China).
- It underscores land system challenges, showcases transformative policies and practices, and points to cost-effective pathways to scale up sustainable land and water management.

Bugun Community Reserve

Context: -

- Arunachal Pradesh** showcased its Singchung Bugun Village Community Reserve (SBVCR).

About: -

- Singchung Bugun Village Community Reserve is a 17-square-kilometre biodiversity hotspot, **around 40 km from the famous Eaglenest Wildlife Sanctuary**.
- The reserve was created in 2017 to protect biodiversity in the region.
- It is home to many rare and endangered species, such as the **Bugun Liocichla and the red panda**, as well as various flora and fauna.

Bugun Liocichla

- It was one of the first bird species to be discovered in India since the country's independence in 1947, and it lives only on the Buguns' community lands.
- It was first spotted in 1995 in Arunachal Pradesh.
- However, the bird was first described in 2006 after being discovered in Eaglenest Wildlife Sanctuary by an astrophysicist, Ramana Athreya.
- It is a **songbird** which is named after the Buguns community.
- It is a **critically endangered species**, with only 14 to 20 individuals believed to exist in the world.
- It is bigger than a sparrow but smaller than a pigeon.
- A five-day **Bugun Liocichla Utsav** was organised in 2021 at Eaglenest Wildlife Sanctuary in AP.



Bugun Tribe

- The Buguns are an indigenous community with a population of about 2,000 people, spread across 12 villages that are dotted outside the forests of Eaglenest Wildlife Sanctuary.

- The Buguns (**formerly Khowa**) are one of the earliest recognised schedule tribes of India.
- Majority of them inhabit the Singchung Sub-Division of West Kameng District of Arunachal Pradesh.
- They are primarily the inhabitants of Tenga Valley, and some also dwell in the subtropical forests near Bhalukpong in the Himalayan foothills of the West Kameng district.
- It is one of India's smallest tribal communities.
- **They speak Kho-Bwa language**, which is derived from the words 'Kho' meaning fire and 'Bwa' for water, hence the name Khowa.
- The chieftain makes decisions on behalf of the community and decides the functioning of the society and the use of the forest resources.
- Buguns are generally endogamous as they marry within their community. Buguns live in several exogamous clans.
- The Buguns practice shifting agriculture (jhum), which is the traditional cultivation practice of most tribes in the region.
- Like most other Himalayan tribes of Arunachal, the Buguns also originally believed in animistic beliefs and nature worship; they were initially believers of the **indigenous Donyi-Polo religion** until they were exposed to the Tibetan faith.
- Buguns were later on exposed to Gelugpa Buddhism (A Tibetan Faith).
- Dying Kho is the main festival of the Buguns. The Buguns also celebrate the Buddhist festivals in the same Tibetan tradition.

India State of Forest Report 2023

Context (PIB):

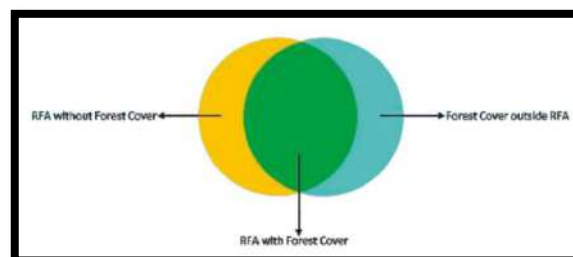
- The union minister released the India State of Forest Report (ISFR) 2023, which is **published by the Forest Survey of India (FSI) every two years.**
- It is the 18th biennial assessment
- Published every two years since 1987

About: -

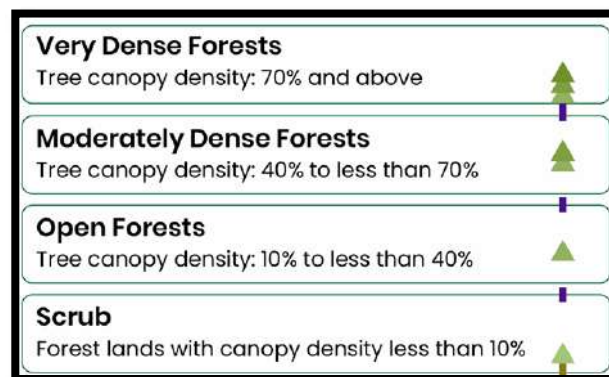
- Forest Survey of India is an organisation under the Ministry of Environment, Forests and Climate Change (MoEFCC).
- It was **established in 1981 and headquartered in Dehradun, Uttarakhand.**
- The ISFR 2023 presents the latest status of the 'Forest cover' and 'Tree cover' of the country, estimates of growing stock, the extent of trees outside forests, mangrove cover, bamboo resources, and assessment of forest carbon stock.
- **According to the National Forest Policy, 1988** the national goal is to maintain at least one-third of the country's land under forest or tree cover, and **two-thirds in hilly and mountainous regions.**

Key terms to understand Forest survey:

- **Forest Cover:** The forest canopy area is covered on the **ground irrespective of the legal status of the land.** It includes all tree patches which have a **canopy density of more than 10% and an area of 1 ha or more in size.**



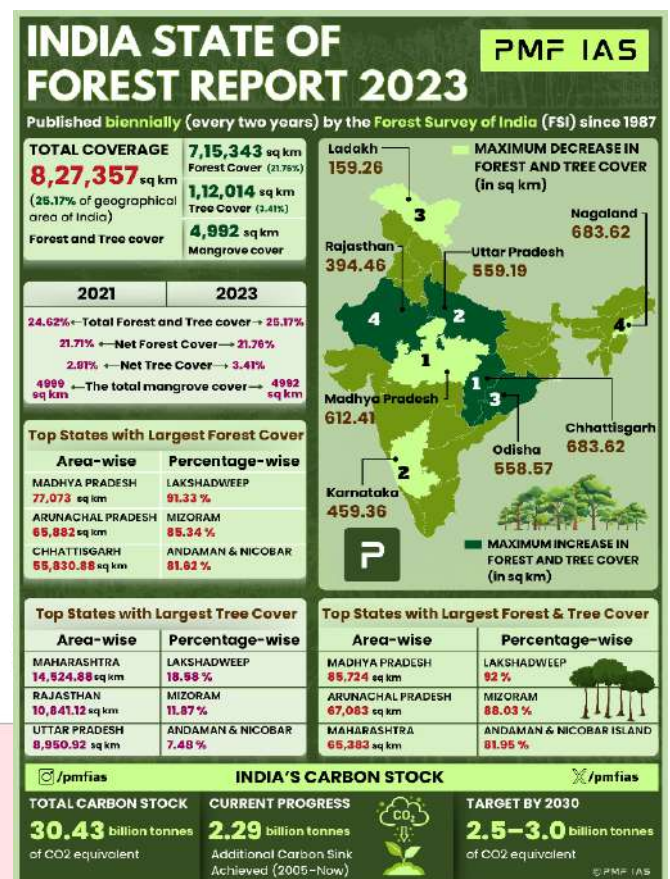
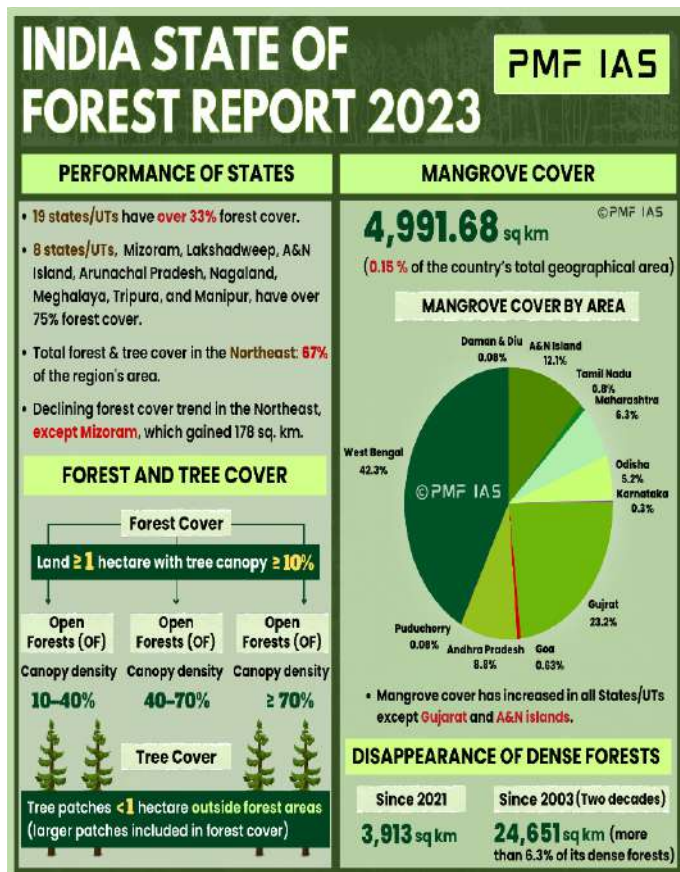
- **Term 'forest area' denotes the legal status of the land as per the government records, whereas the term 'forest cover' indicates presence of trees over any land.**
- **Canopy Density:** It is defined as the proportion of an area in the field/ground that is covered by the crown of trees.
- **Recorded Forest Area (RFA):**
 - Forest Area (or recorded forest area) refers to all the geographic areas recorded as forest in government records.
 - Recorded forest areas comprise Reserved Forests (RF) and Protected Forests (PF), which have been **constituted under the provisions of the Indian Forest Act, 1927.**
 - Besides RFs and PFs, the recorded forest area may include all such areas, which have been recorded as forests under any State Act or local laws or any revenue records.
- **TOF (Trees Outside Forest):** Trees found outside the recorded forest areas. TOF refers to all trees growing outside RFA irrespective of patch size which could also be larger than 1 ha.
- **Tree cover:** All patches of trees **occurring outside RFA which are of size less than 1 ha including the scattered trees.** Tree cover forms an important part of the trees outside forests (TOF). Therefore, tree cover can be considered as a subset of TOF.
- **Forest & Tree Cover:** 'Forest cover' and 'tree cover' put together constitutes 'Forest & Tree Cover' which is the key parameter for monitoring progress as per the **National Forest Policy' goal of achieving 33%** of the country's geographical area under green cover.
- **Green Wash:** The extent of wooded areas generally shown in light green colour on the Survey of India toposheets.



Findings of ISFR 2023: -

- **Total Forest and Tree cover:** Increased to 25.17% (Previous- **24.62%**) (Forest Cover: 21.76% & Tree Cover: 3.41%).
- Total forest & tree cover in the Northeastern region is 67% of the geographical area of these states.
- The total forest and tree cover **increased by 1445 sq km compared to 2021.**
- **Maximum increase:** **Chhattisgarh (683.62 km²)** > Uttar Pradesh (559.19 km²) > Odisha (558.57 km²) > Rajasthan (394.46 km²).
- **Maximum decrease:** **Madhya Pradesh (612.41 km²)**, Karnataka (459.36 km²), Ladakh (159.26 km²), Nagaland (125.22 km²).
- **States having largest forest cover:**
- **In terms of area:** **Madhya Pradesh** > Arunachal Pradesh > Chhattisgarh.
- **In terms of percentage:** **Lakshadweep** (91.33%) > Mizoram (85.34%) > A&N Island (81.62%).
- **Forest cover as geographical area:** 19 states/UTs have forest cover above 33% of the geographical area. Eight states/UTs, namely Mizoram, Lakshadweep, A&N Island, Arunachal Pradesh, Nagaland, Meghalaya, Tripura, and Manipur have forest cover above 75%.
- **Total mangrove cover:** 4,992 km² (0.15% of country's total geographical area); **decrease** of 7.43 km² compared to 2021.
- **Extent of Trees Outside Forest (TOF):** 37.11% of the country's total forest and tree cover.
- **Total bamboo bearing area:** Estimated to be 1,54,670 km² (increase of 5,227 compared to 2021).
- **Maximum bamboo bearing area:** **Madhya Pradesh** > Arunachal Pradesh > Maharashtra > Odisha.
- **Carbon Stock:** Increased by 81.5 million tonnes compared to the previous assessment.
- **Top 3 States/UTs for Mangrove Cover:** **West Bengal**, Gujarat and Andaman & Nicobar Islands
- **Top 3 States for Agroforestry:** Maharashtra, Karnataka and Odisha
- **Forest Fire:** Forest Fire has **decreased during 2021-22 season.**

- **Tiger Reserves with highest Forest Fires:** Nagarjunsagar Srisaigram Tiger Reserve (Andhra Pradesh), Indravati Tiger Reserve (Chhattisgarh) and Valmiki Tiger Reserve (Bihar).



PRAYAAS

2. Climate Change

COP30 Summit

Context:

- 30th Conference of the Parties (COP30) **under the UNFCCC in Belém, Brazil, has concluded with the adoption of the 'Belém Political Package'.**
- **Theme:** Known as the '**COP of Truth**' or the '**Implementation COP**,'
- It seeks to move beyond symbolic commitments towards real, measurable climate action across six thematic areas ("Axes").
- It marked the **first-ever COP held in Amazon region.**
- **COP29, held in Baku, Azerbaijan,** concluded with **Baku Climate Unity Pact** and several significant agreements.
- 28th Conference of the Parties (COP28) **of the UNFCCC, was held in Dubai, UAE.**

UNCED or Earth Summit 1992, Rio De Janeiro Brazil

- The **United Nations Conference on Environment and Development (UNCED)** is popularly known as **Earth Summit 1992**. It raised public awareness of the need to integrate environment & (sustainable) development.
- Climate change, desertification and biodiversity loss are heavily interlinked and pose existential challenges to humanity. In response to these challenges, governments founded **three sister "Rio Conventions"** at the 1992 Earth Summit in Rio de Janeiro, Brazil.

These are:

- The United Nations Framework Convention on Climate Change (UNFCCC, also known as UN Climate Change)
- The Convention on Biological Diversity (CBD, also known as UN Biodiversity)
- The United Nations Convention to Combat Desertification (UNCCD)

United Nations Framework Convention on Climate Change (UNFCCC)

- It is an international environment treaty
- UNFCCC is an international environmental treaty that came into existence under the aegis of the UN.
- It was negotiated in 1992 in New York City and was signed in 1992 at the Rio Earth Summit (UNCED).
- Opened for signature in 1992
- Came into force from 1994
- **Secretariat is located in Bonn, Germany**
- Ratifiers: 198 (197 countries + EU)
- The convention is legally non-binding, but makes provisions for meeting called 'protocols' where negotiating countries can set legally binding limits.

Key Outcomes of COP30

- **Belém Political Package:** The outcome document **reflected the mutirão ("coming together") spirit**, emphasising collective effort and stronger multilateral climate action.
 - **Belém Political Package lacked a clear, time-bound roadmap for "transitioning away" from fossil fuels.**
 - Key commitments on fossil-fuel and deforestation were moved to voluntary, non-binding roadmaps outside the formal UNFCCC framework.
- **Belém Action Mechanism (BAM):** A new Just Transition Mechanism was adopted to support a fair and equitable global transition to a green economy for workers and communities.
- **GGA Indicators:** Countries endorsed a **voluntary framework of 60 indicators** across seven thematic and four-dimensional targets to track progress **under the Global Goal on Adaptation (GGA).**

- **Indigenous Rights:** The **Belém Political Package** reaffirmed the need to uphold Indigenous Peoples' rights, including land rights and traditional knowledge, in climate action.
- **Climate Disinformation Acknowledgement:** It formally acknowledged the harmful impact of climate disinformation and called for information integrity in science-based policymaking.
- **Tropical Forests Forever Facility (TFFF):** A **Brazil-led blended-finance** mechanism offering long-term **performance-based payments** to tropical forest countries for conservation efforts.
- **Global Ethical Stocktake (GES):** Complements the technical Global Stocktake by examining the moral and ethical dimensions of climate action and required behavioural changes.
- **FINI Initiative:** Fostering Investible National Implementation (FINI) platform aims to make National Adaptation Plans more investible and unlock USD 1 trillion in adaptation pipelines by 2028.

Paris Agreement (COP 21)

- The Paris Agreement was adopted by 185 nations in December 2015.
- India had **signed** the agreement in New York in April 2016.
- So far, 191 countries have signed the agreement.
- It officially entered into force after 55 parties to the convention accounting for at least 55% of total GHG (greenhouse gas) emissions ratified it
- India was 62nd country to ratify it.
- Paris Agreement gives thrust to the global actions to address climate change and pertains to post-2020 climate actions. In the pre-2020 period, developed countries are to act as per Kyoto Protocol and some developing countries have taken voluntary pledges.
- **In 2017**, the US announced that it would cease all participation in the 2015 Paris Agreement. In accordance with Article 28 of the Paris Agreement, it remained a signatory till November 2020.

Outcomes of Paris Climate talks

- Commitment to reduce emissions to limit rise of temperature well beyond 2 degree and trying for 1.5 degree
- **Five-year review mechanism** to check progress on nationally declared goals (INDCs)-In Warsaw Cop 19 – First time Discussed
- Funding to the tunes of additional 1 million USD per year in GCF up till 2020, further establishing a mechanism.
- The agreement also includes a provision **requiring developed countries to send \$100 billion annually to their developing counterparts** beginning in **2020**.
- The agreement gives countries considerable leeway in determining how to cut their emissions but mandates that they report transparently on those efforts.
- Every five years nations will be required to assess their progress towards meeting their climate commitments and submit new plans to strengthen them.
- Some elements in the agreement are binding-like reporting requirements.

Shared responsibilities:

- Unlike previous agreements which put all the responsibility for reducing emissions on rich countries, in the Paris Agreement, all 196 signatories agreed that every country must take action, while acknowledging that richer countries should start immediately and cut emissions more steeply, while poorer countries' contributions will depend on their individual situations.

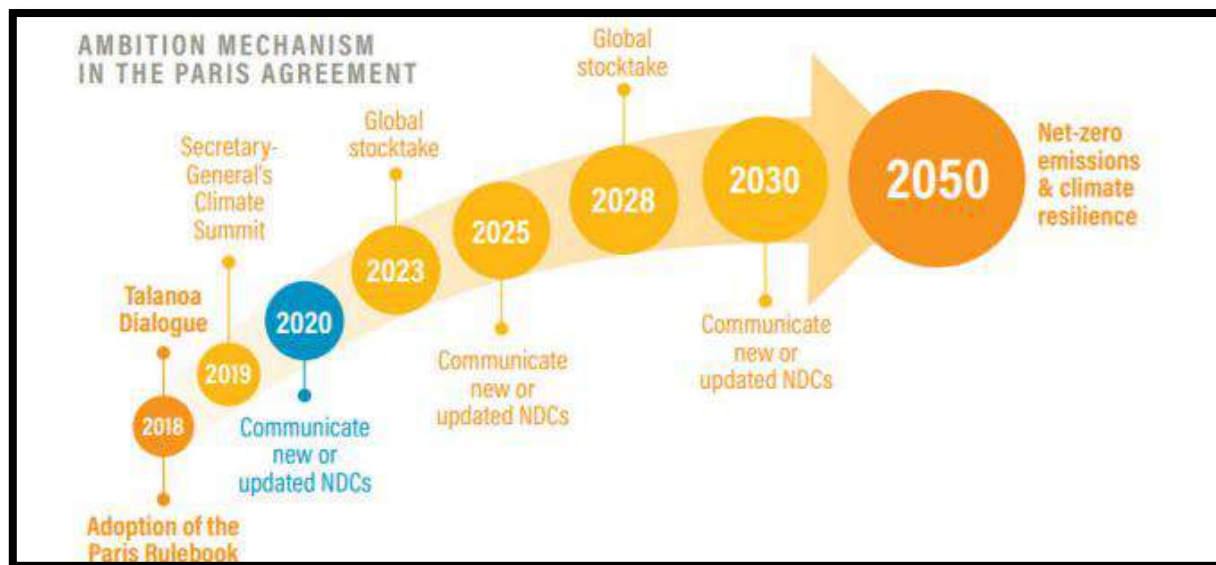
A "ratchet mechanism":

- This is the technical term for the agreement to submit new pledges by 2020.
- It's the most important victory within the agreement, as many large developing nations, like India and Indonesia, were reluctant to agree to a system that would **pressure** them to up their ambition within the next decade.

- The ratchet mechanism requires **countries to return to the table in 2020 and spell out their plans for 2025 to 2030**. This creates the opportunity for the world to potentially put itself on a course to stay below 2 C.

Paris Rulebook

- The 2018 Paris Rulebook governs how the world community of 191 countries must pledge emissions reduction targets under the Paris Agreement and report on their progress.
- It also contains provisions for rich countries to provide climate action finance to developing countries
- Article 6.2 regulates** bilateral and mini-multilateral markets by setting up conditions under which carbon credits can be used to achieve a country's nationally determined contributions, or NDCs.



ARISE Programme

- At UNFCCC COP30 Climate Summit, **Germany and Spain pledged \$100 million to support** Accelerating Resilience Investments and Innovations for Sustainable Economies (ARISE) Programme.
- Objective:** To help developing countries integrate resilience into economic planning, strengthen adaptive capacity, and mobilise climate finance.
- Implementing Body:** Climate Investment Funds (CIF), a \$13 billion multilateral financing mechanism housed within the World Bank.

Integrated Forum on Climate Change and Trade

- Launched at UN COP30** to address rising **climate linked trade frictions and create a dialogue platform**.
- Permanent, politically backed but non-negotiating** platform for climate-trade discussions.
- Purpose:** Align trade policies, climate goals, & development priorities while preventing fragmentation.
- Initial consultations in Geneva, linking it with the WTO-centred multilateral trading system.

Green Credits Programme (GCP)

- GCP was **launched by the Ministry of Environment, Forest and Climate Change (MoEFCC)**.
- It is an initiative within the GoI's broader Lifestyle for Environment (LiFE) Movement.
- It is an effort to create a market-based incentive for various environment-positive actions, not just for carbon emission reductions.
- It incentivises **voluntary environmental actions of individuals, communities, and private industries**.
- It will allow an individual or entity to earn Green Credit and trade it on a dedicated exchange.

This programme will cover eight types of activities:

- Tree plantation
- Water management
- Sustainable agriculture
- Waste management
- Air pollution reduction
- Mangrove conservation and restoration
- **Ecomark**
- Sustainable building and infrastructure
- In its initial phase, the GCP will focus on two key activities: water conservation and afforestation.
- The Indian Council of Forestry Research and Education shall administer GCP.

Eco mark

- Ecomark (or Eco Label) is a voluntary labelling of consumer products meeting Indian environmental criteria and quality standards.
- GoI launched the Eco Mark Scheme in 1991.
- The Ecomark Scheme is **administered by the Central Pollution Control Board (CPCB) in partnership with the Bureau of Indian Standards (BIS)** (the national body for standards and certification).

NDCs

Context: -

- Importance of **Nationally Determined Contributions** (NDCs) in Global climate talks.
- India **announced at COP30 in Belém that it will submit its updated Nationally Determined Contribution (NDC) for 2035 and the first Biennial Transparency Report (BTR) by December 2025.**
- Countries are required to submit their 1st BTRs in 2024 & their 3rd round of NDCs (for 2031-2035) in 2025.

Biennial Update Report (BUR-4)

- India has **submitted its Biennial Update Report (BUR-4) to the UNFCCC**, detailing its greenhouse gas (GHG) emissions inventory and climate action efforts.
- The Biennial Update Report (BUR) is a **submission by developing countries** under the UNFCCC, detailing their **climate action progress, GHG emissions inventory** and mitigation strategies.
- **Mandatory report that every Party to the Paris Agreement must submit every two years detailing national climate actions.**
- Least Developed Countries and Small Island Developing States (SIDS) are exempt from the biennial requirement and may submit BTRs at their discretion.
- Part of Enhanced Transparency Framework (ETF) and replaces the earlier Biennial Reports (BRs) and Biennial Update Reports (BURs) under the UNFCCC framework.

What are NDCs?

- NDC is a **non-binding climate action plan to cut emissions** and adapt to climate impacts. It describes a country's national policies or decisions toward reaching net-zero emissions.
- They represent short- to medium-term plans and are **required to be updated every five years** with increasingly higher ambition based on each country's capabilities and capacities.
- **Article 4 of the Paris Agreement requires Parties** to prepare, communicate, and maintain successive NDCs and adopt domestic measures to achieve them.
- New and progressively ambitious NDCs must be submitted every 5 years, **in sync with Global Stocktake cycle.**

- **Pledges made within an NDC are considered voluntary**, with countries facing no legal penalty if they fail to meet their goals. However, they are **obligated under the Paris Agreement to monitor progress and report on any failures**.
- Some countries like Britain and Chile have incorporated their NDCs into national law, making their climate commitments legally binding at the national level.
- They can help identify if the world is on track with its climate goals. More than 170 countries met the last NDC deadline ahead of COP26 in early 2021.

INDIA'S CLIMATE TARGETS: EXISTING AND NEW

Target (for 2030)	Existing: First NDC (2015)	New: Updated NDC (2022)	Progress
Emission intensity reduction	33-35 per cent from 2005 levels	45 per cent from 2005 levels	24 per cent reduction achieved in 2016 itself. Estimated to have reached 30 per cent
Share of non-fossil fuels in installed electricity capacity	40 per cent	50 per cent	41.5 per cent achieved by the end of June this year
Carbon sink	Creation of 2.5 to 3 billion tonnes of additional sink through afforestation	Same as earlier	Not clear.

About-

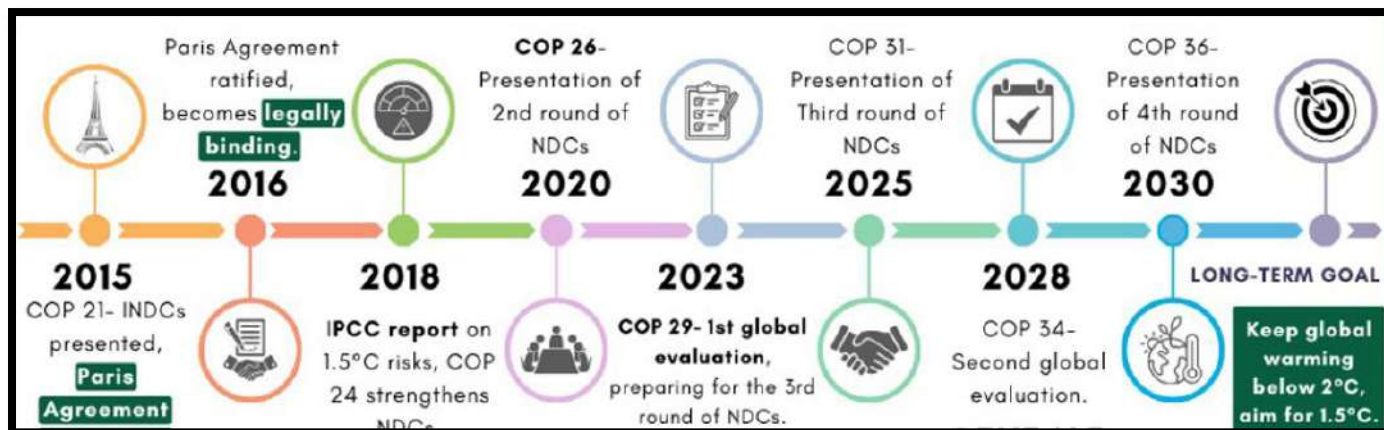
- This update to India's existing NDC is a step forward toward our long-term goal of reaching **net zero by 2070**
- Recently Union Cabinet approved India's updated Nationally Determined Contributions (NDCs)
- In its updated NDC (2022), **India elevated the targets for the first two commitments, having already surpassed the previous goals** eight years ahead of schedule.
- Paris Agreement (COP 21) requires every country to set self-determined climate targets or NDCs
- As per the Paris Agreement's provisions, countries must 'update' their pledges every five years to make higher commitments to greenhouse gas (GHG) emissions reductions.
- India submitted its first NDCs to UNFCCC in 2015.
- Recently Glasgow Climate Pact (CoP 26) requested to strengthen the targets by the end of 2022.
- India has updated its NDCs while considering the principle of common but differentiated responsibilities and respective capabilities (CBDR-RC).
- The 2015 NDC comprised **eight goals** which included three quantitative targets related to emission intensity, fossil fuels and carbon sink and the rest were qualitative targets

Updated INDC

- To put forward and further propagate a healthy and sustainable way of living based on traditions and values of conservation and moderation, including through a mass movement for 'LIFE'- 'Lifestyle for Environment' as a key to combating climate change [UPDATED].
- To adopt a climate friendly and a cleaner path than the one followed hitherto by others at corresponding level of economic development.
- To reduce Emissions Intensity of **its GDP by 45 percent by 2030, from 2005 level [UPDATED]**.
- To achieve **about 50% cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030**, with the help of transfer of technology and low-cost international finance including from Green Climate Fund (GCF) [UPDATED].
- To create an additional carbon sink of 2.5 to 3 billion tonnes of CO₂ equivalent through additional forest and tree cover by 2030.
- To better adapt to climate change by enhancing investments in development programmes in sectors vulnerable to climate change, particularly agriculture, water resources, Himalayan region, coastal regions, health and disaster management.
- To mobilize domestic and new & additional funds from developed countries to implement the above mitigation and adaptation actions in view of the resource required and the resource gap.
- To build capacities, create domestic framework and international architecture for quick diffusion of cutting-edge climate technology in India and for joint collaborative R&D for such future technologies

The Maastricht Principles: A Framework for Future Generations' Rights

- The **Maastricht Principles on the Human Rights of Future Generations** provide a clear framework:
- Affirm that human rights extend to all members of the human family, including future generations.
- Emphasise the continuum of human generations.
- Stress the need to interpret rights in light of humanity's relationship with nature and scientific understanding.
- Outline obligations to protect future generations against risks posed by public and private actors.
- Advocate for meaningful representation of future generations in decision-making processes.



Humboldt Glacier

Context (WION):

- **Venezuela becomes the first** nation to lose all of its glaciers.

About: -

- By 2011, five of Venezuela's glaciers had vanished, leaving only the Humboldt glacier, also known as La Corona, struggling for survival in the Sierra Nevada National Park.
- Recently, the **International Cryosphere Climate Initiative (ICCI)**, held that the South American nation's only remaining glacier - the **Humboldt in the Andes** - had become "too small to be classed as a glacier" and has been classified into ice field.
- While there is no global standard for the minimum size a body of ice must be to qualify as a glacier, the US Geological Survey says a commonly accepted guideline is around 10 hectares.
- An interconnected series of ice caps and glaciers is called an ice field.



International Cryosphere Climate Initiative:

- It was **formed in 2009 following COP-15 in the Copenhagen meeting**.
- It is a **network of senior policy experts** and researchers working with governments and organizations to create, shape and implement initiatives designed to preserve as much of the Earth's cryosphere as possible.

- Its work focuses on three major areas of the cryosphere: the Arctic, the Antarctic and high mountain regions.

Environmental Performance Index (EPI), 2024

- Recently, EPI 2024 has been published by Yale Center for Environmental Law & Policy.
- Using 58 performance indicators across 11 issue categories, EPI ranks 180 countries on climate change performance, environmental health, and ecosystem vitality.
- Estonia tops the list.
- **India has been ranked 176.**
- In 2022, **India surpassed China as the world's largest emitter of anthropogenic SO₂.**

EU's Nature Restoration Plan (NRP)

- European Union approves NRP, first of its kind.
- It is a continent-wide and comprehensive law that forms part of the EU's European Green Deal (aims for net zero emissions of greenhouse gases by 2050).
- Aim: **Contains binding restoration targets for long-term recovery of nature in EU's land and sea areas.**
- It seeks to recover at least 20% of the EU's land and sea areas by 2030, and all ecosystems in need of restoration by 2050.

Teal Carbon

Context: -

- India's first 'teal carbon' study undertaken at Keoladeo National Park (KNP).

About: -

- Refers to **carbon stored in non-tidal freshwater wetlands, encompassing carbon sequestered in vegetation, microbial biomass, and dissolved and particulate organic matter.**

Other types of carbon: -

- Purple: Carbon captured through the air or industrial emissions.
- Green: Carbon stored in terrestrial plants.
- Black: Carbon released through the burning of fossil fuels.
- Red: Carbon released through biological particles on snow and ice that reduce albedo.
- Grey: Carbon released through industrial emissions.



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CTS NO 1262/B Plot No. 594B,
Office 301A, 3012nd floor Starling Plaza,
J M Road, Pune, +91 73787 43031