

5) COMMEMORATIVE PERIODS

A) 2010: INTERNATIONAL YEAR OF BIODIVERSITY

B) 2011-2020: UN DECADE OF BIODIVERSITY

- This was announced on recommendation of the CBD signatories during COP10 at Nagoya in October, 2010.

C) INTERNATIONAL DAY FOR BIOLOGICAL DIVERSITY: 22ND MAY

- The UN has proclaimed May 22 as the International Day for Biological Diversity (IDB) to increase understanding and awareness of biodiversity issues.
- This day was chosen as **Convention on Biological Diversity was adopted by UN Conference** on this day.

6) REPORT: GLOBAL BIODIVERSITY OUTLOOK

- The report provides a summary of the status of biological diversity and an analysis of the steps being taken by the global community to ensure that biodiversity is conserved and used sustainably, and that benefits arising from the use of genetic resources are shared equitably.
- **The fifth edition (GBO-5)** is the final report card on progress against 20 global biodiversity targets agreed in 2010 with a 2020 deadline, and offers lessons learned and best practices for getting on track.
- None of the 20 targets have been fully achieved, though six targets have been partially achieved (Targets 9, 11, 16, 17, 19 and 20)

5. POLLINATORS AND ASSOCIATED ISSUES

- There are more than 20,000 species of wild bees alone, plus many species of butterflies, flies, moths, wasps, beetles, birds, bats, and other animals that contribute to pollination. Pollinated crops include those that provide fruit, vegetables, seeds, nuts, and oils. Many of these are important dietary sources of vitamins and minerals, without which the risks of malnutrition might be expected to increase. Several crops also represent an important source of income in developing countries from, for example, the production of coffee and cocoa

1) IPBES GLOBAL ASSESSMENT OF POLLINATORS

- This assessment, titled **Thematic Assessment of Pollinators, Pollination and Food Production** is the first ever assessment of pollinators issued by IPBES.
- **Key Highlights**
 - **Significance of Pollinators:**
 - » **75% of world's food crops** depend at least in part on pollination.
 - » **90% of the wild flowering plants** depend on pollinators
 - » **Volume of agri-production dependent on pollinators** has increased by 300% during the past 50 years.
 - **A number of pollinator species worldwide** are being driven towards **extinction**. This is threatening millions of livelihoods and 100s of billions of dollars' worth of food supply.
 - **Key factors affecting pollinators**
 - » Changes in land use
 - » Intensive agri production
 - » Pesticides (including neonicotinoid insecticides)
 - » Alien invasive species
 - » Diseases and pests are specially problematic for managed bees.
 - » Climate change
 - **Way forward** - Sustainable Agriculture, reducing chemical pesticides, Improved managed bee husbandry

2) ABOUT INTERGOVERNMENTAL SCIENCE POLICY PLATFORM ON BIODIVERSITY AND ECOSYSTEM SERVICES (IPBES)

- It is an **independent inter-governmental body** established by states to strengthen the science policy interface for biodiversity and ecosystem services for the conservation and sustainable use of biodiversity, long term human well-being, and sustainable development.
- It was **established in 2012** at Panama city.
- It is **not an UN body**. However, at the request of the IPBES plenary and authorization of UNEP Governing Council, the **UNEP provides secretariat services to IPBES**.
- It currently has 134 member states. Many NGOs, organizations, conventions and civil society groupings also participate in the formal IPBES process as observers, with several thousand individual stakeholders,

ranging from scientific experts to representatives of academic and research institutions, local communities and the private sector, contributing to and benefiting from our work

- **The work of IPBES can be categorized in four complementary areas:**

1. **Assessments:** e.g., the Assessment of Pollinators
2. **Policy Support:** Identifying policy-relevant tools and methodologies, facilitating their use, and catalysing their further development.
3. **Building Capacity and Knowledge**
4. **Communication and Outreach**

3) ABOUT "THE GLOBAL COALITION OF THE WILLING ON POLLINATORS)

- The coalition was formed in 2016 to follow up on the findings of IPBES Assessment on Pollinators, Pollination and Food Production.
- The coalition has 28 signatories including 17 European countries, five from Latin America and the Caribbean and four from Africa.
- **Members are supposed to do the following:**
 - Taking action to protect pollinators and their habitats by developing and implementing national pollinator strategies
 - Sharing experience and lessons learnt in developing and implementing national pollinator strategies, especially knowledge on new approaches, innovations, and best practices
 - Reaching out to seek collaboration with a broad spectrum of stakeholders—countries as well as businesses, NGOs, farmers, and local communities
 - Developing research on pollinator conservation

4) WORLD BEE DAY: 20TH MAY

- The World observes Bee Day on May 20 to raise awareness about the importance of pollinators and how they contribute to our sustainable developments. The day has been designated by the UN.

6. CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES (CITES) ON WILD FLORA AND FAUNA

- **About Convention**

- » Convention also known as **Washington convention** is a multilateral treaty to protect endangered plants and animals.
- » It was drafted as a result of resolution adopted in 1963 at a meeting of members of the IUCN (International Union for Conservation of Nature).
- » It came into force in 1975 and now has **184 parties** (as of Nov 2022). Almost every country in the world has signed up + the European Union.

- The convention is **binding on Parties** in the sense that they are committed to implementing it; however, it doesn't take the place of national laws.
- **Aim:** It's aim is to ensure that **international trade** in specimens of wild animals and plants **does not threaten the survival of the species in wild**, and it accords varying degree of protection to more than 35,000 (>5000 plants, and > 30 thousand animals) species of plants and animals.
 - » In essence, **CITES ban hunting, capturing, and selling of endangered or threatened species.**
- **Categorization of Species covered by CITES according to degree of protection they need:**
 - » **Appendix I:**
 - The appendix includes those species which are **threatened with extinction** and where trade is a current or potential threat to their continued existence.
 - **Any international movement of these species** - or products made from them - **requires permits from both the exporting and importing country.**
 - **International trade for commercial purpose** is **generally not allowed** and is permitted **only in exceptional circumstances.**
 - The appendix currently has **over 1,000 species.**
 - » **Appendix II:**
 - Species included in this appendix are **not necessarily threatened with extinction**, but their **trade must be controlled** in order to avoid utilization incompatible with their **survival.**
 - **In practice**, the appendix includes many highly endangered species.
 - This is the **biggest appendix** and has around 40,000 species.
 - **International Trade** in the species is allowed but **requires a permission from exporting countries**, after determining that the export will not harm the survival of the species and that the specimen has been **obtained legally.**
 - » **Appendix III:**
 - This appendix is used when a country wants to regulate trade in a given species. Here, a **country can get a species listed unilaterally.**
 - **Export permits** are then required for that species be exported from the country.
 - **Note:** Additions to Appendix 1 and Appendix 2, require the agreement of two-third of the COP.
- **Significance**
 - » Even though **enforcement** is difficult, CITES has helped reduce trade in many threatened species including elephants, crocodiles, and chimpanzees.

A) COP OF CITES

- » CoP of CITES meet **every three years**. The **18th CITES** was held in Geneva in **2019** and the **COP-19** was held in Panama in Nov 2022.

7. CONVENTION ON CONSERVATION OF MIGRATORY SPECIES OF WILD ANIMALS (BONN CONVENTION – CMS)

- **Introduction:**
 - **Migratory species** are those animals that move from one habitat to another during different times of the year, due to various factors such as food, sunlight, temperature, climate, etc. The movement between habitats, can sometimes exceed thousands of miles/kilometres for some migratory birds and mammals. A migratory route can involve nesting and requires the availability of habitats before and after each migration.
 - To protect the migratory species throughout their range countries, a **Convention on Conservation of Migratory Species (CMS)**, has been in force, under the aegis of United Nations Environment Programme.
 - » Also referred to as the **Bonn Convention**, it provides a global platform for the conservation and sustainable use of migratory animals and their habitats and brings together the States through which migratory animals pass, the Range States, and lays the legal foundation for internationally coordinated conservation measures throughout a migratory range.
 - It is only global convention specializing in the conservation of migratory species, their habitat and migration routes.
- **Appendix I and Appendix 2**
 - **Migratory species threatened with extinction** are listed on **Appendix I** of the Convention.
 - » CMS Parties strive towards strictly protecting these animals, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them.
 - » Besides establishing obligations for each State joining the Convention, CMS promotes concerted action among the Range States of many of these species.
 - Migratory species that need or would significantly benefit from international co-operation are listed in **Appendix II** of the Convention.
 - » For this reason, the Convention encourages the Range States to conclude global or regional agreements.
- **Members**
 - Currently there are 132 members to the convention.
 - **India** has been party to the CMS since **1983**.
- **COP** is the decision making body of CMS.
- **Key Highlights: 13th COP Summit, Gandhinagar Gujarat**
 - i. **Gandhinagar Declaration** sends strong message on importance of migratory species for new global biodiversity strategy.

- iii. **The First Ever Report on the Status of Migratory Species**, presented to CMS COP13, shows that despite some success stories, the **populations of most migratory species covered by CMS are declining.**
 - iv. **Great Indian Bustard, Asian Elephant, and Bengal Florican** have been classified as "Endangered Migratory Species" (Appendix 1) by CMS as per Indian proposal.
 - v. **Animal Culture Linked to Conservation for the first time at UN Wildlife Conference in India**
 - vi. **Seven Migratory Species Champions** were recognized during the conference.
 - Under the Champion program, Germany, India, Italy, Monaco, Norway, the European Commission, and the Environmental Agency - Abu Dhabi were acknowledged for their **generous contributions to the CMS initiatives.**
- **India also has non-legally binding MoUs with CMS** on the conservation and management of **Siberian Crane** (1998), **Marine Turtles** (2007), **Dugongs** (2008) and **Raptors** (2016).
 - India is temporary home to **several migratory animals and birds**. The important among these include Amur Falcons, Bar headed Geese, Black necked cranes, Marine turtles, Dugongs, Humpbacked Whales, etc.

8. TRAFFIC

- **TRAFFIC** is a wildlife **trade monitoring network**. Its **mission** is to ensure that **trade in wild plant and animals is not a threat to the conservation of nature**. It plays a pivotal role in **tackling illegal wildlife trade** through research and analysis, advocacy, and awareness work and by supporting remedial action against illegal wildlife trade.
 - It **specializes** in **investigating and analyzing wildlife trade trends, impacts and drivers; informing and supporting governments** to enforce effective policies and laws; **advising private sector** on mechanism for sustainable sourcing of wildlife etc.
- It was established **in 1976 as a strategic alliance of IUCN and WWF.**
- **TRAFFIC and CITES**
 - **One of the TRAFFIC priorities** is to **promote international cooperation to address wildlife trade issues, with particular emphasis on CITES.**
 - It provides **information and assistance** to help the **decision making process of CITES**, supporting efforts to ensure that international wildlife trade is at sustainable levels and doesn't pose a threat to the conservation of species.
 - In 1999, **CITES and TRAFFIC** signed an MoU to undertake **joint activities for capacity building.**

9. BIRDLIFE INTERNATIONAL

- It is a **global partnership of conservation organizations (NGOs)** which work towards **conservation of birds, their habitats, and global biodiversity.**
 - Its priorities include **preventing extinction of bird species, identifying, and safeguarding important sites of birds**, maintaining, and restoring key bird habitats, and empowering conservationists worldwide.
- It is the **world's largest partnership** of conservation organizations, with over **121 NGO partner organizations.**
 - For e.g., in India, the partner organization is **Bombay Natural History Society (BNHS)**

- Birdlife International has so far identified more than 7,500 important bird areas.

10. IMPORTANT BIRD AND BIODIVERSITY AREAS (IBAS)

- Introduction

- An Important Bird and Biodiversity Area (IBA) is an area identified using an internationally agreed set of criteria as being globally important for the conservation of bird population. The program was developed and sites are identified by Bird Life International.
- Since the late 1970s, the **Bird Life Partnership** has been working collectively to identify, document and protect all places on earth of greatest significance for the conservation of the world's birds.
- As a result, over 13,000 Important Bird and Biodiversity Areas (IBAs) have been identified. All of these sites are also (Key Biodiversity Areas) KBAs for birds at the global or regional level.

- Significance

- IBA recognition enhance the conservation attention of the bird species of the region.
- Some of the region also get statutory protection.

- Criteria to be identified as IBAs

i. Globally Threatened Species

- The site qualifies if it is known, estimated, or thought to hold a population of a species categorized by the IUCN Red List as Critically Endangered, or Endangered or Vulnerable.
 - Presence of CR or EN -> sufficient for qualification
 - Presence of Vul -> presence of more than a threshold is necessary to trigger selection.

ii. Restricted Range Species

- The sites form one of a set selected to ensure that all restricted-range species of an Endemic Bird Area (EBA) or a Secondary Bird Area (SA) are present in significant numbers in at least one site and preferably more.

iii. Biome Restricted Species

iv. Congregations

- How do Birdlife International work to protect these habitats?

- Each of the **Birdlife Partners** has responsibility for their national network of Important Bird & Biodiversity Areas (IBAs).
- The Birdlife Secretariat takes the lead on all international aspects as well as in some priority countries where BirdLife is not present and in the High Seas

- Other Important sub-programs

▫ IBAs in Danger

- These are IBAs under threat from damaging development - the majority of which appears to be poorly planned and doesn't take environmental values into account.
- The IBAs in Danger initiative provides an essential focus for governments, development agencies, the international environmental and conservation conventions, business and

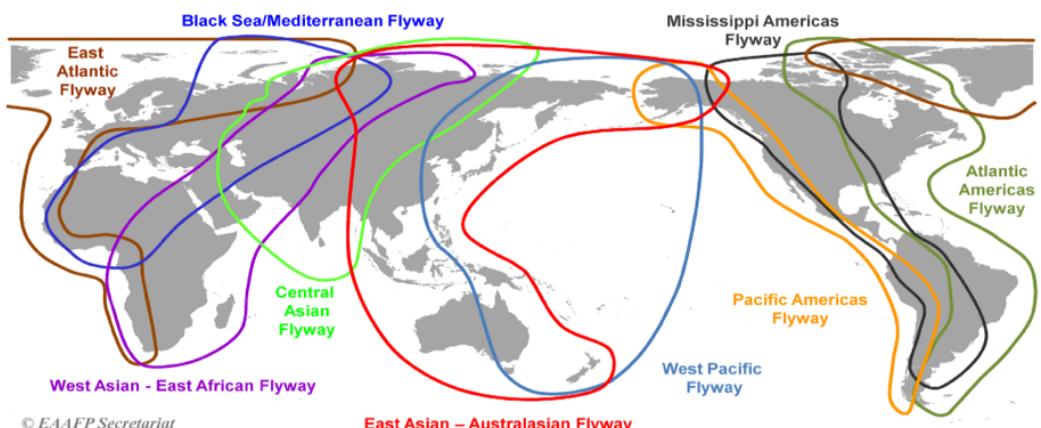
wider civil society to act to prevent the further damage or loss of the sites crucial to the survival of the world's birds.

11. MIGRATORY BIRDS AND FLYWAYS

- Bird migration is one of the great wonders of the natural world. A huge variety of birds, millions of them, make the journey: the tiny Rufous

Hummingbird

migrates up and down the North



American continent, while the Arctic Tern, BirdLife's emblem, migrates from pole to pole. In fact, roughly one in five bird species migrate.

- **Flyways**

- Flyways are **migratory path taken by birds every year between their summer breeding grounds and their wintering grounds**.
- While taking the migratory routes, **birds don't change path at random**. They follow set routes which **include habitats where they can rest and refuel along the way**.
- Many different **species share broadly similar routes**, which have **been loosely split into 9** (some sources mention 8) **major flyways**. They are like **bird super-highways across the sky**.

- **Flyways and India**

- **Major Bird Flyway Network through India**
 - » **370 species of birds visit India through three flyways:**
 - Central Asian Flyway (CAF)
 - East Asian - Australasian Flyway
 - Asian - East African Flyway
 - » **Over 80% of migratory birds through India comes through CAF** among which 87 species are of high conservation concern including two critically endangered, five endangered and 13 vulnerable species.
- **India has also launched the National Action Plan for conservation of migratory species under the Central Asian Flyway.**

- **Birdlife International's Flyway Program** focuses on **protecting birds across all major flyways**.

- Key aims of the BI's Flyway Program:
 - » **Save the threatened migratory species from extinction** by addressing main threats and conserve key sites and habitats which will be beneficial to a wider set of migratory species.
 - » **Address landscape-scale barriers** especially **illegal and unsustainable killings of birds** and **proliferation of poorly planned energy and power transmission infrastructure**.

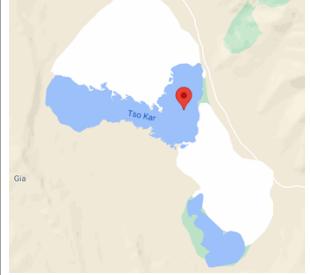
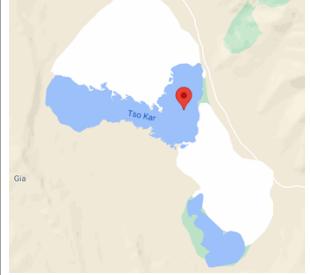
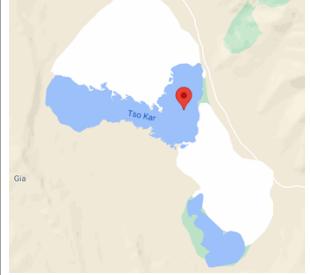
- » **Conserve network of critical stopover sites** through action on the ground by BI's local conservation groups.
- » **Strengthen local and national capacity** in the stop-over sites by strengthening the collaboration between BirdLife Partners.

12. RAMSAR CONVENTION ON WETLANDS

- **What is a Wetland?**
 - A Wetland is a **transitional land between terrestrial and aquatic ecosystem**. It is an ecosystem that is flooded either permanently or seasonally.
 - **UN Ramsar Convention** defines wetlands as '*areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh brackish or salt, including areas of marine water the depth of which at low tide doesn't exceed six meters*'.
- **Significance of Wetlands:** Wetlands provide a wide range of important resources and ecosystem services such as:
 - **Food:** Rice cultivation, fishery etc.
 - **Water storage and ground water recharge**
 - **Water purification, flood moderation and erosion control**
 - **Climate regulation**
 - **Tourism** is another area where Wetlands such as large lakes have played crucial role.
 - **Biodiversity** -> wetlands are transition zones between two different ecosystems and thus are highly productive.
 - **Coastal Protection** is ensured by Wetlands as they act as buffer zones.
- **Ramsar Convention**
 - **Introduction**
 - The **Convention on Wetlands of International Importance, called the Ramsar Convention**, is the intergovernmental treaty that provides the framework for the **conservation** and **wise use** of wetlands and their resources. It is the only global treaty that focuses on a single ecosystem (Wetlands).
 - The convention was adopted in the Iranian city of Ramsar in 1971 and came into force in 1975. Since then almost 90% of UN member states, from all the world's geographic regions, have accepted and become contracting parties.
 - **Headquartered** in Geneva
 - **The aim** of the Ramsar list is "to develop and maintain an international network of wetlands which are important for the conservation of global biological diversity and for sustaining human life through the maintenance of their ecosystem components, processes and benefits".
 - **Concept of 'Wise use'** is at the centre of Ramsar Convention.
 - Through this, the convention continues to emphasize that **human use on sustainable basis is entirely compatible with Ramsar principles and wetland conservation in general**. Application of "wise use" concept is crucial to ensure that wetlands continue to support biological diversity as well as human well-being.

- The wise use guidelines emphasize on:
 1. Adoption of national wetland policies, involving review of local legislation and institutional arrangements to deal with wetland matters.
 2. Development of programs of wetland inventory, monitoring, research, training, education etc.
 3. Take action at wetland sites, involving the development of integrated management plans covering every aspect of the wetlands and their relationships.
- The concept applies to all wetlands and water resources in contracting parties territories (not just to Wetlands of International Importance)

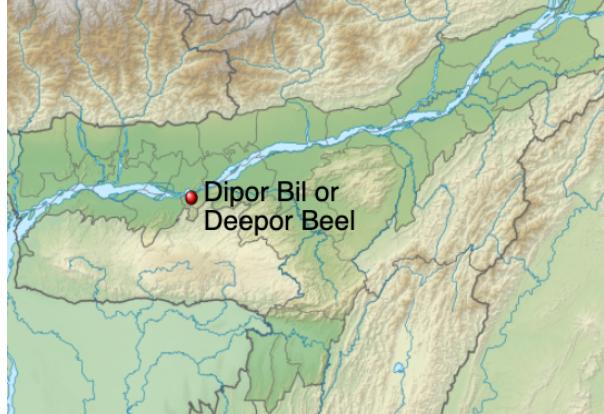
1) LIST OF RAMSAR SITES IN INDIA: WETLANDS OF INTERNATIONAL IMPORTANCE

#	Name of the Site	State	Other Speciality				
1	Tso Kar Wetland Complex	Ladakh	<p>Tso Kar Wetland Complex was included in the Ramsar list in Dec 2020.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; padding: 5px;">Location</th> <th style="text-align: center; padding: 5px;">Two Lakes</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; padding: 10px;">  </td><td style="text-align: center; padding: 10px;">  </td></tr> </tbody> </table> <p>The complex is a notable example of two connected lakes, the freshwater Startsapuk Tso & the hypersaline Tso Kar. They are situated in Changthang region of Ladakh.</p> <p>Tso Kar means white lake, because of the white salt efflorescence found on the margins due to the evaporation of highly saline water.</p> <p>The Tso Kar Basin is also an A1 category Important Bird Area (IBA) as per Bird Life International and a key staging site in the Central Asian Flyway.</p> <p>The site is also amongst the most important breeding areas of the Black-necked Crane (<i>Grus nigricollis</i>) in India.</p>	Location	Two Lakes		
Location	Two Lakes						
							

			This IBA is also the <u>major breeding area of Great Crested Grebe</u> (<u><i>Podiceps cristatus</i></u>), <u>Bar-headed Geese</u> (<u><i>Anser indicus</i></u>), Ruddy Shelduck, Brown headed Gull, Lesser Sand-Plover, and many other species.
2	Tso Moriri Lake	Ladakh	
3	Wular Lake	J&K	
4	Surinsar-Mansar Lakes	J&K	
5	Hokera Wetland	J&K	
6	Hygam Wetland Conservation Reserve	J&K	<p>It falls <u>within Jhelum River Basin</u> and plays an <u>significant role as a flood absorption basin, biodiversity conservation site, eco tourism site, and livelihood security of the local community.</u></p> <p>It is located in the <u>Baramulla district</u>. It serves as an <u>abode to many residents and migratory bird species</u>. It is also <u>recognized as an IBA</u>.</p> <p>High rate of siltation is leading to <u>wetland characteristics being changed to landmass in several areas</u>.</p>
7	Shallbugh Wetland Conservation Reserve	J&K	It is located in <u>Srinagar district</u> . It is an abode to <u>more than 4 lakh resident and migratory birds of at least 21 species</u> .
8	Harike Lake	Punjab	
9	Kanjli Lake	Punjab	
10	Ropar Lake	Punjab	
11	Keshopur-Miani Community Reserve	Punjab	
12	Beas Conservation Reserve	Punjab	
13	Nangal WIS	Punjab	
14	Chandertal Wetland	Himachal Pradesh	
15	Pong Dam Lake	Himachal Pradesh	
16	Renuka Wetland	Himachal Pradesh	Smallest of all Ramsar site in India.

17	Asan Conservation Reserve	UK	Became Ramsar Site in Oct 2020 It is a <u>444 hectare stretch of the Asan river</u> running down to its confluence with <u>Yamuna river</u> in <u>Dehradun</u> district of UK. The river was <u>dammed by the Asan Barrage</u> in 1967 and it resulted in <u>siltation above the dam wall</u> which created <u>suitable habitat for birds</u> . This supports, <u>330 species of birds</u> including the critically endangered vultures - (red headed vulture and white-rumped vulture) and <u>Baer's Pochard</u> . It is also a <u>significant ground for migratory birds</u> . It is strategically located <u>within the Central Asian Flyways</u> . This was <u>declared conservation reserve</u> in 2005 under <u>Section 36A of Wildlife Protection Act, 1972</u> .
18	Sultanpur	Haryana	<u>Sultanpur National Park from Haryana</u> supports more than <u>220 species</u> of resident, winter migratory and local migratory waterbirds at critical stages of their life cycles. More than ten of these are globally threatened, including the <u>critically endangered sociable lapwing</u> , and the <u>endangered Egyptian Vulture, Saker Falcon, Pallas's Fish Eagle and Black-bellied Tern</u>
19	Bhindwas	Haryana	Bhindwas Wildlife Sanctuary, <u>the largest wetland in Haryana</u> is a human-made freshwater wetland. Over 250 bird species use the sanctuary throughout the year as a resting and roosting site. The site supports more than ten globally threatened species including the endangered Egyptian Vulture, Steppe Eagle, Pallas's Fish Eagle, and Black-bellied Tern.
20	Keoldeo Ghana NP	Rajasthan	
21	Sambhar Lake	Rajasthan	
22	Upper Ganga River (Brijghat to Narora Stretch)	Uttar Pradesh	
23	Nawab Ganj	Uttar Pradesh	
24	Parvati Agra	Uttar Pradesh	
25	Saman	Uttar Pradesh	
26	Samaspur	Uttar Pradesh	
27	Sandi	Uttar Pradesh	
28	Sarsai	Uttar Pradesh	

29	Sur Sarovar Lake (Keetham lake), Agra	Uttar Pradesh	<p>It is a <u>human made lake</u> that was created to <u>supply water to the city of Agra</u>. The wetland soon became an <u>important and rich ecosystem</u>. It now provides <u>refuge to resident and migratory birds</u>, and more than <u>60 species of fish</u>. It is located on <u>Delhi-Mathura Highway</u> in Agra district.</p> <p>It was <u>declared a bird sanctuary in 1991</u>.</p> <p>It is also listed as an <u>Important Bird Area</u>.</p> <p>Sur Sarovar also has the <u>biggest Bear Rescue Center</u> for rescued dancing bears.</p>
30	Bakhira WLS	Uttar Pradesh	
31	Haiderpur Wetland	Uttar Pradesh	<p>Haiderpur is one of the <u>largest human-made wetlands</u> that was <u>formed in 1984</u> after the construction of <u>Madhya Ganga Barrage</u> at the <u>confluence of Saloni and Ganga rivers</u>. It is a part of <u>Hastinapur WLS</u>.</p> <p>It covers an <u>area of 6,908 hectares</u> and is <u>situated on the Muzaffarnagar-Bijnor border</u>.</p> <p>Significance: Source of fresh water and ground water recharge Biodiversity Protection: It hosts, <u>more than 30 species of plants</u>, <u>over 300 species of birds</u> including <u>102 waterbirds</u> and <u>more than 40 fish and 10 mammals species</u>. It has <u>CR Gharials</u>; <u>EN Hog Deer</u>, <u>Swamp Deer</u>, <u>Black bellied Tern</u>, <u>Steppe Eagle</u>, etc.</p>
32	Kebartal Wetland (Kanwar Lake)	Bihar	<p>Kabartal (Kanwar Jheel) Wetland, Bihar Became Ramsar site in Oct 2020</p> <p>This is <u>Bihar's first Ramsar site</u>. It is located in Bihar's Begusarai district. It covers <u>2,620 hectares</u> of the Indo-Genetic plains in Northern Bihar. It is a <u>residual oxbow lake</u>, formed during the <u>meandering of Gandak river</u>, a tributary of Ganga in the geological past.</p> <p>It is an <u>important stopover along the Central Asian Flyway</u>, with <u>58 bird species</u> using it to rest and refuel.</p> <p>Some <u>critically endangered birds</u> of the site include <u>red-headed vulture</u>, <u>white rumped vulture</u>, <u>Indian Vulture</u>, <u>Baer's pochard</u>, and the <u>Sociable Lapwing</u>.</p> <p>Note: Kabartal is Asia's largest freshwater oxbow lake</p>

33	Deepor Beel	Assam	<p>It is a <u>lake located to the South West of Guwahati city</u> in Assam. It is a <u>permanent freshwater lake</u>, in a <u>former channel of Brahmaputra river</u>, to the south of the main river.</p> <p>It is also an <u>Important Bird Area</u>. It is <u>the only Ramsar site of Assam</u>.</p>  <p>The Deepor Bil WLS measures <u>4.1 sq km</u> within this wetland</p>
34	Loktak Lake	Manipur	
35	Pala Wetland	Mizoram	
36	Rudrasagar Lake	Tripura	
37	Nalsarovar Sanctuary	Bird	Gujarat
38	Thol Lake	Gujarat	Thol Lake Wildlife Sanctuary from Gujarat lies on the Central Asian Flyway and more than 320 bird species can be found here. The wetland supports more than 30 threatened waterbird species, such as the critically endangered White-rumped Vulture and Sociable Lapwing, and the vulnerable Sarus Crane, Common Pochard and Lesser White-fronted Goose
39	Wadhwan Lake	Gujarat	Wadhvana Wetland from Gujarat is internationally important for its birdlife as it provides wintering ground to migratory waterbirds, including over 80 species that migrate on the Central Asian Flyway. They include some threatened or near-threatened species such as the endangered Pallas's fish-Eagle, the vulnerable Common Pochard, and the near-threatened Dalmatian Pelican, Grey-headed Fish-eagle and Ferruginous Duck
40	Khijadia WLS	Gujarat	
41	Bhoj Wetlands	Madhya Pradesh	

42	Sakhya Sagar	Madhya Pradesh	
43	Sirpur Sagar	Madhya Pradesh	
44	Yashwant Sagar	Madhya Pradesh	<p>It is <u>one of the two Important Bird Areas (IBA)</u> in the <u>Indore region</u> as well as one of the <u>most important birding sites in Malwa region of Madhya Pradesh</u>.</p> <p>Presently it is being used for <u>water supply</u> to the city of Indore and is being also used for <u>fish culture on a commercial basis</u>.</p>
45	Sundarban Wetlands	West Bengal	<p>Largest Ramsar site in India Sundarbans</p> <ul style="list-style-type: none"> It comprises of <u>hundreds of islands</u> and a <u>network of rivers, tributaries and creeks</u> in the delta of the Ganga and the Brahmaputra at the mouth of Bay of Bengal in India and Bangladesh. Indian Sundarban consists of 60% of the country's total mangrove forest area. <p>Sundarbans Reserve Forest (SRF)</p> <ul style="list-style-type: none"> It is the <u>largest mangrove</u> in the world and is now a wetland of international importance. So, it has now become the largest protected wetland (4,23,000 hectare) in the country.
46	East Wetlands	Calcutta WB	<p>It comprises of <u>a larger number of waterbodies distributed east of city of Kolkata</u> across the districts of South and North 24 Parganas. It is spread <u>over 125 km²</u>.</p> <p>Along with the wetlands, it also <u>has 254 sewage-fed fisheries</u>, agricultural and solid waste farms and some built up areas.</p> <p>It was included in the Ramasar List in Aug 2002.</p> <p>The hydrology of this wetland is unique. It doesn't have a catchment area of its own. <u>Approximately 250 million gallons of sewage flows into it everyday</u>.</p> <ul style="list-style-type: none"> The sewage is then <u>drawn by the local fishery owners</u> into fish ponds or bheris directly from the tributary wastewater canals. .

			<ul style="list-style-type: none"> • Sunlight is enough to <u>promote high growth of dense plankton and algae</u> which serves as food for the fish population which thrive on the nutrient rich plankton. • Organic pollution in the wastewater is <u>thus reduced by 80% and the coliform bacteria in the wastewater is reduced by 99.9 %</u> in these ponds. <p>The Kolkata Municipal Corporation saves <u>Rs 5,000 - 7,000 crores every year</u> - the cost of sewage treatment plant for treating so much water.</p> <ul style="list-style-type: none"> • <u>Channels drain out the effluents and slurry from the treated wastewater</u>, that is then used <u>to grow rice and vegetables</u>. • <u>Around 25% of Kolkata's fish and vegetables are grown with the help of this water</u>. This wetland thus support livelihood of more than a lakh population. <p>It acts as kidney of Kolkata as <u>the wastewater from the city</u> is converted into food and used in fisheries and agriculture across this wetland.</p> <p>Bheris are a unique feature of the Kolkata wetlands, and are shallow fishponds fed by naturally treated wastewater rich in algae, which allows for low-cost fish cultivation.</p> <p>Safety of Fish/Vegetables: Some experts have raised the issue of <u>heavy metal contamination</u> from this kind of fishery and vegetable cultivation.</p>
47	Bhitarkanika Mangroves	Odisha	<p>Bhitarkanika is also the <u>second largest mangrove ecosystem</u> in the country (after Sundarbans).</p> <ul style="list-style-type: none"> • Freshwater mixed with seawater near the lower end of the <u>Brahmani and Kharasota river</u> to produce brackish water ideal for mangroves. <p>Key threats:</p> <ul style="list-style-type: none"> • Diversion of water from Brahmani river basin: The Talcher-Angul coal mines, steel and power generating units as well as the Kalinga Steel and power hub in Jajpur district were <u>drawing enormous quantities of freshwater from the Brahmani river</u>.
48	Chilka Lake	Odisha	
49	Satkosia Gorge	Odisha	

50	Tampara Lake	Odisha	<p>It is the <u>most prominent fresh water Lake</u> situated in the state of Odisha (Ganjam district). <u>The depression in the ground gradually filled with rainwater from catchment flow and was called "Tamp"</u> by the British and subsequently termed "Tampara" by the locals. It supports varied biodiversity including that of birds, fishes, phytoplankton, and more than seven species of terrestrial plants and macrophytes. It is important habitat for <u>vulnerable species</u> such as <u><i>Cyprinus carpio</i></u>, <u>common pochard</u> (<i>Aythya ferina</i>), and river tern (<i>Sterna aurantia</i>).</p> <p>With large fish yield, it is an <u>important source of livelihood for the local communities</u>.</p>
51	Hirakud Reservoir	Odisha	<p>It is the <u>largest earthen dam</u> in Odisha which <u>started operating in 1957</u>.</p>
52	Ansupa Lake	Odisha	<p>It is the <u>largest freshwater lake of Odisha</u> situated in the <u>Banki</u> sub-division of Cuttack district and has its fame from time immemorial for its scenic beauty.</p> <p>It is an <u>oxbow lake</u> formed by <u>River Mahanadi</u> and is spread over 231 ha. It is home to several species of birds, fishes, mammals and macrophytes. It provides a safe habitat for <u>at least three threatened bird species</u> - <u><i>Rynchops albicollis</i> (EN)</u>, <u><i>Sterna acuticauda</i> (EN)</u> and <u><i>Sterna aurantia</i></u> and <u>three threatened fish species</u> - <u><i>Clarias magur</i> (Clariidae) (EN)</u>, <u><i>Cyprinus carpio</i> (Cyprinidae) (VU)</u>, and <u><i>Wallago attu</i> (VU)</u>.</p> <p>The lake also <u>sustains fresh water demand of the surrounding area</u> and supports <u>livelihood of local communities through fisheries and agriculture</u>.</p> <p>It is a <u>famous wintering ground for migratory birds</u> and is also <u>known for its scenic beauty</u>.</p>
53	Nandur Madhameshwar	MHA	
54	Lonar Lake	MHA	<p>It is an <u>ancient circular crater lake</u> created by <u>Meteorite strike</u> in Maharashtra</p> <p>It got <u>National geo-heritage tag in 1979</u>.</p> <p>It is <u>relatively young geo-logically</u>, just about 50,000 years old.</p> <p>A meteorite <u>estimated to weigh two-million-tonnes slammed into the Earth</u>, creating a 1.83-km diameter crater where the lake formed. It is distinguished by a <u>near-perfect</u>,</p>

			<p><u>circular ejecta blanket</u>, which refers to earth thrown up during the collision, around it.</p> <p>It is an <u>endorheic</u> (i.e., no outflow) basin, almost circular in shape.</p> <p>The lake is <u>high in salinity and alkalinity</u>, as the lack of outflow leads to a concentration of minerals as the lake water evaporates.</p> <p><u>Outside the lake</u>, there is a <u>considerable diversity of plant and animal life</u>, as springs which help feed the lake provide a source of fresh water.</p>
55	Thane Creek	Maharashtra	<p>It is located in <u>Maharashtra India</u>. Thane Creek is an <u>inlet in the shoreline of the Arabian Sea</u> that <u>isolates the city of Mumbai from the Konkan region of the Indian Mainland</u>. There are <u>several source of fresh water to the Creek</u>, the <u>largest being the Ulhas River</u>. It has been declared as <u>Thane Creek Flamingo sanctuary</u>.</p> <p>Thane creek is <u>fringed by Mangroves on both banks & comprise around 20% of the total Indian mangrove species</u>.</p> <p>The mangrove serves as a nursery for several fishes & sustains the local fishery. The area is an <u>important part of the wetland complex of the Central Asian Flyway of the birds</u> and has been categorized as IBA.</p> <p>Thane Creek Flamingo Sanctuary: The Western bank of the Thane Creek has been declared the "<u>Thane Creek Flamingo Sanctuary</u>".</p> 
56	Kolleru Lake	AP	
57	Nanda Lake	Goa	

58	Ranganathittu Bird Sanctuary	Karnataka	
59	Magadi Kere Conservation Reserve	KAR	Artificial Lake One of the <u>largest nesting ground for bar headed goose</u> in southern India
60	Ankasamudra Bird Conservation Reserve	KAR	Artificial Lake Home to 210 species of plants, 8 species of mammals, 25 species of birds, and 41 species of fish
61	Aghanashini Estuary	KAR	The site is an estuary where the <u>Aghanashini River</u> flows into the <u>Arabian Sea</u> in Karnataka state. It addition to its <u>estuarine and shallow marine waters</u> , it features <u>rocky and pebble shores</u> , intertidal mudflats and some aquaculture ponds and rice fields. These diverse environments provide <u>habitat to more than 80 fish, 115 birds</u> and 45 mangroves species.
62	Karaivetti Bird Sanctuary	TN	It is <u>one of the most important fresh water feeding grounds for migratory water birds</u> in the state of TN. It is also an important nesting site for threatened species like the <u>spotted eagle</u> and the <u>tawny eagle</u> .
63	Longwood Shola Reserve Forest	TN	It is among the <u>last vestiges of urban shola forest</u> , where everything <u>else has been lost to tea cultivation</u> and other land use changes.
64	Point Calimere	TN	
65	Karikili Bird Sanctuary	TN	
66	Pallikaranai Marsh Reserve Forest	TN	
67	Pichavaram Mangrove	TN	
68	Gulf of Mannar Marine Biosphere Reserve	TN	
69	Konthankulam Bird Sanctuary	TN	
70	Udhayamarthandapuram Bird Sanctuary	TN	
71	Vedanthangal Bird Sanctuary	TN	

72	Vellode Sanctuary	Bird	TN	
73	Vembannur Wetland Complex		TN	
75	Chitrangudi Sanctuary	Bird	TN	<p>Chitrangudi Bird Sanctuary, locally known as "Chitrangudi Kanmoli" is located in <u>Ramnathapuram district of TN</u>. Notable waterbirds spotted from the site are <u>spot billed Pelican</u>, <u>little egret</u>, <u>grey heron</u>, <u>large egret</u>, <u>Open billed stork</u>, <u>Purple</u>, and <u>pond herons</u>.</p>
75	Suchindram Theroor Wetland Complex		TN	<p>It is part of the <u>Suchindram-Theroor Manakudi Conservation Reserve</u>. It is an <u>important bird area</u> and <u>lies at the southern tip of the Central Asian Flyway</u> of migratory birds.</p> <p>It was <u>formed for birds' nesting purposes</u> and it attracts <u>thousands of birds</u> every year.</p>
76	Vaduvur Sanctuary	Bird	TN	<p>It is a <u>large human made irrigation tank</u> and <u>shelter for migratory birds</u> as it <u>provides a suitable environment for food, shelter, and breeding ground</u>.</p> <p>While these irrigation tanks have <u>socio-economic and cultural significance</u>, very little is known of their ecological importance.</p> <p>These tanks have the potential to harbor good populations of resident and wintering water birds but no studies have been done to confirm this.</p>
77	Kanjirankulam Sanctuary	Bird	TN	<p>It is a protected area <u>near Mudukulathur Ramanathapuram District, TN</u>. It is <u>notable nesting site for several migratory heron species</u> that roost in the prominent growth of babul trees here.</p> <p>The breeding population of migratory waterbirds arrive here between October and February and include: Painted stork, white ibis, black ibis, little egret, great egret.</p>
78	Ashtamudi Lake		Kerala	
79	Sashthamkotta Lake		Kerala	
80	Vembanad Wetland	Kol	Kerala	

- **Note1:** Globally, there are around 2500 wetlands in Ramsar list. India with 80 Ramsar Sites have the highest number of wetlands in South Asia.

2) HOW A SITE IS DESIGNATED AS RAMSAR SITE

- According to Ramsar convention "**Each contracting party shall designate** suitable wetlands within its territory for inclusion in a List of Wetlands of International Importance".
- The wetlands are selected on account of their international significance in terms of ecology, botany, zoology, limnology, or hydrology. Accordingly any wetland which meets **at least one of the criterion of identifying Wetlands of International Importance (9 criteria)** can be designated by the appropriate national authority to be added in the Ramsar list.
- The **Ramsar secretariat ensures that data and map meet the standards set by the Conference of parties**, before publishing the information on the site of the **Ramsar Sites Information System**.
- The **nine criteria for identifying Wetlands of International Importance**:
- **Group A of the Criteria:** Sites containing representative, rare or unique wetland types
 - **Criterion 1:**
 - A wetland should be considered internationally important if it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region.
- **Group B of the Criteria.** Sites of international importance for **conserving biological diversity Criteria based on species and ecological communities**
 - **Criterion 2:** It supports vulnerable, endangered, or critically endangered species or threatened ecological communities.
 - **Criterion 3:** It supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region.
 - **Criterion 4:** It supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions.
- **Specific criteria based on water birds**
 - **Criterion 5:** It regularly supports 20,000 or more water birds.
 - **Criterion 6:** It regularly supports 1% of the individuals in a population of one species or subspecies of water bird.
- **Specific criteria based on fish**
 - **Criterion 7:** It supports a significant proportion of indigenous fish subspecies, species or families, life-history stages, species interactions and/or populations that are representative of wetland benefits and/or values and thereby contributes to global biological diversity.
 - **Criterion 8:** It is an **important source of food for fishes, spawning ground, nursery and/or migration path** on which fish stocks, either within the wetland or elsewhere, depend.
- **Specific criteria based on other taxa**

- Criterion 9: It regularly supports 1% of the individuals in a population of one species or subspecies of wetland-dependent non-avian animal species

3) MONTREUX RECORD

- It is the principle tool of the Ramsar Convention for highlighting those sites, where an adverse change in ecological character:
 - Has occurred
 - Is occurring
 - Is likely to occur as the result of technological developments, pollution or other human interference and which are therefore, in need of priority conservation attention.
- If such changes are brought to the notice of the Convention Secretariat (by Government or by NGOs), the site is then placed under Montreux Record.
 - This is a **means to drawing attention** to such sites, and it is subject to continuous review.
 - Convention Secretariat, will help the country in taking conservation measures, and if they succeed, the site may be removed from the Montreux Record after a review, and at the request of the country.
- **Indian Ramsar Sites in Montreux Record:**
 - Keoladeo National Park
 - Loktak Lake
 - Chilka lake was once placed on the record. Later, when conservation measures were implemented and succeeded, it was removed from the record.

4) THREATS FACED BY WETLANDS IN INDIA

- **Water Pollution**
- **Noise Pollution** caused by rapid urbanization around the wetlands continues to be an irritant and is putting migratory visitors away.
- **Dumping of Wastes** (Municipal solid waste, construct waste) etc is leading to loss of Wetlands.
- **Very less focus** on small non-notified wetlands.
 - Absence of any inventory related to wetlands.
- **Lack of resources with local bodies** to ensure proper care and protection of the wetlands.

5) WORLD WETLAND DAY: 2ND FEBRUARY

- World wetland day is celebrated every year on 2nd February. The date marks the day of adoption of Ramsar Convention on Wetlands on 2nd February 1971, in the Iranian city of Ramsar on the shores of the Caspian sea.
- **Theme for 2023:** "Wetland Restoration"
 - It highlights the urgent need to prioritize wetland restoration.
- **Why Wetland is significant for Biodiversity?**

- It is stressed by the recently released global **IPBES assessment** which identifies wetlands as the most threatened ecosystem. This impacts **40% of the world's plants and animals** that live or breed on wetlands.

6) WETLAND (CONSERVATION AND MANAGEMENT) RULES, 2017

- It was notified by MoEF&CC replacing the 2010 rules.
- **Key Highlights**
 - **Decentralization** -> empowers states and Uts to identify and manage their wetlands.
 - **State Wetland authorities** to be established in each state and UT
 - Headed by State environment minister.
 - **National Wetland Committee:** It will replace Central wetland regulatory authority and will be responsible for monitoring the implementation of these rules
 - Headed by Secretary, MoEF&CC.
 - It will also advise the central government on appropriate policies and action programmes.
 - **Banned activities** like dumping solid waste, electronic etc.
 - **Applicability**
 - Wetland classified under RAMSAR
 - Wetland notified by Central, state or UTs.

13. WORLD WILDLIFE DAY: 3RD MARCH

- It is celebrated on 3rd March
- **UNGA** in 2013 had passed a resolution for choosing 3rd of March as the WWD. This day was chosen as on March 3, 1973, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was adopted.

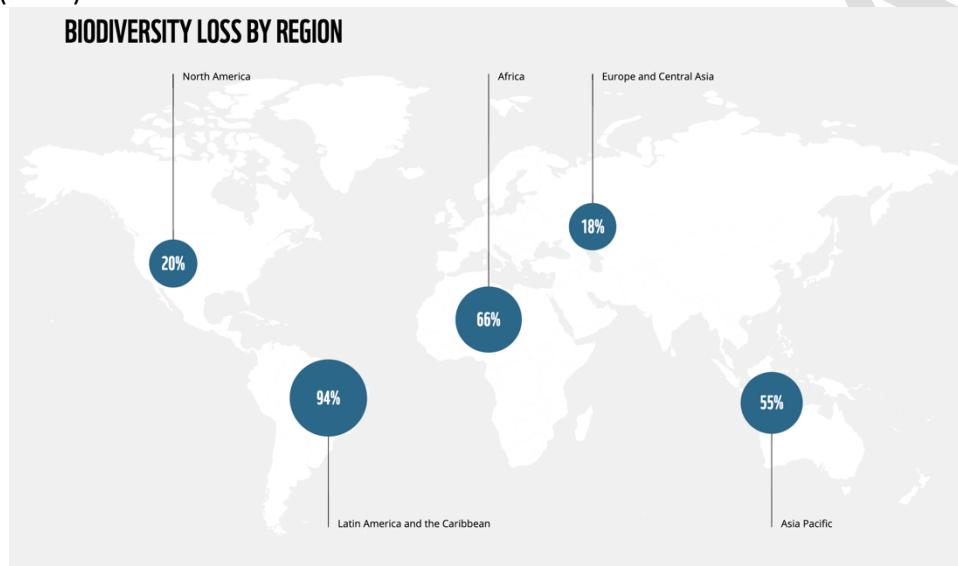
14. WORLD WILDLIFE FUND FOR NATURE (WWF)

1) ABOUT WWF

- The World Wildlife Fund for Nature is an international NGO founded in 1961, working in the field of wilderness preservation, and the reduction of human impact on the environment.
- It is considered the world's largest privately financed conservation organization, with over 5 million supporters worldwide working in more than 100 countries and on more than 3,000 projects.
- **Important Reports:** The Living Planet Report has been published every two years since 1998
- **Important Campaigns by WWF**
 - **Earth Hour** - Encourages everyone to switch off non-essential electric lights, for one hour, from 8:30 - 9:30, on a specific day towards the end of March.
 - Earth hour 2020 was held on 28th March.
 - **Debt for Nature Swaps** are financial transactions in which a portion of a developing countries foreign debt is forgiven in exchange for local investments in environmental conservation measures.

2) REPORT: LIVING PLANET REPORT

- The Living Planet Report comprehensive study of trends in global biodiversity and the health of the planet.
- A Living Planet Index (LPI), featuring about 32,000 populations of 5,230 species across the world, showed that vertebrates wildlife populations are plummeting at a particularly staggering rate in tropical regions of the world.
- In last 50 years, there has been 69% decline in the wildlife populations of mammals, birds, amphibians, reptiles and fish.
- **Region with highest decline** -> Latin America and the Caribbean region (-94%); followed by Africa (-66%) and Asia Pacific (-55%)



- **Freshwater species** populations has globally reduced by 83%, confirming that the planet is experiencing a "biodiversity and climate crisis."
 - Habitat loss and barriers to migration routes were responsible for about half of the threats to monitored migratory fish species.
- **WWF has identified six key threats to biodiversity:**
 - Agriculture; Hunting; Logging; Pollution; Invasive Species and Climate Change
- **Recommendations/Suggestions:**
 - Biodiversity crisis and Climate Change has to be dealt with together - instead of two different issues, as they are intertwined.

15. INTERNATIONAL CONVENTION FOR THE CONTROL AND MANAGEMENT OF SHIP'S BALLAST WATER AND SEDIMENTS (ALSO KNOWN AS "BALLAST WATER MANAGEMENT CONVENTION")

- Convention was **adopted in Feb 2004 by 74 countries** (now 86 countries are signatories).
 - It **came into force in Sep 2017**.
- It is a maritime treaty which **requires signatory states to ensure** that ships flagged by them comply with standards and procedures for the management and control of ship's ballast water and sediments.
- **Objective**
 - Prevent, minimize, and ultimately eliminate the transfer of harmful aquatic organisms and pathogens through the control, and management of ship's ballast water and sediments.

- **Main Provisions**
 - **General Abilities:** Ships must have facilities to treat the ballast water before releasing it in foreign waters.
 - **Reception Facilities:** Under Article 5 Sediment Reception Facilities Parties undertake to ensure that ports and terminals where cleaning or repair of ballast tanks occurs, have adequate reception facilities for the reception of sediments.
 - **Research and Monitoring**
 - » Article 6 calls for parties individually or jointly to promote and facilitate scientific and technical research on ballast water management; and monitor the effects of ballast water management in waters under their jurisdiction.
- **Note:** India is **not participating** in the convention.

16. INTERNATIONAL TREATY ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE (ITPGR)

- **Why in news?**
 - India hosted the 9th session of the Governing Body (GB9) of the ITPGR (Sep 2022)
- **Introduction**
 - This is a treaty which is aimed at:
 - » **Conservation and sustainable use of all plant genetic resources for food and agriculture and;**
 - » **The fair and equitable sharing of the benefits** arising out of their use, in harmony with the CBD, for sustaining agriculture and food security.
 - **Recognizing the contribution of farmers** to the diversity of crops that feed the world.
 - Ensuring that the recipients share the benefits they derive from the use of genetic materials with the countries where they have been originated.
 - » Establishing **a global system to provide farmers, plant breeders and scientists with access to plant genetic material.**
- It was adopted by the **31st session of the Conference of Food and Agriculture Organization (FAO) of the UN on Nov 3, 2001.**
- **Main Provisions**
 - 1. Multilateral System**
 - It is the treaty's innovative solution to access benefit sharing.
 - It puts **64 of the world's most important crops** - crops that together account for 80% of the food we derive from plants - into an easily accessible global pool of genetic resources that is freely available to potential users in the Treaty's ratifying nations for some uses.
 - 2. Access and Benefit Sharing**
 - Ratifying nations are provided facilities to access the genetic material for the 64 crops in the Multilateral System for research, breeding and training for food and agriculture.
 - Prevent the recipient of genetic resources from claiming IPR over those resources in the form in which they received them.

- Those who access genetic materials through the multilateral system agree to share the benefits from their use through the benefit sharing mechanisms established by the treaty.

3. Farmer's right

- The treaty calls for protecting the traditional knowledge of these farmers, increasing their participation in national decision-making process, and ensuring that they share in the benefits from the use of these resources.

4. Sustainable Use

- Most of the world's food comes from four main crops - Rice, Wheat, Maize and Potatoes.
- However, local crops, not among the main four, are a major food source for hundreds of millions of people and has potential to provide nutrition to countless others.
- The treaty helps maximize the use and breeding of all crops and promotes development and maintenance of diverse farming systems.

- The Ninth session of the Governing Body (GB9) of the International Treaty on Plant Genetic Resources of Food and Agriculture (ITPGRFA) was held in New Delhi (Sep 2022)

- Key Highlights:

- In a historical first, Federation of Seed Industry of India (FSII) contributed Rs 20 lakhs (USD 25,000) to the Benefit Sharing Fund (BSF) as the first collective contribution from Indian seed sector, during the GB-9 meeting.
 - The BSF is the funding mechanism of the treaty used for support of capacity building, Conservation and sustainable use projects among the Contracting parties of the Treaty.
- India appointed as the co-chair of the Working Group on "Enhancement of MLS (Multilateral System)"
- Consensus on Implementation of Farmers Rights Reached after extensive negotiation at GB9
- India flags issue regarding genebank funding

17. WORLD SEED VAULTS

- Introduction:

- Seed vaults are places where seeds of various plants are stored to ensure protection of genetic resources and diversity.
 - » They are stored at very low temperatures (at around -18 degree C).
 - » Even at this temperature, seeds have a shelf life and thus seed vaults are regularly updated with fresh, viable samples.

- Svalbard's Vaults, at Spitsbergen, Norway

- It stores crop seeds.
- It is built inside a mountain on the remote Arctic Archipelago of Svalbard. It was opened in 2008 with the intention of being politically neutral and safe location to protect the world's crop diversity. It is designed to survive nuclear war and world war.

- Samples sent here are the duplicates from seed and gene banks, research facilities, and communities around the world, ranging from large institutions like ICARDA, to the Cherokee Nation, who in 2020, became the first tribe in the U.S. to send important heirloom seeds to Svalbard.
- During the **Syrian war**, scientists uplicated and safely transported genetic resources from International Center for Agriculture Research in the Dry Areas facility in Tal Hadia.
- **Millennium Seed Bank** at the Royal Botanic Gardens, Kew, UK is the world's largest wild seed conservation project.
 - It has recently completed 20 years of its formation.
 - Its vault has been built to withstand bombs, radiation, and floods. It holds **2.4 billion seeds** from 39,681 species, coming from 190 countries and territories.
 - The facility claims that they have contributed to protecting 16% of the world's seed-bearing plants.
 - **After the recent massive bushfire in Australia**, the seed bank sent backup seeds of **clover glycine (Glycine latrobeana)**, a rare, wild pea, to its partners in Australia so that the plant could be cultivated and used to restore the ecosystem.
- **Other important seed banks**
 - **The Australian Grains Genebank (AGG)**
 - **Vavilov Institute of Plant Industry**, Russia

18. ANTARCTIC TREATY SYSTEM

- a. **Antarctic Treaty:**
 - It is a treaty that was negotiated during the middle of the Cold War by 12 countries with Antarctic interests. It acts as a foundation for rule based international order for a continent without a permanent population. It remains the only example of a single treaty that governs a whole continent.
 - It is a **remarkably short treaty** and contains only 14 articles. Key provisions include promotion of Freedom of Scientific Research, the use of continent only for peaceful purposes, and the prohibition of military activities, nuclear tests, and the disposal of radioactive waste.
 - The **most important provision** of the treaty is **Article IV**, which effectively seeks to neutralize territorial sovereignty in Antarctica. This means that a limit was placed on making any new claim or enlargement of an existing claim. Further, **no formal recognition** was given to any of the **seven territorial claims** on the continent, by Argentina, Australia, Chile, France, New Zealand, Norway, and the United Kingdom.
 - **Russia, USA, and China** - who are signatory to the conventions but have not made any formal territorial claims - are also bound by the limitations of Article IV.
 - **How has the treaty expanded for 60 years?**
 - Though the compact was held for 60 years, there have been tensions from time to time. For e.g. between UK and Argentina.
 - A key reason because of which the treaty has survived is that it has kept on evolving through a series of additional conventions and other legal protocols.
 - Various disputes have been addressed through the expansion of the treaty framework with new agreements. This framework is now referred to as the "**Antarctic Treaty System**".

- These measures have been a great success, but tensions have arisen in recent years over the promotion of Southern Ocean Marine Reserves. In 2016, agreement was reached on Ross Sea Marine Protected Area, and momentum is building for a broader network of Southern Ocean Marine Protected Areas. China and Russia have resisted these initiatives.
- By, 2020 the treaty has 54 signatories.
- **Changing Circumstances between 1950s to 2020s**
 - Though the treaty has been successful in responding to various challenges so far, the circumstances are radically different now. Antarctic is much more accessible both due to climate change and technological improvement. More countries now have substantive interest in the region when compared to only 12 in the beginning.

19. CONVENTION FOR THE CONSERVATION OF ANTARCTIC MARINE LIVING RESOURCES (CCAMLR)

- **About the CCAMLR**
 - It is part of Antarctic Treaty System. It was entered into force on 7th April 1982 and is headquartered in Hobart City of Tasmania State, Australia.
 - The immediate reason for the convention was the concerns related to increased krill catches in the Southern Ocean which could have had a serious impact on populations of other marine life which are dependent upon krill for food.
 - It is aimed at preserving marine life and the environmental integrity in and near Antarctica. It thus wants to ensure sustainable utilization of resources of Southern Ocean and regulates the use of resources in the region.
 - The commission has 26 members (25 countries + European Union) presently.
 - Note:** India is a member state.
- **Marine Protected Areas**
 - In 2009, the commission by consensus decided to create a network of Marine Protected Areas (MPAs).
 - It was the first international body to do this on the recommendations from the United Nations World Summit on Sustainable Development.
- **Designated or Proposed Marine Protected Areas**

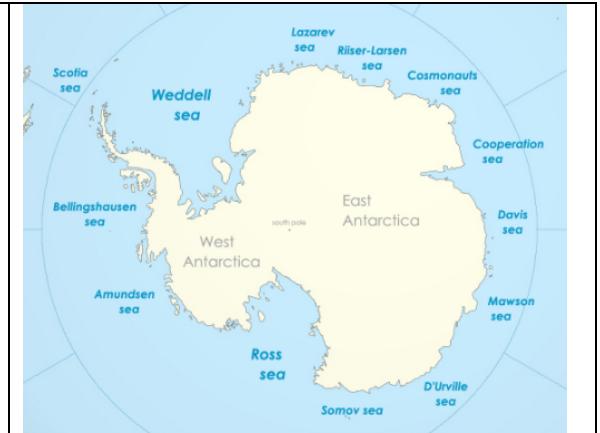
South Orkneys MPA - Designated

Designated in 2009, around South Orkneys Island in the Southern Ocean



Ross Sea MPA - Designated

Designated in 2016



- **East Antarctica, Weddell Sea and Antarctic Peninsula** are the three others proposed MPAs yet to be approved by the commission.
- **East Antarctica** (proposed MPA) will protect blocks of oceans and ocean floor along the East Antarctica, an area rich in cold water corals that provide foraging ground for penguins.
 - It has been proposed by Australia, France, and European Union. It will protect one million square kms of ocean but has been repeatedly been struck down at the meetings of CCAMLR since 2010.
 - Members like **China** and **Russia** have opposed it due to economic and political reasons.
 - **All 26 members** must consent for the creation of Marine Park.
 - **What will be the impact of creation of MPA in East Antarctica?**
 - Ban on fishing in a vast area of the Weddell Sea and parts of Antarctic Peninsula. It will lead to safeguarding of species including penguins, killer whales, leopard seals, and blue whales.
 - It would also play an important role in fighting climate change as the seas around Antarctic are very important sink for Carbon dioxide.
- **Weddell Sea** - lies adjacent to Antarctic Peninsula. It made an MVA, it would become the largest nature reserve anywhere in the world.
- **Antarctica Peninsula** (the area to the west of Antarctic Peninsula) is particularly vulnerable to tourism impacts, fishing activities and global warming. About 75% of the Antarctic Krill is located here.
- In Sep 2021, India announced that it is considering to co-sponsor an MPA proposal at the CCAMLR and getting aligned with countries such as Argentina, Brazil, Chile, Korea, New Zealand, South Africa and USA, which are also proactively supporting the MPA proposals.

A) KRILL FISHERY AND ASSOCIATED ISSUES:

- Krill is the most abundant species in the world, with a biomass of 400 million tons in the Antarctic.
- **Significance:**
 - **Main Source of food for ocean wildlife** including whales, penguins and seals, any disruption to krill populations will ripple across the ecosystem.
 - **Note:** Krill is not a fish, it's a **Crustacean** (a type of arthropod).
- **Fighting Climate Change:** Krill are integral in influencing atmospheric carbon levels, and have the capacity to remove upto 12 billion tonnes of carbon every year from the Earth's atmosphere.
- **Competition for krills is increasing** as the human demand for krill products increase.

- Useful Video: <https://youtu.be/4euvH0K3lsQ>
 - Antarctic Krill Fishery: [Krilling for Oil | Oceans. Inc](#)

20. 6TH MASS EXTINCTION/ HOLOCENE EXTINCTION/ ANTHROPOCENE EXTINCTION

- **Background: Earth's previous five extinction:** Earth is the only known planet to support life. Various kinds of life forms have survived here for at least 3.5 billion years. But it's hospitality doesn't show consistency. In fact, **within the last 500 million years, the natural disasters have caused at least 5 mass extinctions** which wiped out **50-90% of all species on the planet** at the time.

1. End-Ordovician, 443 million years ago

- A severe ice age led to sea level falling drastically upto 100 meters, which wiped out 60-70% of all species which were prominently ocean dwellers.
- Then soon after the ice melted leaving the oceans starved of oxygen.

2. Late Devonian, 360 million years ago

- A messy prolonged climate change event, hit the life in shallow seas very hard, killing 70% of the species including almost all corals.

3. Permian-Triassic, 250 million years ago

- It has been the biggest and worst mass extinction in last 500 million years. More than 90% of the species perished, including trilobites and giant insects - strongly linked to massive volcanic eruptions in Siberia that caused a savage episode of global warming.

4. Triassic-Jurassic, C 200 million years ago

- 75% of species were lost, again most likely due to another huge outburst of volcanism. It left earth clear for dinosaurs to flourish.

5. Cretaceous - Tertiary, 65 million years ago

- A giant asteroid impact on Mexico, just after large volcanic eruptions in India saw the end of 60% of the species that populated the planet including dinosaurs.
- Mammals, and eventually humans took advantage.

- **6th Mass Extinctions** refers to ongoing extinction of various plants and animal species mostly as **a result of human activity**. Scientists believe that billions of population of mammals, birds, reptiles and amphibians have been lost all over the planet, leading them to say a sixth mass extinction has already progressed further than was thought.

- According to a research published in the journal proceedings of the National Academy of Sciences of the United States of America (PNAS), **the ongoing sixth mass extinction** may be one of the most serious environmental threats to the persistence of civilization.

- » This extinction is human caused and is more immediate than climate destruction.
- » The study found that 515 species of terrestrial vertebrates are near extinction.
 - Most of these species are from South America (30%), followed by Oceania (21%), Asia (21%), and Africa (16%) among others.
- » The current loss of species has been occurring since 1800s.

- A study published by University of Hawaii (Jan 2022)
 - » The current mass extinction has been going on since 16th century. Since then earth has lost 1,50,000 to 260,000 species (around 7.5 to 13 percent of its two million species)
 - » It also said that the Red List is biased and leaves out most invertebrates - a group that has seen a dramatic loss and is the majority of diversity on Earth.
- Some other scientists believe that sixth mass extinction is not already under way, but we are on the edge.
- Scientists blame the following factors for this:
 - » Human Over-population and over-exploitation of resources
 - Habitat loss and fragmentation represent primary threat for 85% of all species on the IUCN Red list.
 - It includes deforestation for farming, logging and settlement.
 - » Poaching in case of large animals prized for their body parts (tiger, elephant, lion etc)
 - » Pollution is pervasive in many species, from chemicals like mercury that accumulate in fish to the plastic debris that slowly kill sea turtles, sea birds and cetaceans.
 - » Introduction of Invasive species
 - It threatens a variety of native plants and animals around the world by killing them directly or by outcompeting them for food and nest sites.
 - » Climate Change has also negatively impacted entire ecosystems
 - An economy based on fossil fuels (that pollute the atmosphere) and are producing global warming with dire consequence for ecosystem.
 - An example of the impact of climate change can be seen in case of Corals. The warming of the water and acidification of oceans (due to high CO₂ in the atmosphere) are the principle reason for corals dying.
- This mass extinction will have serious ecological, economic and social consequences
 - » Human civilization is completely reliant on healthy ecosystem for food, water and other resources.

21. IMPORTANT DAYS

1) UN WORLD WATER DAY: 22ND MARCH

- The day is used to advocate for the sustainable management of freshwater resources.
- The **UN World Water Development Report** is released around World Water Day by **UN-Water** every year.

2) WORLD ENVIRONMENT DAY: 5TH JUNE

- The United Nations has designated 5th June as the World Environment Day. The UNEP annually organizes events for World Environment Day, which encourages worldwide awareness and action for the protection of the environment. Since 1974, it has been celebrated every year engaging governments, businesses, celebrities, and citizens to focus their efforts.

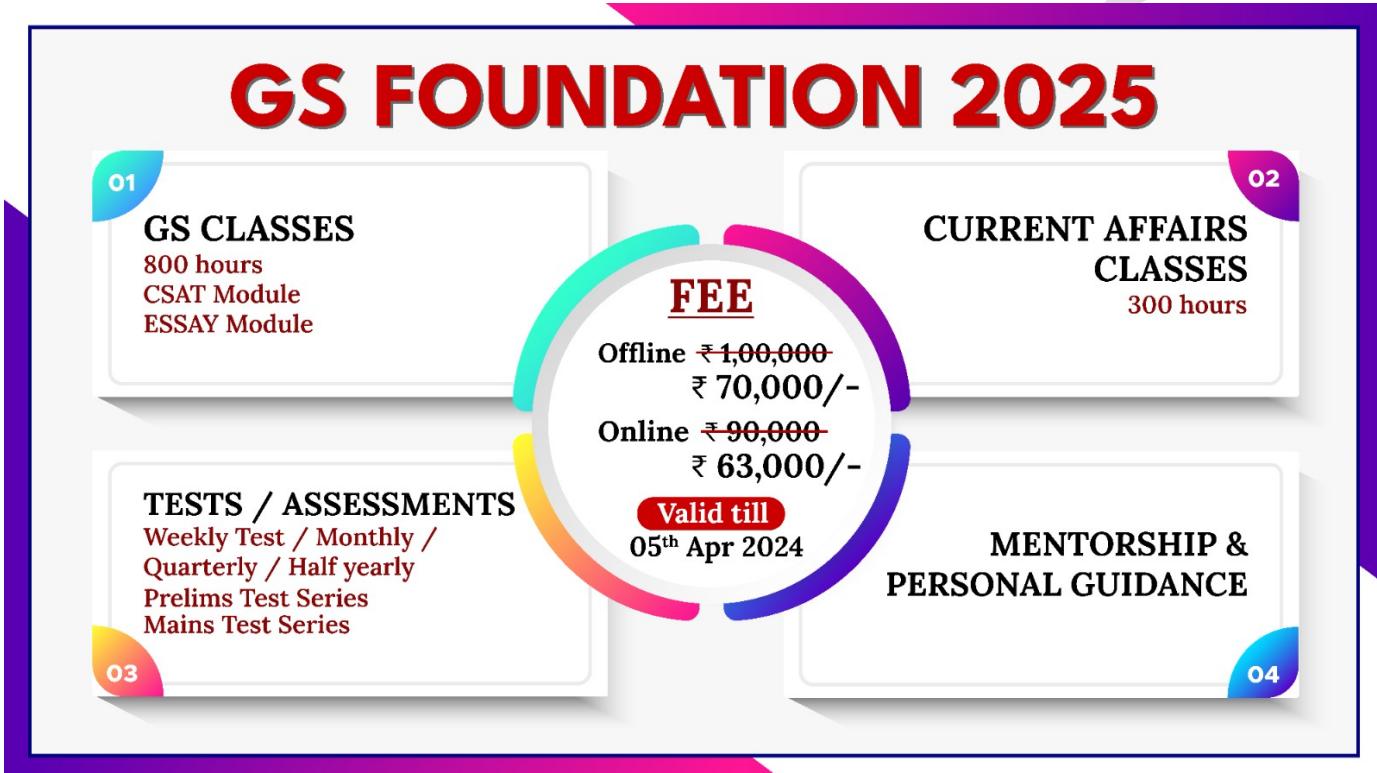
3) WORLD OCEAN DAY: 8TH JUNE

- June 8 is the World Ocean Day, the UN day for celebrating the role of oceans in our everyday life and inspiring actions to protect ocean and sustainably use marine resources.
 - » Many countries have been celebrating this day since 1992, following the UN conference on Environment and Development, held in Rio de Janeiro.

» UNGA officially decided this in 2018.

4) EARTH DAY: 22ND APRIL

- The day is celebrated world-wide to demonstrate support for environment protection.
- The day was first proposed in UNESCO conference in 1969 and the first Earth Day Celebrations took place in 1970.



TARGET PRELIMS 2024

BOOKLET-42; EB&CC-11

NATIONAL CONSERVATION EFFORTS

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2. LAWS DEALING WITH BIODIVERSITY PROTECTION

1) BIOLOGICAL DIVERSITY ACT, 2002

- **Introduction**
 - In order to help it realize the objectives of CBD, India has enacted an umbrella legislation called the Biological Diversity Act 2002. India was the first country, to pass a law to uphold the CBD nationally.
 - The objective of the act are conservation, sustainable utilization, and fair and equitable sharing of benefits arising out of use of biological resources and associated knowledge.
 - The act extends to whole of India.
- The act works towards biodiversity protection in the following ways:
 - » **Regulation of extraction to biological resources**
 - » **Protection of Biodiversity Heritage Sites**
 - » **Biodiversity Management Committees** play a crucial role in promoting conservation and sustainable use of biological resources within their respective areas and facilitate people's participation in biodiversity conservation.
 - » **Conservation of Endangered species:** The act prohibits the transfer of any endangered species, parts, or products without the permission of the State Biodiversity Board (SBB) or the NBA.
- **Conservation of Traditional Knowledge** – the act recognizes the importance of traditional knowledge associated with biodiversity conservation and ensures its protection and preservation.
- **The act recognizes the contributions of Indigenous local communities in conservation of biodiversity** and a company using these resources is required to share 0.5% of the sales post tax to these ILCs. Only those companies whose turnover is more than 3 crore are required to make this payment.
- **Institutional Framework for the implementation of the law**
 - The act is being implemented through three tiered institutional structure
 - i. National Biodiversity Authority (at central level)
 - ii. State Biodiversity Boards (at state level)
 - iii. Biodiversity Management Committees (at local level)

A) NATIONAL BIODIVERSITY AUTHORITY (NBA)

- The central government has established the NBA in exercise of powers conferred by sub-section (1)(4) of Section 8 of BDA, 2002.
- The NBA is Autonomous body and that performs **facilitative, regulatory and advisory function** for Government of India on issue of Conservation, sustainable use of biological resource and fair equitable sharing of benefits of use.

B) BIODIVERSITY MANAGEMENT COMMITTEE (BMC)

- Under section 41(1) of the Act, every local body of the state shall constitute a Biodiversity Management Committee within areas of its jurisdiction for the purpose of promoting conservation, sustainable use and documentation of biological diversity including preservation of habitats, conservation of land races, folk varieties & cultivars, domestic stock and breeds of animals and micro-organisms and chronic knowledge relating to biological diversity.
- The main function of the BMC is to prepare People's Biodiversity Register (PBR) in consultation with local people. This register shall contain comprehensive information on availability and knowledge of local biological resources, their medicinal or any other use or any other traditional knowledge associated with it.
- They shall also be responsible for:
 - » Conservation, Sustainable use and access to benefit sharing of biological resources
 - » Eco-restoration of the local biodiversity
 - » Feedback/Information to the Board, and the NBA in matters of IPRs, traditional knowledge etc.
 - » Management of Biodiversity Heritage sites including Heritage trees, animals, micro-organisms, and Sacred Groves.
 - » Conservation of traditional varieties/breeds of economically important plant species
 - » Biodiversity Education and Awareness building

C) ISSUE OF FAIR AND EQUITABLE SHARING OF BENEFITS ARISING OUT OF USE OF BIOLOGICAL RESOURCES AND ASSOCIATED KNOWLEDGE

- **Introduction**
 - » The Biological Diversity Act, 2002 regulates the extraction of biological resources through the state Biodiversity Boards and the National Biodiversity Authority.
 - Broadly, all foreign entities (companies, institutions and individuals) are within the jurisdiction of NBA while all Indian entities are the subject matter of the state board.
 - » **Biological resources** include plants, animals and micro-organisms but exclude those which are normally traded as commodities.
 - » **What does the law say about sharing of Benefits?**
 - Before a commercial entity extracts biological resources, it must make prior approval of the state board or the NBA and also undertake to share benefits arising out of the use of such biological entities within the local community, which has conserved and protected these biological resources. **The benefits** can be in the form of monetary compensation as well as 'joint ownership of IPRs' and/or 'transfer of technology'.
- **Divya Pharmacy vs Union of India case:** Landmark Judgment by Uttarakhand High Court on Dec 28, 2018
 - » **Core Issue:** Whether the State Biodiversity Board could impose 'Fair and Equitable Benefit Sharing' as one of the regulatory functions on the Indian entities using Biological Resources.

» **Key Highlights of the Judgment:**

- » Indian companies which are extracting biological resources are liable to seek prior approval as well as share part of their revenue with the local communities that are responsible for conserving and protecting such resources.
 - The court also referred to international conventions and treaties such as Nagoya Protocol on Access to Genetic Resources and Fair and Equitable Sharing of Benefits arising from their utilization to the Convention on Biological Diversity.
- » The court held that rights of indigenous and local communities have to be protected, equally from outside as well as from within.
- » The court finally ordered that the State Biodiversity Board does have jurisdiction to demand "fair and equitable sharing of benefits" from Divya Pharmacy and, by implication, from all Indian companies.

D) THE BIOLOGICAL DIVERSITY (AMENDMENT) ACT, 2023

- It was introduced in LS by MoEF&CC in Dec 2021 and was finally passed in the house in July 2023 and Rajya Sabha in Aug 2023.
- The amendment intends to encourage the Indian system of medicine; facilitate fast-tracking of research, patent application process; attract more foreign investment in the preservation and commercial utilization of India's biological resources; and decriminalizes all the offences under the act.
- **Key Highlights:**
 - i. Simplify compliance requirements for domestic companies
 - ii. Exempts AYUSH practitioners, local people, and communities of the area, including growers and cultivators of biodiversity, from giving prior intimation to State Biodiversity Boards for accessing biological resources for commercial utilization.
 - iii. Users of codified traditional knowledge and AYUSH practitioners will be exempted from sharing benefits with local communities
 - Issue/Criticism: The term Codified Traditional Knowledge hasn't been defined by the bill or by CBD. A broad interpretation might exempt all local traditional knowledge from benefit sharing requirements.
 - Legal experts also feel that exemption to Ayush practitioners would be detrimental to ecology and go against the principle of sharing commercial benefits with indigenous communities.
 - iv. Removes research and bio-survey from the purview of benefit sharing.
 - v. Benefit sharing will be based on terms agreed between the user and the local management committee represented by the National Authority
 - Issue/Criticism: The bill removes direct role of local communities in determining the benefit sharing provisions.

- vi. Companies registered in India and controlled by Indians are now treated as Indian companies, even if they have foreign equity or partnership, thereby reducing the restrictions on them.
- vii. **Simplifying the IPR Process:**
 - The act specifies that approval of NBA is required before applying for IPR involving biological resources obtained from India, or (ii) sealing of patent.
 - The bill says that approval would be required before the approval of IPR instead of before the application itself.
 - It further differentiates between foreign and domestic entities.
 - Foreign entities will require approval from NBA whereas domestic entities will be required to register with NBA. However, at the time of commercialization of IPR, domestic entities will need approval from NBA.
- viii. The bill **decriminalizes all offences** under the act and provides for wide range on penalties. Further, it authorizes government officials to hold enquiries and determine penalties.
 - **Issue/Criticism:** Such discretion with government official may promote corruption/rent seeking.
- ix. The bill allows for foreign investment in research into biodiversity. However, this investment will necessarily have to be made through Indian companies involved in biodiversity research.
- x. A new section - 36(A) has been added emphasizing on the monitoring of the Biological Resources obtained from foreign countries for use in India as per the provisions of the Nagoya Protocol on access to benefit sharing.
- xi. Section 36(B) enables state government to develop strategies and plans for conservation and sustainable use of biological diversity.

2) BIODIVERSITY HERITAGE SITES (BHS)

- **About Biodiversity Heritage Sites**
 - They are well defined areas which have unique, ecologically fragile ecosystems - terrestrial, coastal, and inland waters and marine, having rich biodiversity comprising of any one or more of the following components:
 - i. Richness of wild as well as domesticated species or intra-specific categories
 - ii. High endemism
 - iii. Presence of rare and threatened species, keystone species, species of evolutionary significance, wild ancestors of domestic cultivated species, or their varieties
 - iv. Past pre-eminence of biological components represented by fossil beds and having significant cultural, ethical, or aesthetic values and are important for the maintenance of cultural diversity.
- Under Section 37 of the Biological Diversity Act, 2002 (BDA) the state government in consultation with local bodies may notify in the official gazette, areas of biodiversity importance as Biodiversity Heritage Sites (BHS).
- **Biodiversity Heritage Sites of India (As of Jan 2024)**
 - i. Arittappatti Biodiversity Heritage Site, Madurai, TN
 - This is the first BHS of TN.

- It has rich biological and historical significance, with the presence of around 250 bird species including 3 flagship raptors species - Laggar Flacon, Shaheen Falcon, Bonelli's Eagle and wildlife like Indian Pangolin, Python, and Slender Loris.
- ii. **Asramam, Kerala, Kollam**
 - It hosts a unique diversity of Mangrove species with diverse flora and fauna.
 - It also has rare and endangered heritage trees of *Syzygium travancoricum* which is listed as CR in the IUCN list.
- iii. **Nallur Tamarind Grove** in Devanhalli, Bengaluru, Karnataka
 - The area has some of the oldest tamarind trees, recorded age of the oldest one being 410 years.
 - The BHS is spread over 54 acres and comprises of nearly 300 trees.
 - The significant component of this popular structure is a group of old plants standing like ageless sentinels. The area has some of the oldest tamarind trees, some more than 400 years old.
- iv. **Hogrekan in Chikmagalur, Karnataka**
 - The shola vegetation is home to many unique medicinal species.
 - It also serves as a "Wildlife Corridor" between Kudremukh and Bhadra WLS.
- v. **University of Agricultural Sciences, GKVK Campus in Bengaluru, Karnataka.**
 - Large biodiversity -> 13 species of mammals, 10 species of reptiles, 165 species of birds and an impressive 530 species of plants.
- vi. **Ambaraguda** in Shimoga, Karnataka
 - A patch of primitive shola forest, known for many unique and endemic plant species.
- vii. **Purvatali Rai, Bicholim, North Goa**
 - Sacred grove
- viii. **Ameenpur Lake**, Sangareddy, Telangana
 - First water body to be recognized BHS.
 - A man-made lake more than 300 years old.
 - Home to many resident and migratory birds, such as flamingos, egrets, herons, cormorants etc.
- ix. **Glory of Allapalli** in Gadchiroli, MHA
 - First BHS of MHA
 - A patch of dense original forests. Forest is pristine and so dense that hardly any sunlight reaches the forest floor.
 - The forests dates back 100s of years.
- x. **Bambarde Myristica Swamps**, Dodamarg, Maharashtra
- xi. **Ganeshkhind Garden**, Maharashtra

xii. **Landorkhori**, Jalgaon, Maharashtra

xiii. **Schistura Hiranyakeshi** in Amboli, Sindhudurg district

- A species of fish – Schistura Hiranyakeshi – endemic to Amboli was recently recorded for the first time in the western ghats in the local temple pond.



A species of fish — Schistura Hiranyakeshi— endemic to Amboli was recently recorded for the first time in the western ghats in the local temple pond.

xiv. **Mandasuru, Kandhamal, Odisha**

- Mandasaru gorge is an abode of 1563 species of plants, animals and fungi spread over an area of 528 ha.

xv. **Mahendragiri Hill, Gajapati, Odisha**

- It is situated at an elevation between 700-15001 m above mean sea level in Gajapati district of Odisha.
- With increase altitude, the hill complex demonstrates several micro climatic conditions like tropical shola, tropical semievergreen, tropical moist-deciduous & tropical dry deciduous.
- The diversified vegetation with rich floral diversity representing 40% of the reported flora of Odisha.
- The ancient temples of Kunti, Shima, Arjuna and Yudhishtira at Mahendragiri have been declared as protected monuments under the Ancient Monument and Archaeological sites and Remains Act 1958 by the State Government. These monuments provide a sacred and holy background for receiving about one lakh devotees annually every year to worship the deities of the hill.

xvi. **Gandhamardan Hill, Bargarh and Balangir district, Odisha (March 2023)**

- An area of more than 18000 hectares of Gandhamardan Hill (Gandhamardan Reserve Forest) (In Bargarh and Balangir district) has been notified as BHS.
- The hill has high floral diversity with more than 1,000 species of plants.

- One angiosperm, Ficus conccina var dasycarpa and one spider, *Peucetia harishankarensis* are endemic to the hill.
- It is considered a treasure trove of medicinal plants and thus an Ayurvedic paradise of Odisha.
- The hill is home to two important temples - Nrusinghanatha Temple located on northern slope and Harishankar temple located on southern slope.
- The place is famous for highly successful people's resistance against bauxite mining there.

xvii. **Naro Hills, Satna Madhya Pradesh**

- It is a unique and varied geology and it supports a large number of ecosystem and species of flora and fauna.

xviii. **Patlakot, Chhindwara, Madhya Pradesh**

- It has a terrain of 1700 feet deep valley and ecosystem of estimated age of 6 million years and species of rare flora and fauna including rare Bryophytes and Pteridophytes.

xix. **Amarkantak, Anuppur, Madhya Pradesh:**

- It is situated in the Maikal mountain ranges which link the Vindhya and Satpura mountain ranges. It has a unique terrain of a 1700 feet deep valley and an ecosystem of the estimated age of 6 million years and species of rare flora & fauna including rare bryophytes and Pteridophytes.
- Amarkantak ecological system is the origin of three major rivers - Narmada, Johila, and Sone

xx. **Tonglu BHS, Darjeeling Forest Division, WB**

- 230 hectare site is a medicinal plant conservation area.
- Unchecked foot traffic is a major concern for protection here as the BHS borders Nepal border.

xi. **Dhotrey BHS, Darjeeling Forest Division, WB**

- Right next to Tonglu
- Rich in medicinal plants
- Threatened by human encroachment

xxii. **Baneshwar Shiva Dighi, Coochbehar, WB**

- It offers refuge to black softshell turtle listed under CR by IUCN.

xxiii. **Chilkigarh Kanak Durga** in Jhargram, WB

- Chilkigarh Kanak Durga is a small patch of forest ripe with traditional beliefs of local habitats.
- The site is home to 25 species of animals and more than 380 species of plants, out of which many have medicinal properties.

xxiv. **Char Balidanga (Nadia), WB (2023)**

- It is an island spread across 115 acres. It has tropical riverine vegetation with tall grasses and trees, along with swampy flat land covered with algal mats, which are periodically inundated with tidal ebbs.
- It is home to almost 100 species of birds, apart from golden monitor lizard, and golden jackals.

xxv. **Namthing Pokhari** (Darjeeling) WB (2023)

- It is a natural Himalayan Wetlands. It is home to the Himalayan Salamander.

xxvi. **Amkhoi Wood Fossil Park** (Birbhum), WB (2023)

- It has unique geological and paleo-botanical features.

xxvii. **State Horticulture Research Development Station** (Nadia), WB (2023)

- It hosts indigenous horticulture germplasm of orchard trees.

xxviii. **Birampur - Baguran Jalpai**, Purba Medinipur, WB (2023)

- It is a habitat of red crabs and sand bubbler crabs which are fast disappearing from Bengal coastline due to human encroachment.
- The bushes along side the coast have golden jackals, jungle cats and golden monitor lizards.

xxix. **Haldi Char**, Purba Medinipur, WB (2023)

- It is a wetland which is home to Swarna Godhika (Yellow monitor lizard) - a schedule -1 endemic species. The wetland is most conducive for the species to thrive.
- Note: With this WB has 10 BHS (highest in the country)

xxx. **Gharial Rehabilitation Centre**, Lucknow, UP

- Located in Kukrail reserve forest of Lucknow.
- Established for conservation and rehabilitation of CR species of Gharial.

xxxi. **Sacred Grove at Sural Bhatori Monastery**, Pangi Village, Chamba, Himachal

xxxii. **High Altitude Meadows, Hudan Bhatori, Chamba** Himachal

- It is a 108 Bigha high altitude meadow at Muhal Dhar Shinkal in Hudan Bhatori panchayat of Pangi is at an altitude of 3,850m.
- Dominant plants are cranberry, honeysuckle, whitebeam, slender false brome, hairy brome etc.

xxxiii. **Birch-Pine forest patch, Nain Gahar**, in Lahaul's Udaipur

xxxiv. **Tunkyong Dho, Dzongu, Sikkim (2023)**

- It is notified as Sikkim's first biodiversity heritage site.
- It is believed to be one of the oldest natural dho (lake), directly related to the Hee-Youngmingmoo clan of Lepcha community in Dzongu.
- Dzongu valley is a specially protected area for aboriginal/indigenous primitive tribes considered to be the original inhabitant of Sikkim called as Lepchas.

xxxv. **Majuli Island, Assam**

- World's largest river island.
- BHS because of unique ecological and cultural heritage. Home to Assamese - neo-Vaishnavite culture.

xxxvi. **Hajong Tortoise Lake, Dima Hasao, Assam:**

- The lake is a natural habitat of CR freshwater lake 'Black Softshell Turtle" and Endangered "Indian Peacock Softshell Turtle". The site also harbors threatened species like CR Chinese Pangolins.

xxxvii. **Borjuli Wild Rice site, Sonitpur, Assam:**

- This BHS has a good population of wild species of rice - Oryza rufipogon.
- Oryza rufipogon is the progenitor of present day cultivated rice, O. Sativa.

xxxviii. **Khaw Kur Syiem Kmieing, Meghalaya**

- It is a mosaic of natural habitats along with significant diversity of life forms. It is also an old sacred grove with monolith and religious spots.

xxxix. **Dialong Village** in Tamenglong, Manipur

- Home to the rare and endangered citrus indica, or the Indian wild orange. It is the most primitive ancestor to all cultivated citrus fruits in the world.

xl. **Baramura Waterfall, Khowai, Tripura**

- This is the highest natural waterfall in Tripura.
- Critical habitat for rare wildlife, Rich in floristic diversity
- Habitat for many stream water favored fauna

xli. **Unakoti, Tripura**

xlii. **Silarchari Caves, Gomati, Tripura**

- Only natural cave of Tripura.
- Unique habitat for several threatened cave bat species in Tripura

xliii. **Debbari or Chabimura, Gomati, Tripura**

- Unique habitat for threatened plants of Tripura like Dhup tree and cane resources of India

xliv. **Betlingship & its surroundings, North District, Tripura**

- It is the highest peak of Tripura on Jampui Hills, which is famous for a wonderful orange festival.

3) INDIAN FOREST ACT, 1927

- The act was passed to consolidate the then existing laws relating to forest, the transit of forest products, and duties that can be levied on forest product.

- The act provides for three categories of forests:
 - i. **Reserved Forest**
 - » The reserved forests can be notified by states on any forest land or waste land to which government has ownership or right.
 - » They are strictly protected. Many activities are such as fresh clearings, tree felling, burning, grazing, quarrying, manufacturing, hunting, shooting etc are prohibited in reserved forests.
 - ii. **Protected Forest**
 - » Protected forests are also notified on forest lands or waste lands owned by Government.
 - » They are less strictly protected. The state government can declare any portion of the protected forest as closed for a term not exceeding 30 years during which the rights of private person can be suspended and several activities can be prohibited.
 - » **Note: The key difference between reserved forests and protected forests**
 - Rights to all activities like hunting, grazing etc. are banned in reserved forests unless specific orders are issued otherwise.
 - Rights to activities like hunting and grazing are sometimes given to communities living on the fringe of the forest, who sustain their livelihood partially or wholly from forest resources or products.
 - iii. **Village Forest**
 - The State Government may assign to any village-community the rights of Government to or over any land which has been constituted a reserved forest, and may cancel such assignment. All forests so assigned shall be called village-forests.
 - These forests are managed by village community with the assistance of the government.
 - State governments may make rules for regulating the management of village forests, prescribing the condition under which the village community may be provided timber or other forest produce or pasture and their duties for the protection and improvement of forest.
- The act also gives **power to central government** to regulate timber production and its transportation.
- It has been criticized over the years as a:
 - » Tool for Colonial overtake of India's forests for exploitation (specially timber)
 - » Exploitation, Harassment, eviction and loss of livelihood of tribals.
- After independence, the same act (with slight changes) continued and the forest dwellers kept getting harassed, evicted and exploited.

A) 2017 AMENDMENT: EXEMPTION TO BAMBOO GROWN IN NON-FOREST AREAS (CLASS DISCUSSION)

4) FOREST CONSERVATION ACT, 1980 (2023 AMENDMENT)

- **Why in news?**
 - » MoEF&CC have published proposed amendments to the Forest Conservation Act, 1980 and have invited feedback from general public (Oct 2021)

- **Introduction**
 - » It was enacted to help conserve the country's forests.
 - » It strictly restricts and regulates de-reservation of forests or use of forest lands for non-forest purposes without the prior approval of central government.
 - In 1996, the **Supreme Court** in a verdict in **TN Godavarman Thirumulpad vs Union of India** had expanded the definition and scope of forest land to include all areas recorded as forest in government record, irrespective of ownership, recognition and classification. Before this, the act was primarily applicable to reserve forests and national parks.
 - The court also expanded the definition of forests to encompass the "dictionary meaning of forests", which would mean that a forested patch would automatically become a "deemed forest" even if it is not notified as protected, and irrespective of ownership. The order was also interpreted to presume that the act is applicable over plantations in non-forest land.
 - » The Act also covers
 - Requirement for declaring an area as a protected forest, Wildlife Sanctuary or a national park.
 - Maintenance of water supply in springs, rivers and tanks.
- **Forest Conservation Division**
 - » It is mandated to regulate the diversion of forest land for non-forestry purposes through effective implementation of Forest (Conservation) Act, 1980.

A) 1996 SUPREME COURT VERDICT AND EXPANSION OF THE CONSERVATION FUNCTION

- In 1996, the **Supreme Court** in a verdict in **TN Godavarman Thirumulpad vs Union of India** had expanded the definition and scope of forest land to include all areas recorded as forest in government record, irrespective of ownership, recognition and classification. Before this, the act was primarily applicable to reserve forests and national parks.
- The court expanded the definition of forests to encompass the "dictionary meaning of forests", which would mean that a forested patch would automatically become a "deemed forest" even if it is not notified as protected, and irrespective of ownership. The order was also interpreted to presume that the act is applicable over plantations in non-forest land.

B) EXEMPTION PROVIDED BY THE SCHEDULED TRIBES AND OTHER FOREST DWELLERS (RECOGNITION OF FOREST RIGHTS ACT, 2006)

- In this act, certain exemptions to forest clearance for the forest dwelling scheduled tribes and other forest dwelling communities have been provided.
 - Section 3 of the act provides that the Central government can provide diversion of forest and for providing certain facilities managed by the government such as for creation of schools, hospitals, anganwadis, fair price shops, roads, electric and telecommunication lines, tanks and other minor water bodies, minor irrigation canals etc.

- This clearance shall be subjected to the condition that the same is **recommended by Gram Sabha.**
- Thus, it can be understood that the 2006 Act brings in **a balance between conservation of forest rights and protection of rights of forest dwelling communities** and even this is achieved only by an elaborate procedure after seeking sanction of various communities.

C) FOREST CONSERVATION (AMENDMENT) ACT, 2023

- Adding of a **preamble** to the act.
- Changing the name to **Van (Sanrakshan Evam Samvardhan) Adhiniyam**, i.e. **Forest (Conservation and Augmentation) Act.**
- The bill provides that **two types of land** will be **under the purview of the act:**
 - i. Land **declared/notified as a forest under Indian Forest Act, 1927 or under any other law, or**
 - Note: The land which has **not been notified** will not be included under the purview of the act.
 - ii. Land **notified as a forest on or after Oct 25, 1980** in a government record.
 - Note: Land which changed from forest use to non-forest use **before Dec 12, 1996** will not be included.
- **Exempted Category of Land:**
 - » Under the 1927 Act, decisions regarding diversion of forest land for non-forest purposes are taken by the **state government**. The **1980 act** requires **additional prior approval from central government**.
 - » The bill provides that **such approval will not be required** when forest land is **diverted for constructing**
 - i. **Strategic Linear Projects** (roads, railways) of national importance and concerning **national security within 100 km of India's border**.
 - ii. **Security related infrastructure** upto 10 hectares,
 - iii. **Defence related projects**, a camp for paramilitary forces, or public utility projects as specified by the central government, not exceeding five hectares in a left-wing extremism affected area.
 - » The bill also exempts **certain type of land** from the provisions of the act, such as **forest land along a rail line or a public road maintenance by the government providing access to a habitation, or to a rail, and roadside amenities upto a maximum size of 0.10 hectare.**
- **Assignment/Leasing of forest land:**
 - » The Original act **restricts the de-reservation of forests** for use of forest and **non-forest purposes**. Such restrictions can be lifted **only with the prior approval of central government**.
 - The act specifies **certain activities** that will be **excluded from non-forest purposes**, meaning that restrictions on the use of forest land for non-forest purposes will not apply. These activities include **works related to the conservation, management, and development of forest and wildlife** such as establishing check posts, fire lines, and wireless communication.

- » The **amendment adds** more activities to the list such as (i) zoos and safaris under WPA, 1972 owned by the government or any authority, in forest areas other than protected areas, (ii) ecotourism facilities, (iii) silviculture operations (enhancing forest growth), and (iv) any other purpose specified by central government.
- **Powers to issue directions:** The 2023 amendment adds that the central government may issue directions for the implementation of the act to any authority/organization under or recognized by Centre, State, or UT.
- **Significance:**
 - » **Increase Plantation in non-forest areas:** The environment ministry says that the application of the act on land covered under dictionary meaning of forests (or deemed forests) has resulted in a "declining tendency in plantations in non-forest lands owing to the apprehension among individuals, organizations, and authorities regarding such plantations being considered forests".
 - » **Removal of mandatory central government approval** for diversion of forests in certain cases is expected to reduce delays in the implementation of strategically important projects.
- **Criticism:**
 - » The amendment by providing blanket exemptions from the act for several types of lands and several types of projects is going contrary to the intent of the 1980 act which was enacted for prevention of de-reservation of forest lands and large scale deforestation.
 - » Such forest clearance activities will also violate rights of forest dwellers which were secured under the 2006 Act.
 - » The Apex Court in T.N. Godavarman Thirumulpad v. Union of India (UOI) and Ors (AIR 1997 SC 1228), has given a wider meaning to forest land to broaden the scope of their protection. However, the 2023 bill provides a much narrower interpretation to the term forest land by inserting section 1A to encompass only two types of land under its ambit.
 - » **Exemption near border area** would cover large parts of the north-eastern region, Uttarakhand and Himachal Pradesh and could lead to loss of biodiversity in biodiversity hotspots.
 - » **The purpose of allowing a zoo** inside a forest is not clear.
 - Even Supreme Court (2023) has remarked that they don't appreciate the necessity of having a zoo inside tiger reserves or national parks.
 - » There is also a lack of clarity on compensatory afforestation for this diverted land. Similarly, it doesn't provide for how rehabilitation/resettlement/livelihood opportunities etc. would be provided for tribals affected by this kind of diversion.

5) FOREST SITUATION AND KEY STEPS TAKEN TO PROTECT FORESTS

- **Current Situation of forests in India:** As per Indian State of Forest Report 2021, India's total forest cover is 7.13 lakh sq km (21.71% of India's total area). When compared to 2011, there has been an increase of 3.14% in the total area under forest.
- **Concerns:**

- » **Decline in Natural Forests:** Though very dense forests have increased by 501 sq km, but it pertains to protected and reserve forests with active conservation activities.
- » **Decline in North-East India:** Five states in Northeast - Arunachal Pradesh, Manipur, Meghalaya, Mizoram, and Nagaland have all shown loss in forest cover. Its important for protecting the forest cover of NE as it is natural forest and with only 7.98% of the geographical area, it contributes to 23.75% of India's total forest cover.
- **Reasons:**
 - A spate of natural calamities; particularly landslides and heavy rains
 - Anthropogenic factors: Shifting agriculture, pressure of development activities and felling of trees.
- » **Vulnerability to Forest Fire:** Around 35.46% of the forest cover in India is prone to forest fires.
 - Between Nov 2020 to June 2021, 3.4 lakh forest fire hotspots were recorded, which is the highest recorded forest fire cases ever.
- **Why forests are crucial? Why is it important to protect forests:**
 - » **Controlling Global Warming:** Forest restoration will play a huge role in achieving Net Zero climate target. A study in 2017 showed that land-based sinks (natural climate solutions which also includes forests) can provide upto 37% of emission reductions.
 - » **Protecting Biodiversity**
 - » **Preventing Desertification**
 - » **Ensuring Soil Health** (by preventing soil erosion, increasing organic content of soil etc.)
 - » **Protecting micro-climate** of an area
 - » **Livelihood** for crores of tribals and forest dwellers
 - » **Water Security:** Forest restoration is must for water security.
 - » **Medicinal plants** from forests can solve a number of health issues
- **Key Initiatives in India to Conserve Forests:**
 - » Forest Conservation Act, 1980
 - » Compensatory Afforestation Regime
 - » Various Protected Areas - NP, WLS, Tiger Reserves, Biosphere reserves etc.
 - » **Green India Mission** launched in 2010 with three objectives:
 - Double the area to be taken up for afforestation/ eco-restoration in India in the next 10 years.
 - Increase the green house removal by India's forests
 - Enhance the resilience of forests/ecosystem.
 - » **Nagar Van Scheme**
 - » **Forest Fire Prevention and Management Scheme**
 - » **India's International commitments:**
 - India has committed to restore 5 million hectares of degraded and deforested land between 2021 and 2030.
 - India also targets creation of 2.5 to 3 billion tonnes of carbon sink by 2030 as part of its INDC. This would require India to increase its tree cover by 12% over the next 10 years.
- **Key International Initiatives:**
 - » **REDD+** under UNFCCC framework:

- » **New York Declaration on Forests** (NYDF) in 2014 by United Nations Climate Summit: Target of restoring 350 million hectares of forests by 2030.
- » **The span 2021-2030** is the UN Decade on Ecosystem restoration. It emphasizes on efforts to restore degraded terrestrial ecosystems including forests.
- » **Bon Challenge** launched in 2011 focuses on global goal of restoring 150 million hectares of degraded and deforested landscapes by 2020 and 350 million hectares by 2030.
- » **UN** has proclaimed 21st March as the International Day of Forests in 2012 to celebrate and raise awareness of the importance of forests.
 - The year 2022 marks a decade of IDF.

D) SAROJINI FOREST (SAROJINI VAN)

Odisha has named a forest after a tribal women Sarojini Mohanta as a tribute to this homegrown changemaker.



Hired for a Daily wage of Rs 315 as a watcher, she has gone beyond the call of duty to create a forest on a denuded path of land in just two years.

When the Principal Chief Conservator of Forest (PCCF) came for an inspection to Bonai, he was left dazed that the women's dedication led to the survival of 95% of saplings planted in four acres of land.

The PCCF suggested to name the plantation area after her and thus the place was named 'Sarojini Vana'.

Every plant in the area sprawled over three acres of land appears to be at Sarojini's fingertips; she would know which plant would die if it wasn't watered

6) THE WATER (PREVENTION AND CONTROL OF POLLUTION) ACT OF 1974

- It provides for the prevention and control of water pollution, and for the maintaining or restoring of wholesomeness of water in the country.
- The Act was amended in 1988.
- **The Water (Prevention and Control of Pollution) Cess Act** was enacted in 1977, to provide for the levy and collection of a cess on water consumed by persons operating and carrying on certain types of industrial activities.
 - This cess is collected with a view to augment the resources of the Central Board and the State Boards for the prevention and control of water pollution constituted under the Water (Prevention and Control of Pollution) Act, 1974. The Act was last amended in 2003.

7) THE AIR (PREVENTION AND CONTROL OF POLLUTION) ACT OF 1981

- Main Objectives
 - To provide for the prevention, control and abatement of air pollution
 - To provide for the establishment of central and State Boards with a view to implement the Act
 - To confer on the Boards the powers to implement the provisions of the Act and assign to the Boards functions relating to pollution
- **Definitions**

- "Air Pollutants" means any solid, liquid or gaseous substance [(including noise)] present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or properties or environment.

3. ENVIRONMENT (PROTECTION) ACT, 1986

- Why in news?
 - » MoEF proposes amendments in EPA, 1986 to decriminalize provisions (July 2022)
- Details about the Act:
 - » EPA, 1986 was passed under Article 253 of the Constitution, which empowers the centre to enact laws to give effect to international agreements signed by the country.
 - » The Act establishes "the framework for studying, planning, and implementing long-term requirements of environmental safety and laying down a system of speedy and adequate response to situations threatening the environment"
 - » It is an enabling act and empowers the Central Government to establish authorities [under section 3(3)] charged with the mandate of preventing environmental pollution in all its forms and to tackle specific environmental problems that are peculiar to different parts of the country.
 - E.g. authorities created under EPA: Central Ground Water Authority (CGWA)
 - » The act defines terms such as environment, environment pollutant, and hazardous substances.
 - » It provides for imprisonment of upto 5 years and or fine of upto Rs 1 lakh for violator of the law.
 - » **Environment Protection Rules 1986**
 - The rules set the standards for emissions or discharge of environment pollutant.
 - Prohibitions and restrictions on the location of industries and the carrying on processes and operations in different areas.
 - Procedure of taking samples

4. WILDLIFE (PROTECTION) ACT, 1972

- Why in news?
 - » Wild Life (Protection) Amendment Act, 2022 came into force from 1st April 2023
- The Wildlife (Protection) Act, 1972 was enacted to provide for the protection of wild animals, birds and plants with a view to ensure the ecological and environmental security of the country.
 - » It defines wildlife to include any animals, bees, butterflies, crustaceans, fish, and moths; and aquatic or land vegetation, which form part of any habitat.
 - » The act, along with Wildlife Protection Rules, provides for the protection of wild birds, animals and plants and for all matters that are connected to it whether it be their habitat or the waterhole or the forest that sustain them.
- The Act provides for:

- » Prohibition of hunting
 - » Protection and management of wildlife habitats
 - » Establishment of protected areas and reserves such as national parks, wildlife sanctuaries, tiger reserves, conservation reserves, and community reserves.
 - » Management of zoos etc.
- It defines **five types of protected areas**
1. National Parks
 2. WLS
 3. Community Reserves
 4. Conservation Reserves
 5. Tiger Reserves
- It also provides for the formation of:
- » NTCA
 - » Central Zoo Authority
 - » National Board for Wildlife (NBW), an advisory body to help centre of policy decisions.
- **The six Schedules (Before the 2022 amendment)**
- » The act had **six schedules** with varied degree of protection to different kind of animals and plants.
 - **Schedule I and Part II of Schedule II** provided absolute protection and offences under these are prescribed the highest penalties.
 - The Penalties for Schedule III and Schedule IV were less and these animals are protected.
 - Schedule 5: Vermins includes animals which can be hunted.
 - Common crow, Fruits bats, mice and Rats only
 - Schedule 6 contains endemic plants, which are prohibited from cultivation and planting. The cultivation and trade of specified plants can only be carried out with prior permission of competent authorities. These plants are as follows:
 - Beddomes Cycad -> Medicinal, EN
 - Blue Vanda (Medicinal)
 - Kuth
 - Ladies Slippers Orchids
 - Pitcher Plant
 - Red Vanda
 - » **Permitted Hunting of Problematic Wild Animals**
 - Section 11(1)(a) of the WPA authorizes Chief Wildlife Warden to permit hunting of any problem wild animals only if it can't be captured, tranquilized or translocated.

E) WILDLIFE PROTECTION (AMENDMENT) ACT, 2022

- The amendment increases the number of species protected under the law and implement CITES effectively.
- » **Rationalizing Schedules:**
- Reduce the total number of schedules to four by:

- » **Schedule for Specially protected animal species:**
 - Schedule 1 (Species with highest level of protection);
 - It contains 600 species of vertebrates and hundreds of species of invertebrates.
 - Schedule 2 (Species with lesser level of protection);
 - It contains 2000 species (including 1,134 species of birds)
- » **Schedule for Plant Species:**
 - **Schedule 3 (Protected Plant Species);**
- » **Schedule for implementation of CITES:**
 - Schedule 4 (Specimen listed in the Appendices under CITES)
- » **Note:** There is no schedule for vermin species.

- **Implementing the obligations of CITES:** The central government will designate:
 - Management Authority, which grants export or import permits for trade of specimens
 - Scientific Authority, which gives advice on aspects related to impact on the survival of the specimen being traded.
- The amendment empowers central government to regulate or prohibit the import/trade/possession of invasive alien species.
- **Control of Sanctuaries: Increased role of centre.**
 - In the original act the sanctuaries are managed and controlled by Chief WildLife Warden who is appointed by the state government. But the amendment says that the action of the warden will be as per the management plans of the sanctuary which will be prepared as per the guidelines of the central government.
- **Sanctuaries in Special Areas:**
 - For sanctuaries falling under special areas (scheduled areas and areas where forest rights act is applicable), the management plan must be prepared after due consultation with concerned Gram Sabha.
- **Empowers central government to notify conservation reserve** (earlier only state government could do so).
- **Amends section 43 of the principal act** - To permit transfer or transport of a captive elephant for a religious or any other purpose by a person having a valid certificate of ownership.
- **New Section 42A has been added for surrender of captive animals:** Any person may voluntarily surrender any captive animals or animal products to the Chief Wild Life Warden. No Compensation will be paid for such items. The surrendered item becomes the property of state governments.
- **Increased fines and penalties** for violation of the law.

F) WILDLIFE (PROTECTION) LICENSING (ADDITIONAL MATTERS FOR CONSIDERATION) RULES, 2024

- The revised notification came into effect on 16th Jan 2024, the first revision since 1983.
 - » The 1983 rules, prohibited issuing license to trade in a wild animal categorized under Schedule-1 or Part II of Schedule II under the WPA, 1972. The license was granted in exceptional circumstances with previous approval of central government.
 - » New Guidelines says that "no license shall be granted if it related to any wild animals specified in the Schedule-I to the Act, except with previous consultation of the central government.
 - It mentions additional matters to consider granting of licenses, the authorized officers must consider the capacity of the applicant to handle the business concerned in terms of the facilities, equipment and feasibility of premises for the business.
 - » **Note:** The new guidelines doesn't have licensing restrictions for species listed in Schedule-II of the WPA, 1972. It may imply that the license for trading in Schedule - II species can be granted without consulting central government which was required earlier.
- **Analysis:**
 - » **Exclusion of Schedule-II**

5. ZOOLOGICAL PARKS

1) CENTRAL ZOO AUTHORITY

- **About Central Zoo Authority (CZA)**
 - CZA is a statutory body formed under the Wildlife Protection Act, 1972. It is chaired by the environment Minister.
 - » The authority is responsible for regulation of zoos in the country.
 - » It prescribes various standards for the functioning of the zoo and evaluates and assesses the functioning of the zoo.
 - » It is also the authority to recognize or derecognize a zoo.
 - » It makes rules and guidelines for various issues associated with zoos like transfer of animals among zoos including international transfer among zoos.
 - » It consists of a **Chairperson** and **10 members** and a **member-secretary**.
 - Most of the members are officials in environment ministry.
 - Non-government experts are those who are wildlife conservationists or retired forest officers.
 - **Main Objective:** To complement the national effort in conservation of wildlife.
- **Reconstitution of Central Zoo Authority (July 2020)**
 - The environment ministry has reconstituted CZA to include an expert from the School of Planning and Architecture, Delhi, and a molecular biologist.

2) NATIONAL ZOOLOGICAL PARK

- Set up in 1959, as per the decision of Indian Board of Wild Life, 1952 (now a statutory body National Board of Wildlife under WPA, 1971)
- Till 2019, it was directly managed by MoEF&CC.
 - From Sep 2019, the Delhi Zoo (i.e. National Zoological Park) is being administered directly by Central Zoo Authority.
 - » **Criticism of the move:** CZA is a regulating body. So there is a conflict of interest in this case, where a regulating body is managing the zoo as well.
- It was originally known as Delhi Zoo but in the year 1982 it was given the status of the National Zoological park with the idea of it being the model zoo of the country.

3) RELIANCE INDUSTRIES LIMITED WILL BUILD WORLD'S LARGEST ZOO IN JAMNAGAR (DEC 2020)

It will come up in 280 acres of land near Reliance's refinery at Moti Khavdi near Jamnagar. It will house 100 different species of mammals, birds, reptiles, and amphibians.

4) VANDALUR ZOO (ARIGNAR ANNA ZOOLOGICAL PARK) (AAZP)

- **Why in news?**
 - » TN government order to set up museum, theatre at Vandalur Zoo (June 2023)
- **About Vandalur Zoo:**
 - » The zoo is located in Vandalur, to southwest of Chennai.
 - » It was established in 1855 and was the first public zoo in India.
 - » It is spread over 602 hectares and includes a rescue and rehabilitation centre. It is also the largest zoo of India.
 - » The zoo is situated 7 kms from Tambaram.
- **Details of news:**
 - » The TN government has issued an order to set up a museum and a theatre at a cost of Rs 4.3 crores at the AAZP.

5) NANDANKANAN ZOOLOGICAL PARK (NZP)

- It is a large zoo and botanical garden, situated 15 km from Bhubaneshwar. It has been built right inside a forest and set in a completely natural environment.
- **Uniqueness of the zoo**
 - It is the first zoo in India to breed a white tiger and Melanistic tiger.
 - It is the only conservation breeding center of Indian Pangolins in the world.
 - It is the only zoological park in India to become an institutional member of World Association of Zoos and Aquarium (WAZA).
 - A train 'Puri-New Delhi Express' has been named after Nandan Kanan zoo as Nandan Kanan express.

- It is the only zoo to have an open top leopard enclosure.

6. VARIOUS PROTECTED AREAS IN INDIA

- Protected areas are those in which human occupation or at least exploitation of resources is limited. There are several kinds of protected areas, which vary by level of protection depending on the enabling laws of each country or the regulations of the international organization involved.

1) VARIOUS PROTECTED AREAS

Type	Number	Total Area (km ²)	Coverage of the country
National Parks	106	44,402	1.35%
Wildlife Sanctuaries	573	1,27,197	3.87%
Conservation Reserves	123	5585	0.17%
Community Reserves	220	1455	0.04%
Protected Area Total	1022	1,78,640	5.43%

- State with highest number of NP
 - Madhya Pradesh (11)

2) COMPARISON BETWEEN NP AND WLS

NP	WLS
They provide protection to <u>entire ecosystem</u> including fauna, flora, landscape and historical entities.	Known for <u>Wildlife conservation</u> . It focuses that population of wildlife and their habitats are maintained substantially
Highly Restricted and Protected <ul style="list-style-type: none"> Commercial exploitation of forest produce not allowed Activities like hunting, grazing, human settlement etc are prohibited Visit requires <u>official permission</u> from relevant authorities. Limited activities are allowed that too after the permission of Wildlife Warden. 	Relatively lower restriction and protection <ul style="list-style-type: none"> Commercial exploitation of forest produce not allowed Hunting is prohibited without permission in a sanctuary, <u>but Grazing and movement of cattle may be permitted</u> <u>No official permission</u> is required to visit a WLS
Boundaries are <u>clearly specified</u> in case of a National Park	Boundaries may not be specified
It corresponds to Category II of the IUCN protected areas	It corresponds to the Category IV of protected areas.

7. NATIONAL PARKS

8. LADAKH

1) HEMIS NATIONAL PARK

- It is a high altitude NP in the eastern Ladakh region.
- **Only NP of India north of Himalayas.**
- It is also the **largest notified protected area of India** (thus also the largest National Park). It is also the **largest NP in South Asia**.
- It is also the second largest contiguous protected area after the Nanda Devi Biosphere Reserve and the surrounding protected area.
- **Rivers**
 - Bound in the north by the banks of Indus river
 - Includes the catchment of Markha, Sumdah and Rumbak.
- **Fauna**
 - Best place to see snow leopard (VU) in the wild, it is believed to have **highest density of snow leopard in the world**.
 - Other famous species of animals include **Tibetan Wolf, Eurasian Brown bear (LC)**, and the **red fox (LC)**.
- **Flora**
 - The region lies in the **rain shadow area** of the Himalayas and doesn't receive much precipitation.
 - Hence, dry forests of Juniper, Populus-Salix forests, subalpine dry birch - fir are present at **lower altitudes**.



Cultural significance

The park houses numerous Tibetan Gompas and holy chortens within its boundary.

These include the famous 400 year old hemis monastery.

9. J&K – NPS

1) DACHIGAM NATIONAL PARK

- **22 km from Srinagar district**
- **Main Fauna**

- **Hangul**: the park is supposed to contain last viable hangul population in the world.
- Leopard, Red fox, musk deer, black bear, brown bear, yellow throated marten, Himalayan weasel

2) SALIM ALI NATIONAL PARK (ALSO KNOWN AS CITY FOREST NATIONAL PARK - LOCATED IN SRINAGAR DISTRICT).

- In honour of famous Indian ornithologist Salim Ali (some-times referred as bird man of India)
- Very small: 9 km²
- **Main Species**
 - Hangul, Musk deer, Himalayan black beer, leopard, Himalayan serow
 - Birds : Paradise flycatcher, Himalayan Monal, and Himalayan snowcock.

3) KISHTAWAR NATIONAL PARK

- **Main species**
 - Snow leopard
 - Markhor
 - Musk deer
 - Brown bear
 - Himalayan black bear

4) KAZINAG (QAZINAG) NATIONAL PARK

- It is a commissioned future national park in the Baramulla district in the Indian UT of J&K. It is part of a proposal for a Trans-Karakoram peace park with Pakistan.
 - It is located in the northern region of Kashmir and is located on the northern bank of Jhelum River.
- It was created after the Kargil War and based on the increasing pressure to protect the rare **Markhor** wild goat. The national park is being set up in J&K and is the fourth one in state.
- In India, Markhor is only found in J&K and Kazinag habitats the mammal's largest population.

10. HIMACHAL PRADESH NPS

1) GREAT HIMALAYAN NATIONAL PARK

It is a protected area located in Kullu region of Himachal Pradesh. It is spread over an area of 1,171 km square and an altitude between 15,00 and 6,000 meters.

In June 2014, GHNP was added to UNESCO's list of World Heritage Sites. The status was granted under the category of "outstanding significance of biodiversity conservation".

Important Fauna of the park includes some of the most exotic species of animals like snow leopard, blue sheep, Himalayan Brown Bear, Himalayan Tahr, musk deer, etc.



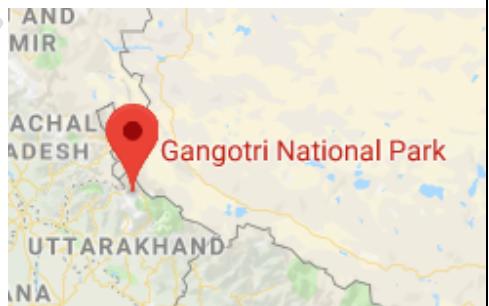
2) OTHER NATIONAL PARKS OF HIMACHAL

Inderkilla, Khirganga, Pin Valley and Col. Sherjung Simbalbara

11. UTTARAKHAND NPS

1) GANGOTRI NATIONAL PARK

- GNP is a national park located in Uttarkashi district Garhwal range. This is the fourth largest NP in the country (after Hemis, Desert, and Simlipal) with total area of 2390 km².
 - The Park provides majestic beauty of coniferous tree and grandeur of glacial world combined with lush green meadows.
 - The north-eastern boundary of the Gangotri National Park is along the international boundary with China.
 - **Important Fauna**
 - Snow leopard, ibex, tahr etc.



2) VALLEY OF FLOWERS NATIONAL PARK

- It is a NP located in north Chamoli region of Uttarakhand. It is known for its meadows of endemic alpine flowers and the variety of flora.
- The area is also home to **fauna** such as **musk deer**, **snow leopard**, **Brown bear**, **blue sheep** etc.



3) NANDA DEVI NATIONAL PARK OR NANDA DEVI BIOSPHERE RESERVE

- It is a national park situated around the peak of Nanda Devi (7816 m) in the state of Uttarakhand.
 - It was declared World Heritage site by UNESCO in 1988. Later in 2005, the designation was enhanced to cover the Valley of Flowers too. So, the present UNESCO world heritage is **Nanda Devi and Valley of Flowers National Parks, 2005**.
 - **Both Parks** - Valley of Flowers and Nanda Devi are encompassed in the **Nanda Devi Biosphere** reserve.



4) RAJAJI NATIONAL PARK (TIGER RESERVE)

- Rajaji national park and tiger reserve is spread in **3 districts of UK: Haridwar, Dehradun and Pauri Garhwal**. It is nestled between the Shivalik ranges and the Indo-Gangetic plains.
- The Park has been named after **Rajagopalachari**, a prominent leader of the national freedom struggle and the second and last governor general of Independent India.
- In 2015, Rajaji became the second tiger reserve of UK.
- The Ganga and Song River flows through the park.
- Fauna: The Park is renowned for its elephants, sambar, barking deer, hog deer etc. Tigers and Leopards are prime predators of the park.

5) JIM CORBETT NP

- It is the oldest/first national Park in India and was established in 1936 as Hailey National Park to protect Bengal Tiger. It is in the Nainital district of Uttarakhand and has been named after Jim Corbett, a well-known hunter and naturalist. It was also the first park to come under Project Tiger initiative (i.e., declared a Tiger Reserve).
- It is also among the few tiger reserves in India which allows overnight stay in the lap of the National Park.



6) GOVIND PASHU VIHAR NATIONAL PARK

- Named after Gobind Ballabh Pant.
- Situated in Uttarkashi district and lies in higher reaches of Garhwal Himalayas.
- The **snow leopard project** started by Gol is being managed at this sanctuary.

12. HARYANA NPS

1) SULTANPUR NATIONAL PARK DETAILS

Details

- Sultanpur National Park (Formerly a bird sanctuary) is located at Sultanpur village (Gurgaon district) on Gurugram Jhajjar Highway, 15 kms from Gurgaon, Haryana.
- Sultanpur National Park is a major attraction for water birds and migratory birds.



2) KALESAR (YAMUNANAGAR DISTRICT)

- **Kalesar National Park** and the adjacent **Kalesar WLS** are protected areas in Yamunanagar district of Haryana state in India.
- It is located contiguous to Rajaji National Park in Uttarakhand.
 - » It is a popular destination for leopards, panthers, elephants, red jungle fowl and bird watching.
- **Vegetation:** The forested area in the Shivalik foothills is covered primarily with Sal with smattering of Semul, Amaltas, and Bahera trees as well.



13. UTTAR PRADESH – NP

1) DUDHWA NATIONAL PARK (TIGER RESERVE)

- DTR is a protected area in Uttar Pradesh that stretches mainly across the **Lakhimpur Kheri and Bagraich districts** and comprises of **Dudhwa National Park, Kishanpur WLS, and Kataranighat WLS**.
- Its total area is more than 1,000 km².
- It shares the north-eastern boundary with **Nepal**, which in large extent is defined by Mohana river.
- **Fauna:** Tigers, leopards, deer, swamp deer, rhinoceros, elephant etc.



14. BIHAR – NP

1) VALMINKI NATIONAL PARK, TIGER RESERVE AND WLS

- It's located on **Indo-Nepal Border** in West Champaran district of Bihar, on the **bank of Gandak**. It is the **only National Park** in Bihar.
- **Nepal's Chitwan National Park** borders the VNP.
- **Gandak and its tributaries** are known to flood the Valmiki Tiger Reserve



15. JHARKHAND – NP

1) BETLA NATIONAL PARK (TIGER RESERVE)

- It is located on the Chota Nagpur Plateau in the Latehar district of Jharkhand, India.
- It consists of Palamau Tiger Reserve and Mahuadar Wolf Sanctuary.
- **Floor:** Sal and Bamboo are the major floral component of the park.
- **Fauna:** Elephants, Sloth bear, Panther, Wolf, Jack etc.



16. WEST BENGAL NPS

1) SUNDARBAN NP

- It is a **national park, tiger reserve, biosphere reserve** in west Bengal.
- It is part of Sundarbans in Ganga Delta and adjacent to Sundarbans Reserve Forest in BD. The Sundarban have also been added to the list of Ramsar Sites.
- **Flora**
 - Mangrove forests - Sundari trees (pneumatophore)
- **Fauna:** Bengal Tiger, Saltwater crocodiles; Fishing cats, leopard cats, wild boar, Pangolin, Chital are also found in Abundance
- **Threatened Species:** Royal Bengal Tiger, Saltwater crocodile, river terrapin, Olive Ridley Sea Turtle, Ganges River Dolphin, Hawksbill turtle and mangrove horseshoe crab.



2) GORUMARA NP

- **Location:** Northern West Bengal Jalpaiguri district, in the Terai region of Himalayan foothills.
- **Physical Features**
 - Medium-sized Park (80 square Kms) with grasslands and forests and is known as Dooars in West Bengal.
 - The Park is located on the flood plains of Murti River and Raidak river. The major river of the park is the Jaldhaka river, a tributary of the Brahmaputra River system.
- **Zoological Features:**
 - Primarily known for its population of Indian Rhinoceros.
 - Other animals found here include Gaur, Asian Elephant, sloth bear, chital and Sambar deer.
 - Lack of carnivores, only big cat being leopard. Tiger occasionally spotted.
 - **Submontane forest birds** like scarlet minivet, sunbird, Asian paradise suncatcher, and Indian Hornbill.
- **Conservation Focus**
 - Maintain a viable breeding community of Indian Rhinoceros



3) JALDAPARA NP

It is a NP in the foothills of Himalayas in the Northern Bengal and is on the banks of Torsa river.
It has second largest rhino population (after Kaziranga (>2400 rhinos)

4) NEORA VALLEY NP

- Kalimpong district, West Bengal
- National Park, IBA site,
- **Fauna:** Red Panda; Civet; Black bear; Himalayan Flying Squirrel; Barking deer



5) SINGALILA NP

- Darjeeling district
- Located on the Singalila ridge at an altitude of 7,000 meters.
- **Flora**
 - Thick bamboo, oak, magnolia, and Rhododendron
- **Fauna:** Red Panda; Leopard Cat; Barking deer; Wild boar



6) BUXA NATIONAL PARK

- **Tiger reserve** located inside National Park.
- Notified as tiger reserve in 1983.
- Consists of moist deciduous and evergreen forests.
- **Other Species at Buxa**
 - Clouded leopard, jungle cats and fishing cats.
 - Elephants, gaurs, chital, sambar, barking deers and hog deer.



17. SIKKIM – NP

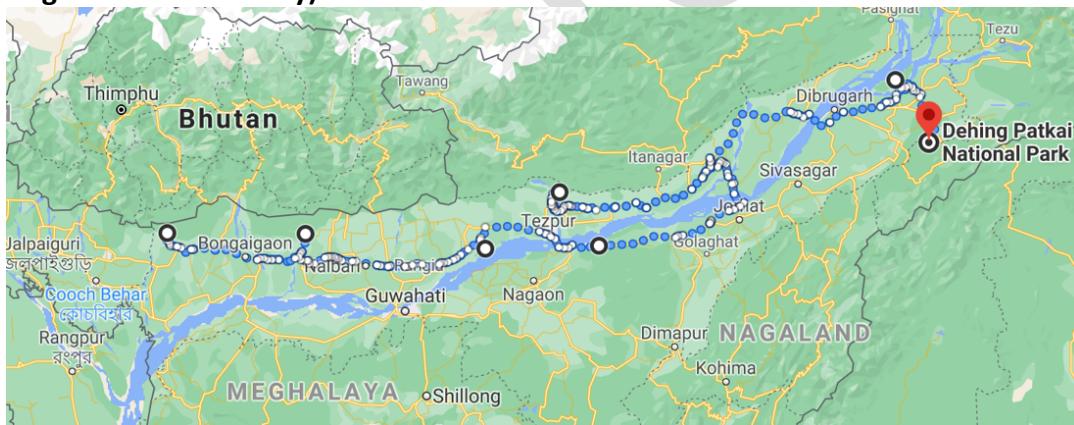
1) KHANGCHENDZONGA NATIONAL PARK (KHANGCHENDZONGA BIOSPHERE RESERVE)

- It is a national park and Biosphere reserve located in Sikkim, India. The total area of the park is 849.5 km². It forms the core of the Biosphere Reserves.
- It includes a unique diversity of plains, valleys, lakes and glaciers and spectacular snow-capped mountains covered with forests including the world's **third highest peak, Mount Khangchendzonga**.
- The National Park falls in the **Himalayan Global Biodiversity Hotspots** and displays an unsurpassed range of sub-tropical to alpine system.
- It was also inscribed to the **UNESCO World Heritage Sites list in July 2016**, becoming the first mixed heritage site in India.
- It was **recently included in UNESCO's MAB program**.
- **Cultural Significance**
 - There are few lepcha tribal settlements inside the park.
 - The Park contains Tholung Monastery, a gompa located in the park's buffer zone.
- **Neighbouring Protected Area**
 - In the **north** it adjoins the **Qomolangma National Nature Preserve** in Tibet and in the **West** the **Kanchenjunga Conservation** area in Nepal.
- **Important Fauna:** Musk deer, snow leopard, Himalayan Tahr, red panda, Himalayan Black Bear, Himalayan Blue Sheep etc.



18. ASSAM – NP

National Parks in Assam - After addition of two national parks in June 2021, Assam now has **7 National Parks (2nd highest in the country)**



1) RAIMONA NATIONAL PARK

- **Details**
 - It is a national park in Assam, India located in Gossaigaon subdivision of Kokrajhar district. It is located within the Bodoland Territorial Region.
 - The area includes the northern part of the notified Ripu Reserve Forest, which forms the western buffer to the Manas National Park.
- **Boundaries:**
 - Raimona is bounded in the **West** by the **Sankosh river** (along the Assam-WB border) running southwards from the India-Bhutan border.
 - **Saralbhanga river** on the east forms the eastern boundary.
 - **Pekua river** defines the NP's southern boundary.
 - It also shares the contiguous forest patches of the Phipsoo WLS and the Jigme Singye Wangchuk National Park in Bhutan creating a transboundary conversion landscape.
- Such secured transboundary ecological landscape will ensure the long-term conversation of endemic species like the golden langur, the mascot of Bodoland Territorial Council and the endangered species such as the Asian Elephants, the Bengal Tiger etc.



2) MANASA NATIONAL PARK

- Situated in the **foothills of the Himalayas and extended to Bhutan**, Manas National Park is one of the most sought after tourist destination in entire North East.
- **History**
 - Declared a sanctuary in 1928
 - World Heritage Site by UNESCO in 1985
 - World Heritage Site in danger in 1992 - due to poaching and other instability
 - Tag of World Heritage Site in danger removed - 2010.
- **Important Wild life species**
 - One horned Rhino, Wild Buffaloes, little known white winged duck, and Manipur Bush Quail, among others.
- **Pygmy Hog Conservation Program (PHCP)**
 - The Pygmy Hog Conservation Program (PHCP) is a collaboration among Durrell Wildlife Conservation Trust of UK, Assam Forest Department, Wild Pig Specialist Group of International Union for Conservation of Nature and MoEF&CC.
 - It is currently being implemented by NGOs Aaranyak and EcoSystems India.
 - Under this initiative six Hogs (two males and 4 females) were captured from the Bansbari range of Manas National Park in 1996 for starting the breeding program.
 - **The reintroduction** began in 2008 with Sonai Rupai WLS (35 Hogs), Orang National Park (59) and Barnadi WLS (22).



- With the June 2021 release, the total number of releases in wild under the PHCP program reached **146**, which is more than their total original global population.
- Conservation of Pygmy Hog was initiated by noted naturalist Gerald Durrell and his trust in 1971. Pygmy Hog was brought back from near extinction by the partnership effort, and the efforts are being made towards establishment of a population across the entire range.
- By 2025**, the PHCP plans to release 60 Pygmy Hogs in Manas.

3) ORANG NATIONAL PARK

- It is located on the northern bank of Brahmaputra in the Darrang and Sonitpur districts of Assam.
- Famous Fauna:**
 - Great Indian one-horned Rhino; Pigmy Hog; Elephants, wild buffaloes and tigers
 - Birds: Bengal Florican (CR)** also called Bengal Bustard is one of the flagship species of the park with a population of 30-40
- It is the only stronghold of Rhino on the northern Bank of Brahmaputra.



4) NAMERI NATIONAL PARK

- Nameri is located in Sonitpur district of Assam.
- Shares border with Pakhui WLS of Arunachal Pradesh.



5) KAZIRANGA NATIONAL PARK

- » Situated in the Golaghat and Nagaon district of Assam.
- » It is a **World Heritage site, a tiger reserve, an IBA** and is most famous for its **one-horned Rhinos**.
- » **Fauna**
 - Great one-horned Rhino:** It hosts 2/3rd of the world's one-horned Rhino population.
 - Tigers:** It has one of the highest density of tigers among protected areas in the world.
 - Elephant**, wild water buffalo, swamp deer, Golden Langur
 - Eastern swamp deer (Barasinga) (**VU**)
- » **Geographical feature**
 - It is situated on the banks of Brahmaputra (The river lies to its north and west)



- » It is crisscrossed by 3 other rivers

6) DIBRU SAIKHOWA NATIONAL PARK AND BIOSPHERE RESERVE

- At Tinsukia and Dibrugarh districts of Assam
- Rivers
 - Bounded by Brahmaputra and Lohit rivers in the north and Dibru river in the South.
- Fauna
 - **White winged duck (EN)**
 - The park was created to protect the white winged duck.
 - Water buffalo
 - Black breasted parrotbill
 - Tiger and capped langur
- Flora: The Forest type of Dibru Saikhowa comprises of semi-evergreen forests, deciduous forests, littoral and swamp forests and patches of wet evergreen forests. It is the largest swamp forest in north-east India.



7) DIHING PATKAI NATIONAL PARK

- The national park is a contiguous stretch of forests, starting from **Upper Dihing Forests in the east (under Digboi division of the Tinsukia district)** upto the **Jeypore RF (under the Dibrugarh Division, Dibrugarh district)**.
- It comprises of Pristine forests along the Assam-Arunachal interstate boundary, classified as **Assam Valley Tropical Wet Evergreen Forests**.
 - Dehing-Patkai is sometimes also referred as '**Amazon of the East**'. It is the only rain forest in Assam and also spreads into Arunachal Pradesh.
 - Note: Dehing Patkai forms the largest stretch of the lowland forests in India.



- Being a **completely virgin forest**, the NP is **very rich in biodiversity**. Rare faunae include Chinese Pangolins, Flying Fox, Wild Pig, Sambar, Barking Deer, Gaur, Serow, and Malayan Giant squirrels.
- It is the **only sanctuary in India** which is home to **7 species of wild cats** - Tiger, Leopard, Clouded Leopard, Leopard Cat, Golden Cat, and Marbled Cat.
 - It is a part of Dehing Patkai Elephant reserve.

19. ARUNACHAL PRADESH NPS

1) NAMDAPHA NATIONAL PARK (TIGER RESERVE)

- About
 - It is a protected area in Changlang district of Arunachal Pradesh and is a **biodiversity hotspot** in eastern Himalayas.
 - It is crossed from east-to-west by the **Noa Dihing** river that originates in Chaukan pass, located on the Indo-Myanmar border.
- Fauna
 - **Namdapha Flying Squirrel** was first collected from the park and is described as **endemic** to the park. It is critically endangered and has been recorded only in a single valley within the park.
 - **Dhole, Red Panda, Red Fox** etc are other important mammals found here.
- Important Tribal Groups within the park include **Lisu, Chakma, Tangsa, and Singpho**.



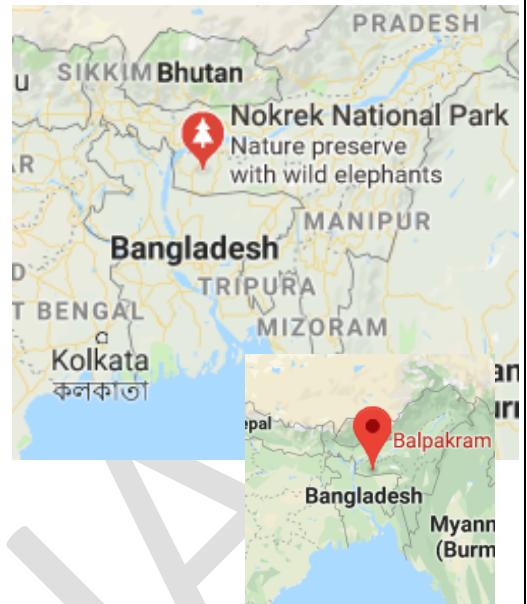
2) MOULING NP

- Spread primarily in upper Siang and East Siang districts
- The Mouling National Park and Dibang WLS are located fully or partly within **Dihang-Dibang Biosphere Reserve**.

20. MEGHALAYA

1) NOKREK NP, CHERRAPUNJI

- Nokrek National Park is the **core area of the Nokrek Biosphere Reserve** is located in West Garo Hills of Meghalaya, India.
- UNESCO added the NP to its list of BR in 2009.
- Along with Balphakram National Park it forms the hotspot of biodiversity in Meghalaya.
- **Important Fauna**
 - » Red Panda, Elephant etc.
- It is also an Important Bird Area.



2) BALPHAKRAM NATIONAL PARK

- It is NP near Garo Hills in Meghalaya. It is located at Extreme south of Garo Hills.
- **Fauna**
 - Red Panda, tiger, elephant etc.

21. MANIPUR NPS

1) KEIBUL LAMJAO NATIONAL PARK

- It is a NP in the Bishnupur district of the state of Manipur.
- Its area is 40 Km² and is perhaps the world's largest floating park.
- It is an integral component of the Loktak Lake. Loktak lake is also the largest freshwater lake of NE India.
- It has also been declared a **Ramsar wetland site.**
- **Important Fauna**
 - Brow Antlered Deer (flagship species), Hog Deer etc.



22. OTHER NPS OF NORTH EAST INDIA

Shiroi (Manipur), Murlen (Mizoram), Phawangpui (Blue Mountain) (Mizoram), Intanki (**Nagaland**), Clouded Leopard (Tripura), Bison (Tripura)

23. RAJASTHAN-NATIONAL PARKS

1) SARISKA NATIONAL PARK (TIGER RESERVE)

- **Location:** Sariska Tiger Reserve is located in the Aravalli Hills, 35 km from Alwar, 250 km SW of Delhi and 110 km NE of Jaipur. It lies in Alwar district of Rajasthan. It was declared as a Tiger reserve in 1978.
- It is a former hunting reserve of Maharaja of Alwar and is home to a variety of flora and fauna.
- The Park has population of tigers, leopards, Nilgai, Sambar, Chital etc.
- It is the **first globally successful reserve to relocate and rehabilitate the tigers.**
- **Other tourist attractions of the reserve**
 - The sanctuary is strewn with ruins of ancient temples dating back to the 10th and 11th centuries.
 - Some of the highlights are the ruins of the Kankwari Fort and the 10th century Neelkanth temples. The way to the temples is rough but the architecture and the Khajuraho-like carvings will simply leave the visitor in awe of the place.
 - Neelkanth Mahadeva, houses the ruins of over 300 Hindu and Jain temples constructed between the 8th and 12th Centuries.
 - Chand Baoli (step well) at Abhaneri is enormous with 3500 steep steps built by the Nikhumbha dynasty is one of the largest stepwells in the world.
 - Note: Alwar is a city dotted with heritage buildings, Forts, tombs and palaces. Some of the important sights not to be missed are Bala Qila, Vijai Mandir Lake Palaces, Fateh jung ki Gumbad, Moti Doongri etc.



2) KEOLADEO GHANA NATIONAL PARK (FORMERLY CALLED BHARATPUR BIRD SANCTUARY)

- Introduction

- » KNP is spread over an area of 28.73 sq km and lies at the confluence of the Gambhir and Banganga rivers in Bharatpur district.
- » This bird sanctuary hosts thousands of birds especially during winters.
- » It is also a World Heritage Site.
- » It is a man-made and man-managed wetland.
- » Along with Loktak lake, Manipur, KNP is placed on the Montreux Record under Ramsar Convention.



- Threats by Invasive Alien Species: Report published in Oct 2020

- » In a new study published in the journal Biodiversity and Conservation, researchers have categorized the site as facing 'high threat' from biological invasion.
- » As many as 14 invasive alien species thrive in the park.
 - 9 plant species
 - 2 fish species (Common Carp and African Cat fish)
 - 2 Mammals (Bovine (Bos Taurus) and Rhesus Monkey (Macaca mulatta))
 - 1 moth species (Parapoynx diminutalis)

3) RANTHAMBORE NATIONAL PARK (TIGER RESERVE), SWAI MADHOPUR

- **Introduction**

- Ranthambore NP has an area of 392 km². It was declared as NP in 1980. It is also a tiger reserve.
- In 1985, adjacent forests were declared the **Sawai Man Singh Sanctuary** and **Keladevi Sanctuary**.
- In 1991, tiger reserve was expanded to include Sawai Man Singh and Keladevi sanctuaries.



- **Fauna**

- Ranthambore is most well-known for its **Bengal tigers** and is one of the best places in India to see these animals in their natural habitat.
 - » **Overpopulation of Tigers** in Ranthambore has continuously led to conflicts between tigers.
- Other fauna includes Indian leopard, nilgai, wild boar, sambar, striped hyena, sloth bear, gray langur, rhesus macaque, mugger crocodile and chital.

- **Flora**

- The NP is famous for the **largest banyan tree in India**.

4) DESERT NATIONAL PARK (DNP)

- Situated in Western Rajasthan near **Jaisalmer**. It is the second largest national park of India having an area of 3162 km².
- Sand dunes form around 20% of the park. The major landforms consist of craggy rocks and compact Salt Lake bottoms, intermedial areas and fixed dunes.
- **Abundance of bird life**
 - The region is a haven for migratory and resident birds of the desert.
 - **Gadsisar Lake** is among the tourist places in Jaisalmer. Thousands of migratory birds come to this place every year.
 - Many eagles, harriers, falcons, and vultures are found here.
 - **The great Indian bustard** is also available in fair numbers.



5) DARRAH NATIONAL PARK (MUKUNDARA NATIONAL PARK)/ TIGER RESERVE

- **Mukundra Hills** National Park is also known as **Darrah WLS**. It is located near the Kota town of Rajasthan. It consists of large tracts of forests formerly part of the Maharaja of Kota's hunting grounds.
- The national park is a **combination of 3 WLS**.
 - Darrah WLS
 - Chambal WLS
 - Jaswant Sagar WLS
- In 2013, it became the **third Tiger Reserve** of the Rajasthan.
- After the death of few tigers in 2020, the NP is left with only 1 tiger.



24. GUJARAT NATIONAL PARK

1) BLACKBUCK NATIONAL PARK, VELAVADAR

- Blackbuck National Park, Velavadar, is situated in the Bhavnagar District of Gujarat state, India.



2) MARINE NATIONAL PARK

- It is situated on the southern shore of Gulf of Kutch in the Devbhumi Dwarka district of Gujarat.
- The national park has 42 islands on the Jamnagar coast. Most of these islands are surrounded by reefs. Out of which 33 islands have coral reef. Some of the best-known islands are **Pirotan, Karubhar, Narara, and Poshitra**.



3) GIR NATIONAL PARK

- Gir National Park and WLS located in the Saurashtra Peninsula of Gujarat, is the only natural habitat of world popular Asiatic Lions.
- **7 major perennial rivers** pass through Gir - Hiran, Saraswati, Datardi, Shingoda, Macchundri, Ghodavadi and Raval.
- **Kamleshwar Dam** is a large water body in the Gir Forest, which is good for marsh crocodile, reptiles and birds.



4) VANSDA (BANSDA) NATIONAL PARK

- It is a protected area located in Navsari district of the state of Gujarat.
- There has seen almost no felling of trees since 1952 which has ensured dense forest.
- It is nestled in Western Ghats.



25. MADHYA PRADESH NATIONAL PARKS

1) MADHAV NATIONAL PARK

- It is in the Shivpuri district of Gwalior in NW Madhya Pradesh, India. It is named after Madhav Rao Scindhia, the Maharaja of Gwalior.



2) KUNO NATIONAL PARK

- It was established in 1981 as a Wildlife Sanctuary also known as **Kuno-Palpur WLS**. In 2018, it was given the status of National Park.
- It is part of Kathiawar-Gir dry deciduous forests region.
- In **1990s**, it was being considered for the **Asiatic Lion Reintroduction Program**, which aimed at establishing second lion Population in India.
 - Place of African **Cheetah reintroduction in India**.



3) PANNA NATIONAL PARK (PANNA TIGER RESERVE)

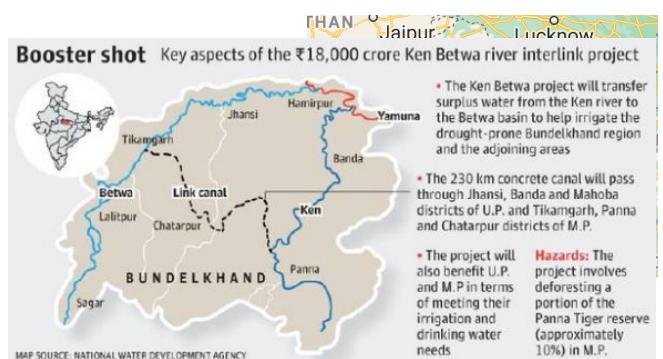
- **About Panna Tiger Reserve/National Park**
 - » It is a TR/NP located in the Panna and Chattarpur district of MP and has an area of 542 km².
 - » **Ken River** flows from South to North through the Panna tiger reserve.
- **Successful Tiger Relocation**
 - » **Background:** Panna tiger reserve was the second tiger reserve in India after Sariska to lose all its native tigers. Though tigers were repopulated in Sariska before Panna, but Panna presently had 3 times the tiger numbers.
 - » **Beginning of Relocation** of tigers started in 2009 when the **T1 tigress** was brought from the Bandhavgarh. Over the years group of 7 founder tigers have mated and produced more than 80 cubs making it a one of the major success stories.
- **River inter-linking and Impact on Panna**
 - » The plan of Gol, and state of MP and UP to interlink **Ken and Betwa** involves construction of 283m long Daudhan Dam. This is expected to inundate 400 hectares of Panna Tiger Reserve and environmentalists have raised concerns regarding this.



Location in Madhya Pradesh, India

4) VAN VIHAR NATIONAL PARK

- It is located in **Bhopal**, the capital city of Madhya Pradesh. It is very small around 4.45 km².
- It has a status of National Park, but it is managed as zoological park, following the guidelines of Central Zoo authority.
- Animals are kept in their natural habitats. Most animals are either orphaned or brought from other zoos. No animal is deliberately captured from the Wild.



5) SANJAY NATIONAL PARK (TIGER RESERVES)

- **About SNP**
 - Located in **Siddhi district** of Madhya Pradesh. The NP is part of Sanjay-Dubri tiger reserve.
- **Note:** Guru Ghasidas National Park is the part of Sanjay National Park which became part of Chhattisgarh on partition of MP. It was renamed to Guru Ghasidas National Park.



6) BANDHAVGARH NATIONAL PARK

- It is located in the Umaria district of MP.
- This park is known for its high tiger density (8 tigers / km²). It was declared a Tiger Reserve in 1993.



7) KANHA NATIONAL PARK (KANHA TIGER RESERVE)

- It is the largest NP of Madhya Pradesh and one of the important tiger reserves of India. Today it stretches over an area of 940 km² in two districts of Mandla and Balaghat.
 - Total Area: 1949 sq km.
 - Core Zone: 940 sq km
- It was declared a national park in 1955 by merging Hallon and Banjar WLS.
- **Important Fauna:** Tiger; Hard ground Barahsingha (*Cervus duvauceli branderi*); Gaurs
- **Major achievements**
 - Important national park for tiger tourism.
 - It is also the only natural habitat of highly endangered hard-ground Barasingha (*Cervus duvauceli branderi*)

8) SATPURA NATIONAL PARK (SATPURA TIGER RESERVE)

- Located in the Hoshangabad district of MP. Its name is derived from Satpura Ranges and its covers an area of 524 km².
- **Adjoining WLS**
 - **Bori WLS**
 - **Pachmarhi WLS**
- SNP also with Bori and Panchmarhi WLS provides an unique central highland ecosystem.
- **Biodiversity rich NP**
 - Leopard, Sambar, Chital, Nilgai, four horned antelope, black buck, mouse deer, Indian giant squirrel etc.
 - **Previous years** have seen rare sightings of tigers, dholes, Indian gaur, Barahsingha etc.



9) PENCH NATIONAL PARK

- It is in Seoni and Chhindwara districts of MP and includes Pench Tiger Reserve.
- It derives its name from **Pench river** that flows through the park from north to South dividing park into almost equal western and eastern halves.

10) OTHER NATIONAL PARKS OF MP

- Dinasour Fossils
- Fossil

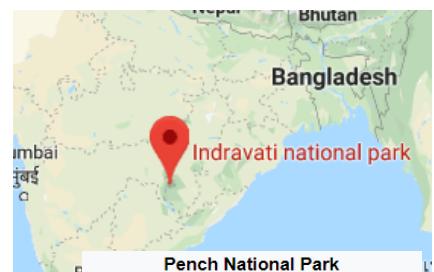
26. CHHATTISGARH NATIONAL PARKS

1) GURU GHASIDAS (SANJAY GANDHI) NATIONAL PARK

- This Park is the result of the carving of Chhattisgarh from Madhya Pradesh in the year of 2000. After Madhya Pradesh was divided in 2000, a large part of the then Sanjay National Park went to Chhattisgarh. Chhattisgarh government renamed this forest area, with an area of 1440.71 km² falling under its jurisdiction, as Guru Ghasidas National Park.
- **Tiger reserves in Chhattisgarh:** At present Chhattisgarh has three tiger reserves:
 - Achanakmar Tiger Reserve in Bilaspur
 - Udanti-Sitanadi Tiger Reserve in Gariaband
 - Indravati Tiger Reserve in Bijapur district
- State government is in the process of declaring Guru Ghasidas National Park into a tiger reserve.

2) INDRAVATI (KUTRU) NATIONAL PARK (TIGER RESERVE)

- » Indravati National Park is a national park situated in Bijapur district of Chhattisgarh state of India. It derives its name from the nearby Indravati River.
 - **Note1:** The Bijapur district is Maoist affected district.
 - **Note2:** The forests in the region are also affected by forest fires. Tribals set fire to forests as it makes it easier for them to collect mahua flowers during March-April.
- » **Fauna:** It is one of the last populations of **rare wild buffalo** (IUCN: EN)
- » **Flora:** Pre-dominance of sal, teak, bamboo, **Mahua** etc.



3) KANGER VALLEY NATIONAL PARK



Why in news?

Bird watchers recorded 200 bird species in Chhattisgarh's Kanger Valley National Park (Dec 2022)

Bird Species: Bird watchers, and forest department officials counted 200 types of birds in Chhattisgarh's first ever inter-state bird survey conducted in the National park from 25th - 27th Nov 2022.

- The survey unveiled that the valley can potentially host species found in the Himalayas, the Northeast, the Eastern and Western Himalayas.

About Bastar Hill Mynah: It is a subspecies of the common hill mynah which is protected under Schedule 1(b) of the WPA.

It is endemic to the Kanger valley National Park.

The jet black colored bird mimics the human voice exceptionally well. For this reason, it is often found in cages and sold as pets in the market.



It is a national park in the Bastar region of Chhattisgarh.

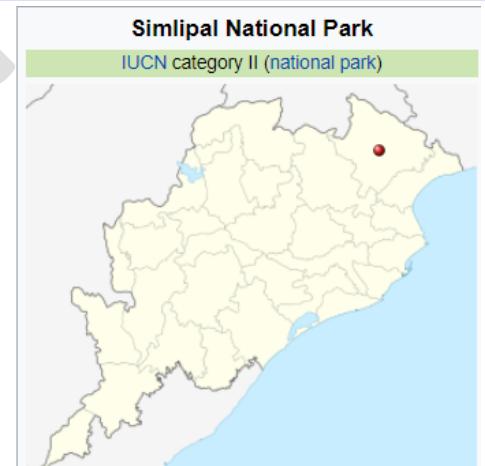
It is one of the densest national parks and is home to the **Bastar Hill Mynah**, the state bird of Chhattisgarh.

The park gets its name from **Kanger river** which flows along the length of the park

27. ODISHA NATIONAL PARKS

1) SIMLIPAL NATIONAL PARK (TIGER RESERVE)

- It is situated in Mayurbhanj district in the Indian state of Odisha. It is part of the Simlipal-Kuldiha-Hadgarh Elephant reserve popularly known as **Mayurbhanj Animal Reserve**, which includes three protected areas - Simlipal Tiger Reserve (2750 km²), Hadgarh Wildlife Sanctuary (191.06 km²) and Kuldiha Wildlife Sanctuary (272.75 km²).
 - Simlipal derives its name from** the abundance of Simul (red silk cotton trees) that bloom here.
 - It is **one of the largest** national parks in India.
 - It is also listed under **UNESCO World Network of Biosphere Reserve**.
 - Faunal Diversity:** Tigers, Elephants, Gaurs, Chousingha etc.
 - Issue of Non-declaration as full-fledged National Park**
 - Though the Simlipal has been accorded the status of National Park provisionally long back but is yet to be declared a full-fledged national.
 - Why not full fledged status?**
 - Families live close to the core area of the forest. Government haven't been able to shift them.



2) BHITARKANIKA NATIONAL PARK

- Introduction**

- It is a national park located in Kendrapara district of Odisha in eastern India.
- **Core area of 145 km²** of the Bhitarkanika WLS spread over 672 Km², has been designated as a National Park.
- **Gahirmatha beach Marine Sanctuary** lies to the east, and separates swamp region cover with canopy of mangroves from the Bay of Bengal.
 - The sanctuary is the second largest mangrove ecosystem in the country.
- It is also a Ramsar convention site.
- **Fauna**
 - **1671 estuarine crocodiles** (saltwater crocodile) were counted living along the Bhitarkanika water bodies.
 - **Other Fauna**
 - White Crocodile, Olive Ridley Sea Turtles, Indian python, King Cobra, black ibis, darters etc.
- **Flora**
 - Mangroves - Sundari, thespia,
 - Grasses like Indigo, Bush etc.
- **Rivers**
 - The NP and WLS is inundated by a number of rivers - **Brahmani, Baitrani, Dhamra, Pathsala** and others
- **3 Protected Areas**
 - The Bhitarkanika National Park
 - The Bhitarkanika WLS
 - The Gahirmatha Marine Sanctuary
 - **Recent Development:**
 - » The Orissa High Court constituted a three-member committee on February 26, 2021 which will submit a report on the conservation of sea turtles in Gahirmatha marine sanctuary. This action followed media reports saying 800 Olive Ridley turtles have died since Jan 2021 due to negligence of state's forest and fisheries department.



28. MAHARASHTRA NATIONAL PARKS

1) GUGAMAL NATIONAL PARK

- Located in Amravati District of Maharashtra, it is part of Melghat Tiger Reserve.



2) PENCH NATIONAL PARK AND TIGER RESERVE

- Pench Tiger reserve is one of the premiere tiger reserves of India and the first one to straddle across two states - Madhya Pradesh and Maharashtra.

- The tiger reserve consist of **Indira Priyadarshini Pench National Park**, the **Pench Mowgli Sanctuary** and a buffer.
 - It is the same forest area portrayed in the famous 'Jungle Book' by Rudyard Kipling.
- The tiger reserve derives its name from the **Pench river** which is its lifeline.

3) NAVEGAON NATIONAL PARK

- It is a national park located in **Gondia district** of Maharashtra.
- It's role as **Bird Sanctuary** is very significant. It is home to **almost 60% bird species** found in whole of Maharashtra.
 - The beautiful **Navegaon lake** is known for its pollution free water and attraction of birds.
 - The area around the lake is known as **Dr. Salim Ali Bird Sanctuary.**



4) TADOOA NATIONAL PARK (TADOOA ANDHARI TIGER RESERVE)

- **Details**
 - It is Maharashtra's **oldest and largest National Park**. It is also one of the 54 tiger reserves in India. It is located in Chandrapur district of Maharashtra.
- The total area of the tiger reserve is 1,727 km², which includes the Tadoba National Park, created in 1955.
 - The Andhari WLS was formed in 1986 and was amalgamated with the park in 1995 to establish the present **Tadoba Andheri Tiger reserve**. This is **most famous of MHA's six tiger reserves**.
- **Fauna**
 - **Keystone Species:** The Bengal tiger
 - Other Mammals: Indian leopards, sloth bears, gaur, nilgai , dhole, striped hyena, small Indian civet, jungle cats.
- **Vegetation of the park**
 - Southern tropical dry deciduous
 - Teak is the most common tree.
- **Two lakes and 1 river in the park**
 - Tadoba lake and Kolsa lake.
 - Tadoba river (also Andhari river (a minor river in Wainganga basin)) flows through the Andheri WLS)



5) SANJAY GANDHI NATIONAL PARK (SGNP) (BORIVALLI)

- It is located in Mumbai, Maharashtra. It is a rare example of a national park situated within a metropolitan and is also one of the most visited parks in the world.
- This is famous for the site of Ancient Kanheri caves.

6) CHANDOLI NATIONAL PARK

- It is a national park spread over Satara, Kolhapur, and Sangli district of Maharashtra. It was established in 2004.
- It is the southern portion of the **Sahyadri Tiger Reserve**.
- It is located near Chandoli dam. It lies between **Koyna WLS** and **Radhangiri WLS**.
 - Sahyadri Tiger Reserve**
 - It was created in 2007, by including all of **Chandoli Tiger Reserve** and **Koyna WLS**.
 - Chandoli Tiger Reserve** forms the southern portion of the reserve.
 - The tiger reserve is known for its population of Tigers and Leopards.



29. TELANGANA NATIONAL PARKS

1) KASU BRAHMANANDA REDDY NATIONAL PARK

- It is located in the Jubilee Hills and Banjara Hills of Hyderabad. It's a small park with a total area of 1.6 km^2 .
- The Park also houses the **famous Chiran palace**.
 - It was built in 1960. The entire palace complex is spread over an area of about 400 acres and was given to Prince Mukarram Jahan on his coronation by his Father Prince (Azam Jahan) in 1967.



2) MAHAVIR HARINA VANASTHALI NATIONAL PARK

- It is a deer national park located in Vanasthalipuram, Saheb Nagar, Hyderabad, Telangana.
- It is the largest green lung space in the city of Hyderabad.



3) MRUGVANI NATIONAL PARK

- Details:**
 - It is a small national park located in Hyderabad. Its total area is 3.6 sq km.



30. ANDHRA PRADESH NATIONAL PARKS

1) PAPIKONDA NATIONAL PARK

- The WLS was upgraded to the National Park Status in 2008.
- The river **Godavari** flows through the park.
- Important Fauna** include Tigers, Leopards, Sloth bear, small Indian Civet, nilgai, four-horned antelope etc.
- It is located in Papi Hills in the East Godavari and the West Godavari districts.
- It is also an important bird area.



2) RAJEEV GANDHI (RAMESHWARAM) NATIONAL PARK

- It is located in Rameswaram of **Kadappa district** of Andhra Pradesh, India. It is a small national park of 2.4 sq km and lies on the bank of Penna River.
- **Note:**
 - Few other national parks in the country have been named after Rajeev Gandhi
 - Mukundara Hills National Park in Rajasthan, Nagarhole National Park in Karnataka etc.



3) SRI VENKATESWARA NATIONAL PARK (PART OF SESACHALLAM BIOSPHERE RESERVE)

- Located in eastern ghats and spread over Seshachallam Hills of Chittoor district.
- It receives most of its rainfall from north-eastern monsoon.
- **Vegetation:** Dry Deciduous mixed forests with patches of moist deciduous forests.



31. GOA – NATIONAL PARK

1) MOLLEM NATIONAL PARK AND BHAGWAN MAHAVEER WLS

- Located in Western Ghats, Goa, along the eastern border with Karnataka.
- It contains several important temples dating to the Kadambas of Goa, and home to waterfalls, such as **Dudhsagar Falls** and **Tambdi Falls**.
- The park is also home to **nomadic buffalo herders** known as **Dhangar**.

32. KARNATAKA – NATIONAL PARK

1) KALI TIGER RESERVE (ANSHI NATIONAL PARK)

- It is a tiger reserve situated in Uttar Kannada district of Karnataka.
- The park is habitat of Bengal Tiger, Black Panther and Indian Elephants.
- The **Kali river** flows through the Tiger reserve and is the lifeline of the ecosystem and hence the name. The tiger reserve is spread over an area of 13,00 sq km.



2) KUDREMUKH NATIONAL PARK

- Dakshin Kannada district of Karnataka.
- Located in Western Ghats.
- NP divided into four ranges
 - Kudremukh, Kerekatte, Kalasa, Shimoga.
- **Flora**
 - Plantation of eucalyptus, casuarinas etc.
- **Fauna**
 - Tiger, leopard, wild dog, Malabar giant squirrel, common langur, sloth bear, gaur, Porcupine sambar, barking deer etc.
 - **Birds' species**
 - » Malabar Trogon, Malabar Whistling thrush, great pied hornbill, and the imperial pigeon
- **Other attraction**
 - Kadambi waterfall



3) BANNERGHATTA NATIONAL PARK

- Near Bangalore, Karnataka
In 2002, a portion of the park was made a **biological reserve**. It is a popular tourist destination with zoo, a pet corner, an animal rescue center, a butterfly enclosure, an aquarium etc

4) BANDIPUR NATIONAL PARK

- **About Bandipur Tiger Reserve**
 - Bandipur was established in 1974 as a tiger reserve under Project Tiger, is a national park located in Chamarajanagar and Mysore district of south Indian state of Karnataka. Bandipur is known for its wildlife and had many types of biomes, but dry deciduous forest is dominant.
 - It is about 80 km² from the city of Mysore on the route to a major tourist destination of Ooty. As a result, Bandipur sees a lot of **tourist traffic** and there are a lot of **wildlife fatalities** caused by speeding vehicles that are reported each year. There is a ban on traffic from the hours of dusk to dawn to help bring down deaths of wildlife.
- The national park spans an area of 874 sq km and protects several species of India's endangered species.
 - Together with adjoining Nagarhole National Park (KAR) (643 sq km), Mudumalai National Park (320 sq km), Wayanad WLS (344 sq km), it is part of Nilgiri Biosphere Reserve.
- **Dominant Flora:** Teak, Rosewood, Sandalwood etc.
- **Dominant Fauna:** Tiger, Elephant, Gaur, Sambhar, Chital, Deer, Antelope, Wild Boars etc.



5) NAGARHOLE NATIONAL PARK (TIGER RESERVE) (ALSO KNOWN AS RAJIV GANDHI NATIONAL PARK)

- Located in Kodagu and Mysore district of Karnataka. It is located on the north-west of Bandipur National Park.
- It is also part of Nilgiri Biosphere Reserve.
- It is also recognized as **Important Bird Area (IBA)**
- **Important Biodiversity:** **Tigers**, Gaur, Elephants, Indian Leopard etc.
- **Tribes Commonly found in the forest**
 - **Jenu Kurubas** - primary inhabitants - slowly disappearing



33. KERALA – NATIONAL PARKS

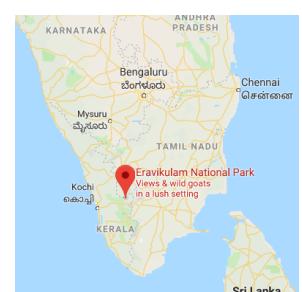
1) SILENT VALLEY NATIONAL PARK

- **Introduction**
 - It is the core of Nilgiri International Biosphere reserve and is part of Nilgiri Sub-Cluster (6000 km²), Western Ghat World Heritage Site recognized by UNESCO in 2007.
 - It consists of undisturbed tracts of Southwestern Ghats Mountain rain forests and tropical moist evergreen forests of India.
- **Location:** Nilgiri Hills, within the **Palakkad district of Kerala**, South India.
- **Important Water Bodies**
 - River **Kunthi** (Kunthipuzha) descends from the Nilgiri Hills above an altitude of 2000 m and traverses the entire length of the valley finally rushing down to the plains through a deep gorge.
 - It is a tributary of Thuthapuzha which in turn is tributary of Bharathapuzha river (second largest river of Kerala after Periyar River)
- **Important Animal Species**
 - Lion Tailed Macaque, Nilgiri Langur, Malabar Giant Squirrel, Nilgiri Tahr etc.
 - Silent valley Bush frog (Raorchestes silent valley), first described in 2016, is named after the park.



2) ERAVIKULAM NATIONAL PARK

- It is a 97 km² national park located along Western Ghats in the Idukki district of Kerala.
- It was the first National Park in Kerala (Now Kerala has 6 National Parks)
- It is a **UNESCO World Heritage Site**.
- It is the national park with **highest numbers of endangered Nilgiri Tahr**.
- **Other important species** found in Eravikulam National Park includes **Tiger, lion tailed macaque, gaur, leopard, Dhole** etc.
 - **Elephants** also make seasonal visit.



3) PAMPADUN SHOLA NATIONAL PARK

- Located in **Idukki** District, it is the **smallest National Park** of Kerala.
- The Park protects a moderate amount of montane evergreen forest that is associated with the wildlife rich Eravikulam National Park.
- **The keystone species** here are highly elusive and endangered, endemic small carnivore - the Nilgiri Marten, Leopards, and Indian Wild Dogs.



4) MATHIKETTAM SHOLA NATIONAL PARK

It is a small NP in Idukki district of Kerala state, South India.

5) ANAMUDI SHOLA NATIONAL PARK

It is a small NP in the Idukki District of Kerala.

It consists of Mannavan Shola, Idivara Shola, and Pullardi Shola, covering a total area of 7.5 km².

6) PERIYAR NATIONAL PARK AND WLS

- Also, an **Elephant Reserve and Tiger Reserve**
- Protected area in districts of Idukki and Pathanamthitta in Kerala, India.
- Area of **925 Km²**, Core area of 305 Km² was declared as the Periyar National Park in 1982.
- The park forms the **major watershed of two important rivers**, the **Periyar and the Pamba**.
- It is often called the **Periyar Wildlife Sanctuary or Thekkady**. It is located in the Cardamom hills and Pandalam hills or the South Western Ghats along the border of Tamil Nadu.

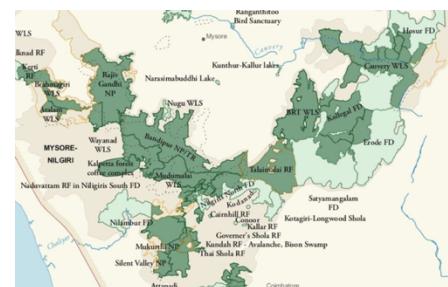
34. TAMIL NADU – NATIONAL PARKS

1) GUINDY NATIONAL PARK

- A very small national park (2.70 km²), located in **Chennai**.
- The park is an extension of the grounds surrounding Raj Bhavan, formerly known as the '**Guindy Lodge**' - the official residence of the Governor of TN.

2) MUDUMALAI NATIONAL PARK, WLS AND TIGER RESERVE

- It lies on the north-western side of the Nilgiri hills, **Nilgiri** district. It is located northwest of Coimbatore city in **TN**. It shares its boundaries with state of Karnataka (Bandipur) and Kerala (Wayanad WLS).
- It is part of the **Nilgiris Biosphere Reserve**
- The **Mysore Ooty Highway** runs through the park.
- **Moyer river** separates **Bandipur and Madumalai**. This river flows along the border of Kerala and TN.



- It is part of Nilgiri Biosphere reserves.

3) MUKURTHI NATIONAL PARK (EARLIER KNOWN AS NILGIRI TAHR NATIONAL PARK)

- It is a NP located in the western corner of the Nilgiri Plateau and north-western corner of TN.
- The Park was created to protect **its key stone species Nilgiri Tahr**.
 - Other important fauna of the park includes Tiger, Elephant etc.
 - Other threatened species of the park is Nilgiri Tahr, Nilgiri Marten, Nilgiri Langur etc.
- The park is characterized by **montane grasslands** and **shrublands** interspersed with Sholas in a high altitude area of high rainfall, near freezing temperature and high winds.
- Park is part of Nilgiri Biosphere Reserve and as part of **Western Ghats** it is also a UNESCO World Heritage site.
- **Culture**
 - **Toda tribe** of the region have harvested firewood from Shola and graze their hill buffaloes in the hill for centuries.



4) ANAMALAI TIGER RESERVE/ INDIRA GANDHI WLS AND NP

- Anamalai Tiger reserve, earlier known as Indira Gandhi WLS & NP is a protected area located in the Anaimalai hills of **Coimbatore district and Tiruppur district of Tamil Nadu**.
- **Important Mammals**
 - Bengal tiger, Indian Elephant, and Indian Leopard, Nilgiri Tahr and lion tailed macaque



5) GULF OF MANNAR NATIONAL PARK

- It is a NP which consists of 21 small islands and adjacent coral reefs in the Gulf of Mannar in the Indian Ocean.
- It is also the **core area of Gulf of Mannar BR** which also includes a 10 km buffer zone around the park, including the populated coastal area.

35. ANDAMAN AND NICOBAR ISLANDS

1) BASICS: UNDERSTANDING THE DISTRIBUTION OF ISLANDS IN A&N

- The **mains Islands** that come under the Andaman & Nicobar Islands are:
 - » **North Andaman, Middle Andaman, South Andaman, Little Andaman, Car Nicobar, Little Nicobar, and Great Nicobar.**
 - They are protruded parts of the oceanic fold mountains formed during tertiary epoch. Here are more than 350 islands of which only 38 are inhabited.
 - **Port Blair** - the capital of A&N Islands is situated in South Andaman.
 - **The Indira Point**, the southernmost point of India is the southern point of Great Nicobar Island.
 - **The Barren Island** which is India's only active volcano is situated in the east of Middle Island.
 - **Narcondam Island** (situated in north eastern part of North Andaman) is a volcanic island.
 - **10 degree channel** (10 degree N Latitude) separates Andaman and Nicobar Islands.
 - **Duncan Pass** is between South Andaman and Little Andaman.
 - **Coco Strait** - is between Coco Islands (Myanmar) and North Andaman.
 - **Saddle Peak** is the highest peak of A&N Islands (North Andaman, 738 m). It is followed by **Mt. Thullier** (Great Nicobar, 642 m)



2) MAHATMA GANDHI MARINE NATIONAL PARK

- It is national park on Andaman Island. It belongs to southern Andaman administrative district.
- **Two major island groups in the park:** Labyrinth Island and the Twin Island.

3) MOUNT HARRIET NATIONAL PARK

- **A national park in A&N islands**
 - **Mount Harriet** (383 m / 1,257 ft) is part of the park and is the third highest peak in the A&N archipelago next to saddle peak (in North Andaman - 732 m) and Mount Thullier (568 m in Great Nicobar).
 - **Important Faunal Species** are **Andaman Wild Pigs, Shrews** (Andaman and Jenkins), Saltwater Crocodile, turtles etc.
 - The park is also a butterfly hotspot.

4) OTHER IMPORTANT NATIONAL PARKS OF A&N ISLANDS

- Campbell Bay National Park
- Galathea Bay National Park
- Rani Jhansi National Park
- Saddle Peak National Park

36. WILDLIFE SANCTUARY

- The Wildlife (Protection) Act of 1972 provided for the declaration of certain areas by the state government as wildlife sanctuaries if the area was thought to be of adequate ecological, geomorphological and natural significance.
 - There are more than 500 WLS in India. Out of these Tiger reserves are governed by Project Tiger.
- In some cases central government can also declare an area to be WLS.
- **Human activities**
 - Some restricted human activities are allowed in WLS as specified in the Wildlife (Protection) Act of 1972.

1) CHANGTHANG WLS

The Changthang WLS (or the Changthang Cold desert WLS) is a high altitude WLS located in the Ladakhi adjunct of the Changthang plateau in the Leh district of the Union territory of Ladakh.

It is one of the few places in India with a population of Kiang or Tibetan Wild Ass, as well as the rare, Black-necked crane.

India's **first night sky reserve** is being developed here.



2) MAHARANA PRATAP SAGAR SANCTUARY

Introduction

- It is a lake sanctuary in the Kangra district of HP, spread over across 450 sq km.
- The sanctuary is locally known as Pong dam Lake and is located about 60 km southwest of Dharmshala.
- It is one of the **80** International Wetland sites declared in India by the **Ramsar Convention**.
- The reservoir is also leading source of fish in Himalayan states.
- **Birds**
 - The Lake is popular for the birds like Surkhabs, red necked grebes, terns etc.
 - Thousands of migratory ducks from Siberia come here every year.
- **Animal**
 - Barking deer, Sambar, wild boars, leopards and oriental small clawed otters.



3) NANDHAUR WLS

- About the WLS

- The sanctuary is located **near the Nandhaur river in Kumaon, UK** and spread over an area of **269.5 sq km**. It was created in 2012. The sanctuary is part of Terai Arc Landscape (TAL), a forest zone that stretches from Uttarakhand in India and extends in Nepal.
- **Flora**
 - » Primarily a **Sal** forest. Contain other 100 species of trees, over 30 species of shrubs etc. **Shisham, Bamboo, Teak and Chir pine** are important trees.
- **Fauna**
 - » Tiger, leopards, elephants, sloth bears etc.
- **Tiger Population in Nandhaur** is increasing and so is the demand for declaring Nandhaur as a **Tiger reserve**



4) TAL CHAPPAR SANCTUARY

Location: Churu district of Northwestern Rajasthan in the Shekhawat Region.

Important Features:

- Known for **Blackbucks** and is also home to variety of birds.
- It has almost flat tract and interpersed shallow low-lying areas. It has open grassland with scattered Aracia and Proposis which gives it appearance of a typical Sawana.
- **Tal:** The rain water flows through shallow low lying areas and collect in small seasonal water ponds.
- **Fauna:** It is famous for **blackbucks** and is home to a variety of birds.



Location in Rajasthan, India

Updates (Dec 2022): The Sanctuary got protection from plan to reduce its size.

- The Rajasthan government had planned to reduce the size of ESZ around it.
- But, **the Rajasthan High Court**, has intervened through a suo motu PIL to protect the sanctuary. It took into cognizance of reports that its area was going to be reduced to three sq km under pressure from mine owners and stone crusher operator. The court ordered a "complete prohibition" on any action to reduce the WLS area.

5) MAHANANDA WLS

- It is situated in the foothills of Himalayas between the **Tista and Mahananda River**, in the **Darjeeling district** of WB.

6) POBITARO WLS

- **Introduction :**
 - It is located in Morigaon district of Assam, 30 km east of Guwahati.
 - It is known for dense population of the Great-Indian one-horned Rhino and is also called **Mini-Kaziranga**.
 - » 102 rhinos in 16 km². Pobitora has the world's densest population of one horned Rhino. The WLS has exceeded its Rhino bearing capacity.
 - » **Rhino Breeding program** is running successfully within the sanctuary under the Indian Rhino Vision 2020.
 - It covers flat flood plains and a hillock (Raja Mayong).
- **Boundaries**
 - Its boundary is made by GrangaBeel on South and the river Brahmaputra on North.
- **Biodiversity**
 - One-horned Rhino, leopard, wild boar, Barking deer, wild buffaloes etc.
 - Home to 200 migratory birds and various reptiles.
 - It is also an Important Bird Area.



7) TALLEY VALLEY WLS

- Talley valley WLS is located in Arunachal Pradesh. It is also a biodiversity hotspot.
- Talley is a plateau with a height of 24,00 meters. It is covered with dense forest of silver fir, pine etc.
- Rivers like Pange, Sipu, Karing, and Subansiri flows through the reserved forest and WLS.



8) PAKKE TIGER RESERVE (PAKHUI TIGER RESERVE/WLS)

Pakke tiger reserve/ Pakhui Tiger reserve is located in Pakke Kasang district of Arunachal Pradesh.

It had won the India Biodiversity Award 2016 in the category of 'Conservation of threatened species' for its **Hornbill Nest Adoption Programme**.

Rivers: It is bound by Kameng river in the west and Pakke river in the east.



Adjoining Protected Areas: The sanctuary adjoins Nameri National Park of Assam in the South. West of Kameng river lies Sessa Orchid Sanctuary and Eaglenest WLS.

- **Pakke Paga Hornfill Festival (PPHF)**

- 9th edition of the PPHF was held in Jan 2024 in the town of Seijosa in Arunachal Pradesh's Pakke Kessang district. It gave a call for protection and conservation of hornbills.
 - » Theme for 2024: 'Domutoh Domutoh, Paga hum Domutoh', translates to 'Let Our Hornbills Remain' in Nyishi, emphasizing the critical need to preserve the iconic birds.
 - » Note: Seijosa is located near the Pakke tiger reserve, which is home to four species of hornbills - Wreathed, Great Indian, Oriental Pied, and Rufous Necked.
 - The area is traditionally homeland to the **Nyishi people**, the largest tribal group of Arunachal Pradesh.
 - The first ever PPHF was held on Jan 16-18, 2015 with the aim to recognize the role played by the Nyishi in conserving the hornbills. The aim was to recognize the role played by the Nyishi in conserving hornbill in PTR.
 - » Note: The Nyishi had formerly hunted hornbills and used their bills to craft traditional headgear. They had later turned into hornbill conservationists.
 - PPHF was declared a state festival by the then-Arunachal Pradesh CM Prem Khandu in 2019

9) DAMPA TIGER RESERVES

- It is the largest WLS in Mizoram and was notified in 1985. It was declared a tiger reserve in 1994.
- **Location**
 - It is situated in the western part of Mizoram state, at the international border with Bangladesh.
- **Important Fauna**
 - It is natural home of leopards, Indian Bison, barking deer, sloth bear, gibbons, langur, slow lorises, etc.



10) NATIONAL CHAMBAL SANCTUARY (OR THE NATIONAL CHAMBAL GHARIAL WLS)

- **About National Chambal Sanctuary**

- It is a tri-state protected area in northern India for the protection of the Gharial (CR), the Red Crowned Roof Turtle (CR) and Ganges River Dolphin (EN).

- It is located on Chambal river on the tripoint of Rajasthan, Madhya Pradesh and Uttar Pradesh.
- It has sanctuary status under the WPA, 1972.
- All three states have separately notified this for territories in their states.
- **Declaration of area around the Chambal Sanctuary as Eco-sensitive zone (March 2020)**
 - Central government has notified an area to an extent of zero to two kms around the sanctuary as Eco-Sensitive Zone.

11) HAZARIBAGH WLS

- In Jharkhand
- **Biodiversity**
 - The sanctuary and its fringe forests have more than 400 deer, mainly the large sambar and the Sprightly and spotted Chital species that are protected under Wild Life Law.
 - The sanctuary is also home to Hyenas, sloth bears, black bears, Nilgai, several types of monkeys, snakes and 180 species of birds.

12) SATKOSIA TIGER RESERVE

- **About Satkosia Tiger Reserve**
 - It is a tiger reserve located in the Angul district of Orissa, India covering an area of 988 km².
 - Satkosia Gorge WLS was created in 1976 with an area of 796 km².
 - Satkosia Tiger Reserve was designated in 2007, and comprise the Satkosia WLS and the adjacent Baisipalli Wildlife Sanctuary.
- **River**
 - It's located where the Mahanadi River passes through a 22 km long gorge in the Eastern Ghats mountains.
- **Forest type**
 - Eastern Highlands moist deciduous forests ecoregion. The major plant community includes mixed deciduous forests including Sal and Riverine Forest.



13) NALABANDA BIRD SANCTUARY

- **About Nalabanda Bird Sanctuary**
 - The Nalabanda island is part of the Chilika Lake, India's largest brackish water lagoon. The island gets partially submerged during Monsoon. As the monsoon recedes in winter, water levels decrease, and the island is gradually exposed.
 - Birds flock to the island in large numbers to feed on its extensive mudflats. It is the largest wintering ground for migratory waterfowl found anywhere on the Indian sub-continent.
 - Some rare and endangered species listed in the IUCN Red List inhabit the lagoon for at least part of their life cycle.



- It was declared a bird sanctuary in 1973 under the **Wildlife Protection Act**.
- It is also core of the **Ramasar** designated wetlands of Chilika lake.
- **About Chilika Lake:**
 - » It is the largest brackish water lake and largest wintering ground for birds in India.
 - » As per the **bird status survey-2022** conducted in the Chilika, a total of 10,74,173 birds of the 107 water bird species and 37,953 individuals of 76 wetland dependent species were counted in the entire lagoon.
 - » **Last year**, the count in Chilika was over 12 lakhs.
 - » **Who conducted the census:** Chilika Development Authority and BNHS.
 - » Chilika lake is the largest wintering ground in Indian subcontinent.



14) THANE CREEK FLAMINGO SANCTUARY

- In 2015, Thane Creek was declared as Flamingo Sanctuary by the Maharashtra government under Section 18 of the WPA 1972.
 - It was Maharashtra's second marine sanctuary after Malvan Sanctuary (Sindhudurg district).
 - By November, about 30,000 birds come to this sanctuary, 90% are lesser flamingos. They stay here till May, then migrate to Kutch in Gujarat.
 - **Other bird species**
 - » About 200, including the globally threatened species like the Greater Spotted Eagle (VU)

15) MHADEI WLS

- **Why in news?**
 - The Goa bench of Bombay High Court has directed Goa government to notify the Mhadei WLS and other areas, referred to in National Tiger Conservation Authority communications and plans prepared by the Goa forest department, as a tiger reserve under the WPA within three months (July 2023: Source - IE)
 - It also said that the state government should take all the steps to prepare a tiger conservation plan and forward it to the NTCA within three months of notifying the reserve.

About Mhadei WLS:

It is a protected area in the Indian state of Goa in Western Ghats. It is located in North Goa district.

The sanctuary is an area of high biodiversity, and is being considered to become a Project Tiger's tiger reserve because of the presence of Bengal Tiger.

The NTCA has suggested on multiple occasions that a tiger reserve be carved out from the uninhabited core zone of Goa's protected area and has requested the state to speed up the process of notifying the Mhadei sanctuary and certain contiguous areas as a tiger reserve.



16) BHADRA WLS (TIGER RESERVE)

- It is a protected area and a tiger reserve as part of Project Tiger. It is located in Chikkamangaluru town in Kar.

17) BUKKAPATNA CHINKARA WLS

- Bukkapatna Chinkara WLS was notified recently in 2019 only. The proposal was approved by the State Board of Wildlife.
- **More Details**
 - Bukkapatna happens to be only the second protected habitat for the rare antelope in the state after Yedehalli in Bagalkot district.
 - Bukkapatna is larger than Yedehalli and it will also be the southernmost tip of the distribution range of Chinkara in India.

18) DANDELI WLS

- It is in Uttara kannada district of Karnataka and covers an area of 866.14 Km².

19) RANGANATHITTU BIRD SANCTUARY (PAKSHI KASHI OF KARNATAKA)

- **About Ranganathittu Bird Sanctuary**
 - Ranganathittu Bird Sanctuary, also known as **Pakshi Kashi of Karnataka**, is a bird sanctuary located in Mandy district of Karnataka. It is located only 3 km away from the historic town of Srirangapatna.
- **Geography**
 - It is the largest bird sanctuary in the state (about 40 acres in area) and comprises of six islets on the banks of Kaveri river.
- **Bird Species**
 - The park is known for roughly 170 bird species including painted stork, Asian openbill stork, common spoonbill, Woolly necked stork, black headed ibis, lesser whistling duck etc.

20) THATTEKAD BIRD WLS

- **About Thattekad WLS**
 - The Thattekad bird Sanctuary, with an area of 25 km² is a small bird sanctuary, located in Kothamangalam, Kerala.
 - It was the first bird sanctuary of Kerala and has been described by Salim Ali (one of the best known ornithologist of India) as the richest bird habitat on peninsular India.
 - It is an evergreen low-land forest located between the branches of Periyar River, the longest river in Kerala.

Key Species

- The bird sanctuary is known for Sri Lankan Frogmouth and other bird endemic to the region. There are 330 bird species in the region, 300 of them endemic to the area.
- The important bird species include Orange headed thrush, large billed leaf barber, Jerdon's nightjar, Oriental Darter, Yellow browed bulbuls etc.

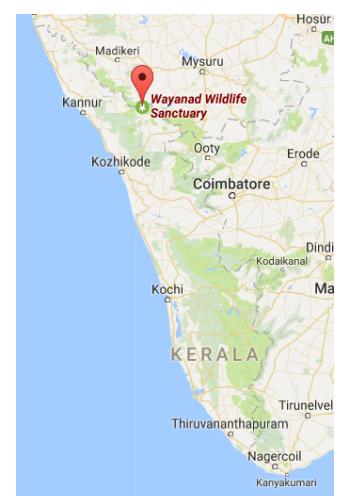
21) CAUVERY WLS

- **Location**
 - The Cauvery WLS is a protected area located in the Mandya, Chamaraja and Ramanagaram districts of Karnataka, India.
- **Physical features**
 - **Largest Protected area in Karnataka**. The sanctuary, is spread over more than 1000 km². It's northern and southern boundary limited by Cauvery river, which drains from west to east.
 - It's eastern and north eastern borders are bounded by the TN state.
 - Cauvery river flows through it for a distance of 101 kilo meters
- **Biodiversity**
 - **Flora**
 - » The dominant species of trees found in the sanctuary are Terminalia arjuna and jambul.
 - **Fauna**
 - » Elephants, wild boar, leopard, dhole, spotted deer, barking deer, sambar, four horned antelope, black naped hare, Malabar giant squirrel, Grizzled giant squirrel which is under the highly endangered category in the state, smooth coated otter.
 - » **Reptiles**
 - Mugger crocodile, Indian mud turtle, Indian Rock Python, Cobra, Russel's viper etc.
 - **Birds**
 - » The sanctuary is listed as an Important Bird Area by Birdlife International.
 - » CR species of White rumped vulture and Indian vulture are found here.



22) WAYANAD WLS

- **Intro:**
 - It is an animal sanctuary in Wayanad Kerala, India.
 - It is an extent of 344.44 km² with four ranges namely Sulthan Bathery, Muthunga, Kurichiat and Tholpetty.
 - Second largest WLS in Kerala.
 - It is now an integral part of Nilgiri BR.
 - It is bounded by protected area network of Nagarhole and Bandipur in Karnataka in the north-east, and on the **South-east** by the Madumalai of Tamil Nadu.
 - **Note:** The sanctuary is separated into two disconnected parts known as the **North Wayanad WLS** and **South Wayanad WLS**. The area in between the two parts was originally a forest region, is now occupied majorly by plantation.



- **Wayanad WLS becomes a migratory destination** for animals from other NP and WLS in the region due to availability of water & fodder in the sanctuary.
 - Mammals such as gaurs migrate to sanctuary from the adjacent Bandipur and Nagarhole national parks in Karnataka and the Mudumalai NP in TN.
- **Proposal of Wayanad WLS as Tiger Reserve:**
 - The attempt of the Kerala forest department to push forward a proposal for notifying the sanctuary as the third tiger reserve in the state was **rejected by the State Wildlife Advisory Board** on account of the public resistance against the proposal.
 - **Arguments supporting the Tiger Reserve Status:**
 - » Highest number of tigers in the state
 - » Tiger reserve status will ensure better financial aid from the Centre and the NTCA which will also lead to better conservation and management of the tiger population and help generate more employment opportunities.
 - **Why the board rejected the demand?**
 - » **Public Protests:** Cattle lifting by the ailing tigers and their straying into human habitats had often triggered widespread public protests in the district.
 - » **Restriction on development activities** which will be brought by the notification have also become an issue.

23) IDUKKI WILD LIFE SANCTUARY

This sanctuary extends over the Thodupuzha and Udumpanchola taluks of Idukki district spreading over 105 Sq. Km. at 450 - 748m above sea level.



- The Idukki reservoir formed by three dams-Cheruthoni, Idukki and Kulamavu-extends to 33 sq km.
- **Common Animals**
 - Elephants, Porcupine, Sambar Deer, Wild Dogs, Jungle Cats, Malabar Giant Squirrel, Wild boar etc.
- **Common Birds**
 - Jungle fowl, Myna, Laughing thrush, Black bulbul, Peafowl, Woodpecker, Kingfisher etc.

24) CHINNAR WILDLIFE SANCTUARY

- **Location:** It is located 18 km north of Marayoor on SH 17, in the Idukki district of Kerala.
- It is under the jurisdiction of and contiguous with Eravikulam National Park to the South.
- Indira Gandhi Wildlife Sanctuary is to the north and Kodaikanal Wildlife Sanctuary is to the east.
- **Roads crossing:** The Munnar - Udumalpet road SH 17 passes through the sanctuary for 16 km and divides it into nearly equal parts.
- **Rivers:** Chinnar and Pambar rivers are the major perennial water resource in the sanctuary.
- **Settlements and crops:**

- 11 tribal settlements inside the Chinnar WLS, each is well demarcated by temporary stone walls
- The main inhabitants are Muthuvas and Pulayars.
- Cultivation of Maize, ragi and lemongrass is carried out
- Madhuvas carry out small scale ganza cultivation for their religious purposes.

25) SATHYAMANGALAM WLS (SATHYAMANGALAM TIGER RESERVE (STR))

- The core or critical tiger habitat in STR is 793.49 sq. km while the buffer or peripheral area is 614.91 sq km. It has a significant population of tiger, elephant, leopards, black buck, gaur, four horned antelope striped hyena, birds, reptiles, amphibians etc.
- It is the largest protected area of TN. It is in the eastern ghats in the Erode district of TN.
 - It acts as gateway to eastern ghats and acts as a significant ecosystem and a wildlife corridor in the Nilgiri Biosphere Reserve between Western Ghats and rest of the Eastern Ghats.
- Also, there are 9 tribal settlements and 18 tribal revenue settlements in STR which are not part of the tiger reserve.



26) SRIVILLIPUTHUR WLS AND MEGAMALAI WLS

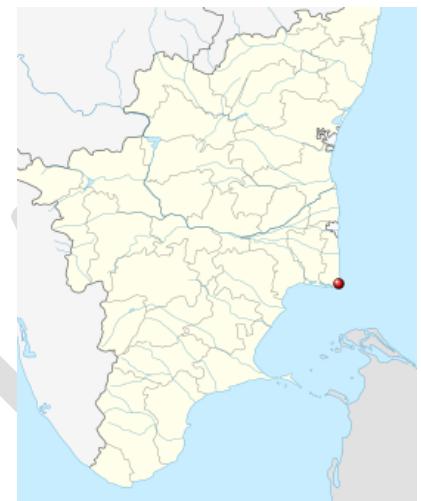
- **Why in news?**
 - In Feb 2021, the Srivilliputhur-Megamalai Tiger Reserve (SMTR), was jointly declared by the Central Government and Tamil Nadu Government.
- **Details**
 - The new tiger reserve (SMTR) is spread over 1016.57 sq km and it has been formed by clubbing Srivilliputhur WLS and Megamalai WLS.
 - Now, they would be eligible for funds from National Tiger Conservation Authority (NTCA).
- **Note:**
 - Megamalai region acts as a catchment for Vaigai river.
 - Vaigai river had faced a lot of problems in the past and it was revived when the water from Periyar river was brought to it after formation of the Periyar dam. Today, Vaigai gets around 80% of its water from Periyar dam. The remaining 20% is got from the watershed of the Megamalai region during the north-eastern Monsoon season.



27) POINT CALIMERE WILDLIFE AND BIRD SANCTUARY

- **About Point Calimere WBS**
 - **Geography**
 - It is a WLS located in Nagapattinam district of TN and is spread across an area of 30 sq m.
 - It comprises of sandy coastal, saline swamps, backwaters, and thorn scrub forests around the backwater.
 - It is located along the Palk Strait where it meets the Bay of Bengal at point Calimere at the south-eastern tip of Nagapattinam.
 - It is also a **Ramsar wetland site**.

- **Important Fauna**
 - **Black buck** (now LC) is the flagship specie of the WLS.
 - It is also famous for large congregation of waterbirds, especially **greater flamingo** (LC).
- **Key Problems faced by the Sanctuary**
 - **Pollution** from surrounding chemical companies.
 - **PH and salinity** of water have exceeded the permissible levels.
 - **Ecological disturbance** by fish farmers
 - **Climate change** has led to an increase in temperature which is negatively affecting the eggs during the pre-incubation period. The higher temperatures are providing better growth conditions for micro-organisms around eggs.
 - There are also high chances of antibiotic resistance among the coliform bacteria.
- **Decrease in number of migratory birds to the WLS**
 - From thousands of birds in the past, now, the numbers have gone down to a few hundred. The birds have started to avoid the sanctuary.



28) KALAKAD WLS AND MUNDANTHURAI WLS

- These were both established in 1962.
- In **1988**, **Kalakkad Mundanthurai Tiger Reserve** was created by combining the two sanctuaries.
 - It is located in the Southern Western Ghats in Tirunelveli district and Kanyakumari district in the southern state of TN.
 - It is the **second largest protected area in TN** (after the Sathyamangalam WLS) in Erode district.
 - It is part of the **Agasthyamalai Biosphere Reserve**.
 - It is also **India's southernmost tiger reserve**.
- The area acts as catchment of Thamiraparani river.



37. CONSERVATION RESERVES AND COMMUNITY RESERVES

- Conservation reserve and community reserves are the outcome of amendment to WPA in 2003.
- They are protected areas, which typically act as buffer zones or connectors and migration corridors to established NPs, WLS, and reserved and protected forests.
- It also provides mechanism to provide recognition and legal backing to the community initiated efforts in wildlife protection.
 - It provides for flexible methods wherein wildlife conservation is achieved without compromising the community needs.

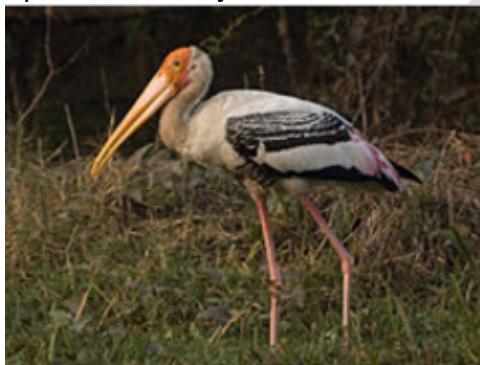
1) CONSERVATION RESERVES

- The area is owned by state government.
- Managed by Conservation Reserve Management Committee.
- **Who declares an area as conservation reserve?**
 - » State government may, after having consultations with the local communities, declare any area owned by the government as conservation reserve.
- When area is marked as conservation reserve, it becomes mandatory for any development projects to get approval of the National Board for Wildlife, and State Board of Wildlife.

A) TIRUPPADAIMARATHUR CONSERVATION RESERVE

- » It was the first conservation reserve established in India.
- » It is an IUCN Category V protected bird nesting area in the 2.84 hectares (7.0 hectares) compound of Siva temple, in Tiruppadaimarathur village, Tirunelveli District, TN.
- » On Feb 14, 2005 it became the first conservation reserve established in India.
- » The reserve is 10 kms from Kalakkad Mundanthurai Tiger Reserve.

Over 400 little egrets, pond heron, and near threatened painted stork nest in the grove of 20 huge, century old marutha, mahwa, neem and illuppai trees and feed in many agricultural fields, a few ponds and the Tamiraparani River adjacent to it



Painted stork



Little egret

B) THREE NEW WILDLIFE CONSERVATION RESERVES IN RAJASTHAN (APRIL 2023)

- **Sorsan** in Baran, Khichan in Jodhpur, and Hamirgarh in Bhilwara
- **Sorsan in Baran:**
 - The grasslands of Sorsan in Baran is a safe home for the Great Indian Bustard, Blackbucks (the state animal of Rajasthan).
- **Khichan in Jodhpur:**

It hosts thousands of migratory Demoiselle cranes. It will be safe home for these birds and will be the first conservation reserve in India for Demoiselle cranes.



IUCN: LC

- With these three additions, there are 26 wildlife conservation reserves in Rajasthan.

2) COMMUNITY RESERVE

- The state government may notify any community land or private land as a community Reserve, provided that the members of the community or individual concerned are agreeable to offer such areas for protecting fauna and flora, as well as their traditions, cultures and practices.
- The reserve is managed through Community Reserve Management Committee.
- No change in the land use pattern shall be made within the community reserve, except in accordance with a resolution passed by the management committee and approval of the same by state government.

A) SINGCHUNG BUGUN VILLAGE COMMUNITY RESERVE

- **Why in news?**
 - Arunachal Pradesh showcased its Singchung Bugun Village Community Reserve, a 17 sq km biodiversity hotspot during the Republic Day parade (Jan 2024)
- **Location:** The village is located in West Kameng district of Arunachal Pradesh and is located about 130 km from Tejpur in Assam. It lies adjacent to Eaglenest reserve.
- **What was the need of creating a community reserve?**
 - Environmentalists and forest department realized that area outside the eagle nest sanctuary was equally diverse and needed protection. This followed multiple rounds of discussions with the villagers over the years to explain what community reserve would mean and most importantly they would retain the land rights. In case the villagers needed to use some of the land for cultivation, they could get it de-reserved through the management committee.
 - Finally the villagers were convinced and they decided to make 17 sq. km of their land into community reserve. The community reserve came into being in 2017 when the state government approved it.
- **In the short time since, the reserve has won the India Biodiversity Award given jointly by the Centre and the UNDP.**



- Reserve has also become a model, with new batches of IFS officers visiting Singchung every year to understand how the reserve was created.
- **Note:** 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.

B) GOGABEEL COMMUNITY RESERVE AND CONSERVATION RESERVE

- Notified by State of Bihar in Aug 2019.
- **About Gogabeel:**
 - It is an ox-bow lake in Bihar's Katihar district. It is formed from the flow of rivers Mahananda and Kankhar in the north and the Ganga in the South and east. It is a permanent water body though it shrinks to some extent in the summer but never dries up.
 - It is the 15th protected area (PA) in Bihar.
 - It is an important Bird Area. More than 90 bird species have been recorded from this site, of which, about 30 are migratory.
 - » Among the threatened species, the Lesser Adjutant Stork is listed as Vulnerable by the IUCN while the Black Necked Stork, White Ibis and White-eyed Pochard are 'Near Threatened'.
 - The water body was notified as a 57 hectare Community Reserve and a 30 Hectare 'Conservation Reserve'. It is Bihar's first community reserve.
- It is a **big win for conservationists** who had been trying for long to convince both local residents as well as the authorities to declare the important birding site as a Protected Area

C) TILLARI CONSERVATION RESERVE

- In June 2020, the Maharashtra government declared the Tillari Forest Area in the Dodamarg and Sawantwadi range in the coastal Sindhudurg district as a Conservation reserve area.
 - » The reserve covers 9 villages in the forest range and is known to serve as a corridor and even as a habitat for the population of tigers and elephants moving between the three states of Goa, Karnataka and Maharashtra.
- Tillari is the 7th Corridor in Maharashtra which has been declared as a 'Conservation Reserve'.
- **Note:**
 - » The 38 km-long Dodamarg wildlife corridor connects Radhanagri WLS in MHA to Bhimgad WLS in Karnataka. This corridor frequently witnesses elephant and tiger movement.

38. CONSTITUTIONAL PROVISIONS

There are few provisions in Indian constitution which directly or indirectly call for biodiversity conservation.

1. Article 21 (Right to Life and Personal Liberty)

- The Supreme Court on many occasion has interpreted this fundamental right to encompass within its ambit the protection and preservation of environment.

2. Article 48A directs the state to protect and improve the environment and to safeguard forests and wildlife (Article 48A)
 - This was added by 42nd Constitutional amendment in 1976.
3. Article 51A(g) makes it a duty of every citizen of India to **protect and improve the natural environment including forests, lakes, rivers and wildlife** and to have compassion for living creatures

39. INSTITUTIONS

1) NATIONAL GREEN TRIBUNAL (NGT)

- **National Green Tribunal Act, 2010**
 - An act to provide for the establishment of a National Green Tribunal for the effective and expeditious disposal of cases relating to environment protection and conservation of forests and other natural resources including enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property and for matters connected therewith or incident thereto.
- It is expected to provide **speedy environmental justice** and help **reduce burden of litigation** in higher courts.
 - The tribunal is mandated to make and endeavour for **disposal of applications or appeals** finally **within 6 months** of filling of the same.
- **Other Facts Useful for Pre**
 - **Branches:** The Principle Bench of the NGT has been established in the National Capital - with **regional benches** in Pune, Bhopal, Chennai and Kolkata.
 - **Chairperson** of NGT is a retired judge of the SC.
 - **Other Judicial Members** are retired judge of the High Courts.
 - **Each Bench** -> At least 1 judicial member and one expert member
 - **Expert Members** should have a professional qualification and a minimum of 15 years of experience in the field of environment/forest conservation and related subjects.
- **Powers**
 - The NGT has the power to hear all civil cases relating to environmental issues and questions that are linked to the **implementation of laws listed in Schedule I of the NGT Act**. These include the following:
 - i. The Water (Prevention and Control of Pollution) Act, 1974;
 - ii. The Water (Prevention and Control of Pollution) Cess Act, 1977;
 - iii. The Forest (Conservation) Act, 1980;
 - iv. The Air (Prevention and Control of Pollution) Act, 1981;
 - v. The Environment (Protection) Act, 1986;
 - vi. The Public Liability Insurance Act, 1991;
 - vii. The Biological Diversity Act, 2002.
 - This means that any violations pertaining to these acts only, or any other decisions order taken by government under these laws can be challenged before NGT.

- **Important Note:** The NGT has not been vested with powers to hear any matter relating to the **Wildlife (Protection) Act, 1972**, the **Indian Forest Act, 1927** and various laws enacted by States relating to forests, tree preservation etc. Therefore, specific and substantial issues related to these laws **cannot be raised before the NGT**. You will have to approach the State High Court or the Supreme Court through a Writ Petition (PIL) or file an original suit before an appropriate civil judge of the Taluk.
- **Principles of Justice adopted by NGT**
 - The tribunal not guided by the Code of Civil Procedure, 1908, but shall be guided by **principal of natural justice**.
 - Further, the NGT is not bound by rules and evidence enshrined in the Indian Evidence Act, 1872.
 - » This ensures that it will be relatively easier for conservation groups to show facts and figures before the NGT.
- **Review Appeal** can be made to NGT
- If the review appeal fails, the **NGT order can be challenged** before the Supreme Court within ninety days.

40. COMPENSATORY AFFORESTATION

- **Introduction**
 - Forest land can be diverted for non-forest developmental activities like infrastructural project with approval of state and central government. For this diversion **afforestation must be done as compensation** for diversion of forest and is called compensatory afforestation.
 - Compensation must be paid for loss of forest, including for loss of ecosystem and biodiversity i.e., both tangible and intangible losses. The total valuation of this is called **Net Present Value**. This cost has to be borne by agency responsible for diversion of the state land.
 - In India, according to the Forest Conservation Act, 1980, and the rules and guidelines formed under it, in case of diversion of forest land for non-forestry purposes.
 - The equivalent non-forest land has to be identified for compensatory afforestation.
 - Funds for raising compulsory afforestation has to be imposed.
 - For certain activities additional conditions are imposed.
 - For e.g. in case forest land is being converted for mining purposes - additional conditions like maintaining a safety zone area, fencing and regeneration etc are stipulated.
- **MoEFCC is the nodal agency**
 - Application for clearance (land conversion) must be made to MoEF&CC through the concerned forest department of the state government.
 - The application/proposal should include details of non-forest/degraded forest identified for afforestation purposes, year wise phased targets, species to be planted and a suitability certificate from afforestation/ management point of view.
 - If clearance is given, the **compensation for the lost forest land** is also decided by Ministry and regulators.
- **Criteria for identifying non-forest land for compensatory afforestation.**
 - It should be identified contiguous to or in proximity of reserved forest or protected forest.

- In case the non-forest land is not available in the same district then it should be identified within the same state/UT.
 - If land is unavailable in entire state, funds for raising the CA in double the area in extent of forest land diverted need to be provided by the user agency. And this non-availability of the suitable non-forest land for CA in the state/UT would be accepted by central government only on the certificate of Chief Secretary to the state/UT.
- **Who implements afforestation and development work?**
 - After receipt of the money, State Forest department is to accomplish the afforestation for which money is deposited in the Compensatory afforestation fund within a period of one year or two growing seasons.
 - **How many saplings have to be planted?**
 - In Raghunath Jha vs Ministry of Urban Development Judgment, the National Green Tribunal said that permission to cut tree can be obtained only on the condition that "if any tree is fell or permitted to cut in place thereof **at least, 10 trees** shall be planted.
 - **Advantages of Compensatory afforestation**
 - Balances development with environmental requirements
 - Can help in increasing the tree cover as the compensatory forestation is larger than the fell tree

41. COMPENSATORY AFFORESTATION FUND ACT, 2016

1) BACKGROUND: FORMATION OF CAMPA (COMPENSATORY AFFORESTATION FUND MANAGEMENT AND PLANNING AUTHORITY)

- **Background**
 - In July 2009, the Supreme Court of India issued orders for the formation of **CAMPA** (Compensatory Afforestation Fun Management and Planning Authority) as National Advisory Council under the chairmanship of Union Minister of Environment and Forest for monitoring, technical assistance and evaluation of compensatory afforestation activities.
- **Objectives of CAMPA**
 - Promote afforestation and regeneration activities as a way of compensating for forest land diverted to non-forest uses.
 - National CAMPA Advisory Council has been established as per the orders of the Hon'ble Supreme Court with following mandates
 - » Lay down broad guidelines for state CAMPA
 - » Facilitate scientific, technological, and other assistance that may be required by state CAMPA
 - » Make recommendations to state CAMPA based on their plans and programmes
 - » Provide a mechanism to state CAMPA to resolve issues of an inter-state or Center-state character.

- **State CAMPA**
 - » Would receive the funds
 - » Administer the amount received from Adhoc CAMPA and utilize the funds collected for undertaking compensatory afforestation, assisted natural regeneration, conservation and protection of forests, infrastructural development, wildlife conservation and protection and other related activities.
 - » Would provide an integral framework for utilizing multiple sources of funding and activities relating to protection and management of forests and wildlife.
 - » **In sum, the prime task of State CAMPA would be regenerating natural forests and building up institution engaged in the task in the state forest department.**

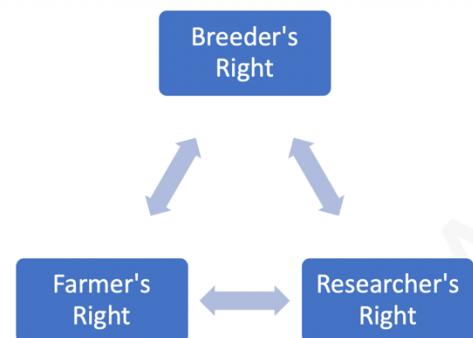
2) COMPENSATORY AFFORESTATION FUND ACT, 2016

- **Main Provisions of the Act**
 - **Statutory Backing to Funds and Authorities**
 - » The act provides legal backing to centre and state funds and regulate how this money will be utilized
 - » The funds would be created under Public Account of India and Public Account of State respectively
 - **What kind of payment would come into fund?**
 - » Payment for compensatory afforestation
 - » Payment for loss of forest ecosystem (Net present value)
 - » Payment for violation and diversion of forest land guidelines
 - » Additional payment for specific projects.
 - **How the funds will split between centre and state**
 - » The state would get bulk of the money (90%) and 10% would go to centre.
 - » The funds will go to Public account of State and Centre.
 - This will bring these funds within the overall oversight and control of parliament and state legislatures.
 - **How the money would be utilized**
 - » **State funds**
 - Compensatory afforestation
 - Regeneration of forests
 - Infrastructure development
 - Forest and wildlife protection
 - » **National Fund**
 - Monitoring purposes and approved schemes of forestry and wildlife
 - **How the fund will manage**
 - » **National CAMPA**
 - Core committee responsible for broader policy and day to day working
 - Specific group of experts from environment, science, economics and other fields responsible for monitoring
 - » **State CAMPAs**

- Responsible for managing state level funds
- **Auditing**
 - » The act also provides for annual audit of the account by CAG.
- **Expected Impact**
 - End of era of Ad Hocism
 - » The statutory authorities at centre and state levels.
 - Expedited Utilization
 - Employment Generation in backward and tribal areas:
 - Increase availability of timber and other forest products:
 - Improving quality of forest
- **MoEF&CC Modifies Compensatory Afforestation Rules for ease of business (May 2019)**
 - States with over 75% forest cover looking to divert forest land for non-forestry projects, can now carry out compensatory afforestation in other states.
 - It will promote ease of business and will give a push to projects stuck for want of non-forest land.

42. PROTECTION OF PLANT VARIETIES AND FARMERS RIGHTS ACT, 2001

- **Need of the law:**
 - Encourage plant breeding activities so that new varieties could be developed. Attract more investment in biotechnology.
 - Protect farmers' rights and interests.
 - Fulfilling the mandate of TRIPS:
 - Article 27.3(b) says that members may exclude plants from patentability - but requires protection for plant varieties in the form of an effective 'su-generis system' or through patents or both.
 - Fulfilling mandates of International Agreements like UPOV (International Union for Protection of Plant Varieties)
 - UPOV- International Union for the Protection of New Varieties of Plants
 - India has initiated the process of joining UPOV, but still not a member. India doesn't follow UPOV and has its own su-generis system.
 - Patent Act, 1970 excluded agriculture and horticulture methods of production from patentability.
- **About the Act**
 - The law was enacted in 2001 to grant IPRs to plant breeders, researchers and farmers who develop any new or extant plant varieties i.e., it has granted rights and protection to all three pillars of agriculture sector.



- **Objectives:**
 - » **Simulate investment for R&D** - both in public and private sector towards development of new plant varieties.
 - » **Facilitate growth of seed industry** in the country by making available high-quality seeds and planting material in the country.
 - » **Recognize the role of farmers** as cultivators and conservers and **contribution of traditional, rural, and urban tribal communities** to the country's agro-biodiversity by **rewarding them for their contribution** through benefit sharing and protecting the traditional right of the farmers.

- **Key Provisions**
 - » **Varieties which are open for registration** - Novel Variety, Extant Variety, Farmer's variety, essentially derived varieties.
 - » **Criterias to be satisfied for registration** - a variety should be **new, distinct, uniform, and stable**.
 - » The IPR granted is a **dual right** - one is for the variety and the other is for denomination assigned to it by the breeder.

 - » **Rights of Farmer's:**
 - Entitled to save, use, sow, re-sow, exchange or sell his farm produce.
 - But farmers can't sell the branded seed of the variety protected under the act.
 - **Farmer's right to register traditional varieties**
 - The act allows the registration of traditional or farmers' variety. Farmer can get Plant breeder rights and the act allows exclusive legal right to PBR-holding farmers.
 - Note: in case of registration of a traditional variety, it is important to involve all communities associated with its conservation. Similarly, in case of farmers' variety, it is important to recognize spousal contribution under joint ownership.
 - Exemption from Payment of fee either for registration or renewal of registration.
 - Farmers right for Reward and Recognition.
 - As per the act, a National Gene Fund is to be created to facilitate reward and recognition to eligible individual farmers and communities. This recognizes farmers who have been contributing in conservation of varietal wealth of crop plants.
 - **Farmers right of benefit sharing**
 - The act provides for equitable sharing of the benefit earned from the new variety with farming or tribal communities that had contributed varieties used as parameters. The benefit share may be reimbursed from the National Gene Fund.
 - **Farmer's right to get compensation for the loss suffered** from the registered varieties
 - **Farmer's right to receive Compensation for undisclosed use of traditional varieties**
 - If the breeder uses Farmers' variety as source material
 - **Farmer's right for the Seeds of Registered Varieties**
 - Seeds of registered varieties should be available to farmers **at affordable prices**. If this doesn't happen within three years of registration, the farmer can raise the matter with PPVFR -Authority.
 - **Protection against innocent infringement.**
 - This protection is only available for the first offence and the farmer is punishable for subsequent offences.

» **Rights of Breeders**

- Right for Production, Sale, Marketing, Distribution, Export and Import
- Penalties for infringement of Breeder's Right.

» **Rights of Researchers**

- Use of registered variety for conducting experiment, as initial source for creating new varieties.
- Free and complete access to protected materials for research use in developing new varieties of plant.
 - However, authorization of the breeder is required "whose repeated use of such variety as parental line is necessary for commercial production of such other newly developed variety".

- **UPOV and India's situation:** Other countries subscribe to the Union for the Protection of Plant Varieties (UPOV), an international agreement with several versions, which offers limited rights to farmers. India has been under constant pressure from the US to join UPOV, an inter-governmental organisation based in Geneva. Several international bodies have warned India against joining UPOV, as they feel it upholds only commercial interests. According to Gol, Indian law is in compliance with UPOV-1978.
- **Significance of the act**
 - » **Recognizes and protects the rights of farmers** in conserving, improving and making available plant genetic resources.
 - » **Enhances agri-growth** by promoting more R&D towards development of new plant varieties.
- **Problems with the law:**
 - » **Lack of proper enforcement:** Seed industry feels that there must be a mechanism to catch and punish those who illegally sell the variety.
 - Unique protection given to farmers can also act as a loophole as an aggregator may also own a small land and call herself a farmer.
 - » **Slow turnaround time for registration of varieties**

1) PEPSICO CASE AND DEC 2021 JUDGMENT

- **Background:**

- » **PEPSICO has sued three Gujarat potato farmers** for growing its proprietary varieties without authorization. The commercial court had stayed farmers from growing and selling the potatoes. But after a lot of protest, Pepsico withdrew the case in May 2019.
- » PEPSICO India holding Pvt limited has informed the court that it uses the registered variety of potatoes called **FL 2027** (of FC5 variety), which is a hybrid of **FL 1867** and **Wischip** varieties, for manufacturing of chip for its brand.
- » The company is registered breeder of the FL 2027 under the protection of Plant varieties and Farmers' Rights Act, 2001.

- **In Dec 2021**, the Protection of Plant Varieties and Farmer's Right Authority (PPV&FRA) revoked PepsiCo India's registration of its potato variety used in Lays chips.

- » In the process, the authority has indicted itself by listing a series of procedural lapses by the registrar in approving the registration despite omissions and fudging in the application submitted by PepsiCo.
- » The argument of farmer's rights and public interest was also used for revocation.
 - The judgment said that **farmers had been put to hardship** including the looming possibility of having to pay huge penalty on the purported infringement they were supposed to have been committing noting that Pepsico had claimed damages of more than Rs 1 crore each from small farmers. This **violated public interest**.
- **Significance:**
 - » After this judgement, the process of registration is expected to get more streamlined as the authority has identified several procedural flaws

43. THE SCHEDULED TRIBES AND OTHER TRADITIONAL FOREST DWELLERS (RECOGNITION OF FOREST RIGHTS) ACT, 2006

- **Background: Need of the law -> Ending the Exploitation under the Indian Forest Act, 1927**
 - Under the **Indian Forest Act, 1927** areas were often declared to be "**government forests**" without recording who lived in the areas, what lands they were using, what uses they made of the forests and so on.
 - **Consequences**
 - » **End of pre-existing traditional rights**
 - » **Eviction, Harassment, exploitation and loss of livelihood**
 - » **Destruction of forests**
 - The loss of more than 90% of India's grasslands to commercial Forest Department plantations
 - Destruction of large areas of forest for mines, dams and industrial projects
 - » **Community management system was destroyed**
- **Introduction**
 - The 2006 law concerns with rights of forest dwelling communities to land and other resources, denied to them over decades as a result of the continuance of colonial forest laws in India.
- **Main Objectives of the 2006 act**
 - i. Grant **legal recognition to the rights of forest dwelling communities**, partially correcting the injustices caused by the forest laws.
 - ii. To address the adverse living conditions of many tribal families living in forests.
 - iii. Make a beginning towards giving communities and the public a voice in forest and wildlife conservation.
- **Nodal agency** for implementing the act: The Ministry of Tribal Affairs
- The main **Provisions** can be summarized as follows
 1. **Individual Forest Rights/ Land Ownership** to land that is being farmed by tribals or forest dwellers as on 13 Dec 2005, subject to maximum of 4 hectares.
 - **Three steps in recognizing land ownership rights under the**
 - Section 6 of the act provides a transparent 3 step procedure for deciding who gets the rights

- » **First**, the gram Sabha (full village assembly, NOT gram Panchayat) makes a recommendation - i.e., who has been cultivating land for how long, which minor forest produce is collected etc.
 - » **Two stages of screening committee**
 - Gram Sabhas recommendation goes through two stages of screening committees at the Taluka and district levels.
 - The district level committee makes the final decision.
2. **Community Rights -> Resource Use Rights** - to minor forest produce (also including ownership), to grazing areas, to pastoralist routes, etc.
 3. **Forest Protection and Management Rights** - to protect forest and wildlife
 - This include right to protect, regenerate, or conserve or manage any community forest resources which they have been traditionally protecting and conserving for sustainable use.
 4. **Relief and Development Rights** - to rehabilitate in case of illegal eviction or forced displacement, and to basic amenities, subject to restrictions for forest protection.
 5. **Powers to Gram Sabha**
 - The act provides for diversion of forest land for public utility facilities managed by Government, such as schools, dispensaries, fair price shops, electricity and telecommunication lines, water tanks etc. with the recommendation of Gram Sabhas.
 6. **Rights of conversion of forest villages into revenue villages** -> Adjudicated by the Gram Sabha, Sub divisional level committee and the District level committee.

- **Significance of the Act**

- i. **Sense of Security:** Individual Forest Rights give forest dwellers a sense of security against future eviction.
- ii. **Huge Potential** to further the goals of:
 - **Grassroot democratization of forest governance -> Empowerment**
 - Communities in different parts of the country have successfully used the FRA to protect forest and their biocultural habitats as illustrated in the examples of Dongria Kondh's campaign to protect Niyamgiri hills.
 - **Sustainable Development and Conservation**
 - **Area:** In terms of area, potentially, up to 85.6 million acres or 34.6 million hectares of forests could be recognized as Community Forest Reserves (CFRs) in the country.
 - **Population:** In terms of potential beneficiaries, an estimated 200 million scheduled tribes and other traditional forest dwellers (OTFDs) in over 1,70,000 villages are the users of potential area, and could, therefore, gain collective rights over forests under the CFR provisions of the FRA.
- iii. **Alleviate poverty in forest heartlands**
 - By ensuring that benefits from forest product harvests and enterprises, and from reforestation, carbon sequestration, and provision of ecological services, go directly to the right-holding gram sabhas and their members.
 - For instance, several tribal and OTFD gram sabhas in Gadchiroli district of Maharashtra and Narmada district of Gujarat have earned tens of lakhs of rupees from the sale of bamboo and tendu leaves from their CFRs.

- iv. **Land Reform:** FRA if properly implemented can become the largest land reform in India's history
- v. **Internal Security:** Potential to deal with Left Wing Extremism

44. OTHER NATIONAL EFFORTS

1) NATIONAL MISSION ON BIODIVERSITY AND HUMAN WELL-BEING

- In 2018, the Prime Minister's Science, Technology and Innovation Advisory Council (**PM-STIAC**) in consultation with the MoEF&CC and other ministries approved an ambitious **NMBHWB**.
- A Bengaluru based Biodiversity Collaborative is working with the National Biodiversity Authority to hold consultation and prepare roadmap for the mission that will be steered by a core of the country's leading biodiversity science and conservation organizations, from public, academic, and civil society organizations.
- **The mission will:**
 - Strengthen the science of restoring, conserving, and sustainably utilizing India's natural heritage.
 - Embed biodiversity as a key consideration in all developmental programs, particularly in agriculture, ecosystem services, health, bioeconomy, and climate change mitigation.
 - Establish a citizen and policy-oriented biodiversity information system
 - Enhance capacity across all sectors for the realization of India's national biodiversity targets and UN SDGs.
- The mission will also allow India to emerge as a leader in demonstrating linkages between conservation of natural assets and societal well-being.
- **Other advantages of the mission**
 - **Increase natural assets** by millions of crores
 - **Fight climate change**
 - **Increase agri-production**
 - **Restoration activities** across India's degraded lands, which amount to almost a third of our land area.
 - Meet the commitments of **international conventions and agreements** like CBD, SDGs etc.

2) ECO-SENSITIVE ZONES (ESZS) AROUND PROTECTED AREAS

- **Introduction**
 - Eco-sensitive zones are buffer zones around protected areas (NP, WLS etc) where only regulated activities for specialized eco-system are allowed.
 - **Why?**
 - » They protected against damages caused by developmental activities and act as shock absorbers.
 - » They also act as transition zone from areas of high protection to areas involving lesser protection.
- **SC Judgment 2006**
 - » In December, 2006, the Supreme Court had ordered all states and Union territories for sending proposals to the MoEF for demarcation of ESZs.
 - » In case no ESZ proposal is sent, ESZ of 10 km shall apply around Protected Areas.

- **MoEF guidelines for creating Eco-Sensitive Zones:**
 - In 2011, MoEF came out with **new guidelines to create eco-sensitive zones**.
 - **Activities Prohibited**
 - » Commercial mining, saw mills, polluting industries, commercial use of fire wood, major hydro power projects etc.
 - » Tourism activities like flying over protected areas in an aircraft or hot air balloon, and discharge of effluents and solid waste.
 - **Activities restricted with safeguards**
 - » Felling of trees, drastic change in agriculture systems and commercial use of natural water resources, including ground water harvesting and setting up of hotels and resorts, are the activities regulated in the area.
 - **Activities Permitted**
 - » Ongoing agriculture and horticulture practices by local communities, rainwater harvesting, organic farming, adoption of green technologies, use of renewable energy resources.
 - **Width of ESZs**
 - » May vary from protected area to area
 - » As a general principle, the width could go up to 10 Kms around the protected area.
- **Controversy over Eco-Sensitive Zone for the Western Ghats**
 - In 2010, MoEFCC set up the **Western Ghat Ecology Expert Panel (WGEEP)** under the **chairmanship of Prof. Madhav Gadgil**.
 - The **Main recommendations** of WGEEP were:
 - i. **Entire Western Ghat** (1,29,037 sq km) should be designated as Ecologically Sensitive Area (ESA).
 - ii. **Three levels of Ecological Sensitivity**: Assign three levels of Ecologically Sensitivity to different regions, termed as ESZ1, ESZ2 and ESZ3.
 - iii. **No new dams based on large scale storage** be permitted in ESZ1.
 - iv. **Restrictions on Mining**:
 - Indefinite moratorium on new environmental clearances for mining in ESZ1 and ESZ2
 - Phasing out of mining in ESZ1 by 2016, and continuation of existing mining in ESZ2 under strict regulation.
 - v. **No New polluting industries**, which would include coal-based power plants, should be permitted to be established in ESZ1 and ESZ2.
 - vi. Establish a **national level Western Ghats Ecology Authority (WGEA)** for the protection of the region.
 - **The report met with resistance** from the governments of all six stakeholder states and could not be implemented. **Key Criticisms** were on the grounds of practicality, energy, and development needs of the region.
- The Delhi High Court directed the government to take action on the recommendations which led to MoEF&CC setting up another High-Level Working Group (HLWG) under the chairmanship of Dr.

Kasturirangan, to suggest an all-round and holistic approach for sustainable and equitable development while keeping in focus the preservation and conservation of ecological systems in Western Ghats.

- **HLWG made the Following main points of recommendations** which were seen as watering down of the Gadgil committee recommendations.
 - **37% of the Western Ghats as ESZ:**
 - It broadened the definition of Western Ghats to include 1,64,280 sq km. Out of the estimated 1,64,280 sq. km of the Western Ghats area, the natural landscape constitutes only 41%. The remaining area was cultural landscape where, where human settlements, agriculture and plantations existed.
 - The area identified as ecologically sensitive is about 37%, (around 60,000 sq km) i.e., about 90% of the natural landscape.
 - **Prohibitory and Regulatory regime in ESA** for those activities with maximum interventionist and destructive impact on the ecosystem.
 - Complete ban on mining, quarrying and sand mining in ESA.
 - No new thermal power projects should be allowed in ESA. Hydropower projects may be allowed but subject to conditions
 - All "Red" category industries should be strictly banned.
 - **Strengthening of existing framework of environment clearance** and setting up of state of art monitoring agency.
- **Non-implementation of Gadgil/Kasturirangan Committee recommendations and impact on Kerala Floods of Aug 2018**
 - According to experts if the recommendation of these committees would have been properly implemented the damages due to flood in Kerala would not have been too severe.

3) URBAN FOREST SCHEME (NAGAR VAN SCHEME)

- **Details**
 - The program is aimed at developing 200 Urban forests across the country in next five years.
 - » Wajre Urban Forest in Pune and Gurgaon's Aravalli Biodiversity Park, may act as a model for the scheme.
 - In this initiative there will be a renewed focus on people's participation and collaboration between forest departments, municipal bodies, NGOs, Corporates and Local Citizens.
 - These will primarily be on forest land in the City or any other vacant land offered by local urban bodies.
- **Funds:**
 - CAMPA
- **Significance of Urban forests**
 - Lungs of the cities
 - Moderates temperature
 - Reduces level of ozone, SO₂ and PM
 - Fights Climate change - removes CO₂ and supplies oxygen

- Space for nature and wildlife

- **Note:**

- The theme for World Environment Day (5th June), 2020 was '**Biodiversity**'.
- India organized WED celebrations virtually in view of the COVID-19 crisis with this year's theme with focus on **Nagar Van** (Urban Forests)

4) HERITAGE TREES

- **Why in news?**

- Maharashtra Legislative Assembly and Legislative Council i.e. both houses, cleared an amendment that protects old trees and provides them 'heritage tree tag'. (July 2021)

- **Details**

- The Maharashtra Legislative Assembly has passed an amendment to the Maharashtra (Urban Areas) Protection and Preservation of Trees Act, 1975, which allows classification of 50 year old trees as "heritage" trees with an aim to increase the forest cover.
 - » The amendment not only conserves old trees in urban areas but also tightens the rules for felling of trees for development works.
- The act also provides for the **formation of the Maharashtra State Tree Authority** and **tree authorities in local civic bodies and councils**.
 - » The tree authority is tasked with increasing the tree cover in urban areas.
 - » The permission for felling of more than 200 trees should come from the state tree authorities.
- The amendment makes it mandatory to plant trees equivalent in numbers to the age of the tree in years, in case felling of trees is allowed for development projects.
 - » The planted trees should be 6-18 feet in height and the survival of such trees should be ensured by geo-tagging.
- In case the compensatory plantation is not possible, the tree feller has to pay compensation for the economic valuation of the trees being felled.
- It also provides for census of trees every five years with the use of new technologies such as GIS etc.
- The amendment also increased the fines for illegal felling of trees from a maximum of Rs 5,000 to Rs 1 Lakh.
- **Extra: Determining the age of a tree:**
 - » The most common method for determining the age of the tree is **Dendrochronology** - or tree ring dating also called growth rings.
 - » A tree, roughly every year adds to its girth. The new growth is also called a tree ring.
 - » By counting the ring of a tree, the age of the tree can be estimated.
 - » **However**, the process is **invasive**.
 - To extract core samples, a borer is screwed into the tree and pulled out. This brings out a straw-size sample of wood. Then, the hole in the tree is sealed to prevent disease.

5) SACRED GROVES

- Introduction

- Sacred groves comprise of patches of forests or natural vegetation – from a few trees to forests of several acres – that are usually dedicated to **local folk deities** (Example – Ayyanar and Amman) or **tree spirits** (Vanadevatais).
- These spaces are **protected by local communities** because of their religious beliefs and traditional rituals that run through several generations.
- The degree of sanctity of the sacred forests varies from one grove to another.
 - In some forests even the dry foliage and fallen fruits are not touched. People believe that any kind of disturbance will offend the local deity, causing diseases, natural calamities or failure of crops.
 - For example, the Garo and the Khasi tribes of northeastern India completely prohibit any human interference in the sacred groves.
- In other groves, deadwood or dried leaves may be picked up, but the live tree or its branches are never cut.
 - For example, the Gonds of central India prohibit the cutting of a tree but allow fallen parts to be used

- Classification of sacred groves

- **Traditional Sacred Groves** – It is the place where the village deity resides, who is represented by an elementary symbol
- **Temple Groves** – Here a grove is created around a temple and conserved.
- Groves around the burial or cremation grounds.

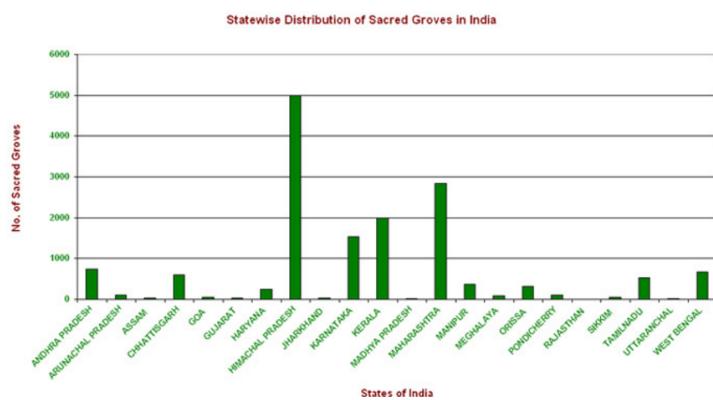
- Ecological Significance

- i. Conservation of Biodiversity
- ii. Recharge of aquifers
- iii. Soil conservation

- Distribution of Sacred Groves in India

- In India, sacred groves are found all over the country and abundantly along the western Ghats. Although, there has been no comprehensive study of sacred groves in the entire country, experts estimate that the total number of sacred groves in India could be in the range of 1,00,000 - 1,50,000.

(Source: "Cultural and Ecological Dimensions of Sacred Groves in India" by Malhotra, K.C., Gokhale, Y., and Chatterjee, S., 1998)



- Threats to Sacred Groves in India

The threats vary from one region to the other and even from one grove to the other. But the common threats identified are:

- **Disappearance of the traditional belief systems**, which were fundamental to the concept of sacred groves. These systems and their rituals are now considered mere superstition.
- Sacred groves in many parts of our country have been destroyed due to **rapid urbanization** and **developmental interventions** such as roads, railways tracks, dams including commercial forestry. Encroachment has led to the shrinkage of some of the largest groves in the country.
- Many groves are suffering due to '**Sanskritisation**' or the transformation of the primitive forms of nature worship into formal temple worship.
- **Invasion by exotic weeds** such as Eupatorium odoratum, Lantana camara and Prosopis juliflora is a serious threat to some groves.
- Pressures due to **increasing livestock** and **fuelwood collection**.

• Local Terms used for Sacred Groves in the country

Sl.No.	State	Local term for Sacred Groves	No. of documented sacred groves
1	Andhra Pradesh	Pavithravana	580
2	Arunachal Pradesh	Gumpa Forests (Sacred Groves attached to Buddhist monasteries)	101
3	Goa	Deoral, Pann	55
4	Jharkhand	Sarana	29
5	Kerala	Kavu, Sara Kavu	299
6	Maharashtra	Devral, Devrahati, Devgudi	1559
7	Manipur	Gamkhab, Mauhak (sacred bamboo reserves)	166
8	Meghalaya	Ki Law Lyngdoh, Ki Law Kyntang, Ki Law Niam	101
9	Puducherry	Kovil Kadu	108
10	Rajasthan	Orans, Kenkris, Jogmaya	255
11	Tamil Nadu	Swami shola, Kolkkadu	527
12	Uttarakhand	Deo Bhumi, Bugyal (sacred alpine meadows)	18
13	West Bengal	Garamthan, Harithan, Jahera, Sabitrihan, Santalburithan	39

45. INTERNATIONAL EFFORTS

1) MARINE PROTECTED AREAS

- **Why in news?**
 - Marine protection falls short of the 2020 target to safeguard 10% of the world's oceans
- **How much of Marine Protected Areas are there in the world?**
 - In 2010, world leaders updated an earlier pledge to establish a network of marine protected areas (MPAs) with a mandate to protect 10% of the world's oceans by 2020.
 - But, by 2020, MPAs only cover 7.66% of the ocean across the globe.
 - Most protected sites are in national waters where it's easy to implement and manage protection under the provision of a single country.

- In more remote areas of the high seas, only 1.18% of marine ecosystems have been gifted sanctuary.
 - Of this, southern Ocean account for a large portion, hosting two MPAs.
 - The South Orkney Islands Southern Shelf MPA covers 94,000 square kms, while the Ross Sea region MPA stretches across more than 2 million square kilometres, making it the largest in the world. CCAMLR is responsible for this achievement.

- MPAs in India

- MPAs in marine environment in India are primarily classified into following three categories:
 - **Category 1:** This covers National Parks and Sanctuaries and having entire areas in intertidal/subtidal or mangroves, coral reefs, creeks, seagrass beds, algal beds, estuaries, lagoons.
 - **Category 2 :** These include Islands, which have major parts in marine ecosystem and some part in terrestrial ecosystem
 - **Category 3A:** They include sandy beaches beyond the inter-tidal line but occasionally interacting with the seawater.
 - **Category 3B :** This include evergreen or semi evergreen forests of Islands.

▫ Important MPAs of India in Peninsular India

Name of MPA	State	Category	Year of establishment
Marine (Gulf of Kutch)	Gujarat	NP	1995
Bhitarkanika	Odisha	NP	1998
Gulf of Mannar Marine	TN	NP	1980
Sundarbans	WB	NP	1984

▪ Important MPAs of India in Islands of India

Name of MPA	State	Category	Year of Establishment
Campbell	A&N	NP	1992
Galathea	A&N	NP	1992
Mahatma Gandhi Marine	A&N	NP	1983
Middle Button Island	A&N	NP	1987
Mount Hariette	A&N	NP	1987
Rani Jhansi	A&N	NP	1996
Saddle Peak	A&N	NP	1987
South Button Island	A&N	NP	1987

46. MAJOR POLICIES, PROGRAMS, PROJECTS

1) NATIONAL FOREST POLICY, 1988

- **Basic Objectives of the 1988 Policy**
 - Maintenance of **environmental stability** through preservation and restoration of the ecological balance.
 - **Conservation of natural heritage** of the country.
 - **Checking soil erosion and denudation** in the catchment areas of rivers, lakes, reservoirs in the "interest of soil and water conservation, for mitigating floods and droughts and for the retardation of siltation of reservoirs
 - **Checking the extension of sand-dunes** in the desert areas of Rajasthan and along the coastal tracts
 - **Increasing substantially the forest/tree cover** in the country through massive afforestation and social forestry programmes, especially on all denuded, degraded and unproductive lands
 - **Meeting the requirements of fuel-wood, fodder, minor forest produce and small timber** of the rural and tribal populations.
 - **Increasing the productivity of forests to meet essential national needs**
 - **Encouraging efficient utilisation of forest produce** and maximising substitution of wood.
 - **Creating a massive people's movement with the involvement of women**, for achieving these objectives and to minimise pressure on existing forests
- **Key Concerns**
 - **No official definition of 'Forests'**. This had led to every state government having their own definition.
 - It doesn't cover provision for **protection of degraded land**.
- **Draft National Forest Policy, 2020**
 - **Why in news?**
 - A GoM has approved Forest Policy, 2020 and have sent it to the PMO and the Cabinet Secretariat for consideration (June 2020)
 - The new policy has been pending since 2016.
 - It is an overarching policy for forest management. This will be **third National Policy on Forests** (after 1952 and 1988).
 - While the NFP of 1952 was focused on production and revenue generation , NFP of 1988 was focused on environmental stability and maintenance of ecological balance, the **draft NFP** will focus on **water conservation** followed by **climate change mitigation** through carbon sequestration and finally to **secure livelihood**.
 - **Target of 33% of India's geographical area under forest and tree cover and in the hills 2/3rd of area under forest and tree cover has been continued from the previous policy.**
 - **Key sticking Points**
 - Undermining the rights of traditional forest dwellers, roping in of the private players for afforestation, and rather than focusing on forest preservation, it talks about raising plantation.

2) NATIONAL WILDLIFE ACTION PLAN (NWAP), 2017-2030

- **Introduction**

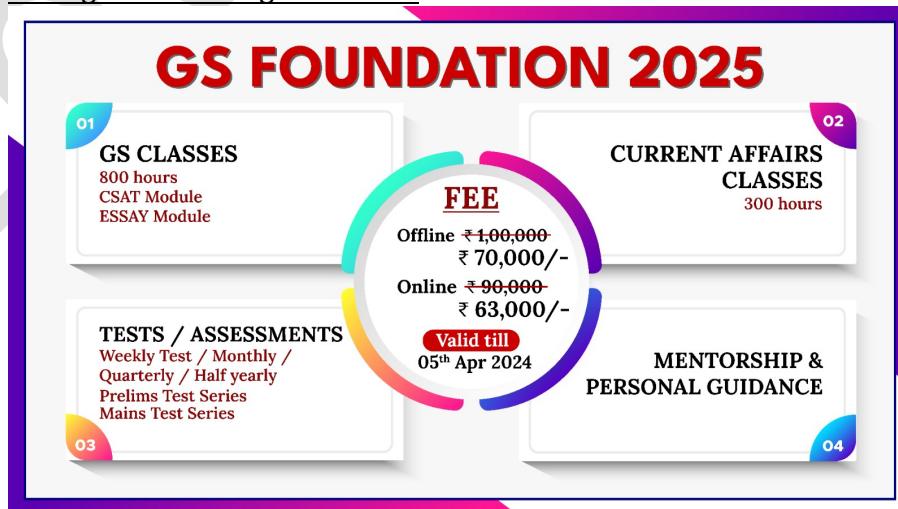
- NWAP is India's roadmap to conserving wildlife for next 15 years. This is the **third** NWAP (first in 1982 and the second in 2002)
- It was **launched Oct 2017** during the Global Wildlife Program (GWP) conference.
 - **Note:** GWP, initiated in 2015, is a World Bank led partnership of 19 countries to promote conservation and sustainable development by combating trafficking in wildlife.
- It focuses on preservation of genetic biodiversity and sustainable development.

- **Key Highlights**

- The plan adopts a "landscape approach" in conservation of all wildlife - uncultivated flora and undomesticated fauna - that has an ecological value to the ecosystem and to mankind irrespective of where they occur.
 - I.e. rather than focusing only on national parks and sanctuaries, the new strategies would be based on landscape of the region that may be limited to a reserve forest system alone.
- The plan integrates climate change into wildlife planning. This is the **first time** that India has recognized concerns relating to climate change's impact on wildlife and stressed on integrating actions that need to be taken for mitigation and adaptation into wildlife management planning process.
- The NWAP has five components, 17 themes, 103 conservation actions and 250 projects.
- **The five components are:**
 - Strengthening and Promoting the integrated management of wildlife and their habitats
 - Adaptation to climate change and promoting integrated sustainable management of aquatic biodiversity in India
 - Promoting eco-tourism, nature education and participatory management;
 - Strengthening wildlife research and monitoring of development of human resource in wildlife conservation
 - Enabling Policies and resources for conservation of wildlife in India.
- **Other thrust area in the planning**
 - Man-Animal conflict mitigation
 - Ensuring public participation in conservation
- The plan will help in mainstreaming wildlife conservation in development planning processes.
- The plan calls for increasing role of private sector in wildlife conservation. The plan lays down that the centre would ensure adequate and sustained funding including CSR funds are made available for NWAP implementation.
- The plans calls for forest rights of people living in tiger reserves and protected areas to be determined by 2020 in accordance with the forest rights act, 2006.

3) SECURE HIMALAYA PROJECT

- **About Secure Himalaya: Need of the Project**
 - Himalayan ecosystem is facing increasing degradation, fragmentation of area etc, which is further increasing due to high dependence of the local communities on the natural resources and unplanned infrastructure.
- **Details of Secure Himalaya:**
 - Launched in Oct 2017.
 - The Project **Securing Livelihoods, Conservation, Sustainable Use and Restoration of High Range Himalayan Ecosystems** (SECURE Himalaya) - is being implemented by **MoEF&CC, GoI and UNDP** with financial support of GEF.
 - It is a six year project aimed at conservation of locally and globally significant biodiversity, land and forest resources in the High Himalayan ecosystem.
 - It is part of **Global Wildlife Programme**.
 - **The key components of the project are**
 - i. Protection of **Snow Leopard** and other endangered species and their habitats
 - ii. Securing livelihood of people in the region.
 - iii. Enhancing enforcement to reduce wildlife crime.
 - iv. Strengthening community institutions
 - v. Improving knowledge, advocacy and information system for promoting landscape based conservation approaches.
 - The project is meant for **specific landscapes**. It includes Changthang (J&K), Lahaul - Pangi and Kinnaur (HP), Gangotri - Govind and Darma - Byans Valley in Pithoragarh (**Uttarakhand**) and Kanchenjunga - Upper Teesta Valley (Sikkim).
 - The project will contribute to Global Snow Leopard and Ecosystem Protection Program (GSLEP), an effort to protect the species in 12 range countries, including India.
 - **Financing**
 - It received a GEF grant of \$11.5 million, and will receive \$60 million in co-financing through the Indian government.



TARGET PRELIMS 2024

BOOKLET-43; EB&CC-12

CA UPDATES

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2. BIODIVERSITY

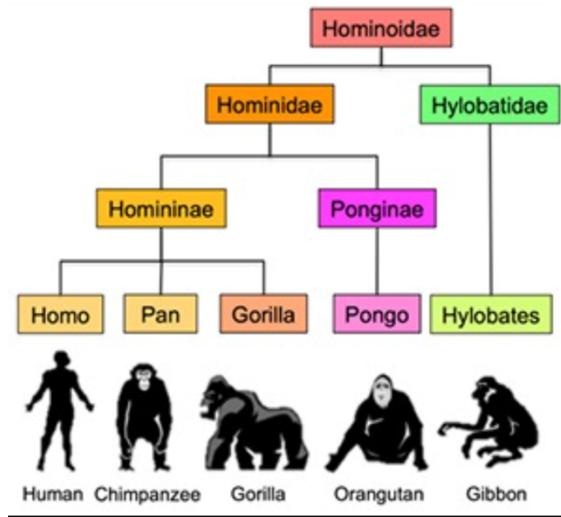
1) "MANIS MYSTERIA": NEW SPECIES OF PANGOLIN DISCOVERED IN CHINA (SEP 2023)

- A ninth species of Pangolin has been discovered through analysis of confiscated scales.
 - » **Tentative name assigned to new species:** "Manis mysteria."
- However, though the new species have been discovered, there are signs that it may be disappearing.
 - » Analysis showed genomic signature of a declining population, including low genetic diversity when compared to other pangolins. This happens because of inbreeding.
 - » **Distribution:** It remains a mystery.
 - The new species doesn't look very different from its Asian cousins, it may well have been overlooked in the wild.
- **Pangolin is amongst the most illegally traded species.**
 - » **Pangolin scales** are coveted for its use in traditional medicine, despite being made of keratin, just like fingernails.
 - » **Meat** - its meat is also considered delicacy in Asian countries.

2) GIBBONS

- Gibbons are among the fastest of all apes.
 - » Ape, (Superfamily Hominoidea), include any tailless primate of the families **Hylobatidae** (gibbons), and **Hominidae** (Chimpanzees, Bonobos, Orangutans, Gorillas, and Human Beings)
 - » Apes are distinguished from Monkeys by the complete absence of tail and the presence of appendix and by their more complex brains.
 - » **Gibbons** are referred as lesser apes.
 - » The **Gorilla, chimpanzees, bonobo, and orangutans** are called Great Apes in recognition of their comparatively large size and humanlike features.

CURRENT CLASSIFICATION SCHEME



3) HOLOCK GIBBON (CLASS: MAMMALIA; ORDER PRIMATES; FAMILY: HYLOBATIDAE)

- It is a species of gibbon found in tropical forests of southeastern Asia. It is also found in India's north-east.
- Found in India's northeast, it is one of the 20 species of gibbons found in the world and only ape found in India.
- **Estimated population** of the hoolock gibbons is 12,000.
- **Features:** Like other apes, they are intelligent, have distinct personalities, strong family bonds etc.
- They are also characterized by their vigorous vocal displays (Singing).
- **One Species, not two:**
 - **Background:** Over the decades, zoologists thought that the northeastern India housed two species of apes - The Eastern Hoolock Gibbon (Hoolock Leuconedys) found in a specific region of Arunachal Pradesh and the Western Hoolock Gibbon (Hoolock Hoolock) distributed elsewhere in the northeast.
 - **Findings of a new study:** A study led by scientists from Center for Cellular and Molecular Biology (CCMB) in 2021 proved through genetic analysis that there is only one species of apes in India. It debunked earlier research that the eastern hoolock gibbon was a separate species based on the color of its coat. The study also concluded that the two populations of the western hoolock gibbon and the assumed eastern hoolock gibbon split 1.48 million years ago.



Western hoolock gibbon

A female in the foreground, and a male in the background

Conservation status



IUCN Status:

- **Eastern Hoolock Gibbon:** VU
- **Western Hoolock Gibbon:** EN

WPA: Schedule-1

A) THE GLOBAL GIBBON NETWORK

- In 2020, on the occasion of the International Gibbon Day (24th Oct), 20 Gibbon conservation organization came together to launch Global Gibbon Network. It included IUCN Species Survival Commission (SSC) Primate Specialist Group Section on Small Apes, International Collaboration to Conserve Gibbons and Siamang, Hainan Institute of National Parks, Eco Foundation Global etc.
- **The vision of GGN** is to safeguard and conserve a key element of Asia's natural heritage: The singing gibbons and their habitats, by promoting participatory conservation policies, legislation, and action.
- The GGN had its first meeting at Haikou in China's Hainan province from 7th - 9th July 2023.
 - The meeting highlighted several threats being faced by Hoolock gibbons in India.
 - **Felling of trees** for infra project

4) CHEETAL

IUCN Status: LC

WPA: Scheduled-II (as updated in 2022)

Distribution: Native to Indian Subcontinent (India, Nepal, Bhutan, BD, SL)

Chital have also been introduced in USA, Australia etc.

State Animal of Telangana

Notable Features: Sexual dimorphism

Note: Chital has become invasive in various parts of the world.

- » It has become invasive in Andaman and Nicobar Islands.
 - It was introduced to the A&N Islands for game hunting in the early 1990s by the British, an herbivore that multiplied unchecked for years in the absence of large predators and has become an expensive and invasive problem.
 - For e.g. on Netaji Subhash Chandra Bose Island (formerly known as Ross Island), which lies east of Port Blair and doesn't have any major residential enclaves, the 500 cheetals have depleted much of the low ground vegetation. The A&N Forest Department has been spending Rs 15-20 lakh per month since the past few months to feed on the islands.
- » W.e.f 2nd Aug 2022, the EU added the Chital to the invasive list of alien species and banned its import in EU.
- » It has also become invasive on many Hawaiian Islands.



Stag



Doe

5) ELEPHANT CORRIDORS

- **Why in news?**
 - **Report: Elephant Corridors of India, 2023** by Wildlife Institute of India (WII), Project Elephant (GoI), and MoEF&CC.
- **Background:**
 - Elephant Corridor is a strip of land that facilitates the movement of elephant between two or more viable habitat patches.
 - The GoI **Elephant Task Force Report, 2010** (also known as the Gajah Report), listed 88 corridors across the country.

- India has not only identified elephant corridors, but some of the critical corridors have also been restored by the efforts of forest departments of states, MoEF&CC and NGOs. Some of these restored Critical corridors include:

- Kaniyanpura - Moyar Corridor in Bandipur landscape of Karnataka
- Chilla - Motichur Corridor in the Rajaji landscape of Uttarakhand
- Thiruneli - Kudarakote corridor in the Wayanad landscape of Kerala
- Segur elephant corridor in the Mudumalai landscape of TN
- Kuldiha - Hadgarh corridor in the Simlipal landscape of Odisha
- Edayarahalli - Doddasampige corridor in MM Hills and BR Hills landscape of Karnataka
- Mudahalli - Talavadi corridor in the BR Hills Karnataka

- **Key Highlights of the 2023 Report:**

- A total of 150 elephant corridors were reported from 15 elephant range states across the four elephant bearing regions of India.
 - » WB with 26 elephant corridors has the highest number (17%) of corridors in the country.
 - » **Landscapes (Elephant bearing region) wise data:**
 - 52 corridors in the East Central Region (nearly 35%).
 - 48 corridors in the North-eastern region (nearly 32%)
 - 32 corridors in the Southern region (21%). It has to be noted that Southern region harbors the highest elephant population in the country.
 - 18 corridors in the northern region (12%). Northern region has the smallest elephant population in the country.
 - » **84% (within state boundaries);** 13% (n=19) are interstate corridors. There were also 6 transnational corridors between India and Nepal.
- Of the 88 corridors that were listed in the Gajah report, 74 were found to be presently active with respect to elephant use.
 - » **Classification:** Elephant Corridors were classified as "active" if it was being effectively used by elephants as reported by forest departments in ground survey. It was classified as "impaired" if the elephant use was perceived to be virtually non-existent.

- **Way Forward:**

- Continuous monitoring: Delineate boundaries of the corridors and include them in respective working plans and management plans.

A) DULUNG-SUBANSIRI ELEPHANT CORRIDOR (MARCH 2024)

- The Wildlife Division of the MoEF&CC has recently directed the forest departments of Arunachal Pradesh and Assam to prepare a proposal to notify the Dulung-Subansiri elephant corridor - downstream of the 2000 MW Lower Subansiri Hydroelectricity Project.
 - The corridor is functional and of vital importance in the larger landscape for elephants.
 - It facilitates east-west movement of elephants across the Subansiri river.

- An expert committee of NBWL, which was inspecting the compliance of conditions imposed by Arunachal Pradesh government, as part of the clearance of the hydroelectric project, had recommended the notification of the elephant corridor in May 2023.
- The proposal to demarcate elephant corridor will be presented during the next meeting of the National Board of Wildlife, which is the apex government body on wildlife conservation and regulation of development projects in wildlife areas.
- Notification of the elephant corridor will involve physically marking the relevant areas used by Elephants on the ground as well as potentially notifying parts of the corridor as either a WLS or a conservation reserve.
 - If the corridor is notified a protected area, it will provide legal sanctity to it.

NATIONAL BOARD OF WILDLIFE

- A statutory body constituted through **WPA, 1972**.
- It is an advisory body that helps centre for policy decisions.
- Chaired by PM, vice chairman - Minister of Environment
- Functions
 - Advises centre on policy decisions.
 - Review all wildlife related issues, approve projects in and around national parks and sanctuaries.
 - Boundaries of NP or WLS can't be changed without permission of NBW

B) ABOUT THE 2000 MW LOWER SUBANSIRI HYDRO-PROJECT

- It is being executed by the National Hydroelectric Power Corporation (NHPC), has been in the works since 2003 and is yet to be commissioned.
- It is located in the Kamle and Dhemaji districts of Arunachal Pradesh and Assam, respectively, and is being constructed on the Subansiri River, a tributary of the Brahmaputra River
- A report from Wildlife Institute of India (WII) has pointed out that hydropeaking for power generation from the project will pose a threat of sweeping away elephants, especially calves, due to flash floods.
 - Hydropeaking refers to regulating the flow of water released from a dam to generate power, depending on demands.

6) CAPTIVE ELEPHANT (TRANSFER AND TRANSPORT) RULES, 2024

- **Background:** Under the WPA, 1972, Elephant has been kept in Schedule-1. A Schedule-1 species can't be captured and traded.
 - **Section 12** of the act allows schedule-1 animals to be translocated for 'special purposes' such as education and scientific research. They can be translocated for population management of

wildlife without harming any wild animal and collection for specimens for recognized zoos/museums.

- **Captive Elephants** because of their historical role in forest management, timber transport, presence in estates of erstwhile royal families and in temple precincts for religious purpose can be owned and therefore come under a special category. However, **strict rules guide the transfer of such elephants.**
- **Section 40(2)** of the WPA, 1972, prohibits the acquisition, possession, and transfer of a captive elephant without the written permission of the Chief Wildlife Warden of the State.
- Until 2021, the provisions explicitly said that such transactions ought not to be of a 'Commercial nature'.
- The 2021 amendment, however, allowed the transfer of elephants for 'religious or any other purposes'. This broad reason was criticized by civil society and even the Standing Committee of Parliament. But it was passed as a law.
- What do the "Captive Elephant (Transfer and Transport) Rules, 2024 say?
 - New relaxations under which captive elephants can change owners or be transferred?
 - i. Situation when an owner is no longer in a position to maintain the elephant or when a State's Chief Wildlife Warden "deems it fit and proper" to transfer the elephant in circumstances which calls for better upkeep of the elephant.
 - » Other pre-requisites for transfers within states: An elephant's health has to be ratified by a veterinarian, and the Deputy Conservator of Forests has to establish that the animal's current habitat and prospective habitats are suitable. The **Chief Wildlife Warden** on receipt of such documents may choose to reject or approve such transfer.
 - » If the transfer is taking place outside state, similar conditions apply.
 - ii. Before a transfer is affected, the "genetic profile" of the elephant has to be registered with the MoEF&CC.
 - iii. **Permission from both originating and recipient state** is required.
 - » Earlier rules required that an elephant being transferred would need permissions from Chief Wildlife Wardens of every state that the elephant passes through in the process of being ferried by road.
 - » Now, the permission only from originating and receiving states are required.
 - iv. **Conditions to be fulfilled during transfer:**
 - » The elephant must be accompanied by a mahout and an elephant assistant.
 - » A health certificate from veterinary doctor confirming fitness for transport.
 - » Proper feeding and water arrangement must be made during transport
 - » Sedative and Tranquilizers could be used to control temperamental elephants.

CHIEF WILDLIFE WARDEN (CWW)

The Chief Wildlife Warden (CWLW) is the statutory authority, under the Wildlife Protection Act, who heads the Wildlife Wing of the Forest Department and exercises complete administrative control over Protected Areas (PAs) within a state. Every PA is typically classified as a Wildlife Division and is headed by a Deputy Conservator of Forests (DCF).

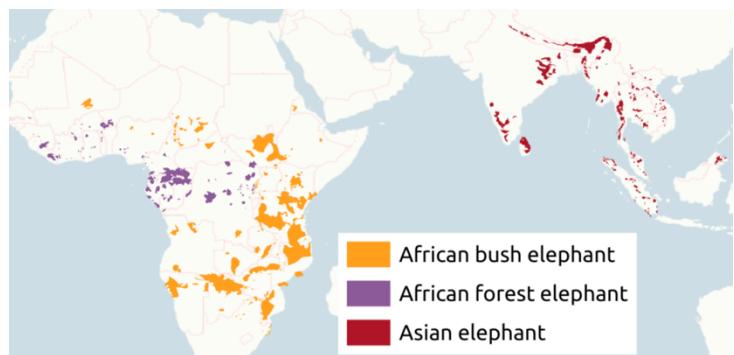
7) DNA PROFILING OF 270 CAPTIVE ELEPHANTS COMPLETED: GOI (MARCH 2023)

- In Aug 2022, while announcing the 30-year celebration of '**Project Elephant**', officials said that the DNA Profiling of elephants, which would act as the 'Aadhaar Card of captive elephants', was started. It was done for 'Gaj Soochna' mobile application for forest officials.
 - The process is being carried out in collaboration with Wildlife Institute of India.
- As of March 2023, DNA Profiling for 270 of the 2675 captive elephants in the country has been completed.
 - With the app, forest officers can identify each elephant and track it and therefore its transfer - which often takes place in case of captive elephants.
- **After the elephant profiling**, focus will be shifted to elephant care. With unique information about elephants, it will be possible to provide better medical care for them.
- **Note:** Unlike Project Tiger, the Project Elephant looks at the Welfare and Health of Captive Elephants too.

8) BOTSWANA'S ELEPHANT PROBLEM

A) AFRICAN ELEPHANTS

- African elephants are the largest animals walking the earth. Their herd wander through 37 countries. They have large ears which allow them to radiate excess heat.
 - » There are two species of African Elephants.
 - i. The Savanna (or bush) elephant
 - ii. The Forest Elephant
 - » **Savanna elephant** are larger than the forest elephants and their tusk curve outwards. They are the largest species of elephants and the biggest terrestrial animal on earth.
 - IUCN: EN
 - » **Forest** elephants are uniquely adapted to the dense forest habitat of Congo basin. They are smaller and darker; their tusks are straighter and point downwards. There are also differences in the size and the shape of the skull and skeleton between the two species.
 - IUCN: CR



B) PROBLEM OF INCREASING ELEPHANT POPULATION IN BOTSWANA

- Why in news?
 - » The President of Botswana has threatened to send 20,000 elephants to Germany in a dispute over conservation (April 2024)
- Elephant Problem in Botswana:

Botswana has the world's highest number of elephant population roughly 1.3 lakh). This is around 33% of the world's elephant.

Why does Botswana has such large population?

- **Political Stability , and small human population** has led to the country remaining safe haven for elephants. For instance, when conflict led mass poaching in Namibia and Angola began, elephants (known to be intelligent species) stopped crossing the Chobe river, preferring to stay in the safer Botswana instead.
- **Strict Conservation Policies in Botswana:** For e.g. during peak poaching period of 2013, Botswana announced a "shoot-to-kill" policy targeting suspected poachers.

So elephant population which was 10,000 in 1960s has increased to 1.3 lakh today. Around 40% of Botswana land is inhabited by Elephants.



How large population of elephants is creating problems?

- Spike in human-animal conflict: it had become a menace for country's rural communities, regularly damaging homes, damaging crops, drinking water shortage, and trampling people and cattle to death.
- **Biodiversity loss:** Elephant tear down trees for fodder and consume large amounts of water.

- What is Botswana doing to keep the population under check?
 - » **It is giving elephants to neighbouring countries** (In 2023, it gave 8,000 elephants to Angola, and in 2022 gave 500 elephants to Mozambique).
 - » It has also lifted ban on trophy hunting in 2019. Botswana argues that it not only controls elephant population but also boosts local economy with hunters from other countries, paying as much as \$50,000 for each elephant killed.
- **Concerns:** Western countries and environmental activists have questioned the above arguments as not true or negligible.
- **Botswana Germany Issue:**
 - » Early in 2024, Germany's environment ministry suggested there should be stricter limit on importing trophies from hunting animals.
 - » **Botswana is unhappy with it.** They feel that this will impoverish people in Botswana and will also hamper efforts to control population in the country. Germany is one of the largest importers of hunting trophies in the EU.

9) ATTENBOROUGH ECHIDNA REDISCOVERED IN INDONESIA (NOV 2023)

A) ECHIDNAS (SPINY ANTEATERS)

- It is a member of **monotremes** - an egg laying group that separated from the rest of the mammal's tree of life about 200 million years ago.

- **Habitat / Distribution:** Australia and New Guinea

- In Echidnas eggs are carried in a pouch on the female's belly until the young hatches, at which point the barely developed young must find a mammary gland and latch onto it for nourishment.

- Echidnas are nocturnal and shy. This makes it difficult to find them.

- Echidnas also curl into a ball and deter predators with its spines.

- **Note:** There are 4 species of Echidnas known:

- » The short beaked Echidna (*Tachyglossus aculeatus*)
 - IUCN: LC
 - Only member of the genus *Tachyglossus*).
- » Sir David's long beaked echidna (*Zaglossus attenboroughi*)
 - IUCN: CR
 - Till its sighting recently, it was not seen since 1961.
- » Eastern Long Beaked Echidna (*Zaglossus bartoni*)
 - IUCN: VU
- » Western Long Beaked Echidna (*Zaglossus bruijnii*)
 - IUCN: CR

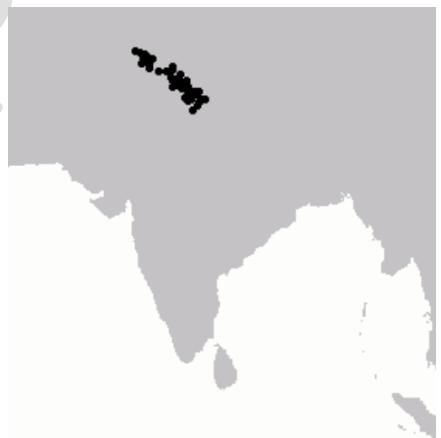
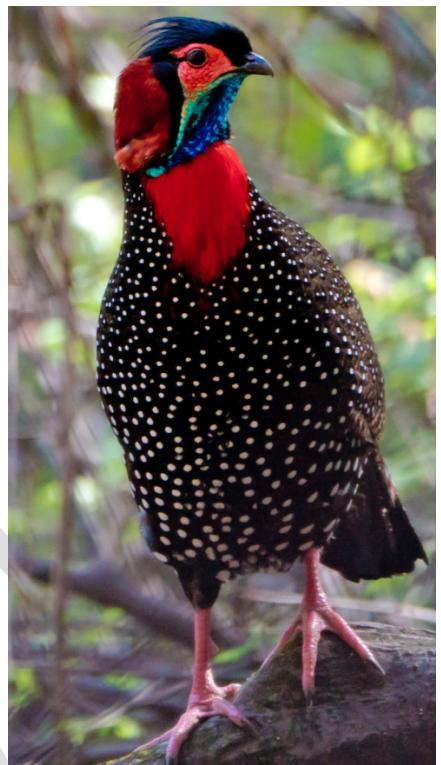


B) ELUSIVE ATTENBOROUGH ECHIDNAS REDISCOVERED IN INDONESIA (NOV 2023)

- The *Zaglossus attenboroughi*, a kind of long-beaked echidna named for famed British naturalist David Attenborough, had last been seen in 1961.
- It has never been recorded outside the extremely remote Cyclops Mountains of Indonesia's Papua region. The rediscovery has happened here only.

10) WESTERN TRAGOPAN (TRAGOPAN MELANOCEPHALUS)

- It is a medium sized pheasant found along the range of Himalayas from northwestern parts of Pakistan to Kashmir, Himachal and Uttarakhand in India.
- Like other pheasants, the species shows sexual dimorphism.
 - **Male** appears mostly dark with prominent white dots all over.
 - **Female** is brownish Grey in color with paler underparts and is finely streaked with white.
- **IUCN: VU**
- **State Bird of Himachal Pradesh.**
- **Threats:** Habitat loss, hunting, and other anthropogenic factors.
- **Captive Breeding:**
 - Because of efforts by government of Himachal Pradesh, there has been steady growth in population of the bird in captivity in the State's Sarahan Pheasantry, the conservation breeding centre. The population was 2 in 2002 and has increased to 47 individuals in 2023.
- **Next Challenge** is of re-introduction in wild.
 - In 2019, four families (Four males, four females) and a few chicks were released in two phases, one in 2020 and the other in 2021 in the Daranghati WLS in the vicinity. While most of them perished, one had not perished on records. It's a fair success as per the international scientific standards.



11) HOUSE SPARROW (PASSER DOMESTICUS) (GOURIYA IN HINDI)

The House sparrow is a bird of the sparrow family Passeridae, found in most parts of the world.

- It is native to most of Europe, the Mediterranean basin, and a large part of Asia.
- It's intentional or accidental introductions to many regions, including parts of Australasia, Africa, and the Americas, make it the most widely distributed wild bird.

Habitation: It is strongly associated with human habitation and can live in urban and rural settings.



- It feeds on the seeds of grains and weeds but is an opportunistic eater and commonly eats insects and many other foods.
- In Sanskrit it is called Chataka. But there is one other Sanskrit name called Grihabalibhuj, since it captures the nature of a house sparrow. It is a bird that feeds on offerings strewn around the house.

IUCN status: LC

- But IUCN has remarked that the population is showing declining trend.

State Bird of Delhi and Bihar

Unique Features:

- **Anting:** Birds rub insects (usually ants) on their bodies to get relief from parasites. This behaviour is known as anting. The body fluids of the ants are thought to repel parasites.

World Sparrow Day: 20th March

It is a joint initiative by the India-based **Nature Forever Society** in collaboration with the France-based **Eco-Sys Action Foundation** and other national and international organizations across the world. Since 2009, we have been observing World Sparrow Day on March 20 every year.

Note: Nature forever society was formed with a vision to involve citizens from all walks of life, diverse backgrounds and different parts of the country and the world.

Why the sparrow population decreasing in Urban Areas:

- **Not enough food and nesting sites:**
 - » **Shrinking Green Space** - Not enough food and nesting sites
 - » **Modern Urban Architecture:** For e.g. in the past, houses had ventilators (Roshandaan) and invariably sparrows or pigeons will build nest in the ventilators. Age of air conditioners have eradicated ventilators.
 - » **Vanishing Home Gardens** - which used to be a food source for sparrows.
- **Increased pesticide use:** It has reduced insects on which sparrows depended.

Goraiya Gram: It means a house of sparrow and this village for sparrows have been set up in Garhi Mandu forest, one of the four city forests in Delhi.

12) DODO (EFFORTS TOWARDS DE-EXTINCTION)

About Dodo Bird: Dodo is an extinct bird which was endemic to island of Mauritius.

- It had evolved into a **flightless bird** because of lot of food resources available on ground and absence of predators.
- Though the dodo has historically been portrayed as being fat and clumsy, it is now thought to have been well-adapted for its ecosystem.
- It used **gizzard stones** - they swallowed stones and retained them in their guts to grind away at stubborn elements in their diet.
- But Dutch Colonists first landed in Mauritius in 1598. Dodos disappeared around 80 years later. It was because it was hunted for meat and other animals such as Dogs, cats, rats etc also wreaked havoc on the defenseless dodos and their eggs.
- **The closest relative of Dodo was the also extinct and flightless Rodrigues solitaire.**



Dodo skeleton cast (left) and model based on modern research (right), at [Oxford University Museum of Natural History](#)

- The closest living relative of Dodo is the Nicobar Pigeon.

A) EFFORTS TOWARDS DE-EXTINCTION

- An ambitious project which is a collaboration between genetic engineering company Colossal Biosciences and the Mauritian Wildlife Foundation - promises to not just bring the dodo back to life, but also re-introduce it in its once native habitat in Mauritius.
- **How?**
 - » Team of scientists at Colossal have sequenced the entire genome of the dodo using DNA extracted from a skull in the collection of the Natural History Museum of Denmark.
 - This is now being compared to genome of Rodrigues Solitaire to understand the unique features of Dodo.
 - Colossal has also sequenced the gene of the Nicobar pigeon, the dodo's closest extant relative, and found its primordial germ cells (PGCs). PGCs are basically the embryonic precursors of a species' sperm and egg.
 - The Nicobar Pigeon's PGC will now be edited to express the physical traits of dodo, with the insight gathered from the comparison of the genomes of all three birds.
 - » These edited PGCs will then be inserted into the embryos of a sterile chicken and rooster, who will act as 'interspecies surrogates'. In theory when the chicken and rooster reproduce, they will give birth to a dodo offspring.
- Re-introduction will be another huge challenge: Because Mauritius of past doesn't exist anymore.

13) PENGUINS (DOMAIN: EUKARYOTA; KINGDOM: ANIMALIA; PHYLUM: CHORDATA; CLASS: AVES; ORDER: SPHENISCIFORMES; FAMILY: SPHENISCIDAE)

Penguin are species of flightless marine birds.

Distribution:

They live primarily in southern hemisphere.

The majority of species live not in Antarctica but rather between latitudes 45 degree and 60-degree S, where they breed on islands.

A few penguins also inhabit temperature regions, and one, the Galapagos penguin, live at the Equator.

Population: The total population of some species, such as emperor penguins are estimated in the hundreds of thousands, but most species of smaller penguins certainly run into millions.

Key threats:

Climate Change and rising ocean temperature

Locomotion

and

Orientation:

Penguins are adapted for



rapid locomotion in water, in which the wings, or flippers, are used for propulsion; i.e. the birds fly underwater. When moving at high speed, they frequently leave the water in leaps that carry them a metre or more through the air; It is during this time they breathe.

On land, penguins are much more awkward, even amusing, as they rock from side to side as they walk. Despite their short legs, they can run with surprising speed.

On snow or ice, many penguins "toboggan", sliding on the belly as they propel themselves with the feet and flippers.

14) EMPEROR PENGUIN

Emperor Penguin (*Aptenodytes forsteri*)

It is the largest, tallest and heaviest of all living penguins.

Distribution: It is endemic to Antarctica.

Features: Like other penguins, it is flightless, with streamlined body, and wings stiffened and flattened into flippers for a marine habitat.

Food: Fish, crustaceans such as krills, and cephalopods, such as squids.

Special Feature: it is the only penguin that breeds during the Antarctic winter. Emperor penguin trek 50-120 km over the ice to breeding colonies which can contain upto several thousand individuals. Females lay a single egg in May/June that is incubated solely by the males, but parents share the chick rearing duties.

IUCN: NT

Negative Impact of Climate Change: Antarctica's melting sea ice killed thousands of emperor penguins chicks.

- In late 2022, four out of five emperor penguin colonies located in Antarctica's Bellingshausen region experienced total breeding failure due to sea ice loss.
- Upto 10,000 emperor penguin chicks across four colonies may have died.
- **Why?**
 - Emperor penguins hatch their eggs and raise their chicks on the ice that forms around the continent each Antarctic winter and melts in the summer month.
 - If the sea ice breaks up under them, the young chicks will drown or freeze to death.
 - The sea ice disappeared before the start of the emperor Chick's fledging period, during which they develop their waterproof adult wings and learn to swim.

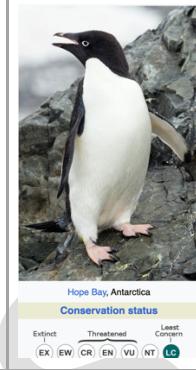


15) ADELIE PENGUIN

Adelie penguin (*Pygoscelis adeliae*) is a species of penguin common along the entire coast of the Antarctic continent. It is the only place it is found.

In March 2024, a team of researchers found 532 dead Adelie penguin, with thousands more thought to have died.

Reasons: The researchers suspect the deadly H5N1 bird flu virus killed the penguins, the field test were inconclusive. Samples have been sent to labs for more details.



16) GALAPAGOS PENGUIN

Galapagos Penguin (*Spheniscus mendiculus*): It is the most northerly of all penguin species. It inhabit the western part of the Galapagos Islands; Some organisms may occasionally venture to other islands of archipelago.

It is among the smallest of all penguins species.

Physical Features: It is a species of penguin characterized by the presence of narrow C-shaped band of white feathers, that extends beyond from the eye to the chin on each side of the head and a single band of black feathers that cuts across the large region of white feathers on the breast.



17) FISH: GHOL (BLACK SPOTTED CROAKER) (SCIENTIFIC NAME: PROTONIBEA DICANTHUS)

- It is not only considered a delicacy but is valued for its medicinal properties in many countries. **Ghol fish bladder** is among Gujarat's high value exports.
- It is a large fish, and a single fish can weigh as much as 25 kg.
- It is also known as Sea Gold for its high market value. It is also known as fisherman's lottery. As 1 kg of the bladder can fetch upto Rs 25,000 kg.
- **Distribution:** Widely distributed in the Indo-Pacific region from the Persian Gulf to the Pacific Ocean.
- **IUCN:** NT
- **State Fish of Gujarat:** In 2023, the state of Gujarat announced Ghol as their state fish during the Global Fisheries Conference in Ahmedabad.
 - Boost attempts to conserve and create awareness about the fish.

18) FISH OTOLITHS (SEA GEM)

- **Why in news?**
 - Fish Otolith ornaments make market debut (March 2024)
- **What is Fish Otolith?**
 - Fish otoliths are biomineralized ear stones. They help fish hear and provide it a sense of balance.

- They are important in fish studies as they have species shapes and grow throughout their life.
- Counting the annual growth rings on the otoliths is a common technique in estimating the age of the fish.
- They were known to Romans and Egyptians as Lucky stones and continues to be used in countries like Brazil.

Ornaments made of Otoliths now in market:

- This the first-time ornaments from fish otoliths are being produced and sold in and organized and sustainable manner.
- It has been made possible due to efforts of enthusiastic fisherwomen in Vizhinjam (Kerala), trained by scientists from Central Marine Fisheries Research Institutions (CMFRI).
 - The ornament has been crafted by fisherwomen under SHG Sea Gems Mahila Sahrudam Group. It recently went on display at Kerala Arts and Crafts Village showroom Kovalam, Thiruvananthapuram.



3. POLLUTION

1) SOLAR WASTE: REPORT

- Introduction:**
 - Solar waste** refers to waste generated during the manufacturing of solar modules and waste from the field (project lifetime)
 - E-Waste Management Rules, 2022** includes solar waste in the definition of E-waste.
- Current Situation of India:** Report: "Enabling a circular Economy in India's Solar Industry - Assessing the Solar Waste Quantum"
 - The analysis was done by MNRE and Council on Energy, Environment and Water (CEEW), a climate think tank in March 2024
 - Generation of solar waste:** 100 Kilotons in FY22-23. It is expected to reach 600 kt by 2030 (this report is referring to end of life waste)
 - The current solar capacity of India was 66.7 GW as of March 2023 which is expected to go to 293 GW by 2030.
 - Therefore, management of solar waste has to be given very high priority.
 - 5 States** - Rajasthan, Gujarat, Karnataka, TN, and Andhra Pradesh - will be responsible for around 67% of the waste produced.
 - Critical Minerals:** Discarded modules also contain critical minerals such as Silicon, Copper, tellurium, and Cadmium. These minerals have been classified as critical minerals for the country's economic development and national security.

- **Key Recommendations of the Report:**

- » **Maintain a comprehensive database; Promote Recycling; Shift towards high-value recycling:**
 - Conventional recycling involves mechanical process like crushing, sieving, and shearing of the waste. This method is able to recycle glass, aluminium, and copper, more valuable materials like silver and silicon can't be recovered through this method.
 - High value recycling involves mechanical, thermal and chemical processes, to recycle the module. It is also able to recycle silver and silicon.

2) THE SC SET ASIDE A NOTIFICATION ISSUED BY THE MOEF&CC IN 2020 THAT EXEMPTED EXTRACTION OF ORDINARY EARTH FOR LINEAR PROJECTS, SUCH AS ROADS AND RAILWAY CONSTRUCTION, FROM OBTAINING ENVIRONMENTAL CLEARANCE (EC) (MARCH 2024)

- **Background:**

- » In Sep 2006, MoEF&CC notified activities that would require prior EC.
- » In Jan 2016, another notification was issued which exempted certain category of projects from this requirement.
- » In March 2020, third notification added "Extraction or sourcing or borrowing of ordinary earth for the linear projects such as roads, pipelines etc." to the list of exempted activities.

- **Why the exemption?**

- » The general purpose of the exemption was to conform to the amendments made to the Mines and Minerals (Development and Regulation) Act, 1957 in March 2020, allowing new lessees to continue mining for two years with the statutory clearance and license issued to their predecessors.
- » The Centre also argued before the NGT that the exemption was necessary "for the aid of general public", and would help "the Kumhars (potters), farmers, gram panchayats, vajaras, oads of Gujarat".
- » Government also said that grant of exemption was a policy matter that didn't warrant judicial interference.

- **Challenge to the Exemption:**

- » The exemption was challenged before the NGT on the ground that allowing the extraction of earth indiscriminately was arbitrary and violative of Article 14 of the Constitution of India.
- » The petitioner also argued that the exemption violated the Supreme Court verdict in **Deepak Kumar versus the State of Haryana (2012)** which required for prior EC in the leases.
- » Ministry had also "circumvented the legal procedure of inviting public objections before issuing the 2020 notification by wrongly exercising its powers to do away with such requirements "under the garb of 'public interest' during the COVID-19 national lockdown.

- **NGT in Oct 2020**, asked government to "revisit" the notification within three months and held that **the ministry should strike a balance and instead of being blanket exemption**, it needs to be hedged by appropriate safeguards.

- Center sat on NGT order until the matter went to SC. After SC concluded the hearing and reserved the judgement, the MoEF&CC notified that exemption in question would be subject to the compliance of SOP and environmental safeguards issued in this regard from time to time.
- Supreme Court Verdict:
 - "Completely unguided and blanket exemption" was arbitrary and violative of Article 14 because the 2020 notification didn't even define linear projects, or specify the quantum and extraction area. This defeats the purpose of EP Act.
 - The court held that the Ministry offered no justification for concluding "that in the public interest, the requirement of public notice should be dispensed with" at any stage - neither in the notification itself or in its submissions to the NGT and SC.
 - Even the Aug 2023 notification failed to elaborate on the concept of linear projects, specify the authority responsible for environmental safeguards, restrictions on the quantum of extraction etc.
 - The court also said that it failed to understand the undue haste shown by Central government in issuing the impugned notification which was issued two days after the nationwide lockdowns was imposed.
- Past cases where these kinds of exemptions have been brought under Judicial Scrutiny:
 - In July 2021, through a notification Ministry sought to perpetuate an amnesty window opened for just six months in March 2017 to clear projects under the "violation category" and issued ex-post facto approval to more than 100 projects, until the Supreme court stayed it in Jan 2024.
 - In March 2024, the High Court of Kerala quashed a 2014 notification that exempted institutions and industrial sheds with build-up areas of more than 20,000 sq m from obtaining EC

4. CLIMATE CHANGE AND ASSOCIATED ISSUES

1) INITIATIVES TO TAKE AHEAD THE 'LIFE' – LIFESTYLE FOR ENVIRONMENT

- To take ahead LiFE movement announced by the Hon'ble PM in 2021, MoEF&CC has introduced two pioneering initiatives that indicates the country's proactive approach to climate change, sustainability, and promotion of eco-conscious practices.
- Both the programs Green Credit Program (GCP) and The Ecomark Scheme were notified in Oct 2023.

A) GREEN CREDIT PROGRAM (GCP)

- The program is a domestic voluntary market mechanism which incentivize environmental actions across diverse sectors and by different stakeholders like individuals, communities, ULBs, private sector etc.
 - Under environmental actions, 8 activities have been identified. It includes : Afforestation, Water Conservation; Sustainable Agriculture, Waste management, air pollution reduction, mangrove conservation and restoration; Ecomark (a government scheme to identify environment friendly products) and sustainable building and infrastructure.

- The environmental actions will earn Green credits and these green credits will be tradable and those earning them will be able to put these credits up for sale on a proposed domestic market platform.
- In its initial phase, the GCP focuses on two key activities: Water Conservation and Afforestation.
- **Institutional Framework:**
 - The GCP's governance framework is supported by inter-ministerial Steering Committee.
 - The Indian Council for Forestry Research and Education (ICFRE) serves as the GCP administrator, responsible for program implementation, management, monitoring and operation.
 - The Green Credit Registry and trading platform, being developed by ICFRE along with experts, would facilitate the registration and thereafter, buying and selling of Green Credits.
- **How to obtain Green Credit:**
 - **Registration of the Activity:** To obtain Green Credits, Individuals and entities must register their activities through the central government's dedicated app/website www.moefcc-gcp.in.
 - **Verification:** The administrator will verify the activity through a designated agency, with self verification for small projects.
 - **Granting of Certificate:** After completion of the verification, the administrator will grant Green Credit Certificate which will be tradable on the green credit platform.
- **How is Green Credit Initiative different from Carbon Credit Initiative:**
 - **Carbon Credit** can be claimed by reducing carbon footprint, whereas Green Credit has a much wider scope and can be claimed by various types of environment friendly activities.
 - While carbon market (carbon credit) is more focused at industry and corporations, green credit program can benefit individuals and communities.
- **How will Green Credit work in case of afforestation:**
 - Under the initiative, registered and approved entities can pay to finance afforestation in specific tracts of degraded forest, and wasteland. The actual afforestation will be carried by the forest department. Two years after planting - and following an evaluation by ICFRE - each planted tree could be worth one 'green credit'.
 - **How credits can be used?**
 - » These credits can be bought to meet obligations under Corporate Social Responsibility (CSR) and Environmental, Social, and Governance (ESG). It can also be used to meet compensatory afforestation requirements under the Forest (Conservation) Act.
 - This green credit could be used by companies which have diverted forest land and non-forest purposes and razed thousands of trees to offset some of their obligations under India's compensatory afforestation laws.
 - **Weeks** after the Union Environment Ministry announced the rules for its Green Credit Program (GCP), ten states have identified parcels of degraded forests land that will be made available for individuals, groups, public and private sector units to earn - and potentially trade - green credits.

- **Concerns:**
 - **Linking Green Credits to Compensatory afforestation** activities is even trickier as the program in essence facilitates the creation of land banks that could be easily diverted to commercial entities **and contribute to even greater level of diversion of forest land.**

B) THE ECOMARK SCHEME

- The Scheme replaces the previous notification and provides accreditation and labelling for household and consumer products that meet specific environment criteria while maintaining quality standards as per Indian norms.
 - Products accredited under the scheme will adhere to specific environment criteria, ensuring minimal environment impact.
- It will build consumer awareness; and encourage eco-conscious choices.
- It will also motivate manufacturers to shift towards environment friendly products.
- The scheme also seeks to ensure accurate labelling and prevent misleading information about the products.
- **Administrator:** The CPCB administers the eco-mark scheme in partnership with Bureau of Indian Standards (BIS), which is the national body for standards and certification.

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TARGET PRELIMS 2024

BOOKLET-44; ECONOMY-9

INDUSTRY

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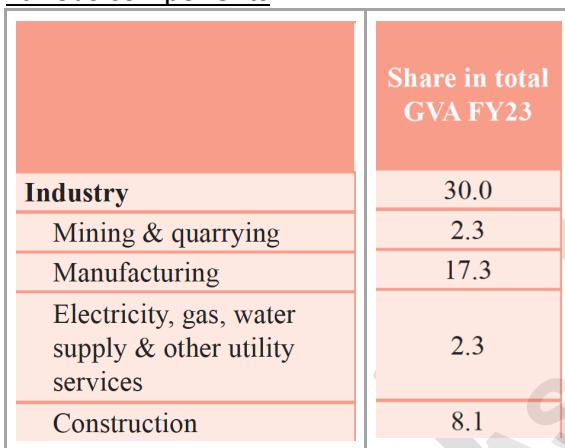
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2. 3 SECTORS OF ECONOMY

Year	Agriculture	Industry	Services
1947	55%	15%	30%
2022-23:	17%	29%	54

3. INDUSTRY

- Industrial sectors consist of manufacturing; construction; Electricity; Gas; water supply & utility; Mining & Quarrying.
- **Share of various components:**



- Industry holds a prominent position in India's economy, accounting for **31% of GDP**, on average, during FY12 and FY21 and employing over 12.1 crore people.
 - o The sector is also significant because of a number of direct and indirect linkages:
 - **Reducing reliance on imports**
 - **Multiplier effect**: Industrial growth has multiplier effect, which translates into employment growth.
 - Industries such as textile and construction have high employment elasticities.
 - Industrial sector also spurs growth in services sector such as banking, insurance, logistics etc.

1) IIP

- **Definition:**
 - o The **IIP** is a composite indicator that measures changes in the volume of production of a basket of industrial products over a period of time, with respect to chosen base year.
 - o The IIP is computed and published by the **Central Statistics Organization (CSO)** on a monthly basis, six weeks after the reference month ends.
- **Description**

- It classifies industry into Manufacturing, Mining and Electricity Sector and measures growth in production in each industry.
 - In addition, use based classification of basic goods, intermediate goods and capital goods is also available. This helps in predicting GDP growth as industry is one of the major contributors to growth.
 - The weight of the 3 categories of sectors are as follows:
 - **Manufacturing** has a higher 77.6%.
 - **Mining (14.4%)**
 - **Electricity (8%)**
 - The weight of various categories under **user-based classification includes:**
 - Primary Goods (34%)
 - Capital Goods (8.2%)
 - Intermediate Goods (17.2%)
 - Infrastructure/construction goods (12.3%)
 - Consumer durables (12.8%)
 - Consumer non-durables (15.3%)
- **Base Year:** 2011-12
- **Purpose:**
- **Policy decisions.**
 - **Crucial input for compilation of GVA** of the manufacturing sector
 - Used by financial intermediaries, policy analysts and private companies for various analytical purposes.
- **Why changes in the IIP calculation methods need to happen regularly?**
- To capture the changes in the structure and composition of the industry over time due to technical changes, economic reforms, changes in pattern of demand and supply.
- **Current Situation**
- For the month of Feb 2024, the Quick Estimates of IIP with base 2011-12 stands at 147.2.

2) ANNUAL SURVEY OF INDUSTRIES (ASI)

- It is the most important source of Industrial statistics of the registered manufacturing sector of the economy.
 - It covers all factories registered under Sections 2(m)(i) and 2(m)(ii) of the Factories Act, 1948, where the manufacturing process is defined under section 2(k) of the said act.
 - It covers all factories employing 10 or more workers using power and those employing 20 or more workers without using power.
 - It also covers Bidi and Cigar manufacturing establishments registered under the Bidi and Cigar Workers (Conditions of Employment) Act, 1966.
 - All Electricity undertakings engaged in generation, transmission, and distribution of electricity, not registered with Central Electricity Authority (CEA) are also covered under ASI.

- Units with 100 or more employees registered in the Business Register of Establishments (BRE) prepared and maintained by the State Governments as and when such lists are shared by the respective State governments.
 - **Industries excluded:** Defence establishments, oil storage and distribution depots, departmental units of railway workshops, RTC workshops, Govt Mints, sanitary, water supply, gas and storage etc., are excluded from the purview of the survey.
- The survey is conducted under the Collection of Statistics Act, 2008 as amended in 2017 and Rules framed there under in 2011.
- It is conducted by **CSO Industrial Statistics (IS) wing** and is released by MoSPI.
- It ensures timely dissemination of statistical information about dynamics of manufacturing sector.
- The data is given with a lag of two years.
- **Note:** For other categories of factories/establishments, which are not covered under the ASI, the information is collected through the unorganized sector surveys conducted by NSSO every 5 years.
- **MoSPI** has released the results of ASI for FY21 and FY22 (Feb 2024)
 - The results show resilience shown by the Indian Manufacturing Sector and tells the unique turn-around story of Indian Manufacturing sector after the COVID-19 crisis.
 - **Employment:** Marginal fall in 2020-21; It was more than compensated in 2021-22 with total estimated employment in the sector showing a robust growth of 7.0% (Y-o-Y).
 - In fact, the estimated number of persons engaged in the sector in 2021-22 has exceeded the pre-pandemic level (i.e. 2018-19) by more than 9.35 lakh.
 - **States:**
 - In terms of GVA, Maharashtra is ranked-1 in FY22 and Gujarat is ranked-2 in FY22. These states are followed by Tamil Nadu, Karnataka and Uttar Pradesh.

3) IIP VS ASI

- **IIP is monthly indicator whereas ASI is a long-term industrial statistics.** It is used to track the health of the industrial activity in the economy over a longer period.
- The index is compiled out of a much large sample of the industries compared to IIP.

4) PURCHASING MANAGER'S INDEX (PMI)

- **What is Manufacturing PMI?**
 - An indicator of the economic health of the manufacturing sector. It predicts the level of industrial production in advance.
 - It is based on five major indicators.
 1. New orders
 2. Inventory levels (stocks of items purchased)
 3. Backlog of work
 4. Suppliers' delivery times
 5. Employment levels

- The **purpose** of the PMI is to provide information about current business condition to company decision makers, analysts and purchasing managers.
- How is info collected?
 - Monthly surveys sent to purchasing executives at approximately 400 manufacturers.
- What does the indicator mean?
 - PMI > 50: Expansion of manufacturing compared to previous month.
 - PMI = 50: No change
 - PMI < 50: Contraction of manufacturing compared to previous month.
- **Famous Manufacturing PMI's of India**
 - S&P Global's Manufacturing PMI
- **Beginning:** It was started by the US-based Institute of Supply Management in 1948. Over the years it has become one of the most closely watched indicators of business activity across the world

4. INDUSTRY-CORE SECTOR

1) THE COMBINED INDEX OF EIGHT CORE INDUSTRIES (ICI)

- The ICI measures the collective and individual performance of production in select eight core industries.
 - These eight industries comprise 40.27% of the weight of items included in the IIP.
 - It is compiled and released by Office of Economic Advisor, DIPP, Ministry of Commerce and Industry.
 - » **Base Year: 2011-12.**
 - » **Weights of different sectors:** Coal (10.33%), Crude Oil Production (8.98%), Natural Gas (6.88%), **Refinery Products (28.04%)**, Fertilizers (2.63%), **Steel (17.92%)**, Cement (5.37%) and **Electricity (19.85%)**.
 - ICI for a reference month is released with a time lag of 1 month, a fortnight prior to release.
- **Updates:**
 - ICI increased by 6.7% (provisional) in Feb 2024 as compared to the Index of Feb 2023.

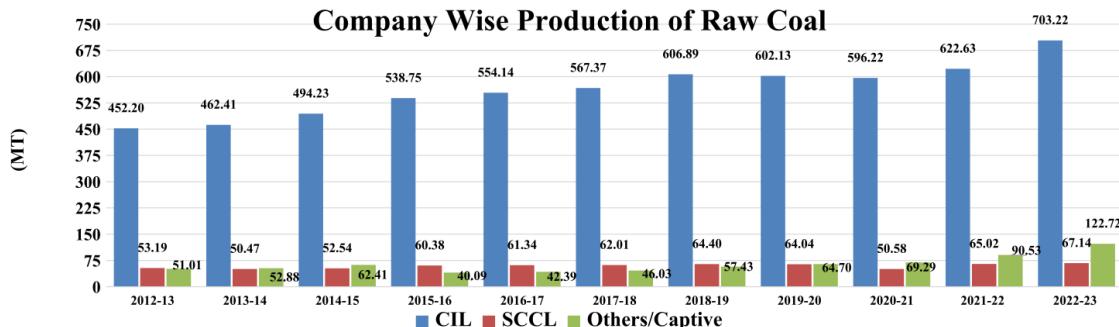
2) COAL INDUSTRY

- **Coal** is the most important and abundant fossil fuel in India. It accounts for 55% of the country's energy need.
- **India will continue to rely on coal for foreseeable future:**
 - » **Surging power demand in India:** As per the latest World Energy Outlook published by International Energy Agency (IEA), India will witness the largest energy demand growth of any country or region in the world over the next 30 years.
 - » **Renewable** only contributes to 22% of energy being produced in the country. Fossil fuels (mainly coal) still provide for 75% of India's power supply.
 - **Issue of intermittency** in the renewable sector.
- **Coal power dependency is also growing globally:**

- » For e.g. as per a report by US-based think-tank, Global Energy Monitoring, - coal fired powerplant capacity grew 2% last year, the highest annual increase since 2016.

A) COAL PRODUCTION IN INDIA

- In recent years, India's coal production is on increasing trend (except 2020-21)



Year	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Total Production (Million tonnes)	609.18	639.23	657.87	675.40	728.72	730.87	716.08	778.20	893.08

- The All-India Production of Coal during 2022-23 was **893.19 MT** with a positive growth of 14.77%.
 - » Coal India Limited (CIL) produces around 78% of coal in India.
 - » Singareni Collieries Company Limited (SCCL) around. 8% of coal production in the country.
 - » Captive and others are responsible for more than 14% of the production.

B) COAL IMPORT

- As per the present import policy, coal can be freely imported (under Open General License) by the consumers themselves considering their needs based on their commercial considerations.
- **Coking Coal** is being imported by Steel sector mainly to bridge the gap between requirement and indigenous availability and to improve the quality.
 - » Note: Coking Coal (also known as metallurgical coal) is a grade of coal that can be used to produce good-quality coke. Coke is an essential fuel and reactant in the blast furnace process for primary steelmaking.
- Other sectors like Power Sector, cement, etc. and coal traders are importing non-coking coal.

Coal	2019-20	2020-21	2021-22	2022-23	2023-24*
Coking Coal	51.83	51.20	57.16	56.05	48.29
Non-Coking Coal	196.70	164.05	151.77	181.62	172.20
Total Coal Import	248.53	215.25	208.93	237.67	221.19
Coke	2.88	2.46	2.48	3.63	3.21

*Import upto Jan, 2024 (Source:-DGCI&S)

NEW US SANCTIONS ON MOSCOW AND IMPACT ON INDIA'S IMPORT OF COAL FROM RUSSIA (FEB 2024)

- Russia was historically a minor exporter of fuel to India. But this changed after western sanctions against Moscow over its war in Ukraine.
- **New US Sanctions** are more likely than previous ones to cut Indian imports of thermal coal from Russia because they specifically cite top exporters SUEK (Russia's largest coal producer and exporter) and Mechel. It also includes Russia's payment system, financial institutions and energy production.
 - **Indian conglomerates** JSW Group, Vedanta and consortium Arcelor Mittal Nippon Steel India were among the biggest importers of Russian thermal coal in the last six months.

C) MINISTRY OF COAL AND COAL PSUS

- MoC has the overall responsibility of determining policies and strategies in respect of exploration and development of coal and lignite reserves, sanctioning of important projects of high value and for deciding all related issues.
- **Three PSUs** come under the Ministry.
 - a. **Coal India Limited (CIL)**
 - » A 'Maha Ratna' company under the Ministry of Coal, with headquarter at Kolkata, WB.
 - » It is the single largest coal producing company in the world and one of the largest corporate employers with a manpower of 3,46,638.
 - » In **FY24**, Coal India Limited (CIL) has surpassed its annual supply target of 610 MT to the thermal power sector, achieving 610.8 MT till 27th March 2024.
 - It's coal supply to the sector rose by 29.3 million tonnes in absolute volume terms compared to the corresponding period last fiscal.
 - b. **Neyveli Lignite Corporation Limited (NLC)**
 - » A 'Navratna' with registered office at Chennai and corporate office in Neyveli in TN.
 - c. **Singareni Collieries Company Limited (SCCL)** which is a joint sector undertaking of Government of Telangana and Government of India with an equity capital ratio of 51:49.

D) COAL CONTROLLER ORGANIZATION (CCO)

- It is a subordinate office of the Ministry of Coal, having its headquarter at Kolkata and field offices in Dhanbad, Ranchi, Bilaspur, Nagpur etc.
- It collects and maintains coal production data of all private and public sector coal mines in the country. The info is collected on a monthly basis.
- **History:**
 - » Office of Coal Controller (earlier Coal Commissioner) was established in 1916. It is one of the oldest offices in Indian coal sector.
 - The mains aim was to have government control over coal production to adequately meet the coal requirements during World War-1.
- **Functions and Responsibilities:**
 - » Inspection of collieries to ensure the correctness of the class, grade or size of coal.

- » To issue directives for the purpose of declaration and maintenance of grades of coal of a seam mined in a colliery.
- » To act as the appellate authority in case of dispute between consumers and owner arising out of declaration of grade and size of coal.
- » To regulate disposal of stock of coal or the expected output of coal in the colliery.
- » Quality surveillance with respect to maintenance of grade, loading of coal in wagons/ trucks according to laid down procedures regarding grades and sizes.
- » To grant opening / re-opening permission of coal mine, seam or a section of seam or to subdivide a mine.
- » Assessment and collection of excise duty levied on all raw coal raised and dispatched.
- » Submission of monthly coal data to different ministries of central and state governments, national and international organisations

E) COAL DEPOSITS IN INDIA (FROM INDIA YEAR BOOK)

- Coal Reserves (308.80 billion tonnes) of coal reserves have been estimated by Geological Survey of India. The reserves have been found mainly in Jharkhand, Odisha, Chhattisgarh, West Bengal, Madhya Pradesh, Telangana and Maharashtra.
- Lignite Reserves (44.59 billion tonnes) have been estimated by GSI. The major deposits are located in Tamil Nadu, followed by Rajasthan, Gujarat, Kerala, West Bengal, Jammu & Kashmir and UT of Puducherry.

F) TYPES OF COAL:

- The degree of change undergone by a coal as it matures from peat to anthracite is known as coalification. Coalification has an important bearing on coal's physical and chemical properties and is referred to as rank of the coal. Ranking is determined by the degree of transformation of the original plant material to carbon. There are four main categories of coal which differ in heating value, carbon content, Sulfur levels, and moisture contents. The ranks of coals, from those with the least carbon to those with the most carbon, are lignite, sub-bituminous, bituminous and anthracite.
 - Peat is a layer of vegetable material directly underlying the growing zone of coal forming environment. The vegetable material shows very little alteration and contains roots of living plants.
 - » Uses
 - Peat is widely used as domestic fuel in rural parts of Scotland and Ireland.
 - Lignite or Brown Coal, (lowest carbon content of 25-30%). It is the youngest coal type geologically, makes up the largest portion of the world's coal reserves. It is brown and can be soft and fibrous, containing discernible plant material. However, lignite has very high moisture and ash content and low energy content.
 - » Uses
 - It is used almost exclusively for electric power generation.
 - Jet a compact form of lignite, is sometimes polished and has been used as an ornamental stone since the upper Paleolithic.
 - Sub-bituminous Coal (35-45% carbon) is a dull black coal with a slightly higher heat value than lignite. Despite its low heat value, it has lower sulfur content and is clean to burn.
 - » Uses:
 - It is used primarily as fuel for steam electric power generation

- Important source for light aromatic hydrocarbons for the chemical synthesis industry.
- **Bituminous Coal or soft coal (45-86% carbon)** : Older than subbituminous coal, dense sedimentary rock, usually black, but sometimes dark brown.
 - » **Uses**
 - Primarily as fuel in steam electric power generation
 - Substantial quantities used for heat and power applications in manufacturing and to make **coke**.
- **Anthracite (86-98% carbon)**, highest rank of coal, is a harder, glossy black coal. Low in volatile matters which can form tars, oils and gasses when heated. Only a small percentage of the overall market.
 - » **Uses**
 - Primarily for residential and commercial space heating
- **Graphite (100% technically)**, technically the highest rank coal, difficult to ignite and is not commonly used a fuel.
 - » **Uses**
 - It is mostly used as pencils.
 - When powdered, also used as Lubricant.

3) OPENING UP OF COMMERCIAL COAL MINING

- **Background**
 - » **Nationalization of Coal Mines, 1973**
 - Coal Mines (Nationalization) Act, 1973 nationalized all the coal mines in India.
 - **Why?**
 - Adequate investment needs in the coal mining sector were not fulfilled by the private sector.
 - Unscientific mining practices adopted by some private miners and poor working conditions of labour in some of the private coal mines became matters of concern for the government.
 - So, since 1970s, **Coal India** had the monopoly over mining and selling of coal in India. It accounted for 80% of the country's coal supply. Another public sector company is Singareni Collieries, a venture of Coal India and the Telangana (earlier Andhra) government.
 - The rest of the requirement is met through **import** and **production from captive mines by private players**.
 - These coal mines were allocated on recommendation basis (not auction) only for their specific use (also called Captive Mining)

- **In Sep 2014, Supreme Court cancelled 214 coal block allocations since 1993.**
 - » The 4 allocation which were not cancelled included government run blocks on non-Joint-venture basis.
 - » **The Coal Mines (Special Provisions) Act, 2015** passed in March 2015, contained provisions enabling government to allocate coal mines through auction. This thus theoretically opened coal mining sector in theory to private sector.

- **In Feb 2018, Cabinet approved bidding process for Commercial Coal Mining: Key features:**
 - » Ascending forward auction on an online platform where the bid parameters will be the price offer in rupees per tonne, which will be paid to the state government on the actual production of coal.
 - No share for centre from commercial mining.
 - » **No restriction on sale and/or utilization** of the coal from mine.
 - » **No cap on price and type** of coal.
- **100% FDI allowed in Coal mining through automatic route in commercial coal production (Aug 2019)**
- **Government unveils auction process for Coal Mines (June 2020)**
 - » This marks the full opening of Commercial coal mining for the private sector through auction and ends seven decades of restrictions.
 - Commercial Coal Mining Auctions are completely different from the earlier regime of restricted sectors, use and price. Now there is no such restrictions.
- **Terms and conditions** of the auction are also **very liberal**.
 - » New companies (without prior experience) in coal mining can participate.
 - » Reduced upfront amount.
 - » Adjustment of upfront amount against royalty
 - » Liberal efficiency parameters.
 - » 100% FDI through automatic route allowed.
 - » Reasonable financial terms and revenue sharing model based on National Coal Index

4) NATIONAL COAL INDEX (NCI)

- **National Coal Index (NCI):**
 - » The NCI is a price index which reflects the change of price level of coal on a particular month relative to the fixed base year. The base year for the NCI is FY 2017-18.
 - » It has been created by combining the prices of coal from all the sales channels - Notified prices, Auction Prices and Import Prices.
 - » The index is meant to encompass all transaction of raw coal in Indian market. This includes coking and non-coking coal of various grades transacted in the regulated (power and fertilizer) and unregulated sector.
 - **Note:** Washed coal and coal products are not included.
 - » It was first rolled out in June 2020.
 - » It consists of **five subindices**: three for non-coking coal and two for coking coal.
 - The three subindices for non-coking coal are combined to produce index for Non Coking coal and the two sub-indices for Coking coal are combined to arrive at the Index of Coking coal.
 - **Thus, Indices are separate for coking and non-coking coal.**
 - » The NCI is released every month.
- **The concept and design of the index** as well as the Representative Prices have been developed by the Indian Statistical Institute, Kolkata.

- **Purpose**

- » Ministry of Coal has started **commercial auction of coal on revenue share basis**. The amount of revenue share per ton of coal produced from auctioned blocks would be arrived by using the NCI by means of defined formula.
- » Thus, NCI will truly reflect the market price.

5) OTHER RECENT REFORMS/INITIATIVES IN COAL SECTOR

i. **Scheme for Harnessing and Allocating (Coal/Koyla) Transparently in India (SHAKTI) Policy:**

- Launched in May 2017
- **Need:**
 - Before SHAKTI, coal supply to thermal power plants (TPPs) were done according to New Coal Distribution Policy (NCDP), 2007. CIL had provided Letter of Assurance (LOAs) for around 1,08,000 MW capacity by 2010 and after that no new LOAs were issued due to prevailing scarcity scenario.
 - In 2013, CCEA's decision directed CIL to sign Fuel Supply Agreement (FSA) with TPPs of around 78,000 MW.
 - So, the remaining 30,000 MW plants were lacking fuel supply agreement and thus awaiting fuel supply.
- **Aim:** Promoting transparency and competition in the allocation of coal mines. It is applicable to all coal-based power plants in the country.
- **Key Provisions of the Policy**
 - **Right to fuel produced by Coal India/SCCL** for thermal capacities in the private sector which are equipped with long term PPAs.
 - The policy prescribes direct linkage allocation to public-sector plants and reverse auction for supply of coal linkages to private players.
 - **Coal linkages is awarded to designated state-owned power distribution companies (DISCOMS).**
 - State or central power generation companies would be assigned linkages via allocation.
 - The firms (independent power producers (IPPs)) with PPAs based on domestic coal will participate in the auction and will bid for discount on existing tariff. This is expected to result in a win-win situation of IPPs having a long-term supply security of coal from a source of their choice while consumer will benefit from a lower tariff.
 - Firms without PPAs shall be bidding for linkage over the notified price of the coal company (i.e. they will bid for fuel linkages with CIL's notified price serving as the reserve).
- By FY2023, 209.614 million tonnes coal linkages have been booked/ allocated under different provisions of SHAKTI Policy.

ii. **New sub-sector under the Policy for Auction of coal linkages of Non-Regulated Sector (NRS):-** A new Sub-sector 'Production of Syn-Gas leading to coal gasification' has been created in 2022 under the NRS linkage auctions in order to encourage coal gasification technology so that new consumers requiring

coal for gasification are incentivized. This will also mitigate the adverse impacts of the conventional use of coal on the environment.

- iii. **Single window for e-auction of coal:** - Government has recently approved a new mechanism for e-auction of coal by the coal companies. The erstwhile sectoral e-auction windows of Coal India Limited has been done away with and henceforth, all the non-linkage coal of the coal companies would be sold through one e-auction window of Coal India Limited / Singaren Collieries Company Limited. This single e-auction window will cater to all the sectors like power & nonregulated sector included traders. Therefore, coal of any particular grade would be sold in the market to all consumers at one rate (**one nation – one coal grade- one rate**).
 - It will remove market distortions. It will increase operational efficiencies and lead to an increase in domestic coal demand.
- iv. **Amendment to NCDP:** To promote optimum utilization of coal resources in the national interest, enabling provisions have been made by way of amendment to the New Coal Distribution Policy (NCDP), 2007, in order to allow the coal produced from Closed / Abandoned / Discontinued mines of CIL / SCCL to be sold through a transparent and objective manner as per the guidelines issued by Ministry of Coal from time to time.
- v. **Coal linkages for gasification plants of the coal companies:** CIL / SCCL have been allowed to provide long term allotment of coal to their own gasification plants at prices as may be decided by the coal company. This move will encourage coal gasification technology in the country and will help in early establishment of this new use of coal.
- vi. **Mission Coking Coal:**
 - **Understanding Coking Coal:** Metallurgical coal or Coking coal is a grade of coal that can be used to produce good quality coke. It is an essential fuel and reactant in the blast furnace process of steel making. The demand for coking coal is coupled with demand for steel.
 - **Domestic Coking Coal** is high ash coal (mostly between 18% - 49%) and is not suitable for direct use in blast furnace. Therefore, Coking coal is washed to reduce the ash percentage and is blended with imported coking coal (<9% ash) before utilization in blast furnace.
 - **Imports:** About 50 MT coking coal is imported by the country on an annual basis and the value of coking coal imported in FY2020-21 was Rs 45435 crores.
 - **Inter-ministerial committee** including stakeholders from industry to strategize augmentation of coking coal production in India submitted its recommendations. Based on this, Ministry of Coal has set up Mission Coking coal to evolve a roadmap for increasing production and utilization of domestic coking coal.

5. CRUDE OIL AND PRODUCTS

1) PRODUCTION

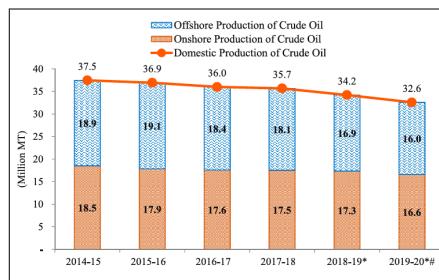
- **India's total Crude oil Production** (on-shore and off-shore production) was **29.18 million metric tonnes (MMT)** in FY22-23.

- India's oil production is one of the lowest among the major economies of the world and has been declining over a period of time.

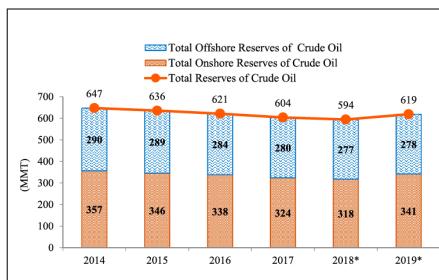
» It has seen a continuous decline since 2014.

- Why? -> Natural decline and ageing and matured fields and no major discoveries.
- » Proven reserves have decreased concurrently since 2014, with the steeper fall in onshore reserves. This fall has seen a reversal in 2019.

(a) Production of Crude Oil



(b) Reserves of Crude Oil



Source: Ministry of Petroleum and Natural Gas and Economic Survey calculations.

2) IMPORTS

- India is the **third largest oil importer and consumer**, shipping in about **85% of its crude needs** and **relies heavily** on the middle east.
- » **India's total import in FY23 was 140 million tonnes.**

Spot Cargoes vs Term Cargoes:

» India purchases crude oil from the Middle East through term contracts, and with Russia through the spot market.

- **Term Contracts** are finalized on a yearly basis, and this is done with National oil Companies (NoCs), while the balance is covered by spot tenders.

- **Advantages of Term Contract:** Stability in price and supply

- **Advantage of Spot market:**

- **Flexible purchases** to meet varying seasonal/market demand and to meet operational exigencies.
- **Competitive purchase opportunities** -> if price drops in the market
- **Explore new crude oil grades** from diverse geographies.
 - There are many grades where term contracts are not available.

» India imported 49.6 million tonnes from the spot market (35.13% of imports) and 91.6 million tonnes using term cargoes (64.87%).

- Since 2018, India has increased its dependency on spot contract.

Diversification of Crude Oil Sources:

» Oil PSUs have started importing crude oil from the US, Canada, Russia, Australia, Brazil, Guyana, Norway, Egypt, Ghana, Congo, Equatorial Guinea, Libya, Nigeria, etc. and have diversified its crude supply.

Oil Imports from Russia:

- » In the first half of FY24, the share of Russian oil in India's overall import rose to 40%, consolidating Moscow's position as the top supplier as refiners curbed purchase from middle east.
- » Though, the imports from Russia have started decreasing in the 2nd half of FY24.
 - In Jan 2024, India's Russian import of oil fell to a 12-month low.
- India's imported 21.4 million tonnes crude oil in Jan 2024 - the highest in last 20 months (since April 2022)
 - » **Reasons:** Increasing domestic consumption and rising export demand for export products.
 - » In Jan 2024, India also received first cargo of Venezuelan oil after a gap of three years, as the US eased sanctions on the south American producer.

3) VARIOUS CRUDE OIL BENCHMARKS

- **Intro: Various characteristics of Crude**
 - There are different types of Crude oil - the thick, unprocessed liquid that drillers extract below the earth - and some are more desirable than others.
 - » For instance, it's easier for refiners to make gasoline and diesel fuel out of low-sulfur, or "sweet" crude that oil with high sulfur concentration.
 - » Low-density, or "light" crude is generally favorable to the high density variety for the same reasons.
 - » Where the oil comes from also makes a difference - transport cost
- **The main benchmarks**
 - There are dozens of different oil benchmarks, with each one **representing crude oil from a particular part of globe**. However, the price of most of them are pegged to one of the three primary benchmarks.
 - i. **Brent Blend**
 - Two-third of the all crude contracts around the world reference Brent Blend making it most widely used oil marker of all
 - These days, "Brent" actually refers to oil from four different fields in the North Sea: Brent, Forties, Oseberg and Ekofisk.
 - Crude oil from this region is light and sweet, making it ideal for refining of diesel fuel, gasoline and other high demand product.
 - Also because supply is waterborne, it is easy to transport to distant locations.
 - ii. **West Texas Intermediate**
 - WTI refers to oils extracted from the wells in the US and sent via the pipeline to Cushing, Oklahoma. The fact that supplies are land locked is one of the drawbacks - its relatively expensive to ship.
 - The product itself is sweet and light, making gasoline refining very easy, in particular.
 - It continues to be the main benchmark for oil consumed in US.
 - iii. **Dubai/Oman**

- The middle eastern crude is a useful reference for oil of a slightly lower grade than WTI or Brent.
- A "basket" product consisting of crude from Dubai, Oman or Abu Dhabi, it's somewhat heavier and has higher sulfur content, putting it in the sour category.
- Dubai/Oman is the main reference for Persian Gulf oil delivered to the Asian market.



- **Russian Oils:**

- **Urals**

- Russia produces several types of crude oil, but its main export blend is Urals, which is a medium sour crude. Other grades include Siberian Light, Sokol, Sakhalin Blend, Arctic Oil, and Novy Port.

4) STRATEGIC CRUDE OIL RESERVE PROGRAMME

- **Background**

- » The erstwhile Planning Commission in its Integrated Energy Policy, 2006, identified supply market and technical risks as major threats to India's energy security and recommended to "maintain a reserve equivalent to 90 days of oil imports for strategic-cum-buffer- stock purposes".

- **Need of strategic petroleum reserve**

- » Potential Supply crisis -> West Asia is very volatile, tension between major powers etc.
 - » Price Fluctuations -> A situation like 1970s is very harmful for economies.
 - » Exchange rate fluctuations

- **Crude Oil Storage facilities**

- » These are underground rock caverns. The rock must be strong enough for the cavern to be stable. A wide range of rock types are suitable, such as igneous (granite, diorite), metamorphic (gneiss, schists) and even sedimentary rocks (sandstones, limestone, chalk, shale)

- » **Why underground caverns**

- Safety from hazard of leakage.
 - Lower capital cost and lower operating cost compared to conventional tanks
 - Inherent safety over the above ground storage systems

- Safety from natural calamities and various forms of sabotage.
- **Locations**
 - » Mostly coastally located - as imports are easy and suitable refinery capabilities.
- **Strategic reserves in India**
 - » State owned Special Purpose Vehicle (SPV), India Strategic Petroleum Reserve Limited (ISPR) has established Strategic Petroleum Reserve (SPR) facilities with total capacity of 5.33 million Metric Tonnes (or 39 million barrels) at **3 locations** under Phase-1.
 - **Vishakhapatnam** (1.33 MMT)
 - **Mangalore** (1.5 MT)
 - **Padur** (Uduppi district, Karnataka) (2.5 MT)
 - Taking advantage of low crude oil prices in April/May 2020, the Strategic petroleum reserves were filled to full capacity. This led to national saving of around Rs 5,000 crores.
 - » **In 2021**, government has approved the establishment of two additional commercial-cum-strategic facilities with total storage capacity of **6.5 MMT** at Chandikhol and Padur on PPP Model.
 - **Chandikhol** (Odisha) (4 MMT)
 - **Padur** (2.5 MMT).
 - » **In 2024**, ISPR has invited bids for constructing 2.5 million tonnes of underground storage at Padur in Karnataka.
 - Bids are due on 22nd April 2024 and tender is to be awarded by 27th June 2024.
 - » **The entire facility will be owned by Gol.**
 - The Concessionaire shall transfer the SPR with Single Mooring Point (SPM), onshore and offshore pipeline to the Gol, at the end of the 60 years of concession period.
 - Gol will also have the first right to take the oil in case of the Oil Shortage Event.
- **For how many days can India be served by these strategic reserves:**
 - » As per the consumption pattern of 2019-20, the **total capacity in first phase** (5.33 MMT) is estimated to provide for about **9.5 days of crude oil requirement**.
 - » Further, the **oil marketing companies** have a storage capacity of **64.5 days** requirements.
 - » The **Phase-2 reserves** with a total capacity of **6.5 MMT** will be able to serve 12 days of India's requirement.
- **Updates: India hold back \$600 million strategic oil reserve top-up: (Jan 2024)**
 - » It has been done due to market volatility and the prospect of further decline in prices.
 - » Government has decided to lease out around 1 million tonnes of vacant strategic crude oil storage capacity to Indian and International Companies, instead of spending government money on filling up the available capacity in the caverns.

6. MINING SECTOR

1) THE MINES AND MINERALS (DEVELOPMENT AND REGULATION) AMENDMENT ACT, 2023

- Amends the 1957 act.
- The act specifies the condition for getting mining and prospecting license.
- **Other Recent Amendments:**
 - » It was comprehensive amended in 2015 to bring several reforms in the mineral sector, notably, mandating method of auction for grant of mineral concessions to bring transparency in allocation of mineral resources; for establishing District Mineral Fund (DMF) for the welfare of the people and areas affected by mining; Establishment of National Mineral Exploration Trust (NMET) to give thrust to exploration and for ensuring stringent penalty for illegal mining.
 - » The act was further amended in 2016 and 2020 to address emergent issues.
- It was again amended in 2021, to bring further reforms in the sector, such as, removing the distinction between captive and merchant mines, transfer of statutory clearances to ensure continuity in mining operations even with changes of lessee, removing the restrictions on transfer of mineral concessions, lapsing of rights of non-auctioned concession holders which have not resulted in mining leases to ensure that concessions to private sector are only granted through auctions etc.
- **Key changes by 2023 Amendment:**
 - » **Reconnaissance to include sub-surface activities:**
 - **Before amendment** the act defined reconnaissance operations as operations undertaken for preliminary prospecting and includes (i) aerial surveys (ii) geophysical surveys, and (iii) geochemical surveys. It also includes geological mapping. But it prohibited pitting, trenching, drilling, and subsurface excavation as part of reconnaissance.
 - **The amendment** allows these prohibited activities.
 - » **Introduction of a new type of mineral concession called Exploration License (EL) for Specified Minerals:**
 - **Before amendment**, the act provided for a reconnaissance permit, a prospecting license, a mining lease, and a composite license for prospecting and mining.
 - **Amendment** introduces an exploration license, which will authorise either reconnaissance or prospecting, or both activities for specified minerals.
 - The exploration license can be issued for 29 minerals specified in 7th schedule.
 - These include gold, silver, copper, cobalt, nickel, lead, potash, and rock phosphate.
 - These also include six minerals out of 12 which were earlier classified as atomic minerals under the Act:
 - (i) Beryl and other Beryllium mineral, (ii) Lithium, (iii) niobium, (iv) titanium, (v) tantalum, and (vi) zirconium
 - **Note:** The amendment has omitted 6 minerals from the list of 12 atomic minerals specified in Part-B of the First Schedule of the Act:

- These six minerals have various application in renewable energy sector, space sector, electronic sector and are **critical in net-zero emission commitment of India.**
 - **Impact:** Removal of these minerals from the list of atomic minerals will open up the exploration and mining of these minerals to private sector.
 - **Note:** Unlike other minerals, the prospecting and mining of atomic minerals is reserved for government entities under the act.

- **Central Government, through rules,** will prescribe the details such as manner of auction, term, conditions, bidding parameters etc. The **state government**, through competitive bidding will grant the license.

- **Validity of exploration license** will be **5 years** (extendable by 2 years by application to state government (after completion of 3 years, but before the expiry of license)).

- **Maximum Area in which activity can be conducted:**
 - Under the act, a prospecting license allows activities in **area upto 25 sq km**; a single reconnaissance permit allows activities in area upto 5,000 sq kms.
 - **Amendment** allows activities under a single exploration license in area upto 1,000 sq km.

- **Submission of geological reports regarding findings** within three months of the completion of the operations or expiry of the exploration license is a must.

- **Incentive for exploration licensee:** If the resource are proven by exploration, the state government must conduct an auction for mining lease within six months of the submission of the report by the exploration licensee. The licensee will receive a share in the auction value of the mining lease for the minerals prospected by them. The shares will be prescribed by the central government.
 - If auction doesn't happen in six months, the state government will pay to exploration licensee an amount prescribed by the central government.

- **Significance:**
 - » The proposed EL would facilitate, encourage, and incentivize private sector participation in all spheres of mineral exploration for critical and deep-seated minerals. This will lead to introduction of new technology, finance, and expertise in exploitation for deep seated and critical minerals.

- **Central government has been empowered to exclusively auction some critical and strategic minerals:**
 - » Under the act, auction of concession is undertaken by the state governments, except in certain specified cases.
 - » The amendment empower the central government, to exclusively auction mining leases and composite license for certain critical minerals viz., molybdenum, rhenium, tungsten, cadmium, indium, gallium, graphite, vanadium, tellurium, selenium, nickel, cobalt, tin, platinum group of elements, minerals of "rare earth" group (not containing

Uranium and Thorium); **fertilizer minerals** such as potash, glauconite and phosphate (without uranium) and minerals being removed from the list of atomic minerals.

» **Why?**

- It will increase the pace of auction and early production of minerals which have become indispensable for new-technologies such as space, electronics, IT, energy transition, food security, etc.
- » **Note:** Even though the auction will be conducted by Central Government, the mining lease or composite license for these minerals to the successful bidders will be granted by the State Government only and the auction premium and other statutory payments shall continue to be received by the State governments.

- **Significance of the Amendment:**

- » Attract FDI and other investment in Mining sector.
- » Encourage new junior mining companies in the sector.
- » Promote exploration and mining of critical minerals.

2) CRITICAL MINERALS

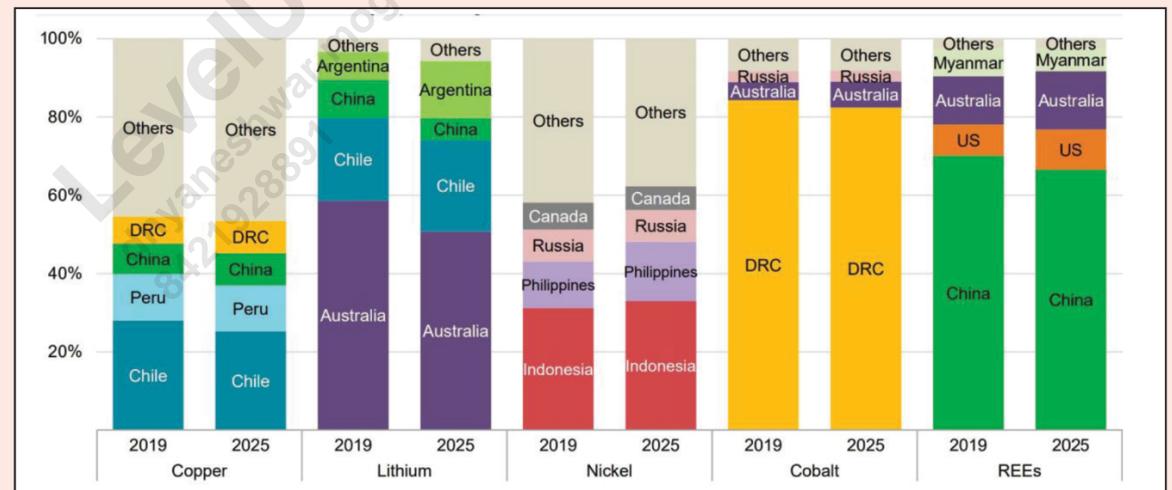
- **Why in news?**

- » Report: Critical Minerals for India: By Ministry of Mines (June 2023)

- **Critical Minerals** are those minerals that are essential for economic development and national security.

- » Scarcity of these minerals or concentration in few countries may create supply chain vulnerabilities.
 - In fact, the demand for critical minerals is set to increase with renewable energy transition, the supply chain is very concentrated and unevenly distributed.

Figure VII.11: Concentration of production of selected minerals in 2019 and 2025



Source: International Energy Agency Report on 'The Role of Critical Minerals in Clean Energy Transitions'

- **Critical Minerals** are essential for advancement of many sectors, including high-tech electronics, telecommunication, transport and defence. They are also vital for global transition to clean energy.

» For e.g.:

- Lithium, nickel, cobalt, manganese, and graphite are crucial to battery performance, longevity and energy density.
- REEs are essential for permanent magnets that are vital for wind turbines and EV motors.
- Electricity networks need a huge amount of copper and aluminium, with copper being a cornerstone for all electricity-related technologies.

- Which are the minerals which are considered critical?

- » The Ministry of Mines have formed a committee in 2022 to identify the minerals critical for India. Based on three stage assessment process and also considering important parameters such as reserve position in the country, production, import dependency, use for future technology/clean energy, requirement of fertilizer minerals in an agrarian economy the committee has identified a set of 30 critical minerals: These are:
- Antimony, Beryllium, Bismuth, Cobalt, Copper, Gallium, Germanium, Graphite, Hafnium, Indium, Lithium, Molybdenum, Niobium, Nickel, PGE, Phosphorous, Potash, REE, Rhenium, Silicon, Strontium, Tantalum, Tellurium, Tin, Titanium, Tungsten, Vanadium, Zirconium, Selenium and Cadmium.
 - **Note:** Platinum Group Elements (PGE) consist of Platinum (Pt), Palladium (Pd), Rhodium (Rh), Ruthenium (Ru), Osmium (Os) and Iridium.
 - **Note:** Of these 30 critical minerals, 24 are included in the list of critical and strategic mineral in Part D of Schedule-1 of MMDR Act.
- » The committee also recommends creation of a Centre of Excellence for Critical Minerals (CECM) in the Ministry of Mines which will periodically update the list of critical minerals for India and notify the critical mineral strategy from time to time and will execute a range of functions for the development of an effective value chain of critical minerals in the country.

A) OTHER STEPS TAKEN TO PROMOTE THE PRODUCTION AND AVAILABILITY OF CRITICAL MINERALS IN THE COUNTRY:

- » The Ministry of Mines have created a joint venture company - Khanij Bidesh India Ltd (KABIL) with the equity contribution from three Central Sector Enterprises namely, National Aluminium Company Ltd, Hindustan Copper Ltd, and Mineral Exploration and Consultancy Ltd with the objective to ensure consistent supply of critical and strategic minerals to Indian domestic market.
- KABIL is also mandated to identify and acquire overseas mineral assets of critical and strategic nature, such as Lithium, Cobalt etc.
 - It has already initiated engagement with several state-owned organizations of the shortlisted source countries, through Ministry of External Affairs and the Indian Embassies in Countries like Argentina and Australia to acquire mineral assets overseas primarily the critical and strategic minerals.
- » The 2023 Amendment to MMDR Act, 1957 has also streamlined the auctioning process of critical and strategic minerals.

- 24 Critical and Strategic Minerals have been inserted in part D of the Schedule-1 of the MMDR Act, 1957.
 - Central government has been empowered to auction the critical and strategic mineral blocks.
- » **Ministry of Mines** under its '**Science and Technology Program**' provides **grants for Promotion and Research and Innovation in Start-Ups and MSMEs** in Mining, Minerals Processing, Metallurgy and Recycling Sector (S&T-PRISM).
- One of the thrust areas of S&T-PRISM includes focus on extraction of strategic and critical minerals and elemental level.
- » The Ministry is also actively involved in Mineral Security Partnership (MSP) and other multilateral/bilateral partnerships with various countries to secure the critical mineral demand of India.

A) MINERAL SECURITY PARTNERSHIP

- The MSP is a collaboration of 14 countries and the EU to catalyze public and private investments in responsible critical minerals supply chains globally.
 - » It aims to accelerate the development of critical energy sector in a diverse and sustainable manner. It will be working with host government and industry to facilitate targeted financial and diplomatic support for strategic projects along the value chain.
 - » It seeks to ensure that critical minerals are produced, processed, and recycled by catalysing investments from governments and private sector across the full value chain.
 - » **Members:** India became the 14th member in June 2014. Other members include USA, Canada, UK, France, Germany, Italy, Norway, Sweden, Finland, Estonia, Japan, Republic of Korea, Australia, and the European Union (represented by European Commission).

B) SUPPLY CHAIN RESILIENCE INITIATIVE

- It was unveiled by India, Japan and Australia in 2021 to strengthen economic ties and to reduce dependency on countries like China for critical imports. It is aimed at addressing vulnerabilities in the global supply chain which were exposed by the COVID-19.
- **Goals:**
 - » Build a more resilient, stable, and inclusive supply chain network in the Indo-Pacific region.
 - » Promoting diversification of trade and investment among the three countries
 - » Use technology (especially digital technology) to enhance the supply chain efficiency.

3) RARE EARTH METALS

- Rare earth elements are a **group of 17 chemical elements that occur together in the periodic table** (see image)

- The group consists of **Yttrium (39)** and **15 Lanthanide (57-71)** elements

» Lanthanide elements include.

- Lanthanum, Cerium, Praseodymium, Neodymium, Promethium, Samarium, **Europium**, Gadolinium, Terbium, Dysprosium, holmium, Erbium, Thulium, Ytterbium, and Lutetium.

» **Scandium** is found in most rare earth element deposits and is sometimes classified as rare earth element. International Union of Pure and Applied Chemistry (IUPAC) includes scandium in their rare earth element definition.

Rare Earth Elements																	He					
H	Li	Be	Na	Mg	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe					
Cs	Ba	La-Lu	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn					
Fr	Ra	Ac-Lr	Rf	Db	Sg	Bh	Hs	Mt														
Lanthanides																	Lu					
Actinides																						
La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb									
Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr								

- They are all metals and have many similar properties which often cause them to be found together in geological deposits.

- **Uses of Rare Earth Metals, why the demand has increased in last few decades, why is it expected to increase further?**

» They are used in **electronic devices** (e.g. computer memory, DVDs, rechargeable batteries, cell phones, catalytic converters, magnets, fluorescent lightings etc.)

- Explosion in demand in last 30 years => Telecommunication revolution.
- E.g. **Neodymium** is a critical component of permanent magnets and has the ability to carry material 1,300 times its own weight.
- E.g. **Europium** is necessary for **LED bulbs** and **Color television screens**.
- E.g. **Samarium** is used in optical lasers.

» **Batteries of electric and hybrid electric batteries.**

- Concern for climate change, energy independence => will further increase the demand

» Rare earths are also used as **Catalysts, Phosphors, and Polishing compounds**.

- These are used for air pollution control, illuminated screens on electronic devices, and the polishing of optical quality glass.
 - All these products are expected to rise in demands.

» **Emerging Medical Technologies:** Several rare earth metals are used in these.

» **Critical Defense uses.**

- Rare earth metals are key ingredients for **making the very hard alloys used in armored vehicles and projectiles**.
- **Defense Electronic**

- Night vision goggles, precision guided weapons, communication equipment, GPS equipment, batteries and other defense electronics.
 - Substitutes are not as effective and diminishes the superiority of military
- So, it is clear that Sunrise technologies currently being developed are rare earth intensive.
- **Rare???**
 - Despite being named rare, the metals are plentiful in earth's crust. However, these metals are very difficult to mine because it is unusual to find them in concentrations high enough for economic extraction. Because of geochemical properties these metals are typically dispersed.
- **Production and Trade**
 - Before 1965 - very little demand; supply from placer deposits in India and Brazil; in 1950s South Africa leading supplier, US also producing.
 - First Explosion of Demand - Color television - Europium essential element to produce color.
 - US became leading producer from Mountain pass mine California.
 - China - began to produce notable amount in 1980s and became leading producer in 1990s and early 2000s.
 - **Why was China able to become world leader in Rare Earth Metals?**
 - Long term view and consistent support from government
 - Mineral Availability
 - Weak Environmental laws
 - Cheap Production -> Closure of mines in other parts of the world
 - Huge Demands in China as China is the world leader in consumer electronics.
 - Until a few years ago, China controlled 90% of the supply of rare earths. The danger of this fact was illustrated most starkly in 2010 and 2011, when China imposed extreme export restrictions. The entire world was left scurrying to fend for Rare Earth Supplies. It led to more than 700% jump in global prices, crippling downstream industries dependent on rare earths worldwide.
 - Now, after aggressive production by the US, Australia and Canada, **China's share is down to 60%**. But still, China's control over global market remains a pain point for all involved.
 - Further, COVID-19 disruptions and tensions with China have demonstrated major supply side insecurities which India may face.
 - A group of Western countries are cooperating to develop alternatives to China through '**China plus one**' strategy.
- **India and Rare Earth Metals:**
 - India's rapidly growing economy currently has two massive input deficiencies which threaten its stability - Oil, and rare earths. India is almost 100% import dependent for most rare earths.
 - Interestingly though, India has great potential for domestic production as it possesses 4th highest reserves of rare earths in the world (after China, Russia and Vietnam).
- **Why India produces very small quantity of REMs**
 - a. In India, they are classified as atomic minerals. Why?

- Because some of these elements occur in the earth's surface along with thorium and uranium which are radioactive minerals. Thorium is prevalent in the same beach sands where other rare earth minerals also occur.
 - Thus, mining for rare earth in India is reserved for government companies of which there are only two in India: Indian Rare Earths Ltd (IREL) (owned by GoI) and Kerala Minerals and Metals Ltd (owned by Kerala Government). And their production capacities and technologies are limited which is why India is import dependent.
 - Beach sand mining was banned in 2016 in an attempt to conserve strategic minerals including rare earth and thorium.
- b. **Expertise mismatch:** Present policies separate the rare earth ecosystem from other R&D ecosystems like electronics and metallurgy.
- c. **Incentive Mismatch:** For IREL, most of the income come from the production and marketing of other minerals contained in beach sands - ilmenite, sillimanite, and zircon. With access to beach sand with easily recoverable other minerals, IREL has little incentive to refocus on globally competitive rare earth extracting and processing.
- d. **Fragmented, siloed, and severely inefficient research system**
- e. **Lack of proper linkages between miners and manufacturers**
- f. **License-Permit Raj:** Even after 1991 Economic reforms, some sectors like agriculture and mining continue to be highly regulated.
 - For e.g. in 2019, the central government amended the atomic Minerals Concessions rules, 2016, whereby threshold values for a range of minerals were drastically reduced. This decision effectively nationalized beach sand and forced several private players out.

7. NEXT BOOKLET

- 1) TEXTILE SECTOR**
- 2) ELECTRONICS SECTOR/ SEMICONDUCTOR SECTOR**
- 3) E-VEHICLE SECTOR**
- 4) MSME SECTOR**
- 5) VARIOUS SCHEMES LIKE PLI SCHEME**
- 6) SERVICE SECTOR**

TARGET PRELIMS 2024

BOOKLET-45; ECONOMY-10

INDUSTRY-2

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2. INDUSTRY

1) MINING (CONTINUATION FROM PREVIOUS BOOKLET)

A) NATIONAL MINERAL EXPLORATION POLICY, 2016

- The primary aims of the policy is to accelerate the exploration activity in the country through enhanced participation of the private sector.
- **Why is such policy needed?**
 - To uncover full mineral potential of the country and thus to put the mineral resources of the country to best use.
- **NMEP has following main features.**
 1. Auctioning of identified exploration block to private sector on revenue share basis.
 - Provisions for attracting private investment in exploration through attractive revenue sharing model.
 2. If the explorer agencies do not discover any auctionable resource, their exploration expenditure will be reimbursed on normative cost basis.
 3. Government will carry out a National Aerogeophysical Program for acquiring state-of-art baseline data for targeting concealed mineral deposits.
 4. A National Geoscientific Data Repository is proposed to be set up to collate all baseline and mineral exploration information generated by various central and state government agencies and also mineral concession holders and to maintain these on geospatial database.
 5. National Central for Mineral Targeting: It is proposed to be set up as a not-for-profit autonomous institution to address the mineral exploration challenges of the country.
 6. Special initiative to probe deep/seated concealed minerals.

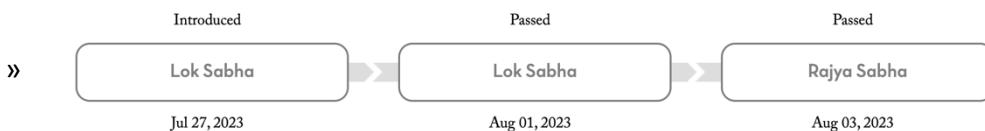
B) NATIONAL GEOSCIENCE DATA REPOSITORY (DEC 2023)

- **Why in news?**
 - » Union Minister Prahil Joshi launched National Geoscience Data Repository Portal (NGDRP) (Dec 2023)
- **Ministry of Mines**
- **NGDR** has been created, as a part of the National Mineral Exploration Policy, 2016, **hosting all baseline and exploration related geoscientific data in a single GIS platform**, to expedite, enhance and facilitate the exploration coverage of the country.
 - » The survey is spearheaded by Geological Survey of India (**GSI**) and Bhaskaracharya Institute of Space Application and Geoinformatics (**BISAG-N**).
 - » It will make available all geological, geochemical, geophysical, and mineral exploration data in public domain on a digital geospatial platform. This will include baseline geoscience data and all mineral exploration information generated by various central and state government agencies and mineral concession holders.
 - » It represents a significant leap forward in democratizing critical geoscience data, empowering stakeholders across industries and academia with unprecedented access to valuable resources.
- **How to access the portal?**

» <https://geodataindia.gov.in.>

C) OFFSHORE AREAS MINERAL (DEVELOPMENT AND REGULATION) AMENDMENT ACT, 2023

- Why in news?



- **About the Offshore Areas Mineral (Development and Regulation) Act 2002 (OAMDRA, 2022)**
 - » The act regulates mining in maritime zones of India.
 - » It categorizes offshore mining-related activities into:
 - (i) Reconnaissance, which involve a preliminary survey to locate mineral resources.
 - (ii) Exploration, which includes exploring, proving, or locating mineral deposits, and
 - (iii) Production, the commercial activity of the extraction of minerals.
 - » The act came into force in 2010.
 - » However, no mining activity has been undertaken in the offshore areas till date. Therefore, central government has brought some changes which are focused on improving the ease of doing business.
- **Key Highlights of the amendment:**
 - » **Introduction of Composite License:**
 - The act provides for a reconnaissance permit, exploration license and a production lease.
 - **The amendment** introduces a composite license for granting rights for exploration as well as for production. Under the composite license, the licensee will be required to complete exploration within three years.
 - The maximum area of exploration under a composite license will be 30 minutes latitude and 30 minutes longitude. The maximum area for undertaking production under a single composite license will be 15 minutes latitude and 15 minutes longitude.
- **Extension in the validity of concession:**
 - » The act provides that concession lease be granted for a period of 30 years and can be further renewed for upto 20 years.
 - » The amendment, provides that the production lease, as well as production lease under a composite license, will be valid for 50 years.
- **Competitive bidding for production lease and composite lease:**
 - » The act provides for grant of concession through administrative allocation.
 - » The amendment, mandates competitive bidding, for a production lease and a composite license to private entities.
- **Government Joint Ventures allowed to mine in reserved areas:**
 - » The act allows the government to reserve offshore areas that are not held under any operating right.
 - » The amendment allows composite license or production license to the government or government company. Joint ventures of government companies will also be eligible, subject to certain conditions. These conditions are:

- i. Partner must be selected through competitive process.
 - ii. Government company owns at least 74% of the paid up capital.
- **Mining of atomic minerals only by Government:**
 - » The amendment, says that in case of atomic minerals, exploration, production and composite licenses will be granted only to the government or government companies.
 - » **Note: What are atomic minerals?**
 - They are defined under MMDRA, 1957 and includes:
 - Rare Earth Minerals containing Uranium and Thorium
 - Pitchblende and Uranium Ores
 - Uriniferous allanite, monazite and other thorium ores.
 - **Reduction in Standard Area Blocks:**
 - » The Act, the size of one block for offshore mining is five minutes latitude by five minutes longitude.
 - » The amendment, reduces this to one minute latitude and one minute longitude. It also limits the maximum area one entity can acquire under all concessions to 45 minutes latitude by 45 minutes longitude.
 - **Offshore Areas Mineral Trust (OAMT) set up:**
 - » The amendment creates OAMT. The concession holder will be required to pay an amount to the Trust in addition to any royalty.
 - » The fund can be used for specified purposes including (i) exploration in offshore areas (ii) research and studies about the mitigation of adverse effects of offshore mining on the ecology, and (iii) Relief upon the occurrence of a disaster.
 - **Increase in fines** for violating the law.
 - **Note:** Royalty, Auction Premium and other revenues from the production of minerals from offshore areas shall accrue to the Government of India.

D) DRAFT RULES FOR OFFSHORE MINERAL BLOCKS AUCTION FOR PUBLIC CONSULTATION (DEC 2023)

- In order to implement the provisions of the amended act, the Ministry of mines have framed two draft rules i.e.,
 - (i) Offshore Areas Mineral Auction Rules
 - It provides for ascending forward online electronic auction.
 - (ii) Offshore Areas Existence of Mineral Resource Rules
 - This draft rule provides norms for exploration of various types of minerals and deposits.

2) SPECIAL ECONOMIC ZONES (SEZS)

- **Background**
 - » The Indian Government had long used export processing zones (EPZs) to promote exports. In fact, Asia's first EPZ was established in 1965 at Kandla, Gujarat state.
 - » **SEZ policy in India first came into inception on April 1, 2000.**
 - Prime Objective was to enhance the foreign investment and provide an internationally competitive and hassle-free environment for exports. The idea was to promote exports from the country and realizing the need that level playing field must be made available to the domestic enterprises and manufacturers to be competitive globally.

- Special Economic zones denote geographical areas which enjoy special privileges as compared with non-SEZ area in the country.
 - SEZs in India functioned from 1st Nov 2000 to 9th Feb 2006 under the provisions of Foreign Trade Policy and Fiscal incentives were made effective through provisions of different laws.
- **SEZ Act, 2005 and SEZ Rules 2006:** To ensure stable SEZ policy, the Special Economic Zones (SEZs) Act, 2005 was passed by Parliament in 2005.
- » It envisages key role for the state governments in Export Promotion and Creation of related infrastructure.
 - » A Single Window SEZ approval mechanism has been provided through a 19-member inter-ministerial SEZ Board of Approval (BoA).

How a SEZ is set up? (Just note the process for Prelims)

The developer submits the proposal for establishment of SEZ to the concerned state Government. The state government has to forward the proposal with its recommendations within 45 days from the date of receipt of the proposal to the Board of Approval.

The applicant also has the option to submit the proposal directly to the Board of Approval.

Board of approval has been constituted by the Central government in exercise of powers conferred under the SEZ act. The decision is taken by Board of approval by consensus. It has 19 members and is headed by the chairperson (secretary, Department of Commerce).

- » SEZ Rules came into effect in 2006. It provided for drastic simplification of procedures and for single window clearance on matters relating to Central as well as State governments.

- **Key features of the SEZ Scheme:**

- » A designated duty-free enclave to be treated as a territory outside the customs territory of India for the purpose of authorized operations in SEZ.
- » No License required for import.
- » Both manufacturing or service activities are allowed
- » The Unit shall achieve positive net Foreign Exchange to be calculated cumulatively for a period of five years from the commencement of production.
- » Domestic sales subject to full customs duty and import policy in force.
- » SEZ units will have freedom of sub-contracting.
- » No routine examination of customs authorities of export/import cargo.
- » SEZ developers/ Co-developers and Units enjoy tax benefits as prescribed by SEZs Act, 2005.
 - For e.g. 100% income tax exemption on export income from SEZ units for the first five years; Exemption from GST and levies imposed by state government (supplies to SEZs are zero rated under IGST Act, 2017, meaning they are not taxed).
- » Single Window Clearance for all state and federal government approvals.

- **Primary Objectives:**

- Economic growth; export promotion; increase investments (both from domestic and foreign sources); employment; improvement in infrastructure.

- **Notable SEZs in India:**
 - » **Nodia** (Uttar Pradesh); **Falta** (West Bengal state); **Vishakhapatnam** (Andhra Pradesh); **Chennai** (TN); **Cochin** (Kerala); **Santa Cruz** (Maharashtra), **Indore** (Madhya Pradesh), **Kandla & Surat** (Gujarat).
- **Numbers:**
 - » As of Jan 2023, 425 SEZs are approved in the country of which 270 are operational.

A) SEZ (FIFTH AMENDMENT) RULES, 2023

- The amendment is specifically tailored for IT enterprises and IT Enabled Services (ITES) SEZs. This amendment introduces a ground-breaking concept - non-processing areas, geared towards fostering enhanced development.
- **Sub-leasing non-processing areas (Section 11B):** Developers now have the liberty to request demarcation of non-processing area within IT/ITES SEZs.
 - These areas can harbor businesses engaged in IT or ITES services, abiding by conditions set by the Board of Approval.
 - Guidelines mandated that non-processing areas must encompass complete floors, fortified with access control mechanism. These surplus areas can be sublet to other tenants that fit the criteria of an SEZ based business.
- **Navigating Limits of Non-Processing areas:** Businesses within non-processing areas face restrictions, barring them from enjoying rights or facilities navigable to SEZ units.

3) PRODUCTION LINKED INCENTIVE SCHEME (PLI SCHEME)

- Keeping in view India's vision of becoming 'Atmanirbhar', **Production Linked Incentive (PLI) Schemes** for 14 key sectors have been announced with an outlay of **Rs 1.97 lakh crore (over US\$ 26 billion)**.
 - » The purpose of the PLI Schemes is to:
 - i. Attract investments in key sectors and cutting-edge technology.
 - ii. Ensure efficiency and bring economies of scale in the manufacturing sector.
 - iii. Make Indian companies and manufacturing globally competitive.
 - » They focus on enhancing India's manufacturing capabilities and Exports. It has the potential of significantly increasing production, employment and economic growth.
- **When was it launched?**
 - » It was initially launched in March 2020 and focused on three industries. It was later extended to 14 sectors.
- **PLI scheme** for 14 sectors have been notified by concerned ministries/departments after due approval. These schemes are in various stages of implementation.
 - » **The sectors are:** (i) Mobile Manufacturing and Specified Electronic Components, (ii) Critical Key Starting Materials/Drug Intermediaries & Active Pharmaceutical Ingredients, (iii) Manufacturing of Medical Devices (iv) Automobiles and Auto Components, (v) Pharmaceuticals Drugs, (vi) Specialty Steel, (vii) Telecom & Networking Products, (viii) Electronic/Technology Products, (ix) White Goods (ACs and LEDs), (x) Food Products, (xi) Textile Products: MMF segment and

technical textiles, (xii) High efficiency solar PV modules, (xiii) Advanced Chemistry Cell (ACC) Battery, and (xiv) Drones and Drone Components.

- The scheme is also expected to have a **cascading effect on the country's MSME sector**. The anchor units that will be built in every sector are likely to set up a new supplier/vendor base in the entire value chain.
 - » As of Jan 2024, **176 MSMEs have been direct beneficiaries** in sectors such as Bulk drugs, medical devices, pharma, telecom, white goods, food processing, textiles and Drones.
- **Progress:**
 - » As of Jan 2024, **746 applications** have been approved in **14 sectors** with expected investment of **Rs 3 lakh crores**.
 - » **176 MSMEs** are also PLI beneficiaries.

A) PLI SCHEME 2.0 FOR IT HARDWARE

- **Background:**
 - » In Feb 2021, the **government approved the PLI scheme for IT hardware, covering the production of laptops, tablets, all in one PCs, and serves with an outlay of Rs 7,350 crores.**
 - » However, **industry players requested government to increase the outlay.**
- In May 2023, the Union Cabinet approved the **PLI Scheme 2.0 for IT hardware** with a **budgetary allocation of Rs 17,000 crores**. The **tenure of the program is six years**.
- The scheme covers **laptops, tablets, all in one PCs, servers, and ultra-small factor devices**.
- **Ministry:** Ministry of Electronics and Information Technology (MeitY)

4) TEXTILE AND APPAREL SECTOR

- **Significance:**
 - » **Employment** Textile sector and apparel sector **directly employs more than 5 crore of the population** and is the **2nd largest employer** after Agriculture sector in the country.
 - » **GVA:** 10% of **India's industrial GVA**.
 - » **Export Earnings:** \$40 billion in FY23.
 - » **Inclusive Growth:** Textile mills give **opportunity to weaker sections including women**.
- **Key Initiatives:**

A) PM MITRA (PM MEGA INTEGRATED TEXTILE REGION AND APPAREL)

- **Details of the Scheme:**
 - » Announced in the Budget 2023
 - » **Ministry of Textiles**
 - » Government has approved setting up of **seven PM MITRA Parks** in **Greenfield/Brownfield** sites with world class infrastructure.
 - » The parks will not only **reduce logistics costs** and **improve competitiveness of Indian textiles** but also boost employment generation, attract domestic investment and FDI, and position India firmly in the global textile market.
 - » Government expects the parks to attract investments worth **Rs 70,000 crores**, generate jobs for **20 lakh people**, and can **create integral value chain for the products**.

- The government has finalized 7 states viz. Tamil Nadu (Virudhnagar), Telangana (Warangal), Gujarat (Navsari), Karnataka (Kalaburagi), Madhya Pradesh (Dhar), Uttar Pradesh (Lucknow) and Maharashtra (Amravati) for setting up PM Mitra Parks.
- **Ministry:** Ministry of Textiles

B) PLI SCHEME FOR TEXTILES

- Approved outlay of Rs 10,683 crores (over five years starting from Jan 2022) to promote investment and increase the production of Man-Made Fibre (MMF) Apparel, MMF Fabrics and Products of Technical Textile.
- This will enable the textile sector to achieve size and scale, enhancing export competitiveness.

C) SAMARTH (SCHEME FOR CAPACITY BUILDING IN TEXTILE SECTOR)

- **Details about SAMARTH:**
 - » It is a flagship skill development initiative of Ministry of Textiles.
 - » Launched in 2017, it aims to provide demand-driven, placement-oriented skilling programs to incentivize and supplement the efforts of the industry in creating jobs in the organized textile and related sectors.
 - » It was formulated under the broad skilling policy framework adopted by M/o Skill Development & Entrepreneurship (MSDE).
 - » It has provisions for skilling in Apparel & Garmenting segments both at the entry level as well as upskilling/reskilling of existing workers.
 - » It also caters to the upskilling/reskilling requirement of traditional sectors such as handloom, handicraft, silk and Jute.
- **Progress:**
 - » As of July 2023, the Ministry of Textiles has partnered with 157 Industries/Industry associations, 16 central/state government agencies and 3 sectoral organizations of the Ministry undertaking the training program SAMARTH.
 - » Out of the skilling target of 4.72 lakh beneficiaries allocated so far, 1.88 lakh beneficiaries have been provided training.
 - » More than 85% of the beneficiaries trained so far under the schemes are women. More than 70% of the beneficiaries trained in organized sector course have been provided placement.

D) VIRAASAT

- By Ministry of Textile
- VIRAASAT-Celebrating Handloom Home Décor (20th Jan 2023 - 30th Jan 2023)
- VIRAASAT - Celebrating handloom Sari Exhibition (two phases: 16th Dec - 30th Dec , and 3rd Dec to 17th Dec)
 - » This exhibition was held at handloom haat, Janpath, New Delhi.

5) TECHNICAL TEXTILE

- Technical textiles are textile materials and products used for their technical performance and functional properties.
 - Technical textiles include textiles for automotive applications, medical textiles (e.g. implants), geotextiles (reinforcement of embankments), agrotextiles (textiles for crop protection), and protective clothing (e.g. heat and radiation protection for fire fighter clothing, molten metal protection for welders, stab protection for bulletproof vests, and spacesuits).

A) NATIONAL TECHNICAL TEXTILE MISSION

- The National Technical Textile Mission (NTTM) is a scheme launched by the Government of India to promote technical textiles and boost the manufacturing of such textiles in the country. Here are some key highlights of the mission:
 - i. **Objectives:** Increase the use of technical textiles in various sectors such as healthcare, agriculture, transportation, and construction among others. It also seeks to promote innovation, research and development, and create job opportunities in the technical textile sector.
 - ii. **Budget:** The mission has a total budget of Rs. 1480 crore, which will be implemented over a period of four years (2020-2024).
 - The mission has been extended till 2026.
 - iii. **Focus Areas:** The mission focuses on four key areas, namely, research and development, promotion and market development, export promotion, and skill development.
 - iv. **Implementation:** The mission is implemented by the Ministry of Textiles in collaboration with other stakeholders, including industry associations, research organizations, and academic institutions.
- **Helping Startups in the field of Technical Textile:**
 - A portal for start-ups in technical textiles segment to submit applications for support under the Mission will be launched soon.
- **Standardization:** the Bureau of Indian Standards (BIS) has developed 600 quality standards for technical textile products and Quality Control Orders (QCO) have been issued for various TT products.

6) ELECTRONICS SECTOR/ SEMICONDUCTOR SECTOR

- **Need for promoting electronics manufacturing in the country.**
 - » There is a need to improve the electronics manufacturing within the country as this sector holds tremendous potential in terms of significant employment generation, ability to transform socio-economic identity of citizens, contribution in the upliftment of the economy, value addition, forex savings etc.
- **Current Situation and Targets:**
 - » India has also seen an improvement in manufacturing and export of electronics over the last five years. Electronic goods were among the top five commodity groups exhibiting positive export growth in Nov 2022, with the exports in this segment growing YoY by 55.1%.

- » As of **FY20**, the domestic electronics industry is valued at US\$ 118 billion.
- » **Government of India** targets to reach US\$ 300 billion worth of electronics manufacturing by FY26 and exports worth US \$120 billion.

- **Most Important Products:**

- » Mobile phones, consumer electronics, industrial electronics
 - In Mobile phones, India has become the second highest mobile phone manufacturer globally, with the production of handsets going up from six crore units in FY15 to 31 crore units in FY22. These numbers are further expected to increase as more international players set up their base in India.

Government initiative to promote the sector:

A) NATIONAL POLICY ON ELECTRONICS, 2019 (NPE, 2019):

The vision of the policy is to position India as a global hub for Electronics System Design and Manufacturing (ESDM) by encouraging and driving capabilities in the country for developing core components, including chipsets, and creating and enabling environment for industry to compete globally.

B) PLI SCHEME FOR LARGE SCALE ELECTRONICS MANUFACTURING

- It is an initiative under MEITY.
- The scheme aims to attract large investments in the mobile phone manufacturing and specified electronic components, including assembly, testing, marking and packaging (ATMP) units.
- Under this 4% to 6% incentive is being provided on incremental sales of goods manufactured in India. These incentives will be offered for a period of five years subsequent to base year (FY 2019- 20). The applicant companies will be required to meet minimum thresholds of investment and production. The scheme has an outlay of USD 5.5 billion.
- For e.g.: In Dec 2022, Empowered Committee headed by CEO, NITI Aayog, approved incentives for two companies – one a domestic and other global – for mobile Manufacturing under PLI scheme for LSEM:
 - » **Foxconn India** (a Taiwanese company) to receive incentives under mobile manufacturing for the period 1st Aug 2021 to 31st March 2022 based on its incremental investments and sales figures.
 - » **M/s Padget Electronics Pvt. Ltd**, a domestic company, has been approved by the Empowered Committee to receive incentives under mobile manufacturing.

C) SCHEME FOR PROMOTION OF MANUFACTURING OF ELECTRONICS COMPONENT AND SEMICONDUCTORS (SPECS):

Notified in 2020, it provides financial incentive of upto 25% on capital expenditure for the identified list of electronics goods.

D) MODIFIED ELECTRONICS MANUFACTURING CLUSTERS (EMCS 2.0) SCHEME:

Notified in April 2020. It provides support for creation of world class infrastructure along with common facilities and amenities, including **Ready Build Factory** (RBF) sheds/ Plug and Play Facilities etc.

E) MODIFIED SCHEME FOR SEMICONDUCTORS AND DISPLAY FAB ECOSYSTEMS:

- **Ministry:** MEITY
- In furtherance of the vision of Atmanirbhar Bharat and positioning India as the global hub for ESDM, a comprehensive program for the development of semiconductors and display manufacturing ecosystem in India was approved by GoI with an outlay of Rs 76,000 crore in Sep 2022.
- The program provides active incentive support to companies / consortia that are engaged in Silicon Semiconductor Fabs, Display Fabs, Compound Semiconductors/ Silicon Photonics/ Sensors (including MEMS) Fabs/ Discrete Semiconductor Fabs etc.
- **Following Schemes** are offered by the Scheme:
 - i. **Semiconductor Fabs and Display Fabs:** Offers fiscal support of 50% of the project cost on pari-passu basis to applicant who are eligible and have technology and capacity.
 - ii. **Compound Semiconductors/ Silicon Photonics / Sensors (including MEMS) Fabs and Semiconductor ATMP/ OSAT Units:** Fiscal support of 50% of the capital expenditure on pari-passu basis to applicant who are found eligible.
 - iii. **Semiconductor Design Companies:** The Design Linked Incentive (DLI) shall extend product design linked incentive of upto 50% of eligible expenditure; and product deployment linked incentive of 6% - 4% on net sales for five years.
 - C-DAC (Centre for Development of Advanced Computing), a scientific society operating under MeitY, will serve as the nodal agency for implementation of the DLI scheme.
 - iv. **Semiconductor Laboratory (SCL):** MEITY will take requisite steps for modernization and commercialization of semi-conductor Laboratory (SCL), Mohali. MeiTy will explore the possibility of joint venture of SCL with a commercial fab partner to modernize the brownfield fab facility.
 - v. **India Semi-Conductor Mission:** In order to drive the long-term strategies for developing a sustainable semiconductor and display ecosystem, a specialized and independent "**ISM**" has been set up. It will be led by global experts in semi-conductor and display industry.
- **Note:** In the older scheme, there were different rate of incentives for different areas and thus was making it difficult to go for integrated development of various different parts

F) 100% FDI

As per the existing FDI Policy, FDI up-to 100% under the automatic route is permitted for electronics manufacturing.

7) E-VEHICLE SECTOR

- **Why we need to promote electric vehicles in India?**
 - i. **Energy Security**
 - ii. **Transition to renewable**
 - iii. Dealing with **air pollution and Noise Pollution** in big cities
 - iv. Reducing Greenhouse gas emission -> Achieve Paris Targets on Climate Change
 - v. **Competitive Domestic Manufacturing Ecosystem: Technology Development and Make in India**

- vi. Making Transportation less expensive:
- vii. Power sector growth
- viii. EVs can act as storage for Solar Energy

- **Schemes / Programs / Policies / Other steps to promote EV in India**

1. Subsidy, Tax Incentives and PLI

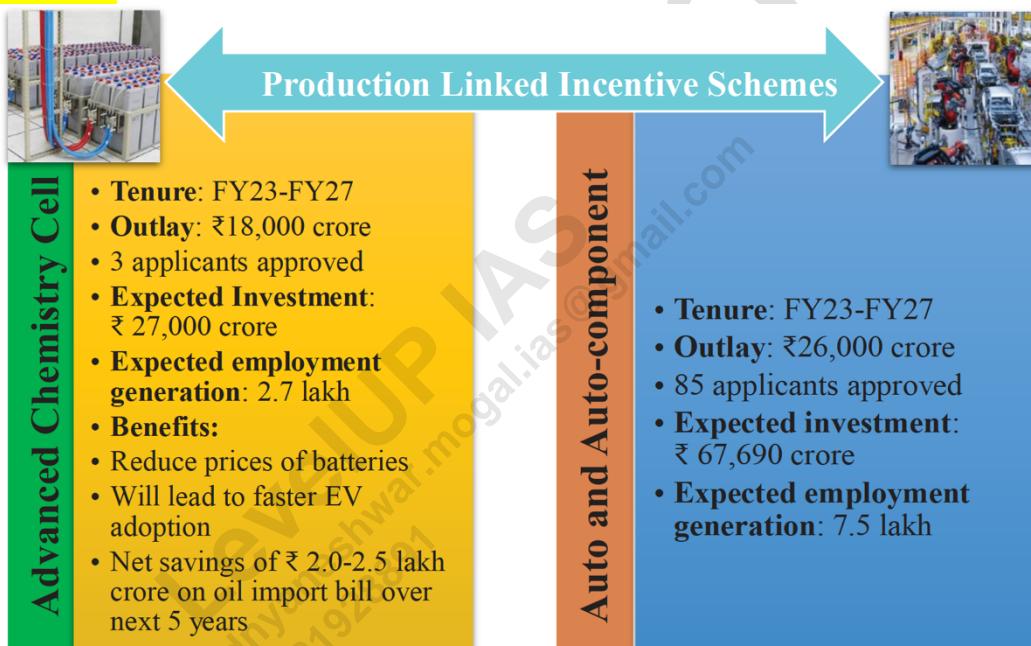
- a. FAME (Faster Adoption and Manufacturing of Electric (& Hybrid) Vehicles):

- It is the key subsidy scheme for electric vehicles through which government incentivizes buyers to purchase e-vehicles.
- Phase-1 had started in 2015 and Phase-2 has been running since 2019.
- Under phase-2 companies may offer a discount of upto 40% on the cost of locally manufactured vehicles and claim it as a subsidy from government.

- b. Tax Incentives:

- GST on Electric Vehicles is on the lower bracket of 5% as against 28% for conventional vehicles.
- Budget 2019-20: Tax Subsidies for EVs: Additional income tax deduction of Rs 1.5 Lakh on the interest paid on the loans taken to purchase electric vehicles before 31st March 2023.

- c. PLI Schemes:



Source: Ministry of Heavy Industries

- In April 2023, government released SOP for the PLI scheme for the automobile and auto component industry.

2. EV Policies of Select States and Uts:

- A number of state/UT governments have formulated policies for the successful implementation of the national EV mission and FAME scheme.
 - For e.g., Delhi targets that 25% of all new vehicles registration should be EVs by 2024.

3. National E-Mobility Program of Ministry of Power (Launched in March 2018)

- Aggregate demand by procuring electric vehicles in Bulk to get economies of scale

4. **National Mission on Transformative Mobility and Battery Storage** (approved by cabinet in March 2019)
 - The mission recommends and drive the strategies for transformative mobility and PMPs for EVs, EV components, and Batteries.
 - The mission will ensure holistic and comprehensive growth of the battery manufacturing industry in India.

7. **E-Amrit Portal:** It is a web portal on electric vehicles and provide one stop solution for all information related to EVs - bursting myths around the adoption, details about policies/ subsidies etc.
 - The portal has been developed and hosted by NITI Aayog under a collaborative knowledge exchange program with UK government and as part of the UK-India Joint Roadmap 2030, signed by the Prime Ministers of the two countries.

- **Key challenges of India's EV Sector:**
 1. **Battery Cost**
 2. **Low Lithium Reserves in India:**
 3. **Limited availability of Charging Infrastructure and long time for EV Charging**
 4. **Policy Conundrums:** Provisions of Electricity Act, 2003 is restrictive in nature and hinder setting up of charging stations - it is important to bring reforms here to promote ease of doing business.

8) MSME SECTOR

- MSMEs are considered **pillar of economic growth/ engine of growth** in both developed and developing countries of the world. They have played a prominent role in the economic development of India too.
- There are more than 6.34 crore MSMEs in India and around 50% of them are situated in rural areas.
- The revision of the **definitions of MSMEs** brought in w.e.f. 1st July 2020 as part of the AtmaNirbhar Bharat Package introduced a composite criterion of investment and annual turnover - and identical limits for manufacturing and service sector.

Micro	Investment [in Plant and Machinery or Equipment] <u>doesn't exceed Rs 1 crore</u> and <u>turnover doesn't exceed Rs 5 crore</u> .
Small	Investment <u>doesn't exceed Rs 10 crore</u> and <u>turnover doesn't exceed Rs 50 crore</u>
Medium	Investment <u>doesn't exceed Rs 50 crore</u> and <u>turnover doesn't exceed Rs 250 crore</u> .

- **Note:** In the older definition, only investment criteria was used and separate parameters were there for Manufacturing sector and service sector.

- **Significance of the above change:**
 - The change in definition will facilitate expansion and growth of these enterprises.
 - The resulting economies of scale can enhance productivity without MSMEs losing out on several government incentives including market support, export promotion, preferential procurement in the public sector, and incentives through various government initiatives (MSE-CDP, PMEGP, SFURTI).

- This change will also align MSMEs with GST regime and would prove to be a good tool to assess the contribution of the MSMEs to GDP. It will also avoid unnecessary inspections and enable authorities to verify claims of businesses using GST network sales data
 - Same criteria for both manufacturing and Service SME will simplify the classification.
- **Importance of MSME Sector:**
 - **Economic:**
 - Share of MSME in the country's GVA is approx. **33.08 percent** (current price, 2019-20 (as per ESI 2021-22)).
 - It employs around **11 crore people** in India.
 - High Labor to capital ratio
 - It provides maximum opportunities for self-employment and wage employment outside the agri-sector.
 - Manufacturing -> 40% of the total manufacturing output.
 - Exports: Around **50%** of the total manufacturing exports
 - **Curtailing Regional Disparity**
 - Geographical distribution of MSME's are more even.
- **Government Initiatives and Programs for MSME Sector:**
 1. **Initiatives under Atmanirbhar Bharat Abhiyan**
 - Emergency Credit Liquidity Guarantee Scheme (ECLGS) (extended till March 2023)
 - New Definition of MSMEs
 - Rs 20,000 crore of subordinate debt to stressed MSMEs.
 3. **Raising and Accelerating MSME Performance Scheme (RAMP) in July 2022:**
 - **Ministry:** Ministry of MSME
 - It is a World Bank supported Central Sector Scheme. It is aimed at strengthening institutions and governance at the Centre and State, improving Centre-State linkages and partnership and improving access of MSMEs to market and credit, technology upgradation and addressing issues of delayed payments and greening of MSMEs.
 - **Duration:** it will be implemented over a period of five years.
 - **Outlay:** The total outlay of the scheme is Rs 6,062.45 crores or USD 808 million, out of which Rs 3750 crore or USD 500 million would be a loan from the World Bank and the remaining Rs 2312.45 crore or USD 308 Million would be funded by GoI.
 4. **MSME Cluster development program of Ministry of MSME**
 - MSME is running two cluster development programs.
 - i. Micro and Small Enterprises - Cluster Development Program (MSE-CDP)
 - ii. Scheme for upgradation of rural and traditional industries (**SFURTI**)

- **Advantages of such cluster programs**
 - Quicker dissemination of info allows easy sharing of knowledge and best practices
 - Better cost effectiveness due to distribution of common cost
 - Focuses on holistic development covering infra, common facility, testing, technology, & skill upgradation, marketing and export promotion.
 - Weaves the fabric of networking, cooperation and togetherness in the industry

5. Other Past steps for Easy Credit Availability

i. Interest Subvention Scheme for MSME Sector

- The scheme was launched in 2018 and provides a 2% interest subvention to GST Registered MSME sector.
- ii. **MUDRA** initiative focuses on collateral free loans of upto Rs 10 lakh for non-farm sector.
- iii. MSME sector brought **under PSL** by RBI from July 2016. From 2018, foreign banks also have to follow the PSL norms.
 - Banks should **advance 7.5% of their loans to MSME** under PSL guidelines.

6. Steps to increase production by MSME and demand of MSME products

- i. **Reservation of items to be manufactured by MSME sector** -> provided in the Industries (development and regulation) Act, 1951.
- ii. **Purchase Preference Policy:** All CPSUs/Central Government Departments are required to procure **25%** of their annual procurement from MSMEs (including 4% from MSEs owned by SC/ST and 3% from MSEs owned by women entrepreneurs) and there is a sub-target of 20% for procurement of MSMEs owned by SC/STs under the Procurement Policy launched in 2012.
 - **MSME SAMBANDH Portal** - To monitor the implementation of the public procurement from MSEs by Central PSUs.
- iii. **Price Preference Policy:** For selected items a price preference of 15% premium over the lowest quotation of the large scale unit is provided to MSME.
- iv. **Benefits in tendering:** MSMEs are provided benefits such as exemption from payment of security deposit etc.
- v. **Marketing Assistance Scheme:** Provides assistance to MSMEs for the following activities: Organization of exhibitions abroad, co-sponsoring of exhibitions organized by other organizations, organizing buyer seller meets etc.

7. Other Initiatives to Increase Ease of Doing Business for MSMEs

i. Udyam Registration (UR) Portal (became operational in July 2020)

- It provides faceless, fully online, paperless, and transparent MSME registration process fully integrated with Income Tax and GSTIN system. It is also integrated with government e-market place to make end to end MSME registration paperless.
- In 2021, government has included Retail and wholesale trade as MSMEs. They are allowed to be registered on Udyam registration portal. But the benefits to them is restricted to PSL only.

ii. MSME SAMADHAN PORTAL

- It was set up under the Micro, Small and Medium Enterprise Development (MSMED) Act to monitor the outstanding dues to the MSME sector.
 - MSMEs can directly register their cases relating to delayed payments by Central ministries/departments/CPSEs/Statements governments.
- iii. **TReDS (Trade Receivable Discounting System) Platform** for facilitating the discounting of trade receivable of MSMEs through multiple financiers.
 - TReDS is an institutional mechanism for financing of trade receivables of MSMEs from corporate buyers through two or more financiers.
 - There are 3 direct participants involved in the activities of TReDS viz.
 - MSME Sellers
 - Corporate Buyers
 - Financiers
 - TReDS provides a platform to bring these participants together for facilitating, uploading, accepting, discounting, trading and settlement of the invoices / bills of MSMEs.
- iv. **The CHAMPIONS portal (www.champion.gov.in):**
 - It is a grievance redressal portal for MSMEs launched by Ministry of MSME in June 2020.
 - It is an ICT based technology system for making the smaller units big by helping and handholding them. A network of control rooms is created in a Hub & Spoke Model where hub is situated in the Ministry of MSME.
 - The portal continues to improve through initiatives such as localization of the portal in 11 regional languages and introduction of chatbot.
- v. **GST Composition Scheme** (turnover limit 1.5 crore (75 lakh in case of NE States)
- vi. **Budget 2020-21: Easing Compliance burden.**
 - In order to reduce the compliance burden on small retailers, traders and the MSME sector, the auditing threshold has been raised by 5-times from INR 1 Cr in turnover to INR 5 Cr. This would be applicable only to those **MSMEs that transact less than 5% in cash.**
- viii. **Zero Defect Zero Effect (ZED) Scheme** to rate and handhold MSMEs to delivery top quality products using clean technology.
- ix. **Pre-Packaged Insolvency Resolution**

9) AGRICULTURE UPDATE FOR MSME SECTOR

A) PRADHAN MANTRI MATSYA KISAN SAMRIDHI SAH – YOJANA (PM MKSSY)

- PM-MKSSY is a central sector sub scheme under Pradhan Mantri Matsya Sampada for Formalization of Fishery Sector and supporting fisheries MSMES.
- It was approved by cabinet in Feb 2024.
- **Expenditure Involved:**
 - » The estimated outlay is Rs 6,000 crores consisting of 50% i.e. Rs 3,000 crore public finance including the World Bank and the AFD external financing, and rest 50% i.e. Rs 3,000 crore being the anticipated investment from the beneficiaries/private leverage.
- **Duration:**
 - » The scheme will be implemented for 4 years from FY 2023-24 to FY 2026-27 across all the states and Uts.
- **Intended Beneficiaries:**
 - » Fishers, Fish (Aquaculture) Farmers, Fish workers, Fish Vendors or such other person directly engaged in fisheries value chain.
 - » Micro and Small enterprises in the form of Proprietary Firms, Partnership Firms and Companies registered in India, Societies, Limited Liability Partnerships (LLPs), Cooperatives, Federations, Village Level Organizations like Self Help Groups (SHGs), Fish Farmers Producer Organizations (FFPOs) and Startups engaged in fisheries and aquaculture value chains.
 - » FFPOs also include Farmers Producer Organizations (FPOs).
 - » Any other beneficiaries that may be included by the Department of Fisheries, GoI as targeted beneficiaries.
- **Implementation Strategy:** The sub-scheme has following main components:
 - i. **Component 1-A: Formalization of fisheries sector and facilitating access of fisheries microenterprises to Government of India programs for working capital financing.**
 - » A National Fisheries Digital Platform (NDFP) will be created and all the stakeholders (fish producers, vendors, processors, MSME in fishery sector) will be mobilized to register on it.
 - It will serve multiple functions including disbursement of financial incentives.
 - It is also proposed to undertake activities such as training and extension support, improving financial literacy, facilitating project preparation etc.
 - ii. **Component 1-B: Facilitating adoption of aquaculture insurance:**
 - The scheme will facilitate creation of appropriate insurance product and to cover at least 1 lakh hectare of aquaculture farms during the project period to provide the scale of operation.
 - One time incentive to the willing famers against purchase of insurance with farm size of 4 hectares of water spread area or less. This incentive will be at the rate of 40% of the premium subject to a limit of Rs 25,000 per hectare (i.e. maximum incentive of Rs 1 lakh)
 - For more intensive form of aquaculture other than farms such as cage-culture, Recirculatory Aquaculture System (RAS), bio-floc, raceways, etc. the incentive payable is 40% of the premium. Maximum incentive payable is Rs 1 lakh and the maximum unit size eligible will be 1800 m³.

- The benefit will be provided as 'onetime incentive' and will be provided for aquaculture insurance purchased for one crop only i.e. one crop cycle.
- SC/ST/Women beneficiaries will be provided an additional incentive @10% of the incentive payable for General categories.

iii. **Component 2: Supporting microenterprises to improve fisheries sector value chain efficiencies:**

- Through a system of performance grants with associated analytics and awareness campaign.
- The scale of performance grant and the criteria for providing performance grants are indicated below:
 - The performance Grant for a Microenterprise shall not exceed 25% of the total investment or Rs.35 lakhs, whichever is lower, for General Category and 35% of total investment or Rs.45 lakhs, whichever is lower, for SC, ST and Women owned microenterprises.
 - Performance Grant for Village Level Organizations and Federations of SHGs, FFPOs and Cooperatives shall not exceed 35% of total investment or Rs.200 lakhs, whichever is lower.
 - The total investment for the purpose above shall consist of expenditure incurred on capital investments made on new plant and machinery, equipment including technical civil/electrical works and associated infrastructure, transport and distribution infrastructure, energy efficient devices including Renewal Energy devices, technology interventions, such other interventions leading to improvement in value chain efficiency; and salary bills for additional jobs created in the year of application made under the scheme.

iv. **Component 3: Adoption and expansion of fish and fishery product safety and quality assurance systems:**

- This component proposes to incentivize fisheries micro and small enterprises to adopt safety and quality assurance systems in marketing of fish and fishery products through provision of performance grants against a set of measurable parameters.

v. **Component 4: Project management, monitoring and reporting:**

- Under this component, it is proposed to set up Project Management Units (PMUs) to manage, implement, monitor and evaluate project activities.

10) PHARMACEUTICAL INDUSTRY

A) CURRENT SITUATION

- Indian Pharmaceutical industry is an important player in global pharma sector.
- **Market Size in India:** India's domestic pharmaceutical market is estimated at US\$ 41 billion in 2021 and is likely to grow to US\$ 65 billion by 2024 and is further expected to reach US\$ 130 billion by 2030.
- **India** is ranked 3rd worldwide in the production of pharma products by volume and 14th by value.

- India is also the largest provider of generic medicines globally, occupying a 20% share in global supply by volume, and is leading vaccine manufacturer globally with a market share of 60%.

B) PLI SCHEME TO BOOST MANUFACTURING CAPACITY IN PHARMA SECTOR

Critical KSMs/DIs/APIs	Medical Devices	Pharmaceuticals
<ul style="list-style-type: none"> • Tenure: FY21 to FY30 • Outlay: ₹6,940 crore • Progress: Until Dec 2022, 51 applicants approved with committed investment of ₹4,138.4 crore. • Employment: Estimated employment generation from 51 projects is 10,598 persons. • Financial incentive: NA 	<ul style="list-style-type: none"> • Tenure: FY21 to FY28 • Outlay: ₹3,420 crore • Progress: Until Dec 2022, 21 applicants approved with committed investment of Rs 1,058.97 crore. • Employment: Estimated employment generation from 21 projects of around 6,411 persons. • Financial incentive: The financial incentive at the rate of 5 per cent on incremental sales of medical devices for 5 years. 	<ul style="list-style-type: none"> • Tenure: FY21 to FY29 • Outlay: ₹15,000 crore • Progress: Until June 2022, 55 applicants approved with actual investment of Rs 18,669 crore. • Employment: Estimated employment generation from 55 projects : 20,000 direct and 80,000 indirect jobs. • Financial Incentive: on incremental sales under various categories at varying rate over the years ranging from 10 per cent to 3 per cent.

Source: Department of Pharmaceuticals

KSMs: Key Starting Materials

DIs: Drug Intermediaries

APIs: Active Pharmaceutical Ingredients (APIs)

C) NATIONAL MEDICAL DEVICES POLICY, 2023

- Approved by Cabinet in April 2023
- **Ministry:** Ministry of Chemical and Fertilizer
- **Salient Features:**
 - » **Vision:** Accelerated growth path with a patient-centric approach and to emerge as the global leader in the manufacturing and innovation of medical devices by achieving 10-12% share in the expanding global market over the next 25 years.
 - Policy is expected to help the Medical Devices Sector grow from present \$11 Bn to \$50 Bn by 2030.
 - » **Mission:** Policy lays down a roadmap for accelerated growth of the medical devices sector to achieve the following missions viz, Access & Universality, Affordability, Quality, Patient Centred

& Quality Care, Preventive & Promotive Health, Security, Research and Innovation and Skilled manpower.

» **Strategies to Promote Medical Device Sector:** These strategies will cover six broad areas of policy intervention.

- **Regulatory Streamlining:** In order to enhance ease of doing research and business and further to balance patient safety with product innovation measures such as creation of a **Single Window Clearance System' for Licensing of Medical Devices** co-opting all the stakeholder departments / organizations such as AERB, MeitY, DAHD, etc, enhancing the Role of Indian Standards like BIS and designing a coherent pricing regulation, will be followed.
- **Enabling Infrastructure:** The establishment and strengthening of large medical device parks, clusters equipped with world class common infrastructure facilities in proximity to economic zones with requisite logistics connectivity as envisioned under the **National Industrial Corridor Program** and the proposed National Logistics Policy 2021 under the ambit of PM Gati Shakti, would be pursued with the State Governments and Industry for better convergence and backward integration with medical device Industry
- **Facilitating R&D and Innovation:** The policy envisages to promote Research & Development in India and complement the Department's proposed National Policy on R&D and Innovation in the Pharma- MedTech Sector in India. It also aims at establishing Centres of Excellence in academic and research institutions, innovation hubs, 'plug and play' infrastructures and support to start-ups.
- **Attracting Investments in the Sector:** Along with recent schemes and interventions like Make in India, Ayushman Bharat program, Heal-in-India, Start-up mission, the policy encourages private investments, series of funding from Venture Capitalists, and also Public-Private Partnership (PPP).
- **Human Resources Development:** In order to have a steady supply of skilled work force across the value chain such as scientists, regulators, health experts, managers, technicians, etc., the policy envisages:
 - Leveraging the available resources in Ministry of Skill Development and Entrepreneurship
 - Supporting dedicated multidisciplinary courses for medical devices in existing institutions to ensure availability of skilled manpower for futuristic medical technologies, high-end manufacturing and research, to produce future ready MedTech human resources and to meet the evolving needs of the Sector.
 - Developing partnerships with foreign academic/industry organizations to develop medical technologies in order to be in equal pace with the world market.
- **Brand Positioning and Awareness Creation:** The policy envisages the creation of a dedicated Export Promotion Council for the sector which will be an enabler to deal with various market access issues.

D) STRENGTHENING OF PHARMACEUTICAL INDUSTRY (SPI) SCHEME

- Launched in March 2022 with a total outlay of Rs 500 crores for five years from FY22 to FY26 with multiple objectives:

- » **First**, it aims to strengthen the existing infrastructure facilities by providing financial assistance to pharma clusters to create common facilities.
- » **Second**, it upgrades the production facilities of MSMEs to meet national and international regulatory standards by providing interest subvention or capital subsidy on their capital loans.
- » Third, it also promotes knowledge and awareness about the pharmaceutical and medical devices industry by undertaking studies, building databases, and bringing industry leaders, academia and policymakers together to share their knowledge and experience.

GS FOUNDATION 2025



7 PILLARS OF THE PROGRAM

- **700 hours of classroom** in 10 months, along with handouts
- **Weekly/Monthly assessments** - subjective and objective **tests** (about 40 total tests)
- **Current Affairs** for 15 months
- **Mentorship** and **doubt resolution** (weekly)
- **Prelims Test Series** (about 25 tests)
- **CSAT module** (about 40-45 lectures)
- **Essay module** (about 10 lectures)

OFFLINE & ONLINE

DURATION
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TARGET PRELIMS 2024

BOOKLET-46; ECONOMY-11

INFRASTRUCTURE-1

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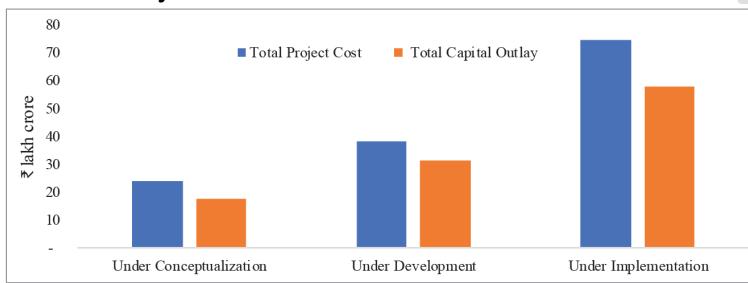
2. MAJOR INITIATIVES IN INFRASTRUCTURE SECTOR

1) NATIONAL INFRASTRUCTURE PIPELINE (NIP) 2020-2025

- In 2019, Ministry of Finance estimated that to achieve a GDP of \$5 trillion by 2024-25, India needed to spend about \$1.5 trillion (Rs 111 lakh crore) over these years in infrastructure. Keeping this in mind, government has launched National Infrastructure Pipeline (2020-25) with projected infrastructure investment of around Rs 111 lakh crores. It also envisages to improve project preparation and attract investment, both domestic and foreign in infrastructure.

- **Progress So Far:**

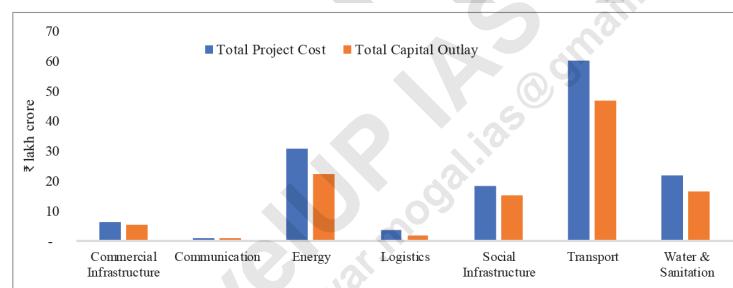
- » The NIP currently has 9,288 projects with a total investment of more than Rs 108 lakh crore under different stages of implementation.
 - » **Status of Projects under NIP**



Source: Department of Economic Affairs.

Note: Data as of 13 January 2023

- **Transportation Sector Dominates the NIP**



Source: Department of Economic Affairs.

Note: Data as of 13 January 2023

- **Jointly funded by Central Government, State Government and Private Sector:**

- **Some steps to improve the implementation of NIP:**

- **Invest India Grid (IIG):**

- NIP is hosted on the Invest India Grid (IIG) platform and provides opportunities for states/UT and ministries to collate all major infrastructure projects at a single location. It is thus a centralized portal to track and review project progress across all economic and social infrastructure sub-sectors. It also provides the project sponsoring authorities to showcase investment opportunities to national and international investors.

- **Project Monitoring Group (PMG)**

- It is an institutional mechanism put in place by the government for resolution of issues related to large-scale projects. It is also involved in fast tracking of approvals/ clearances for projects with an anticipated investment of Rs 500 crore and above. Now it has been proposed to integrate NIP and PMG portals. PMG portal will pick up data, as per requirements (project cost of Rs 500 crore

or more), from the NIP database. This will save substantial time and effort by Ministries and States/UTs and ease monitoring of large-scale projects.

2) NATIONAL MONETIZATION PIPELINE

- **Background**
 - » **Asset Monetization** is one of the key recommendations of National Infrastructure Pipeline (2020-25). Consequently, National Monetization Pipeline was announced in 2021. It focuses on the principle of 'asset creation through monetization' and thus taps private sector investment for new infrastructure creation.
- **Details:**
 - » Asset monetization entails a limited period license/lease of a brownfield underutilized asset owned by government or a public agency, to a private sector entity for an upfront or periodic consideration.
 - **The private sector entity** is expected to operate and maintain the asset based on the terms of the contract/concession, generating returns through higher operating efficiencies and enhanced user experience.
 - **Public authority**, which receives the fund, will invest it in new infrastructure or deploy it for other public purposes.
 - » A robust asset pipeline has been prepared to provide a comprehensive view to investors and developers of the investment avenues in infrastructure.
 - It includes selection of de-risked and brownfield assets with stable revenue generation profile (or long rights) which will make for an attractive investment option.
 - » Total indicative value of NMP for core assets of the Central Government has been estimated at Rs 6.0 lakh crore over 4-year period (FY22 - 25) (5.4% of the total infrastructure investment envisaged under NIP)
- **National Land Monetization Corporation (NLMC)**: Cabinet approved the setting up of the NLMC to monetize surplus land and building assets of CPSEs and other agencies linked to government (March 2022)
- **Progress so far: ESI 2022-23:**
 - Against the monetization target of 0.9 lakh crore in FY22, Rs 0.97 lakh crore have been achieved during the period under roads, power, coal and mines.
 - NMP's 2nd year target, i.e. FY23 target is ₹ 1.6 lakh crore (27% of the overall NMP target).

3) PM GATISHAKTI NATIONAL MASTER PLAN

- **Need of PM GatiShakti:**
 - There are many infrastructure projects like roadways, railways, airways, waterways, internet connectivity (optical fiber), Gas Pipelines etc. These projects come under different ministries, leading to lack of coordination in planning and implementation of these projects. This leads to duplication of work, delays, financial loss, increase in cost etc., which eventually puts more burden on the public exchequer and impacts the quality of services reaching people.
 - E.g. 1: Newly built roads being dug by water departments to lay pipelines.
 - E.g. 2: Newly built fertilizer factory not working properly as the gas supply infrastructure isn't available.

- E.g. 3: Separate tunnel for roadways and railways
- Details
 - PM GatiShakti is aimed at breaking departmental silos and bring more holistic and integrated planning and execution of projects with a view to address the issue of Multi-Modal connectivity and last mile connectivity.
 - This will help in bringing down the logistic cost and will translate into enormous financial gains to consumers, farmers, youth as well as those engaged in businesses.
- The PM GatiShakti National Master Plan entails creation of a common umbrella platform with all infrastructure projects pertaining to various ministries/ departments incorporated within a comprehensive database for efficient planning and implementation on a real-time basis.
 - The projects pertaining to seven engines (roads, railways, airports, ports, mass transport, waterways, and logistic infrastructure) in the NIP have been aligned with PM GatiShakti framework.
 - In order to facilitate integrated planning and coordinated implementation, a GIS based and data driven decision support called PM GatiShakti National Master Plan has been introduced.
 - The portal will also allow various government departments to track, in real time and at one centralized place, the progress of various projects. This will enable various government departments to synchronize their efforts into a multi-modal network.
 - The portal will also highlight all the clearances any new project would need, based on its location - and allow stakeholders to apply for these clearances from the relevant authority directly on the portal.
- Six Pillars of PM Gati Shakti
 - PM Gati Shakti is based on six pillars: Comprehensiveness, Prioritization, Optimization, Synchronization, Analytics and Dynamic.
- How were inter-ministerial issues resolved earlier?
 - At regular meetings of infrastructure related ministries.
 - PM PRAGATI (Pro-Active Governance and Timely Implementation) portal also helped in resolution of several issues even prior to inter-ministerial meetings.
 - **How would GatiShakti portal help?**
 - It will reduce the human intervention required as ministries will be in constant touch, and projects will be reviewed by the project monitoring group in real time.
- Who has built the portal?
 - The Bhaskaracharya Institute for Space Applications and Geoinformatics (BISAG-N).

4) NATIONAL INVESTMENT AND INFRASTRUCTURE FUND (NIIF)

- Introduction
 - » NIIF was proposed in Union Budget 2015 and was set up by GoI in Dec 2015 with a corpus of Rs 40,000 crore to provide long term capital for infrastructure projects.
- Objectives
 - » To maximize economic impact through infrastructure development in viable projects both greenfield and brownfield, including stalled projects, mainly in the core infra sector.
- Structure

- » NIIF has been structured as a Fund of funds and set up as Category II Alternate Investment Fund (AIF) under SEBI.
- » **Gol has 49% stake** in NIIF with rest being held by marquee foreign domestic investors such as Abu Dhabi Investment Authority (ADIA), Temasek and HDFC group. This helps NIIF to be seen with characters of both sovereign fund as well as private fund (and is sometimes referred as India's quasi sovereign wealth fund).
- » The government invested Rs. 20,000 crores into it from Budget while the remaining 20,000 crores are expected to come from private investors (including foreign).
- » **Fund of funds** means that there would be multiple alternative investment funds underneath the main fund.
 - **How much does it manage presently?**
 - NIIF manages about \$5 billion of capital commitments across four funds, each with a distinct investment strategy.
 - **NIIF Master Fund:** It focuses on infrastructure and operating assets. It is the largest infrastructure fund in India, with commitment of over US\$1.8 billion. It has the largest size of US\$2.1 billion.
 - **NIIF Private Market Fund:** It invests in funds managed by third-party managers in infrastructure and associated sectors.
 - **NIIF Strategic Opportunities Fund:** It invests and develops large-scale businesses and greenfield projects that are of strategic importance to the country. It has a target size of \$3 billion.
 - **India-Japan Fund:** It is NIIF's first bilateral fund and invests in environmental preservation in India. It also seeks to enable opportunities for collaboration between Indian and Japanese companies in India.

- Governance

- » NIIF has been set up as a Trust registered under the Indian Trust Act. The activities of NIIF will be overseen by a Governing Council, which will be headed by Finance Minister.

- Functions of NIIF

- » NIIF would raise funds from investors and markets and would invest the same in companies, institutions and infrastructure projects.
- » It will also provide advisory services.

- Sources of Funds

- » The sources of funds of NIIF are as follows.

- **Government Budgetary Funds** to each AIF set up under NIIF, these funds will be provided every year as required.
- **Private investors.** The funds will solicit equity participation from strategic anchor partners. It is also expected to attract overseas investors, PSUs, domestic pension, provident funds and NSSF (National Small Savings fund) also.

A) ALTERNATE INVESTMENT FUND (AIF)

- Alternative Investment Funds are a class of investment entities that are not covered under the usual SEBI regulatory framework for investment institutions.
 - AIF refers to any privately pooled investment fund (trust, company or LLP) which are not presently covered by any regulation of RBI, SEBI, IRDA and PFRDA. They may be foreign or Indian.
- They include private equities, Venture Capital Funds, Hedge Funds, Commodity Funds, Debt Funds, infrastructure funds etc. They are generally owned by big corporate houses or wealthy individuals.
- This classification is done for the purpose of regulation.
- **SEBI in 2012 had notified guidelines for AIFs** as funds established or incorporated in India for pooling in of capital from Indian or foreign investors for investing as per a pre-decided policy.
- **SEBI guidelines have classified AIF in three categories:**
 1. **Category1:** AIFs which can produce positive spillovers in the economy and for that get incentives from government, SEBI or other regulators. They include social venture funds, Infra funds, Venture capital funds including angel investors, SME funds etc.
 2. **Category2:** For these funds no specific incentives or concessions are given by the government or any regulator. These includes private equity funds, debt funds, Funds of Funds and such other funds.
 3. **Category 3** AIFs are institutions like hedge funds that trade with a view to make short term returns. They employ diverse or complex trading strategies and do leverage including investment in listed or unlisted companies.

5) INFRASTRUCTURE INVESTMENTS TRUST (INVITS)

- InvITs are mutual funds like institutions that enable investment into the infrastructure sector by pooling small sums of money from multitude of individual investors for directly investing in infrastructure so as to return a portion of the income (after deducting expenditures) to unit holders of InvITs, who pooled the money.
- They are designed to attract low-cost, long-term capital in infrastructure sector and reduce pressure on the banking system.
- **Structure of InvITs in India**
 - » InvITs are set up as a trust and registered with SEBI.
 - » **Regulation**
 - InvITs are regulated in India by **SEBI**.
 - SEBI notified **SEBI (Infrastructure Investment Trusts) Regulations, 2014**, providing for regulation and registration of InvITs in India with an objective of facilitating investment in Infrastructure sector.
 - InvITs can invest in infrastructure projects, either directly or through a special purpose vehicle (SPV). In case of a PPP project, such investments can only be through SPV.
 - As per the present regulations, InvIT unit's minimum size is Rs 10 Lakh and thus are suitable only for High net worth individuals, institutional and non-institutional investors like pension funds, FPI, MF, banks and insurance firms.

- InvITs are listed on exchanges just like stocks - through IPO
- Taxes
 - Capital Gain Tax
- India's First InvIT issue was done by road developer IRB Infrastructure in May 2017 which garnered Rs 5,035 crore through IPO.

3. PUBLIC PRIVATE PARTNERSHIP (PPP)

- **Introduction:**
 - In 1997, the report of the **Rakesh Mohan Committee (RMC)** concluded that India's problem was that of poor infrastructure holding back development. It also highlighted the importance of bringing in the private sector into most areas of infrastructure in the country.
- **Public Private Partnership (PPP)** is a collaborative arrangement between government and private sector to jointly plan, mobilize resources, develop, and/or operate infrastructure projects.
- **Significance of Public Private Partnerships:**
 - **Mobilization of Resources:** For e.g. in the BOT (Toll/ Annuity) model of road construction, private player invests the entire initial money for the construction of the road project).
 - **Getting Private Sector expertise and Innovation:** E.g. in the EPC model, private sector engineers and construct the entire road.
 - **Risk Sharing**
 - **Increased Efficiency and Reduced cost of the project**
 - **Increased Transparency and Accountability**
 - **Better Infrastructure**
- But, the success of PPPs lies in the robustness of institutional structure, financial support, and use and availability of standardized documents, such as Model Requests for Qualifications (RFQ), Model Request for Proposal (RFP) and Model Concession Agreement (MCAs).
- Government of India has taken several measures:
 - Government of India has streamlined the appraisal and approval mechanism for Central Sector PPP projects to ensure speedy appraisal of projects, eliminate delays, and have uniformity in appraisal mechanisms.
 - » Procedure for approval of PPP projects was finalized in 2005 and in 2006, the Public Private Partnership Appraisal Committee (PPPAC) for the appraisal of was notified in 2006. It has cleared 79 projects with a total cost of Rs 2,27,268 crore from FY15 to FY23.
 - **Viability Gap Funding (VGF) Scheme, 2006**
 - » It provides financial assistance to financially unviable but socially/economically desirable PPP projects.
 - » **Economic Sector Projects** may get upto 40% of Capex as VGF grant.
 - » **Social Sector Projects** include higher provisions of VGF grant. It may get upto 80% of CAPEX and upto 50% of the Operating Expenditure (OPEX).

- **India Infrastructure Project Development Fund (IIPDF) Scheme** notified in Nov 2022
 - » The scheme aims to develop quality PPP projects by providing necessary funding support to project sponsoring authorities, both in the central and the state governments, for creating a shelf of bankable and viable PPP projects by on-boarding transaction advisors.
 - » It has an outlay of Rs 150 crores for a period of 3 years from FY23 to FY25.
 - » Under the scheme a maximum amount of Rs 5 crores for a single proposal, inclusive of any tax implications, can be funded which can include cost of consultants/transaction advisors of a PPP project.
 - » By: Department of Economic Affairs (DEA), Ministry of Finance, GoI

- **Several types of PPP Models** are used in India in different sectors:

- » **EPC Model (Engineering, Procurement, and Construction)**: In this model, the cost of project is completely borne by government. Private sector with its expertise is responsible for engineering, procuring raw material and constructing the project. Ownership remains with government.
- » **Built Operate and Transfer (BOT)** model involves private player entity designing, financing, constructing, operating, and maintaining an infra projects for a specific period. After the specified period, the ownership is transferred back to government. This model has been used in sectors like Roadways, Ports, Airports and Power Generation. It can be of two types - BOT (Toll) & BOT (Annuity).
- » **Hybrid Annuity Model (HAM)**: It is a mix of EPC and BOT (Annuity) model.
- » **Build Own Operate (BOO)**: The private sector entity builds and owns the asset, and then operates it for a specified period of time.
 - Government has agreed to "buy" the goods and services delivered by the project on mutually acceptable terms and circumstances.
- » **Build Own Operate Transfer (BOOT)**:
 - It is a model of PPP in which a private company is granted a concession to finance, build, own, and operate a project for a specified period of time. At the end of the concession period, the project is transferred back to government.
 - E.g. of project under BOOT model, Delhi Mumbai Expressway, The Mumbai Metro, the Bangalore International airport etc.
 - It involves a private sector entity being responsible for the complete lifecycle of the project, including design, financing, construction, operation, and maintenance. However, here private sector entity retains ownership of the project even after the concession period.
- » **Build Own Lease Transfer (BOLT)**: It is a PPP model in which a private company is granted a concession to finance, build, own and lease a project to the government for the specified period of time. At the end of the concession period, the project is transferred back to government. Some notable BLT projects in India are, the Delhi-Gurgaon Expressway and the Mumbai-Pune Expressway.
- » **Design Build Finance and Operate (DBFO)**: It allows a private sector to design, build, finance, and operate a project for a specified period of time. This public sector client retains the ownership of the project, but the private sector contractor is responsible for all aspects of its delivery.

- E.g. Delhi Metro: Project was awarded to a consortium of private companies, which designed, built, financed, and operated the metro for a period of 30 years. At the end of the concession period, the metro will be transferred back to government.
 - » **Lease Developed Operate (LDO) Model:** Private company is granted a concession to finance, develop, and operate a project for a specified period of time. The government sector retains the ownership, but the private sector is responsible for all aspects of its delivery. At the end of the concession period, government may choose to operate the project itself, or it may contract with another private company to operate the project.
 - » **Rehabilitate-Operate-Transfer (ROT) Model:** Under this model, government allows private promoters to rehabilitate and operate a facility during a concession period. After the concession period, the project is transferred back to government / local bodies.
- **Recommendations of Vijay Kelkar Committee:**
- » Vijay Kelkar Committee on "Revisiting & Revitalizing the PPP model of infrastructure Development" was set up in the Union Budget of FY15-16. It recommended:
 - The Need of PPP contract to be more focused on service delivery.
 - The need to identify, balance and allocate risks amongst the different stakeholders.
 - Viability Gap Funding for unviable social and economic projects
 - Careful monitoring of performance as well as managing the risk.

4. LOGISTIC SECTOR

- Logistics, including transportation, inventory management, warehousing, material handling & packaging, and integration of information, is related to management of flow of goods between the point of origin and the point of consumption.
- **LOGISTIC PERFORMANCE OF INDIA:**
 - » As per the Logistics Performance Index, 2023 released by World Bank, India is ranked 38/139 countries in terms of the logistics performance.
 - » Logistics Cost in India have been in the range of 14-18% of the GDP against the global benchmark of 8%.
 - » Thus, logistic sector can play a crucial role in promoting the competitiveness of our industries. Besides it will also play a role in job creation and enhancing India's GDP.

1) NATIONAL LOGISTIC POLICY, 2022

- The vision of NLP is " to develop a technologically enabled, integrated, cost-efficient, resilient, sustainable and trusted logistics ecosystem in the country for accelerated and inclusive growth."
- The Targets for achieving the vision of NLP are to
 - reduce the cost of logistics in India to be comparable to global benchmarks by 2030.
 - improve the Logistics Performance Index ranking - endeavour is to be among the top 25 countries by 2030, and
 - create a data driven decision support mechanism for an efficient logistics ecosystem.

- The Policy has **four key features (four key pillars)**: Integration of Digital System (IDS); Unified Logistics Interface Platform (ULIP); Ease of Logistics (ELOG); and System Improvement Group (SIG);
 - **Under IDS, 30 different systems of seven departments are integrated** - including data from the road transport, railways, customs, aviation and commerce departments.
 - **ULIP would bring all digital services related to the transportation sector into a single platform.**
 - **Ease of Logistics (E-Logs)** is a new digital platform which has been started for industry associations to resolve issues by reaching out to the government.
 - **Systematic Improvement Group (SIG)** has been created along with the **Network Planning Group (NPG)** to improve coordination across government ministries and between the state and central governments.
- The policy will be implemented through CLAP (Comprehensive Logistics Action Plan), which proposes the following interventions:
 - **Integrating digital logistics systems** to develop a system of unified logistic interface.
 - **Sectoral Plan For Efficient Logistics**
 - **Facilitating the development of logistics Park**
 - **EXIM logistics**
 - **Logistics manpower skill development and capacity building**
 - **Service Improvement Program**
 - **Standardizations of physical assets and benchmarking service quality standards**
 - **Engagement with different Indian states**

2) MULTIMODAL LOGISTICS PARKS

- **What is Multi-Modal Logistic Park (MMLP):**
 - MMLPs have been conceptualized to enable seamless intermodal freight movement and offer multiple functionalities such as freight aggregation, and distribution. Storage, warehousing solutions, value-added services like custom clearances and IT services will be provided.
 - The parks will enable the switch from a point-to-point to a hub-and-spoke model in the logistic parks, eventually bringing down logistics costs by at least half and enabling more efficient movement of new generation vehicles.
- **Details about Multi-Modal Logistic Park (MMLPs):**
 - MoRTH&H is developing 35 MMLPs under Bharatmala Phase-1.
 - Of these 6 MMLPs are undertaken by MoRTH in port cities namely Cochin (Kerala), Chennai (TN), Vishakhapatnam (Andhra Pradesh), Mumbai (Maharashtra), Kolkata (WB), and Kandla (Gujarat).
- **Advantages:**
 - Logistic Efficiency -> Reduced time and cost
 - **Seamless Intermodal transports** -> simplify imports and exports
 - Improved warehousing -> reduced wastage of food
 - Improved Employment opportunities
 - Helps in growth of MSME sector
 - **Environmental benefits** -> improved efficiency -> reduced dependency on fossil fuels

B) SOUTH INDIA'S LARGEST MULTIMODAL LOGISTICS PARK IN BENGALURU (JAN 2024)

- The groundwork for 400-acre facility has begun at Obalapura on the northern outskirts of Bengaluru.
- It will provide a host of logistics, warehousing and cold storage facilities that are aimed at reducing overall logistics costs from 13% to 9% and making exports competitive.
- It will handle 30 million tonnes of cargo by 2070.
- This is a 1770 crore project and is being developed by Bengaluru MMLP Pvt Ltd, a special-purpose vehicle with three stakeholders.
 - The NHAI's National Highways Logistics Management Ltd (NHLML) owns the majority of stake (51.29%), followed by the Karnataka Industrial Areas Development Board (32.38%) and Rail Vikas Nigam Limited (16.33%).

3) LOGISTIC EASE ACROSS DIFFERENT STATES (LEADS) INDEX, 2023

- **Why in news?**
 - » Ministry of Commerce and Industry releases the 5th edition of the LEADS index (Dec 2023)
- **About the Index**
 - » It is a composite indicator to assess international trade logistics across states and Union Territories and is based on stakeholders' survey and uses the World Bank's Logistic Performance Index (LPI) methodology (LPI).
 - » While LPI relies entirely on perception-based surveys, LEADS incorporates both perception as well as objectivity thereby enhancing the robustness and comprehensiveness of the exercise.
- **The 5th edition of the LEADS annual exercise - LEADS 2023 report**, provides insights into improvement of logistics performance at State/UT level.
 - » The report signals a positive shift in States' performance across the key pillars - Logistics Infrastructure, Logistics Services and Operating and Regulatory Environment.
 - » The report is based on a pan-India primary survey, conducted between May and July 2023, covering over 73,000 responses across 36 states/UTs. Additionally, over 750 stakeholder consultations, facilitated by National, regional, and state associations, significantly contributed to this comprehensive evaluation.
 - » **Performance Highlights:**
 - **Coastal Group**
 - Achievers: Andhra Pradesh, Gujarat, Karnataka, Tamil Nadu
 - Fast Movers: Kerala, Maharashtra
 - Aspirers: Goa, Odisha, West Bengal
 - **Landlocked Group**
 - Achievers: Haryana, Punjab, Telangana, Uttar Pradesh
 - Fast Movers: Madhya Pradesh, Rajasthan, Uttarakhand
 - Aspirers: Bihar, Chhattisgarh, Himachal Pradesh, Jharkhand
 - **North-East Group**
 - Achievers: Assam, Sikkim, Tripura
 - Fast Movers: Arunachal Pradesh, Nagaland

- Aspirers: Manipur, Meghalaya, Mizoram
- **Union Territories**
 - Achievers: Chandigarh, Delhi
 - Fast Movers: Andaman & Nicobar, Lakshadweep, Puducherry
 - Aspirers: Daman & Diu/ Dadra & Nagar Haveli, Jammu & Kashmir, Ladakh

5. SHIPPING AND INLAND WATERWAYS

1) HUGE POTENTIAL IN SHIPPING SECTOR

- **India's Geography:** India is endowed with a rich coastline of ~7500 km and has a strategic location on key international maritime trade routes.
- **India's fleet** is just 1.2% of the world's fleet and carries only 8% of India's Exim trade.

2) SEAPORTS IN INDIA

- Our coastline is not very serrated and therefore we have very few natural seaports on our coast. There are **13 major and about 200 non-major ports** in India.
- **Port development** in India is a concurrent subject.
- The Major seaports are maintained and managed by central government (Ministry of Shipping) under **Major Port Authorities Act, 2021** and other seaports are controlled by the state governments under the Indian Ports Act, 1908.
- **Installed capacity of major ports** in India has increased to 1534.91 MTPA in March 2020.

3) MAJOR PORT AUTHORITIES ACT, 2021

- **The need of this act?**
 - Major Ports Trust Act of 1963 was very restrictive which made it difficult for major ports to function in highly competitive environment and respond to market challenges.
 - The Board of Trustees was considered too large and disparate to allow efficient decision making.
- The 2021 act provides for regulation, operation, and planning of major ports in India. It was enacted in Sep 2021 and replaced the Major Port Trusts Act, 1963.
- **Key Provisions:**
 - It vests the administration, control and management of major ports in the **Boards of Major Port Authorities (MPAs)**. It will replace the existing port trusts.
 - » **Responsibility:** The boards are responsible for overall planning, development, and operation of the port. They are also responsible for fixing the scale of rates for port services and assets.
 - **Greater autonomy to MPAs in decision making:**
 - » MPAs are now free to enter into public-private partnership (PPPs) for the development and operation of port facilities.

- » **Significance:** This will allow the ports to be more responsive to the needs of their users and to make decisions that are in the best interest of the port community.
 - They are also responsible for fixing the tariffs for port services based on market conditions.
 - » **Significance:** This will allow ports to be more competitive and to attract more traffic.
 - **Reorient the governance model** in the major ports to landlord port model in line with the global practices.
 - **Improved grievance redressal mechanism:** The act provides for creation of an adjudicatory board to resolve disputes between MPAs and stakeholders.
- The above changes are also expected to increase investment in the port sector.

4) MAJOR SEAPORTS OF INDIA

i. Kandla (now known as Deen Dayal) - Gujarat

- Located in Gulf of Kutch and is the largest port by volume of cargo handled. Its harbor is natural and protected.
- Kandla port also is a free trade zone, where import duties are not levied. The basic concept is that entrepreneurs setting up units in the zone can import raw material and machinery free of duty, but the manufactured products must be completely exported and not sent into hinterland. Consumable articles like TV, tape recorders etc can't be imported in the free trade zone.
- The port is famous for import of petroleum products.
- One limitation of the port is that it is situated in a earthquake prone zone (zone v).
- Updates:

» **Kandla becomes the first Green SEZ (July 2021)**

- It achieved CII's IGBC (Indian Green Building Council) Green Cities Platinum Rating.
 - With this KASEZ (Kandla SEZ) has become the first Green SEZ to achieve the IGBC Green Cities Platinum Rating for Existing Cities.
 - It has been awarded for 'Green Master Planning, policy initiatives, and implementation of Green infrastructure'.
- It shows that GoI is working towards ensuring environmentally sustainable development.

ii. Mumbai: It is situated in the natural serrated area of the Salsette Island and thus have a natural harbour which is safe too.

- Here also, there has been an establishment of free trade zone.
- It is the largest port in India.

iii. Nhava Sheva or Jawaharlal Nehru Seaport (JLNP)

- It is an all whether tidal port.
- Developed near Panvel in Navi Mumbai to ease off the pressure of Mumbai port. It is the most modern sea-port of the country.

iv. **Mormugao Port**- Situated on the left bank of Zuari river in Goa. It is a natural seaport protected by backwater and also by a mole. It is specially known for the export of iron ore (as Goa is rich in it), other products which are exported from here includes Cashew, fish, spices, rice etc.

v. **New Mangalore**

- It handles iron ore export from Kudremukh mines. Other items exported include, fish, fertilizers, cashew, forest products and coffee.



vi. **Kochi**

- It is a natural harbour located in the Vembanad lake on Wellington Island on the coast of Kerala. It is situated on the mouth of a large lagoon parallel to the sea.
- Major items exported from here are coconut products, cashew, tea, rubber, fish and spices.
- Important items imported from this port includes mineral oil, fertilizers, coal and edible oils.

vii. **New Tuticorin (V.O. Chidambarnar Port)**

- It is one of the major ports in TN, located in Gulf of Mannar. It is an artificial, deep sea, open seaport which is located 9 km from the eastern side of Hare Island.
- Its harbour has been made deeper and it has been developed artificially.
- The port handles the trade of coal, food grains, salt, sugar, petroleum products etc.

viii. **Chennai Port**

- It is a major seaport on east coast of India. It is an artificial port and is located in open seas where the ships have to face the wave. To protect the ships, a long wall has been built at 3 km away from the coast.
- It is the second largest trading seaport after Mumbai.
- Key imports: Iron ore, food grain, leather, sugar, tobacco, coconut products, etc.
- Key exports: Petroleum, coal, edible oil, chemicals, cotton etc.

ix. **Ennore Port (Kamarajar Port)**

- Located in Tamil Nadu, North of Chennai. Developed to ease pressure on Chennai.
- Especially significant for coal trading. The Tamil Nadu government gets internal and imported coal for itself from this seaport.