IAS 2023

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ENVIRONMENT

Yearly CURRENT AFFAIRS Compilation

- Comprehensive Coverage *of* Last 2 Years Current Affairs *for* Prelims 2023
- Topic-wise Previous Year MCQs
- Practice MCQs *to* validate your learning

Edited by

MANOJ K. JHA

Contents

INTRODUCTION

Current affairs are "The Thread" which binds the various stages of the UPSC CSE together, it is also the ropeway to achieve success in this extremely challenging examination finally. Current affairs present themselves in varying forms in the examination- sometimes directly and sometimes indirectly. They reflect themselves in the prelims in terms of direct as well as applied questions

GS Score Prelims Sampoorna Current affair Yearly compilation for UPSC CSE prelims 2023 offers holistic Coverage of the last 1.5 years of Current affairs with a special focus on Preliminary examination along with practice questions to validate your learning. The compilation offers pointed and quick notes for effective revision saving you the effort to make separate notes. We have also provided Previous Years Prelims Question at the end of each sectionn to give insight into the type of questions that come in the exam and the way the UPSC expects the aspirants to prepare the topics. The practice questions not only simulate the pattern of the questions asked in the examination but also season you better to navigate through the challenges which one might encounter in the real examination.

These notes are not just quick and handy but covers almost everything that one requires to get a good hold on the area of Current Affairs. With this much effort, current affairs would become a cakewalk for you! This compilation provides lucid and effective content making your learning easy, effective and efficient. A hassle-free logically arranged bouquet of current affairs to master the news in sync with concepts. So that you shine on May 28th, 2023 and beam with confidence that you know it all and how. Face the examination with confidence and attempt to win.

This edition covers current affairs from October 2021 to January 2023. We will release the second edition in the 1st week of May, covering the current affairs of February to April.

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1 BIODIVERSITY

1. Rhino reintroduction success in Assam

Context According to the **14th Assam rhino estimation**, **Manas National Park** rhinos have higher life expectancy but need translocation support.

About: 14th Assam Rhino Census

The Indian state of Assam is home to the largest population of greater-one horned rhinos, with more than **90% in Kaziranga National Park.**

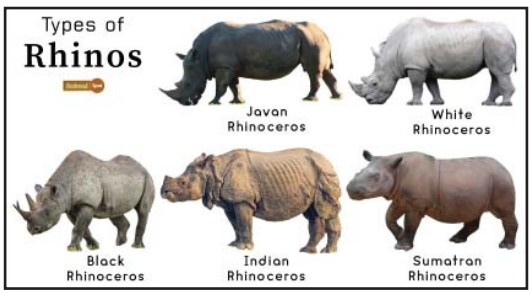
- The rhino census in the **Manas Park** was carried out in all three ranges: **Bhuyanpara, Bansbari and Panbari** comprising 71 estimation blocks.
- The current rhino population in the park was estimated at 40.
- The park's rhinos have a male-female sex ratio of 1:1.
- The number of calves born in the wild reflects the availability of welfare factors to foster rhinos in **Manas National Park.**

Manas National Park

- Manas National Park is situated in Assam on the bank of the river mans at the foothills of the Himalayas.
- It is a UNESCO Natural World Heritage Site, a tiger and elephant reserve, and a biosphere reserve.

About Greater One-Horned Rhino

- There are five species and 11 subspecies of rhino. **White, Black, Indian, Javan, and Sumatran** make up the five species of rhino in the world.
  - **White and black rhinoceros** are native to Africa.
  - **Indian, Javan and Sumatran** can be found in India and Asia.



- **Habitat:** The animal is primarily found in the Himalayan foothills — India and Nepal.

Conservation Status

IUCN Red list

- **Javan and Sumatran Rhino** are **critically endangered.**
- Greater one-horned (or Indian) rhino is **vulnerable.**

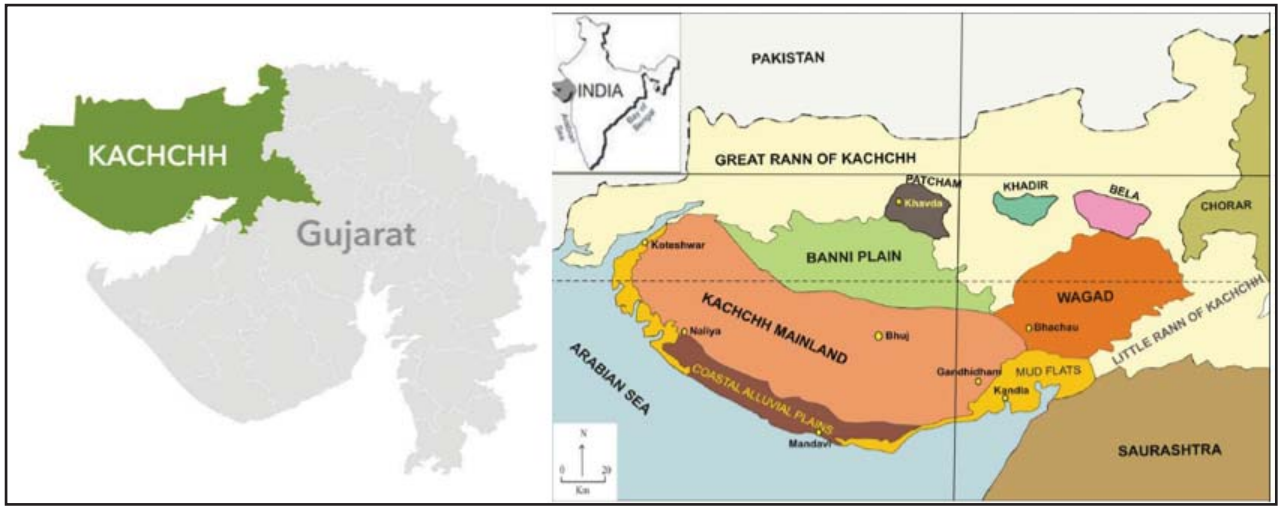
CITES

- All three listed under **Appendix I**.
- **Wildlife Protection Act, 1972- Greater one-horned rhino** is listed under the **Schedule I of the Act.**

2. Banni grasslands battles invasive tree species

Context The Gujarat forest department plans to restore 10,000 hectares of the **Banni grasslands** in the coming year.

About Banni Grasslands:



- Banni Grassland is situated near the **Great Rann of Kutch** in Gujarat.
- It is considered to be the **largest Grassland in Asia**. This grassland is a **high-biodiversity area.**
- The grassland spreads over 2,618 kilometers and accounts for almost 45% of the pastures in Gujarat.
- **Formation:** The land here was formed from the sediments that were deposited by the **Indus and other rivers** over thousands of years.
- **Ecosystem:** Two ecosystems, wetlands and grasslands are juxtaposed in Banni.
- **Vegetation:** The vegetation in Banni is **sparse** and highly dependent on rainfall.
  - It is dominated by **low-growing forbs and graminoids**, many of which are **halophiles (salt-tolerant),** as well as scattered tree cover and scrub.

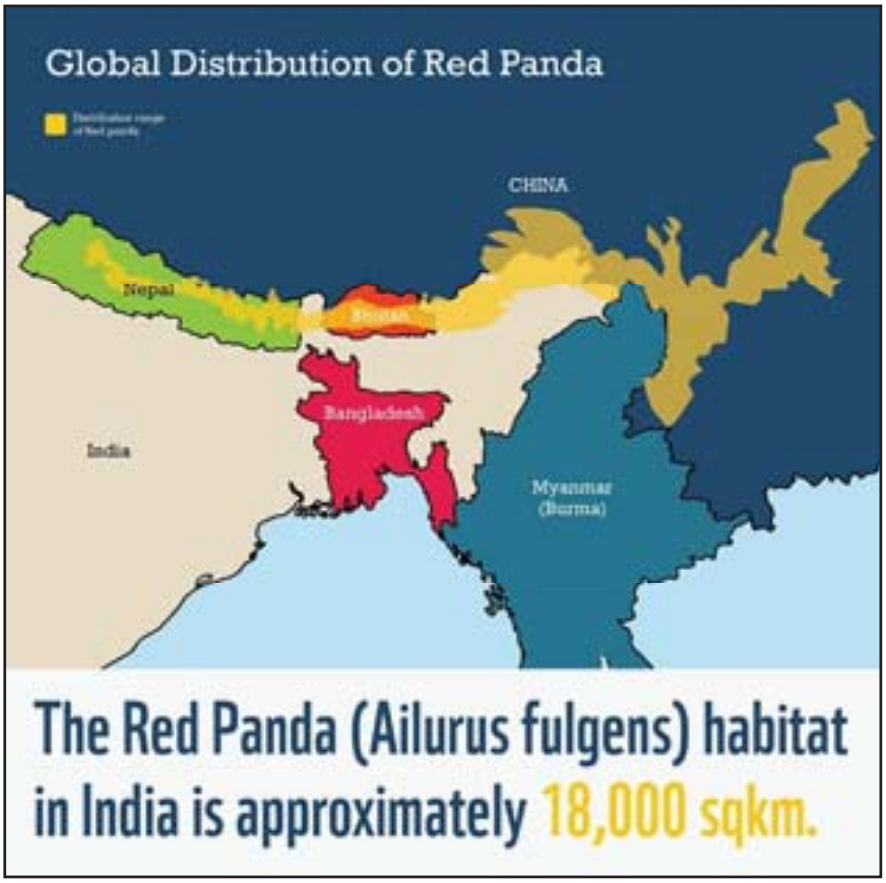
- Besides having 40 species of grass and 99 species of flowering plants, Banni is also home to the **Indian wolf, jackal, Indian fox, desert fox, desert cat, caracal, hyena, chinkara, Nilgai, wild boar,** Indian hare, common monitor **lizard — and the cheetah** before it became extinct.

3. Red pandas to make a home in the forests

Context The **Singalila National Park**, the highest protected area in West Bengal, launched programme that aims to release about **20 Red Pandas** in a period of five years.

Important facts about the species

- The red panda is a small **arboreal mammal** found in the forests of **India, Nepal, Bhutan,** and the northern mountains of **Myanmar and southern China.**



  - In India, this elusive species is found in **Sikkim, Arunachal Pradesh, Darjeeling and Kalimpong districts of West Bengal.** It is the **state animal of Sikkim.**
  - The three major national parks with known Red Panda population are **Khangchendzonga National Park, Neora Valley National Park and Singalila National Park.**
- They belong to the phylum **Chordata** and the family **Ailuridae.**
- **IUCN Status**: Endangered
- **Subspecies:** Red pandas are made up of two subspecies—
  - **Himalayan red panda (*Ailurus fulgens fulgens*),** which resides in the mountains of northern India, Tibet, Bhutan, and Nepal
  - **Chinese red panda (*A. fulgens styani*),** which lives in China's Sichuan and Yunnan provinces

Singalila National Park

- Singalila National Park is located on Singalila Ridge in the Eastern Himalayan region.
- Sandakphu and Phalut, the two of the highest peaks in West Bengal, are located right inside the park.
- There are two rivers flowing through the park; River Rammam and River Sirikhola.

4. 'Sharp' decline in Vulture population: Study

Context: According to a New UK study, **decline in Vulture population** is one the key issues seen by all around the world. This issue has been addressed by many countries via conservation efforts, however still there is a need to improve the vulture tracking measures.

Vultures in India

- Vultures are **scavenging birds** of prey. They are nature's most efficient scavengers.
- India shelters about **nine species** of vultures, but most of them face the danger of extinction.
  - The nine recorded species of vultures in India are – **the oriental white-backed, long-billed, slender-billed, Himalayan, red-headed, Egyptian, bearded, cinereous and the Eurasian griffon.**
  - The Indian vulture (*Gyps indicus*) is an **Old World vulture** native to India, Pakistan and Nepal.

Sr. No.	Name of the Vulture Species	IUCN status	Pictorial Representation
1	Oriental White-backed Vulture (Gyps bengalensis)	Critically Endangered	
2	Slender-billed Vulture (Gyps Tenuirostris)	Critically Endangered	
3	Long-billed Vulture (Gyps Indicus)	Critically Endangered	
4	Egyptian Vulture (Neophron Percnopterus	Endangered	

5	Red-Headed Vulture (Sarcogyps Calvus)	Critically Endangered	
6	Indian Griffon Vulture (Gyps Fulvus)	Least Concerned	
7	Himalayan Griffon (Gyps Himalayensis)	Near Threatened	
8	Cinereous Vulture (Aegypius Monachus)	Critically Endangered	
9	Bearded Vulture or Lammergeier (Gypaetus Barbatus)	Near Threatened	

- **Significance:** Vultures feeding on dead animals help **areas getting rid of carcasses** that, otherwise, would provide foul smells and scenery for a much longer period hence also known as **nature's cleanup crew**.
  - Vultures also play a valuable role in keeping wildlife **diseases in check**.

Global Vulture Status and Conservation

- Vulture numbers saw a decline as much as **90% in some species in India** since the 1990s in one of the most drastic declines in **bird populations** in the world due to increasing usage of Diclofenac.

Diclofenac

- **Diclofenac** is a **veterinary non-steroidal anti-inflammatory drug (NSAID),** which is used to treat pain and inflammatory diseases such as gout in carcasses that vultures would feed off.
- Uncontrolled veterinary usage of non-steroidal anti-inflammatory drugs (NSAID), including Aceclofenac, Ketoprofen and Nimesulide are toxic to vultures if they feed on carcasses within 72 hours of the drugs' administration to such livestock.

Important Government Initiatives

- **Vulture Conservation 2020-2025**: A Vulture Care Centre (VCC) was set up at Pinjore, Haryana in 2001 to study the cause of deaths of vultures in India.
- **Jatayu Conservation Breeding Centre** in Pinjore is the world's largest facility within the state's Bir Shikargah Wildlife Sanctuary for the breeding and conservation of Indian vulture species.
- **SAVE (Saving Asia's Vultures from Extinction):** The consortium of like-minded, regional and international organizations, created to oversee and coordinate conservation, campaigning and fundraising activities to help the plight of south Asia's vultures.
- **Ramadevarabetta Vulture Sanctuary**: The vulture sanctuary was officially set up in 2012, but the long-billed, Egyptian and white-backed vultures have been roosting in the hills of Ramanagara for several decades. These are the three species found in Ramanagara out of the nine found in India.

5. India State of Forest Report- (ISFR) 2021

Context: The **India State of Forest Report** is an assessment of India's forest and tree cover, published every two years by the Forest Survey of India under the Ministry of Environment, Forests and Climate Change. The first survey was published in 1987, and ISFR 2021 is the 17th.

About the India State of Forest Report

- **The India State of Forest Report** is an assessment of **India's forest and tree cover,** published every two years by the **Forest Survey of India** under the **Ministry of Environment, Forests and Climate Change.**
  - The first survey was published in 1987, and ISFR 2021 is the 17th.
- India is one of the few countries in the world that brings out such every two years, and this is widely considered comprehensive and robust.

India State of Forest Report-2021

- As per the Report, forest and tree cover in the country increased by 2,261 square kilometre since the last assessment in 2019.
- India's total forest and tree cover was 80.9 million hectares, which accounted for 24.62% of the geographical area of the country.
- 17 States and Union Territories had more than 33% of their area under forest cover.
  - Madhya Pradesh had the largest forest cover, followed by Arunachal Pradesh, Chhattisgarh, Odisha and Maharashtra.

India's Target to increase forest cover

- **National Mission for a Green India (GIM)** is one of the eight Missions under the **National Action Plan on Climate Change.**
  - It aims at protecting, restoring and enhancing India's forest cover and responding to climate change.
  - The target under the Mission is **10 million hectares (Mha)** on forest and non-forest lands for increasing the forest/tree cover and to improve the quality of existing forest.

- The top five States in terms of forest cover as a percentage of their total geographical area were
  - Mizoram (84.53%)
  - Arunachal Pradesh (79.33%)
  - Meghalaya (76%)
  - Manipur (74.34%)
  - Nagaland (73.90%)

6. 4th Asia Ministerial Conference on Tiger Conservation

Context: The **Government of Malaysia and Global Tiger Forum (GTF)** has organized the **4th Asia Ministerial Conference** on tiger conservation to review progress towards the **Global Tiger Recovery Programme** and commitments to **tiger conservation**.

Tigers in India

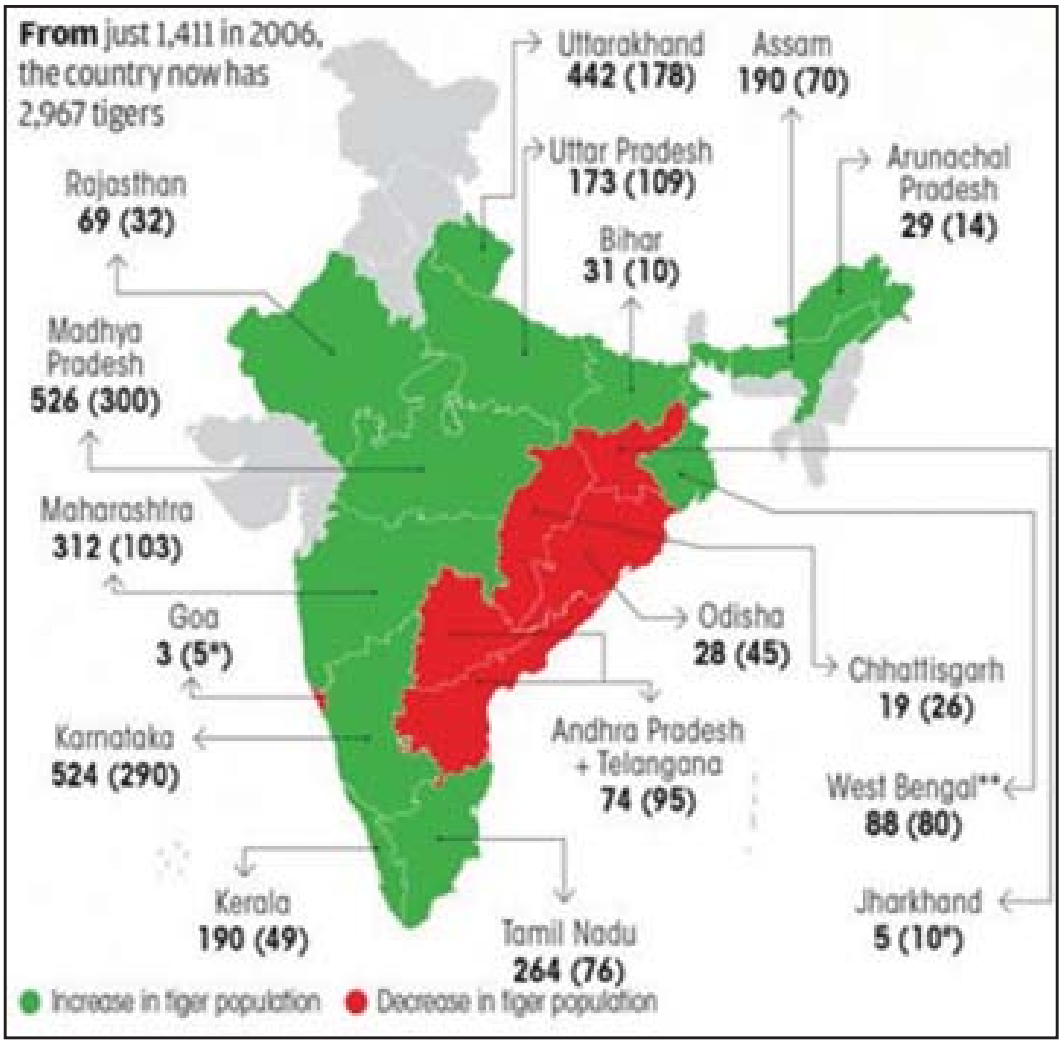
- According to a 2018 report, there are **2,967 tigers** (increased by **6%** since the last census) in the country spread across **53 tiger reserves**.
  - The Census (2014) reported 2,226 tigers in the country, up from 1,706 in 2010.
- Every 4 years the **National Tiger Conservation Authority (NTCA)** conducts a tiger census across. The first was conducted in 2006.

NATIONAL TIGER CONSERVATION AUTHORITY (NTCA)

- It is a statutory organization.
- It was established in 2005.
- It was given **statutory status** by the 2006 amendment of the **Wildlife (Protection) Act, 1972** for strengthening tiger conservation, as per powers and functions assigned to it.
- Functions under the **Ministry of Environment, Forests and Climate Change**

Conservation Efforts:

- **Project Tiger:** Launched in 1973, it is a centrally sponsored scheme of the Ministry of Environment, Forest and climate change. The project is administered by the National Tiger Conservation Authority (NTCA).
- **Tiger Relocation Projects:** The tiger relocation project was initiated in 2018 wherein two big cats, a male (Mahavir) from Kanha Tiger Reserve and a female (Sundari) from Bandhavgarh from Madhya Pradesh were relocated to Satkosia Tiger Reserve in Odisha, to shore up the tiger population in the
- **Tiger Special Protection Force:** To check illegal human intrusion into the reserve through villages located on its fringes and serve as a second layer of protection for tigers
- **Global Tiger Forum:** It is an Inter-Governmental international body working exclusively for the conservation of tigers.
- **Global Tiger Initiative:** Global Tiger Initiative (GTI) was launched in 2008 as a global alliance of governments, international organizations, civil society, conservation, and scientific communities, and the private sector, with the aim of working together to save wild tigers.
- **Integrated Tiger Habitat Conservation Program (ITHCP):** ITHCP was launched in 2014. It is a strategic funding mechanism that aims to save tigers in the wild, and their habitats.
- **PETERSBURG DECLARATION:** It aimed at promoting a global system to protect the natural habitat of tigers and raise awareness among people on white tiger conservation



7. Reintroduction of cheetah

Context The Union Environment Ministry of India reintroduced the cheetahs from South Africa to **Madhya Pradesh's Kuno-Palpur National Park**.

How cheetahs went extinct in India?

- The cheetah is the only **large carnivore** to have gone extinct in India, primarily due to hunting and habitat loss.
- **India's last three cheetahs** were hunted by **Maharaja Ramanuj Pratap Singh Deo, King of Koriya (Chhattisgarh)** in 1947.
- In 1952, the Indian government officially declared the **Cheetah extinct** in the country.

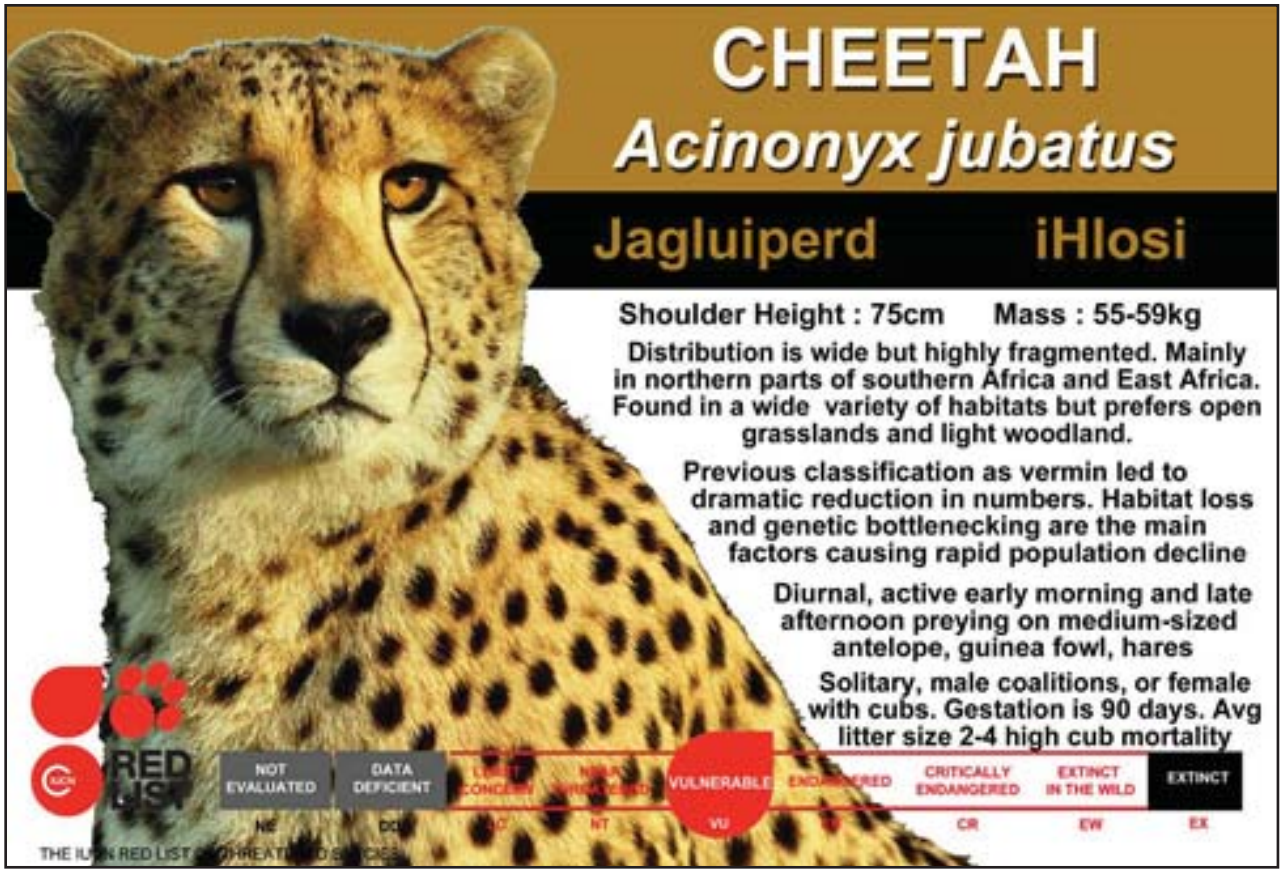
Re-introducing Cheetah in India:

- The project to **translocate cheetahs from Africa to India** is a long-term one being implemented by the environment ministry with the help of the Wildlife Institute of India.

Cheetah in Indian History:

The **earliest available record for cheetahs being used for hunts** in India, comes from the 12th century Sanskrit text **Manasollasa**, which was produced by the **Kalyani Chalukya ruler**, **Someshvara III** (reigned from 1127-1138 CE).

- The **Supreme Court** appointed an expert panel, which **approved Kuno Palpur as the possible location for cheetah relocation.**
- In the past six months, the Madhya Pradesh forest department has relocated villagers from Kuno and has prepared an enclosure with round-the-clock surveillance for reintroduction of cheetahs.



About Cheetah:

- The Cheetah (*Acinonyx jubatus*), is one of the **oldest of the big cat species**, with ancestors that can be traced back more than five million years to the Miocene era.
- The cheetah is also the **world's fastest land mammal**.
- It is listed as **vulnerable** in **IUCN red listed species**.
- The country's last spotted feline died in Chhattisgarh in 1947. Later, the cheetah — which is the fastest land animal — was **declared extinct in India in 1952.**
- **The Asiatic cheetah is classified as a "critically endangered"** species by the IUCN Red List, and is believed to survive only in Iran.

Kuno National Park

- Kuno National Park is a national park in the Sheopur district of MP established in 1981 as a wildlife sanctuary.
- In 2018, it was given the status of a national park.
- It is part of the Khathiar-Gir dry deciduous forests.
- One of the main tributaries of the Chambal River, the Kuno River, cuts across the whole length of the National Park division.

8. Deemed Forest

Context: The issue of **deemed forests** is a contentious one in Karnataka, with legislators across party lines often alleging that large amounts of agriculture and non-forest land are "unscientifically" classified as such.

Deemed Forests:

In India, deemed forests account for about 1% of total forest land.

- Deemed Forests are physical parcels that look to be forested but aren't listed as such in historical or official records.
- The Supreme Court ruled in the case of **T N Godavarman Thirumalpad (1996)** that governments must identify and categorise designated forests.
  - It covered all **statutorily recognised forests**, whether designated as reserved, protected or otherwise for the purpose of **Section 2 (1) of the Forest Conservation Act.**
  - The term 'forest land' occurring in Section 2 will not only include 'forest' as understood in the dictionary sense but also any areas recorded as forest in the government record irrespective of the owners said the court.

9. Ancient forests found in Sinkhole

Context A cave exploration team has discovered an **ancient forest with trees** at the bottom of a **giant karst sinkhole in Leye County** in **South China's Guangxi Zhuang Autonomous Region.**

Guangxi

- **Location**: South China's Guangxi region that extends up to 630 feet deep and spans more than 176 million cubic feet.
- The Guangxi site is famous for sinkholes in Southern China and among the 30, it is the largest.
- The site reportedly had three caves in its walls and a well-preserved primitive forest at the bottom.

What are Sinkholes?

- In Mandarin, giant sinkholes are called **Tiankeng or "heavenly pit".**
- Sinkholes are **depressions** formed in the ground when layers of the **Earth's surface start collapsing into caverns.**
- They can **occur suddenly and without warning**, because the land under the surface of the Earth can stay intact for a period of time until the spaces get too big.

How are sinkholes formed?

- Sinkholes can be formed due to **natural processes or human activity.**
- Typically, sinkholes form in areas of **"karst" terrains**, where the rock below the surface of the Earth can be easily dissolved by groundwater.
- Karst terrain is created from the dissolution of soluble rocks, mostly limestone and dolomite and is characterised by distinctive landforms such as caves, sinkholes and springs.
- Sinkholes can also be formed due to human activity due to broken land drains, water mains and sewerage pipes, increased rainfall, storm events, underlying limestone and diverted surface water, among other reasons.

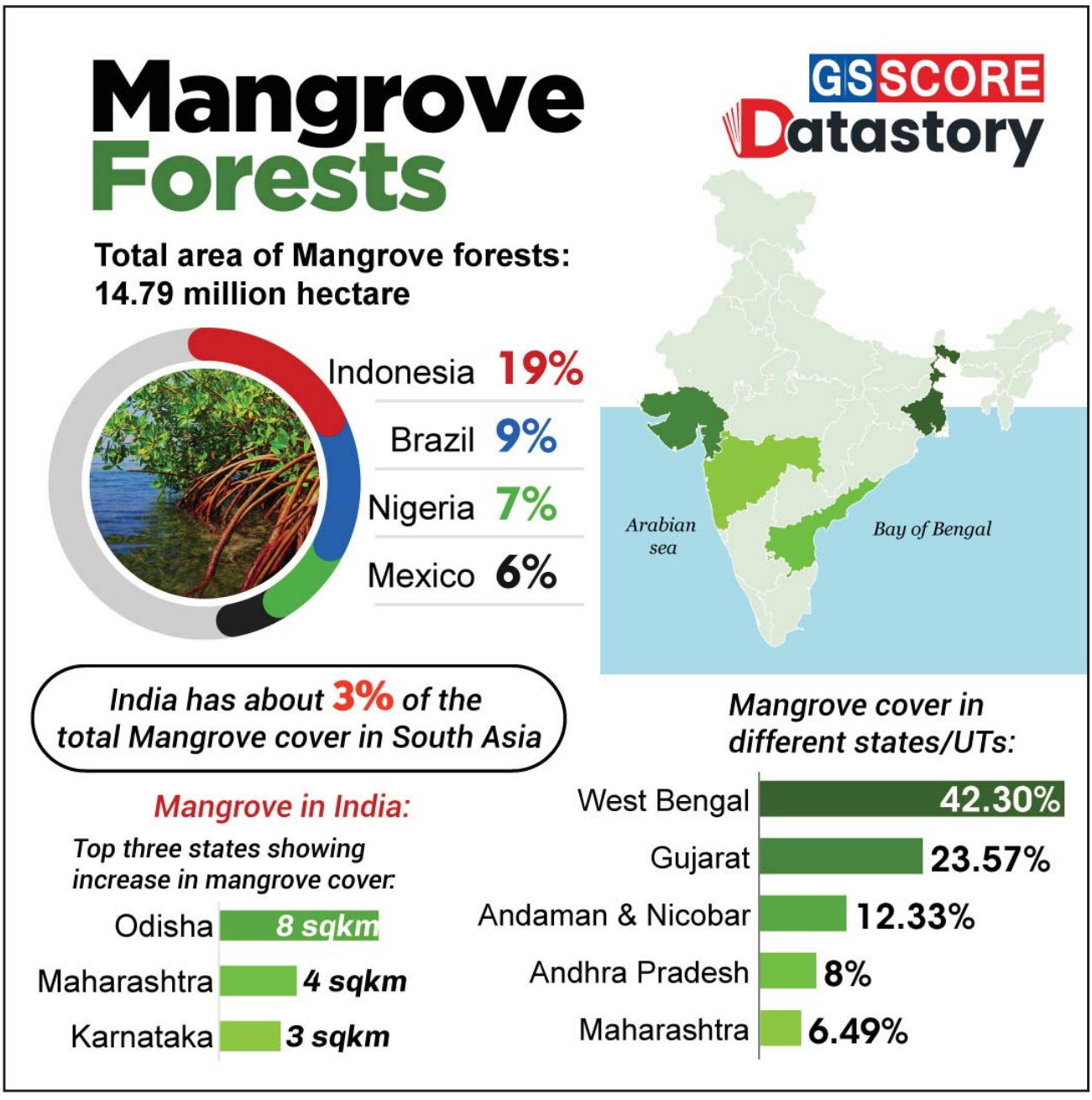
10. MISHTI Scheme to conserve Mangrove In India

Context: The **Union Budget for 2023-24** announced an initiative for mangrove plantation along the coastline and on salt pan lands, under **MISHTI (Mangrove Initiative for Shoreline Habitats & Tangible Incomes).**

What are Mangroves?

- Mangroves are **salt-tolerant plant communities** found in **tropical and subtropical intertidal regions**.
- They are important **refuges of coastal biodiversity** and also act as **bio-shields** against extreme climatic events.
- They can survive the limiting factors imposed by **lack of oxygen, high salinity and diurnal tidal inundation.**

Mangroves are included in **Type Group-4 Littoral & Swamp Forests.**



Mangroves in India

- About **40% of the world's Mangrove Cover** is found in South East Asia and South Asia.
- The mangrove cover in India is **4,992 sq km**.
- Among the states and UTs, **West Bengal has the highest percentage of area** under total Mangrove cover followed by **Gujarat and Andaman Nicobar Islands.**

About MISHTI Scheme

- MISHTI is a new programme that will facilitate mangrove plantation along India's coastline and on salt pan lands.
- MISHTI will be implemented through convergence between the **MGNREGS (Mahatma Gandhi National Rural Employment Guarantee Scheme), CAMPA (Compensatory Afforestation Fund Management and Planning Authority)** Fund and other sources.

11. Panamaram Heronry

Context: Due to the intervention of the **Kerala State Biodiversity Board (KSBB)** and **the Panamaram grama panchayat, Panamaram heronry** is set to get a fresh lease of life.

What is Panamaram heronry?

Heronry

- It is the breeding grounds of herons.
- The herons are long-legged, long-necked, freshwater and coastal birds in the family Ardeidae

- Panamaram heronry is the **largest breeding ground** of different species of herons in the **Malabar region.**
- The heronry, formed on a sandbank on the **Panamaram River**, is a breeding ground for nine species of waterbirds.
- The tiny islet is a haven for globally threatened waterfowls, including the black headed-ibis, purple heron, large egret, median egret, little egret, pond heron, night heron, and little cormorant.
- The site is also the only location in State where the cattle egret breeds.

Panamaram river:

- The river joins the Kabini river at Koodalkadavu village near Payyampally in Wayanad district of Kerala.
- **Kabini river:** River Kabini is a tributary of river Kaveri. River Kabini joins river Kaveri at Tirumakudalu Narasipura in Karnataka.

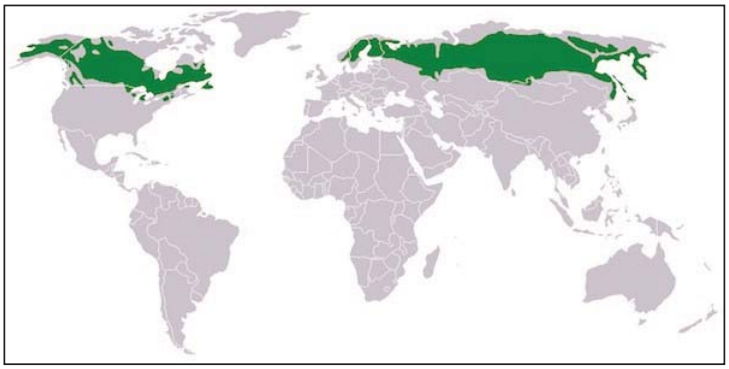
Malabar region

- The Malabar region, is an area of southern India lying between the **Western Ghats** and the **Arabian Sea.**
- Malabar covers the geographical area, north of the **Bharathapuzha,** stretching over parts of **Thrissur, Palakkad, Malappuram, Kozhikode, Wayanad, Kannur and Kasaragod** districts of Kerala.

12. Boreal Forest

Context: The wildfires pose threat to **subarctic boreal forest**. In the boreal forest, the most prevalent type of fire is a **crown fire,** which spreads quickly from **treetop to treetop**.

About:



- **Boreal forests** (also known as **taiga**) make up the **world's largest biome** and account for around 30% of the world's forests.
- **Boreal Eco Zone**: It principally spans 8 countries: **Canada, China, Finland, Japan, Norway, Russia, Sweden and the United States.**
- It is typically comprised of **coniferous tree species** such as pine, spruce and fir with some broadleaf species such as poplar and birch.
- The circumboreal belt of forest represents **about 30% of the global forest area**, contains more surface freshwater than any other biome.

****

2 SPECIES IN NEWS

1. Icefish

About the Ice Fish (*Channichthyidae*)

- The crocodile icefish or white-blooded fish comprise a family of notothenioid fish found in the Southern Ocean around Antarctica.
- They are the only known vertebrates to lack hemoglobin in their blood as adults.
- The blood of the ice fish is transparent in colour. They do not have red blood cells. They do not have haemoglobin to transport oxygen.
- They absorb oxygen through their skin. They have huge hearts.

Unique Warm waters

- The ice fish nests were found in a warm patch of water. This was unique and strange to the scientists. The temperature of the water here was 35 degrees Fahrenheit.

2. Clouded leopard

Context: A recent research paper published on clouded leopards by over 20 researchers from across the globe has helped understanding the habitats, migration corridors and laid out the conservation strategies.

About:

- Clouded leopards are a member of the Felidae family and come under nebulosa species.
- They are included in the endangered species around the world because they face the threat of extinction.
- Clouded Leopard is a shy and elusive wildcat and can be spotted in the Tropical dense rainforest.
- **Sub Species**: Classically considered a single species, the Clouded Leopard has recently been split into two species.

- **Neofelis Nebulosi**: It is restricted to mainland Southeast Asia.
- **Neofelis Diardi**: It is found on the islands of Sumatra and Borneo.

- **Conservation status:** Both the species are listed as Vulnerable in IUCN red list.
- **Range:** Historically, their range covered most of Southeast Asia from Nepal and southern China through Thailand, Indonesia, and Borneo. It is regionally extinct in Singapore and Taiwan.
  - In India, it occurs in north-east and West Bengal. It is the state animal of Meghalaya.
  - **Dampa tiger reserve** in Mizoram has one of the highest population densities.
- In 2018, India added clouded leopards to its Recovery Programme for Critically Endangered Species to aid more research and strengthen conservation efforts.

3. Oriental Darter

Context: In order to monitor seasonal fluctuations in birds' movements, the ringing of oriental darters has been taken up in **Bharatpur bird sanctuary (Keoladeo National Park).**

About: Oriental Darter

- The Oriental darter or Indian darter (*Anhinga melanogaster*) is a water bird of tropical South Asia and Southeast Asia.
- It is characterized by a long and slender neck with a straight pointed bill, and it hunts for fish with its body submerged is in water.
- They are classified as "near-threatened" by the International Union for Conservation of Nature (IUCN).

Keoladeo National Park

- Keoladeo National Park is a **UNESCO World Heritage** and a **Ramsar Site** located in Bharatpur district of Rajasthan.
- The National park is famous for its **Siberian crane** and is a habitat for nearly 365 species of birds, raptors and waterfowls.

India's first dedicated wildlife park

- **Clouded leopards National park of Tripura** is India's first dedicated wildlife park to spot Clouded leopards located inside **Sipahijola wildlife sanctuary.**
- Apart from these places, Clouded Leopards can be seen in
  - Balphakram National Park, Meghalaya
  - Kanchanjunga National Park, Sikkim
  - Manas National Park, Assam
  - Phawngpui National Park, Mizoram
  - Dibrusaikhowa National Park, Arunachal Pradesh
  - Buxa National Park, West Bengal

4. Fimbristylis sunilii - (Plant Species)

Context: **Researchers identified** two new plant species from the biodiversity-rich Western Ghats regions in Thiruvananthapuram and Wayanad districts of Kerala. They have been christened

- Fimbristylis sunilii
- Neanotis prabhuii

Fimbristylis sunilii:

- Collected from the grasslands of Ponmudi hills, Thiruvananthapuram, Fimbristylis sunilii has been named after plant taxonomist C.N. Sunil, retired professor and research guide of Botany, SNM College.
- A perennial plant of the Cyperaceae family, it stands 20-59 cm tall and was collected from an elevation of 1,100 metres.
- Fimbristylis sunilii has been provisionally assessed as data deficient (DD) under the IUCN Red List categories.

Neanotis prabhuii

- Neanotis prabhuii is a **prostrate perennial herb** named after K.M. Prabhukumar, Senior Scientist at CSIR-NBRI, Lucknow, in recognition of his research on flowering plants of the Western Ghats.
- Discovered in the Chembra Peak grasslands of Wayanad, it hails from the family Rubiaceae and grows on high-altitude grasslands.
- Neanotis prabhuii grows up to 70 cm in length and is many-flowered with the petals pale pink in colour.

5. Monoceromyia flavoscutata

Context: Researchers have discovered two new species of very **rare wasp-like flower flies** from north-eastern India and the Western Ghats.

About

- The newly described species, **Monoceromyia flavoscutata** and **Monoceromyia nigra**, belong to the **Syrphidae family.**
- They are wasp like flower flies or syrphid flies.
- They were named so because of their black colored thorax and yellowing in their body.

About Monoceromyia

- The Monoceromyia genus is generally referred to as syrphid fly.
- They are generally found in Australasian, Afrotropical, Neotropical and Oriental regions.
- Afrotropical includes Africa, Arabian Peninsula, south of Sahara Desert, southern Iran, Madagascar, islands of western Indian Ocean and extreme south west Pakistan.
- The oriental region refers to East, South and Central Asia. Neotropical region includes South America, Caribbean and Central America.

6. Sloth Bear

Context: The first World Sloth Bear Day was observed on October 12. It aims to spread awareness about protection and conservation of sloth bears.

Sloth bears (Melursus ursinus):

- Sloth bears are **endemic** to the Indian sub-continent with small populations in Nepal and Sri Lanka and 90% of the species population is found in India.
- **IUCN Red List:** Vulnerable
- They are identified by their very distinct long, shaggy dark brown or black fur, distinct white V-shaped chest patch and four-inch long ivory-coloured curved claws used for digging out termites and ants from rock-hard mounds.
- Listed under **Schedule I of the (Wildlife Protection) Act of India, 1972** the species has the same level of protection as tigers, rhinos and elephants.
- They are found in all parts of the country **except** Jammu and Kashmir and north-eastern States.

7. Denison Barb

Context: Denison barb, a native **freshwater fish species** commonly found in parts of **Karnataka and Kerala**, has been included in **Schedule I of the Wild Life (Protection)** Amendment Bill, 2021.

About Denison barb:

- It is an endangered species of freshwater fish endemic to the fast-flowing hill streams and rivers of the Western Ghats in India.
- Threats: Aquarium trade; pet collection.
- Conservation status: Endangered under IUCN Red list.

Schedules of the Wild Life (Protection)Act:

- The Wild Life (Protection) Act, 1972 is an Act of the Parliament of India enacted for **protection of plants and animal species.**

It has six schedules which give varying degrees of protection.

- **Schedule I and part II of Schedule II** provides absolute protection - offences under these are prescribed the highest penalties.
- **Schedule III and Schedule IV**: Penalties for Species listed in Schedule III and Schedule IV are much lower than above category.
- **Schedule V:** Animals under Schedule V, e.g. common crows, fruit bats, rats and mice, are legally considered vermin and may be hunted freely.
- **Schedule VI** : The specified endemic plants in Schedule VI are prohibited from cultivation and planting.

8. Eastern Swamp Deer

Context: Recently, the population of the vulnerable eastern swamp deer has dipped in the Kaziranga National Park and Tiger Reserve (Assam). The eastern swamp deer is extinct elsewhere in South Asia.

- The eastern swamp deer has now been distributed to areas beyond the **Kaziranga National Park**, such as **Orang National Park** and **Laokhowa-Burachapori wildlife sanctuaries (Assam).**

About Swamp Deer:

- The barasingha, also called swamp deer, is a deer species distributed in the Indian subcontinent. Barasingha is the state animal of the Indian states of Madhya Pradesh and Uttar Pradesh.
- There are three subspecies of swamp deer found in the Indian Subcontinent.
  - Western swamp deer (Rucervus duvaucelii) found in Nepal.
  - Southern swamp deer/Hard Ground Barasingha (Rucervus duvaucelii branderi) found in central and north India.
  - Eastern swamp deer (Rucervus duvaucelii ranjitsinhi) found in the Kaziranga (Assam) and Dudhwa National Parks (Uttar Pradesh).

Kaziranga National Park

- Kaziranga National Park is a protected area in the northeast Indian state of Assam.
- It is located in the edge of the Eastern Himalayan biodiversity hotspots – Golaghat and Nagaon district.

Protection Status of Swamp Deer:

- IUCN Red List: Vulnerable
- CITES: Appendix I
- Wildlife Protection Act, 1972: Schedule I

- It is home to more than 2200 Indian one-horned rhinoceros, approximately 2/3rd of their total world population.
- In 1985, it was declared as a World Heritage Site by UNESCO. It was declared as Tiger Reserve in 2006.
- It is recognized as an Important Bird Area by BirdLife International for the conservation of avifaunal species.

Laokhowa-Burachapori wildlife sanctuaries

- It is a protected area located in the state of Assam, on the south bank of the Brahmaputra River.
- This reserved forest became a sanctuary in 1995.
- It forms an integral part of the Laokhowa-Burachapori eco-system and is a notified buffer of the Kaziranga Tiger reserve.

9. Spot-billed Pelicans

Context: A nematode infestation has led to mass mortality of **Spot-Billed Pelicans (*Pelicanus philippensis*)** at **Telineelapuram Important Bird Area (IBA)** in **Naupada swamp** of Srikakulam district in Andhra Pradesh.

About Spot-billed pelicans

- The spot-billed pelican (*Pelecanus philippensis*) or gray pelican is a member of the pelican family.
- It breeds in southern Asia from southern Iran across India east to Indonesia. It is a bird of large inland and coastal waters, especially large lakes.
- **Conservation status:** Near Threatened
- Over 150 spot-billed pelicans have succumbed to the infestation since December. Only adult birds have succumbed to the infestation till date.

Telineelapuram Bird Sanctuary

- Telineelapuram Bird Sanctuary is an internationally recognised exotic bird sanctuary for the conservation of rare exotic birds.
- It is a designated **Important Bird Area (IBA).**
- Until now, in South India, the Telineelapuram IBA is the prime winter sojourn for the spot-billed pelican for breeding.
- The same IBA is also a breeding habitat for the painted stork (Mycteria leucocephala).

10. Golden Langurs

Context: Neighbours of a golden langur habitat in western Assam's Bongaigaon district have opposed a move by the State government to upgrade it to a wildlife sanctuary.

About Golden langur

- Gee's golden langur (*Trachypithecus geei*), also known as simply the golden langur, is an **Old World monkey**.
- **Habitat:** It is endemic to western Assam, India, and southern Bhutan.
- Their habitat is restricted to the region surrounded by four geographical landmarks: the foothills of Bhutan (North), Manas river (East), Sankosh river (West), and Brahmaputra river (South).
- Adult males have a cream to golden coat with darker flanks while the females and juveniles are lighter.
- It has a black face and a long tail up to 50 cm (19.69 in) in length.
- It lives in high trees and has a herbivorous diet of ripe and unripe fruits, mature and young leaves, seeds, buds and flowers.
- The average group size is eight individuals, with a ratio of several females to each adult male.

Protection Status:

- **IUCN List of Threatened Species:** Endangered
- **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES):** Appendix I
- **Wildlife Protection Act, 1972 :** Schedule I

11. Koala

Context The Australian government declared the **Koala (*Phascolarctos cinereus*)** as **'Endangered'** in the states of Queensland and New South Wales as well as the **Australian Capital Territory.**

About Koala

- The Koala is an **arboreal marsupial** with fur ranging from grey to brown above, and white below. It has large furry ears, a prominent black nose and no tail.
- Inhabit **eucalypt** woodlands and forests.
- The Koala has a fragmented distribution throughout **eastern Australia from north-east Queensland to the Eyre Peninsula in South Australia.**
  - In **New South Wales**, koala populations are found on the **central and north coasts, southern highlands, southern and northern tablelands, Blue Mountains, southern coastal forests, with some smaller populations on the plains west of the Great Dividing Range.**

Why did the Australian government finally declare Koalas endangered?

- Australia's Koala population has been on the road to extinction for over two decades now.
- The number of Koalas in New South Wales declined by between 33 per cent and 61 per cent since 2001
- In Queensland the Koala population decreased by at least half during the same period.

Will the change in status make a difference?

- The Endangered status of the koala means that Koalas and their forest homes should be provided with greater protection under Australia's national environmental law.

12. Indian gaur

Context: The images of an Indian Bison, or Gaur, in Pune's urban landscape, the frenzy among people, the capture of the injured animal that ran around in panic, and the sad news of its death has put the spotlight on human-Gaur conflict in the country.

About: Indian Bison, or Gaur

- **Common Name:** Indian Gaur; Gaur.

- **Scientific Name**: Bos Gaurus.
- **Physical Characteristics**: It is one of the largest extant bovines. It is one of the largest species among the wild cattle, reaching a shoulder height of up to 220 cm.
- **Habitat:** Gaurs are found on the forested hills and grassy areas of south to south-east Asia.
- **Conservation Status:** The Gaur has been categorised as **vulnerable on the IUCN Red List** since 1986.

Distribution:

- They are found in **India, China, Thailand, Malaysia, Bangladesh, Bhutan, and Nepal.**
- The Western Ghats in southern India constitute one of the most extensive extant strongholds of gaur, in particular in the Wayanad – Nagarhole – Mudumalai – Bandipur complex.
- The gaur is the State Animal of Goa and Bihar.

13. Crimson Rose Butterfly

Context: The Crimson Rose butterflies have been flying from **Dhanushkodi** across the Indian Ocean. It is known for crossing the sea to migrate to Sri Lanka.

About Crimson Rose Butterflies

- Crimson Rose belongs to the **Swallowtails (Papilionidae) family.**
- It is known to migrate along the coast, inland and crosses the sea often.

Description:

- It is a large butterfly with a mix of black, white and crimson colours on its wings and body, and is known for crossing the sea to migrate to Sri Lanka.
- The most interesting and visually stunning aspect of the migration was that the butterflies made small pit stops on flowering plants on the beach to fuel their journey.

Characteristics:

- Crimson Roses were spotted on Ipomea flowers and half leaf flowers on the beach.
- The grandest gathering was on a Calotropis gigantea plant, which was the sole plant in the vicinity.
- Each butterfly spent about 30 seconds on nectaring and then continued its journey towards Sri Lanka.

Distribution:

- The species occurs mostly in dry, deciduous forests, dense scrub, jungles, and open country, but can also be found in disturbed semi-evergreen, evergreen forests.
- This species occurs across mainland Sri Lanka and Peninsular India to West Bengal, as well as possible distributions along with the Andaman Islands, Nicobar Islands, in Western Myanmar, and Bangladesh.

IUCN Status:

- The IUCN Red List of Threatened Species in 2019 listed it as **Least Concern.**

14. Cyrtodactylus exercitus

Context: A team of herpetologists have recorded a new species of **bent-toed gecko** from a wooded part of the Umroi Military Station in Meghalaya.

About: Crytodactylus exercitus

- Its scientific name is Crytodactylus exercitus and English name is Indian Army's bent-toed gecko.
- Exercitus in Latin means army.
- The name was given to honour the Army for its services to the country. The military station where the bent-toed gecko was discovered was also a factor behind its name.

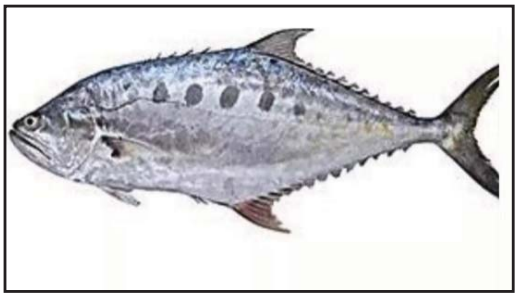
Other species

- The finding of the study was published in the latest issue of the European Journal of Taxonomy.
- The paper recorded another new bent-toed gecko, the Cyrtodactylus siahaensis named after Mizoram's Siaha district where it was found.
- These lizard specialists had in a separate study recorded the Cyrtodactylus lungleiensis, a new species of bent-toed gecko named after Mizoram's Lunglei town.
- India is now home to 40 species of the bent-toed gecko with the northeast accounting for 16 of them.

15. Scomberoides pelagicus

Context: The Central Marine Fisheries Research Institute (CMFRI) has identified a new carangid (Vatta) species from the Indian coast.

About Vatta species:



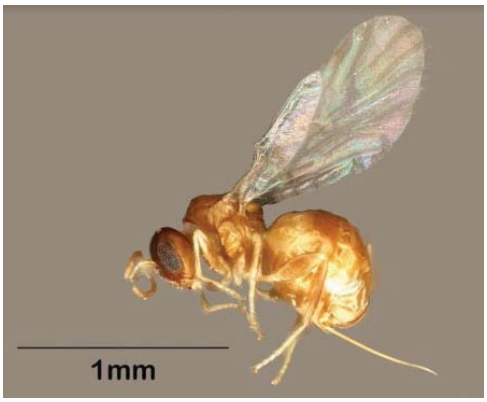
- It belongs to the 'queen fish' group.
- It is named scomberoides pelagicus'.
- The fish is locally known as "pola vatta".
- Distinctive features: Deep ovate body, concave dorsal head profile and stout and less numerous gill rakers on the first gill arch compared to the closely related species.
- It is the fifth queen fish discovered from the Indian waters.

16. Neuroterus Valhalla

Context: The Rice University researchers recently discovered a new wasp species called **Neuroterus Valhalla**. It is a weird species that spends 11 months of a year locked in a crypt. It is just a millimetre long.

A wasp is an insect with wings and yellow and black stripes across its body**. Wasps have a painful sting like a bee but do not produce honey.**

About N.valhalla



- It was discovered outside a student pub Valhalla. And thus named after it. The species was collected from an oak tree in 2018. The scientists are yet to find the male member of the species.
- The females lay eggs in trees. It is a cynipid gall wasp. It uses chemicals to produce crypts or galls around its eggs.
- Around 1,300 gall wasps are known to human. They are distributed in Europe and North America. The reproduction of gall wasps is partly **parthenogenesis.**

Parthenogenesis is asexual reproduction where growth and reproduction occur without the fertilization of sperm.

17. New genus of a parasitic Flowering plant

Context A new genus of a parasitic flowering plant (Septemeranthus) has recently been discovered from the Nicobar group of islands.

What is Parasitic plant?

- Parasitic plants produce root-like structures called haustoria which penetrate the host, connect to its vasculature and facilitate the exchange of materials such as water, nutrients, and pathogens between the host and the parasite, and between any plants simultaneously parasitized, even unrelated plant species.

Key-highlights of the discovery

- The genus Septemeranthus grows on the plant species Horsfieldiaglabra (Blume) Warb.
- The parasitic flowering plants have a modified root structure spread on the stem of the tree and are anchored inside the bark of the host tree.
- The plant was found on the periphery of the tropical forest in one of the biodiversity hotspots referred to as the Nicobar group of islands separated from the Andaman group of Islands by a wide gap of 160 km with heavy tidal flows.
- Septemeranthus partially depends on its host but also has leaves capable of photosynthesis.

- In addition to Septemeranthus, four other genera have also been discovered earlier from Nicobar group of islands, highlighting the ecological significance of the region on non-parasitic plants-
  - Nicobariodendron (Hippocrateaceae)
  - Pseudodiplospora (Rubiaceae),
  - Pubistylis (Rubiaceae),
  - Sphyranthera (Euphorbiaceae)

18. Dugong conservation reserve in the Gulf of Mannar

Context The Tamil Nadu government has decided to go ahead with the establishment of a conservation reserve for the elusive dugong (Dugong dugon).

About

- Dugong (Dugong dugon) is a **sirenian species** native to parts of the **Indian littoral.**
- Dugongs are **cousins of manatees** and share a **similar plump appearance**, but have a **dolphin fluke-like tail.**
- And unlike manatees, which use freshwater areas, **the dugong is strictly a marine mammal.**
- Commonly known as "sea cows," dugongs graze peacefully on sea grasses in shallow coastal waters of the Indian and western Pacific Oceans.
- Dugongs as a **Schedule I Animal under the Wildlife (Protection) Act, 1972.**
- **Declining population:** The dugongs are on the verge of extinction.
- In the **Andaman and Nicobar Islands**, their population is less than 100.
- There are very few left in the **Gulf of Mannar.**
- In the **Gulf of Kutch**, there are very few sporadic records.
- They were present in **Lakshadweep** but now are locally extinct.
- The plan included to set up a dugong conservation reserve in the **Gulf of Mannar, Palk Bay between India and Sri Lanka**, for the conservation of the animals.

19. White-Cheeked Macaque (Macaca leucogenys)

Context: Recently, the Scientists from the **Zoological Survey of India (ZSI)** have found a new mammal species in the country — the **White Cheeked Macaque (*Macaca leucogenys*).**

Background

- While the species was first discovered in China in 2015, its existence was not known in India before this.
- It is only now that Indian scientists have discovered its presence in the remote Anjaw district in central Arunachal Pradesh.
- The latest discovery takes India's mammal count from 437 to 438.

About White Cheeked Macaque

- The **White Cheeked Macaque** has distinct **white cheeks, long and thick hair on the neck and a longer tail than other Macaque species.**

- It is the **last mammal** to have been discovered in **Southeast Asia.**
- Both the Arunachal macaque as well as the White Cheeked Macaque exist in the same biodiversity hotspot in the eastern Himalayas.
- Along with White-Cheeked Macaques and Arunachal Macaque (Macaca munzala) the other species of Macaques are Assamese Macaque (Macaca assamensis) and Rhesus Macaque (Macaca mulatta) reported from the same landscape.
- This species is **not covered by the Wildlife Protection Act of India**, because till now it is not known that the species existed in India.

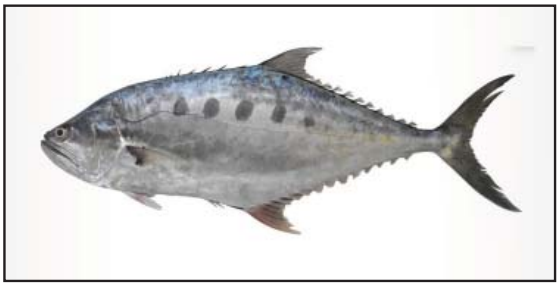
Zoological Survey of India (ZSI)

- **Founded in:** 1916
- **Parent organisation:** Ministry of Environment, Forest and Climate Change
- The Zoological Survey of India is the premier Indian organisation in zoological research and studies to promote the survey, exploration and research of the fauna in the country

20. Polavatta

Context: The Central Marine Fisheries Research Institute (CMFRI) has identified a **new fish species** locally known as **Pola Vatta.**

About Pola Vatta



- The Central Marine Fisheries Research Institute (CMFRI) has identified a new fish species locally known as Pola Vatta.
- The identified fish is a new carangid (Vatta) species from the Indian coast.
- It belongs to the 'queen fish' group.
- This is one of the five queen fish species from the Indian waters.
- **Features:** Deep ovate body, concave dorsal head profile and stout and less numerous gill rakers on the first gill arch.

21. Maxillaria anacatalinaportillae

Context: Scientists have described a new species of the **Neotropical orchid genus Maxillaria** from northern Ecuador.

About: Maxillaria anacatalinaportillae

- **Maxillaria anacatalinaportillae** grows as an epiphyte in cloud rainforests at altitude of 1,700 m above sea level.
- According to the IUCN Red List criteria, the species should be classified as 'Critically Endangered'.

22. Glycosmis albicarpa

Context: A team of scientists from the **Botanical Survey of India (BSI)** has discovered a new gin berry species named Glycosmis albicarpa from the Kanyakumari Wildlife Sanctuary in Tamil Nadu.

About: Glycosmis Albicarpa

- The species is endemic to the southern Western Ghats.
- The species belongs to the Orange family, Rutaceae.
- Many of the related plants of these taxonomic groups are being utilised for their medicinal values and food.
- Most commonly related species of these plants are collected from the wild, mainly for local use as food and medicine.
- Berries of Glycosmis species have the unique characteristic of 'gin aroma' and have gained in popularity as an edible fruit.
- The species is also a larval host plant for butterflies like other species of Glycosmis.

Botanical Survey of India (BSI)

- BSI was established in 1890 with the objectives of exploring the plant resources of the country and identifying plant species with economic virtue.
- **Located in:** Kolkata, West Bengal, India.

23. Indian Grey Hornbill

Context: Gujarat Forest Department is reintroducing the **Indian Grey Hornbill (IGH)** in **Gir Forest** after almost ninety years when they vanished from this largest contiguous forest tract in western India.

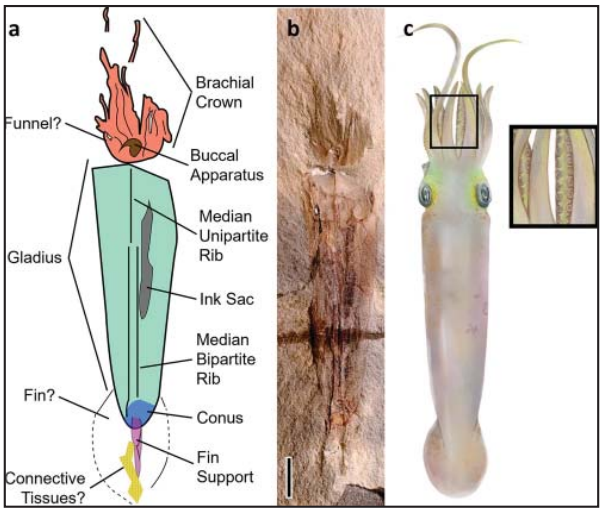
About: Indian Grey Hornbill

- **Indian Grey Hornbill (*Ocyceros birostris*)** is a fairly common hornbill species found only in the Indian subcontinent. It is a medium-sized hornbill with a brownish-grey body.
- **IUCN Status:** Least Concern.
- **Diet:** They feed on fruits and berries from fig trees, insects, reptiles (snakes, lizards), small birds (mostly fledglings) but on occasion can go after slightly bigger adult birds as well.
- These birds are known to be **arboreal,** i.e. spend most of their time on tall trees but may descend for food and to collect mud pellets for nesting.

24. Syllipsimopodi bideni

Context: Recently, a fossil unearthed in central Montana (US) of a species named Syllipsimopodi bideni represents the oldest-known relative of today's octopuses and boasts 10 arms, with two twice as long as the other eight.

About: Syllipsimopodi bideni



- It has been named after the **US president, Joe Biden.**
- Syllipsimopodi, about 12 cm long, had a **torpedo-shaped body and squid-like appearance** though it was not closely related to squids.
- It also is the **oldest-known creature with suckers**, which enable the arms to better grasp prey and other objects.
- It represents the only member of the octopus lineage with 10 arms, meaning two were lost in later evolution.
- There are numerous similar examples in the history of life on Earth – such as the reduction in the number of digits seen in meat-eating dinosaurs or horses.
- Syllipsimopodi prowled the warm waters of a tropical bay – Montana at the time was situated close to the equator. It may have been a mid-level predator, eating smaller invertebrates.
- It drifted across oceans nearly 328m years ago.
- Syllipsimopodi pushes back by 82 million years the origins of a group called **vampyropods** that includes today's octopuses.

Vampyropods

- Vampyropods are soft-bodied cephalopods typically characterized by eight arms and an internalized chitinous shell or fin supports.
- Cephalopods are a group of marine invertebrates that include octopuses, squids and cuttlefish.
- Vampyropoda, the clade combining octopods, vampyromorphs, and their relatives, is one of three main groups of coleoid (internally-shelled) cephalopods, the other two being Decabrachia (squids, cuttlefishes, bobtail squids, and Spirula) and the extinct Belemnoidea.

25. Halari donkey

Context: Recently, a special convention was organized at **Upleta town of Rajkot district for Gujarat's donkey breeders.**

About Halari donkey breed

- Halari donkeys are white and are native to Gujarat's Saurashtra region. They are very docile and are used as pack animals during the migration of pastoralists and also for transportation as donkey carts.
- One foal (baby donkey) is valued at Rs 1 lakh and their milk is priced at around Rs 150 to Rs 250 per liter. The donkey milk contains a high level of antioxidants, which makes it invaluable for use in cosmetic and pharmaceutical products.

- Halari donkey is an endangered species. A survey conducted in 2021-22 showed that the number of Halari donkeys in Saurashtra dipped to 439 down from 1,200 as found in the survey of 2015.

26. Sawfish

Context: According to the **International Union for Conservation of Nature (IUCN),** all seven species of **sawfish are listed as Critically Endangered.**

About Sawfish

- Sawfish also known as carpenter sharks are a family of rays.
- They are characterized by long, narrow, flattened rostrum or nose extension, lined with sharp transverse teeth resembling saw.
- Sawfish are closely related to sharks and have shark-shaped bodies, hence, they are also called flat sharks.
- IUCN Status: Different Families of Sawfish are categorised in "Endangered" and "Critically Endangered"
- It is also listed in Schedule I of the Indian Wildlife (Protection) Act 1972.

27. Himalayan Griffon Vulture

Context Recently, Himalayan griffon vultures were sighted in Telangana. This is one of rare instance, where the huge bird from the north is being sighted in the southern parts. This makes for a new distribution of the Old World vulture.

About: Himalayan griffon vultures

- **Common name:** Himalayan vulture.
- **Scientific name:** Gyps himalayensis.
- It is an **Old World vulture in the family Accipitridae.** It is one of the two largest Old World vultures and true raptors.
- **Distribution:** This species is found along the Himalayas and the adjoining Tibetan Plateau.
- **International Union for Conservation of Nature (IUCN) status:** Near Threatened species.

28. Drosophila Melanogaster

Context: Pune hosted the fifth edition of the **Asia Pacific Drosophila Research Conference (APDRC5),** which was organised in the country for the first time by the **Indian Institute of Science Education and Research (IISER).**

About: Drosophila Melanogaster

- Drosophila is a **genus of flies, belonging to the family Drosophilidae**, whose members are often called "small fruit flies" or pomace flies, vinegar flies, or wine flies.
- One species of Drosophila in particular, D. melanogaster, has been heavily used in research in genetics and is a common model organism in developmental biology.

- Its genome is entirely sequenced and there is enormous information available about its biochemistry, physiology and behaviour.

29. Rough-toothed Dolphin

Context: Rough-toothed dolphins are dolphin species that are generally founded in the tropical and deep warm waters around the globe. In 1823, Georges Cuvier first described this species.

About the species:

- The scientific name of this species is Steno bredanensis.
- This species is the only member of the genus Steno.
- Steno in Greek means narrow, which describes the beak of this animal.
- This animal has no sub-species.

30. Hornbill

Context: Recently, Great Indian Hornbill tortured to death in Nagaland.

About: Hornbills

- Hornbills (Bucerotidae) are a family of bird found in tropical and subtropical Africa, Asia and Melanesia. They get their name from the horn-like structure on the top of their beak—the casque.
- Globally, Hornbill distribution is limited to Sub-Saharan Africa, Indian-Subcontinent, Philippines, Indonesia and the Solomon Islands.
- In India, they are found in the Western Ghats and the northeastern states.
- **Habitat**– Great hornbills inhabit the canopy of tall evergreen forests.
- **Diet:** Hornbills are one of the biggest frugivores (fruit-eating birds) in the Asian rainforest. Around 40-70% of their diet consists of large ficus fruits, figs, drupes and berries, usually red or black in colour.

- **Conservation status:** India is home to 9 species of Hornbill. All species except the Oriental pied hornbill are listed under Schedule I of the Wildlife Protection Act (1972).

These species are:

- Indian Grey Hornbill (Least Concern)
- Malabar Grey Hornbill (Vulnerable)
- Malabar Pied Hornbill (Near Threatened)
- Great Hornbill (Vulnerable); Also in Schedule I of the Wildlife Protection Act, 1972.
- Narcondam Hornbill (Vulnerable) is found only in the Narcondam Island of Andaman Sea.
- Rufous-necked Hornbill (Vulnerable)
- Wreathed-Hornbill (Vulnerable)
- White-throated Hornbill (Near Threatened) and
- Oriental Pied Hornbill (Least Concern)

31. Olive Ridley - Operation SaveKurma

Context: Recently, Hundreds of Olive Ridley turtles were found dead in their breeding grounds between Kakinada and Antarvedi in the Godavari region of India's east coast.

About Olive Ridley turtle

- The Olive Ridley turtles are the smallest and most abundant of all sea turtles found in the world.
- They are best known for their unique mass nesting called **Arribada,** where thousands of females come together on the same beach to lay eggs.
- They are **carnivores** and get their name from their olive-colored carapace, which is heart-shaped and rounded.
- **Habitat:**
  - They are mainly found in the warm waters of the **Pacific, Atlantic and Indian oceans.**
  - Odisha's **Gahirmatha Marine Sanctuary** is known as the world's largest rookery (a colony of breeding animals) of sea turtles.

Conservation status

- **IUCN Red List:Vulnerable**
- Wildlife Protection Act, 1972: Schedule 1
- CITES Appendix I

The initiative was taken to protect the Olive Ridley turtle

- **Operation Olivia:** Every year, the Indian Coast Guard's "Operation Olivia", initiated in the early 1980s, helps protect Olive Ridley turtles as they congregate along the Odisha coast for breeding and nesting from November to December.

32. Ganoderma lucidum

Context Attempts are being made to popularise Ganoderma lucidum mushroom for business and livelihood, by cultivating it on wood logs and sawdust.

About: Ganoderma lucidum mushroom

- The mushroom is shiny red-brown and naturally grows on wood.
- It has been cultivated in various wood logs as well as sawdust substrates, with wheat bran, tea leaves, cotton husk and others being the additional substrates.

- It prefers broad-leaved tree species like acacia, poplar, oak, maple, Melia, eucalyptus, hevea, Tectona and Grewia.
- The mother culture of Ganoderma lucidum is commonly prepared from its fruiting body by tissue culture method; it is further used to prepare its spawn.

Geographical conditions:

- It thrives well in warm and humid climates and grows preferably in mixed forests of subtropical to temperate regions.
- Unlike normal mushrooms, the peculiar character of this one is that it grows on wood or wood-based substrate only.

33. Indian Tent Turtle

Context: Ministry of Environment informed Rajya Sabha about the Indian Tent Turtles.

About: Indian tent turtle (*Pangshura tentoria*)

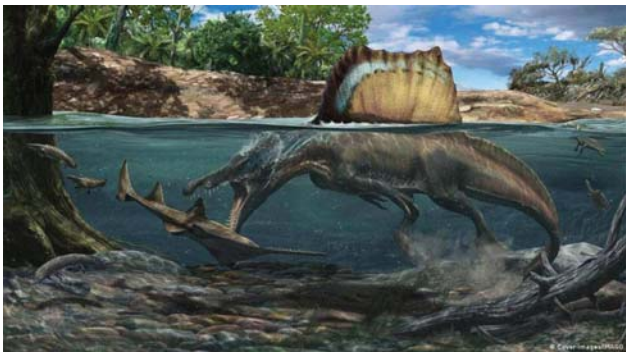
- The **Indian tent turtle (*Pangshura tentoria*)** is a species of turtle in the family **Geoemydidae.** The species is endemic to India and Bangladesh.
- The preferred habitats of P. tentoria are freshwater rivers and swamps.
- Indian tent turtle is listed in **Schedule –I of the Wild Life (Protection) Act, 1972** and is thereby provided the highest degree of protection.

- There are no reports to indicate that the Indian tent turtle is on the verge of extinction due to illegal mining in Narmada River.
- **IUCN Status:** Least Concern.
- **CITES Status**: Appendix II.

34. Spinosaurus

Context: Recently, Rare Spinosaurus dinosaur fossils found on Isle of Wight.

About Spinosaurus Aegyptiacus



- **Spinosaurus Aegyptiacus':** 1st Known Aquatic Dinosaur
- A team of scientists from various Universities of the United States have discovered a carnivorous (meat eating) swimming dinosaur named "Spinosaurus aegyptiacus" at the Kem Kem region of the Moroccan Sahara in North Africa.
- Unlike other theropod dinosaurs, the 50-feet (15 meters) long Spinosaurus used its tail for swimming to actively hunt for prey in rivers.
- Lived about 95 million years ago (Cretaceous period), spinosaurus was even longer than an adult Tyrannosaurus rex (T-rex).

35. Palmking

Context The **rare butterfly Palmking** has been spotted for the first time in Tamil Nadu.

About Butterfly Palmking:

- The unique woody species was earlier seen only in Kerala.
- It is the first recorded instance of the rare species in Tamil Nadu.
- Palmking was first recorded in South India by British scientist S.Ferguson in 1891.
- More than a Century later, it was rediscovered in 2007 in Thenmala by C. Susanth.

Distribution:

- This butterfly is widely distributed across parts of **India, Myanmar, Indo China, Peninsular Malaysia and Thailand.**
- It occurs in the Indonesian archipelago and the Philippines.
- In India, Palmking sightings were recorded in the forests of **Arippa, Shendurney, Periyar Tiger Reserve in the south of Western Ghats.**
- The butterfly is characterised by its brown colour and dark bands and is described as reclusive, mostly resting in the shade.

- It is not easy to spot a Palmking because its wood colour makes for easy camouflage and it rarely spreads its wings.
- Palmking belongs to the **Nymphalidae subfamily** and feeds on palm, coconut and calamus varieties of plants.

36. Vaquita porpoise

Context: According to the United States Commission for Environmental Cooperation (CEC), **Vaquita porpoise (Phocoena sinus)** is nearing extinction and immediate measures are needed to save the remaining population.

About: Porpoises

- Porpoises are among the smallest members of the cetacean family (whales, porpoises and dolphins).

About: Vaquita Porpoise

- The vaquita (Phocoena sinus) is the world's smallest cetacean. Its name means "little cow" in Spanish.
- It has a dark ring around the eyes is its most striking feature, along with a proportionally large dorsal fin.
- It is unique among the porpoises as it is the only species of that family found in warm waters, and the size of the dorsal fin is believed to be an adaptation to that, allowing for extra body heat to dissipate.
- Like many other species of porpoise, vaquita tend to be shy and elusive, avoiding boats when approached.
- **Habitats:** Found only in the northern Gulf of California (Sea of Cortez) in Mexico. Most commonly seen in shallow waters up to 50 metres deep.
- **Threats:** The vaquita population has been in sharp decline for decades, recently accelerated by illegal fishing with gill-nets for the vulnerable totoaba, a large fish sought after for its swim bladder.
- The small animal frequently gets caught in fixed fishing nets (gill-nets), as by-catch.

Protection Status:

- IUCN Red List: Critically Endangered.
- CITES: Appendix I

37. Actinimenes koyas

Context Scientists from the **ICAR-National Bureau of Fish Genetic Resources (NBFGR),** focused on documentation of aquatic genetic resources with special attention on fish and shell fish resources, have discovered a new species of shrimp.

About: Actinimenes koyas

- The species was collected at a depth of 1.0–2.0 m from the coral atoll of Agatti Island, which is part of the Lakshadweep group of islands.
- This new species has been named 'Koyas' to honour the local community on the Lakshadweep islands.
- Koyas form an important ethnic community on the islands, who have made a significant contribution to the development and preservation of the heritage of the society.

38. Ariosoma indicum

Context: Recently, Scientists discovered new eel species named Ariosoma indicum from Kerala and West Bengal respectively.

About Ariosoma indicum

- Scientists confirmed Ariosoma indicum as a new species after two years of through research, taxonomic studies and molecular analysis.
- The newly discovered eel belongs to the Congrid eels group and has been named Ariosoma indicum.
- The Ariosoma genus has seven species, including the newly identified eel that have been documented in Indian waters.
- Globally, there are 223 species in the genus.
- The term Indicum means that it was found in India.
- The total length of the new species is 362 millimetres.
- **Distribution:** It is possibly distributed along the Indian coast, including the coastal waters of Kerala and West Bengal.

Features:

- A greenish-brown body, with faint dark bands on the dorsal portion of the head
- Minute dark pigmentation patches on the extremities of the lower jaw

- Bicoloured pectoral fin
- A short wedge-shaped pointed vomerine teeth patch, with three or four rows in the anterior portion

Protection status:

The new eel species is not listed as 'Threatened' or 'Endangered' by the International Union for Conservation of Nature's Red List or the Convention on International Trade in Endangered Species of Wild Fauna and Flora.

39. Grey Slender Loris

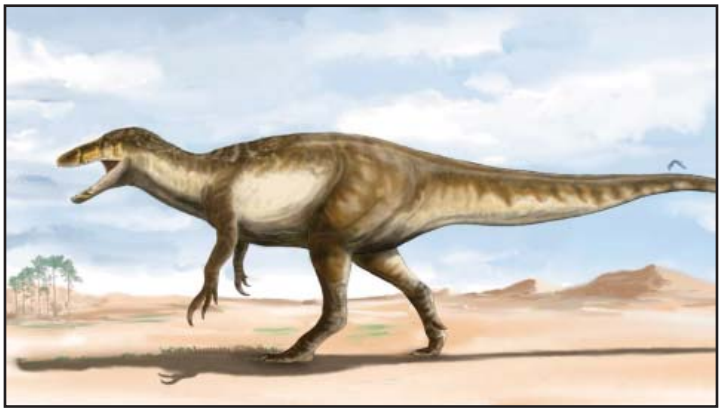
Context: India's first ever sanctuary for the endangered Slender Loris is to be set up in Karur & Dindigul districts of Tamil Nadu.

- The state government notified 'Kadavur slender loris sanctuary' under Section 26 (A)(1)(b) of Wildlife (Protection) Act, 1972.

Slender Loris:

- Slender Loris is a **small nocturnal mammal** that spends most of its life on trees.
- They are native to **India and Sri Lanka** and are also amongst the world's top 25 endangered primates.
- **IUCN Status:** Endangered
- They are also protected under **Schedule 1** of the **Indian legislation of the Wildlife (Protection) Act (WPA), 1972.**
- They act as **biological predators of pests that harm agricultural crops and help farmers.**
- As per reports, there are 14,000 Slender Loris in the Dindigul and Karur forests in Tamil Nadu.

40. Maip Macrothorax



- The remains of the largest dinosaur named Maip macrothorax ever recorded have been found in Patagonia. It was around 9-10 meters long.
- It had an agile skeleton, a long tail, a long neck and an elongated skull with over 60 small teeth.

41. Emperor Penguin

- It is the tallest and heaviest of all living penguin species and is endemic to Antarctica.
- They are the world's deepest-diving birds.
- They are capable of diving to depths of approximately 550 metres (1,800 feet).
- There population is decreasing due to the climatic changes associated with global warming.
- It is listed as Near Threatened in the IUCN Red List.

42. Madtsoiidae

Context Scientists have reported spotting of the fossil of a Madtsoiidae snake from the Ladakh Himalaya for the first time.

- It is an extinct group of medium-sized to gigantic snakes, firstly appeared during the late Cretaceous.
- It is mostly distributed in the Gondwanan landmasses.
- The whole group disappeared in the mid-Paleogene across most Gondwanan continents except for Australia where it survived with its last known taxon Wonambi till late Pleistocene.

43. Trimeresurus mayaae

Context A new species of snake has been discovered at Umroi Military Station in the Meghalaya.

- Locally it is known as U Thlen.
- It looked very similar to Pope's Pit Viper but the colour of the eyes was different.
- This new species was relatively common in Meghalaya, Mizoram and even in Guwahati.

44. Money Spider

Context It has been reported for the 1st time in the India from the Muthanga range of the Wayanad Wildlife Sanctuary.

- It is commonly found in European meadows.
- It belongs to the family of dwarf spiders under the genus Prosoponoides.
- Both sexes are dark brown and have irregular silver patches and black spots on the elliptical abdomen.

45. Ant-mimicking Spiders

- The ant-mimicking spider has been named Toxeus alboclavus.
- The male and the female spiders of this species grow up to 4 mm and 6 mm long respectively.
- The forward-projecting fangs have a characteristic shape of an antler.

46. Wild Boar

- It is the largest of the wild pigs.
- It is native to forests ranging from western and northern Europe and North Africa to India and China.
- It is listed as Least Concern in the IUCN Red list and under Schedule III in the Indian Wildlife Protection Act 1972.

47. Sela Macaque

- A new species of old-world monkey recorded from Arunachal Pradesh has been named after Sela Pass, as Sela Macaque.

- They are genetically closer to the Arunachal macaque and both species have many similar physical characteristics such as heavy built and long dorsal body hair.
- This species is a major cause of crop damage in West Kameng district.

48. Eublepharis Pictus

- It is also known as the Painted Leopard Gecko.
- It is strictly nocturnal, actively foraging along trails in the forest after dusk.
- This new species appears to be common in forests of Andhra Pradesh & Odisha.
- Based on IUCN conservation prioritization criteria, the researchers suggested it to list as Near Threatened.

49. Fishing Cat

- Recently the world's first population estimation of the fishing cat has been conducted outside the protected area network.

- The fishing cat is **nocturnal (active at night)** and apart from fish also preys on frogs, crustaceans, snakes, birds, and scavenges on carcasses of larger animals.
- The species breed all year round. In India, fishing cats are mainly found in the mangrove forests of the **Sundarbans, Chilika lagoon**, on the foothills of the Himalayas along the Ganga and Brahmaputra river valleys and in the Western Ghats.
- **IUCN Status**: Endangered

50. Saras Crane

- It is a large non-migratory crane found in parts of the Indian subcontinent, Southeast Asia, and Australia.
- It is the tallest flying bird in world standing 152-156 cm tall with a wingspan of 240cm.
- It is easily distinguished from other cranes in the region by its overall grey colour and the contrasting red head and upper neck.
- It is listed as **Vulnerable on IUCN Red List** and in **Schedule IV of the Wildlife (Protection) Act 1972.**

51. Blue Duke

Context The Chief Minister of Sikkim declared Blue Duke as "State Butterfly of Sikkim".

- It is a native butterfly species of Sikkim. It is also called Bassarona durga.

- It was first discovered in Sikkim in 1858.
- It is listed in Schedule 2 of Wildlife Protection Act, 1972.

52. Chelonoidis Phantasticus

Context A giant tortoise, found alive in 2019, has been confirmed to belong a Galápagos species long believed extinct.

- Named Fernanda after her Fernandina Island home, the tortoise is the first of her species, Chelonoidis phantasticus, to be identified in more than a century.

- Chelonoidis phantasticus means "fantastic giant tortoise". Commonly called the Fernandina Island Galápagos giant tortoise, the species was so far known only from a single individual, collected in 1906.
- Although Fernanda was found on Fernandina Island itself, and although tortoises can't swim from one island to another, they can be carried from one Galápagos island to another during major storms.

53. Haploptychius Sahyadriensis

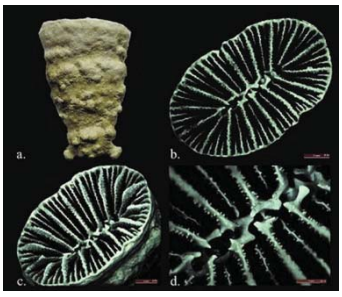
Context A new species of snail has been found in northern Western Ghats of Maharashtra.

- The species is endemic to Vishalgad Conservation Reserve in Kolhapur.
- It has been named after the type locality of the species in the northern part of the Western Ghats, which is Sahyadri in Sanskrit.
- India has nearly 1,450 snails and slugs with the highest diversity in north-eastern India followed by the Western Ghats.

54. Azooxanthellate Corals

Context Scientists have recorded four species of corals for the first time from Indian waters. These new species of azooxanthellate corals were found from the waters off the Andaman and Nicobar Islands.

Azooxanthellate Corals



- The azooxanthellate corals are a group of corals that do not contain zooxanthellae and derive nourishment not from the sun but from capturing different forms of planktons.
- They are deep-sea representatives with the majority of species being reported from depths between 200 metres and 1,000 metres. They are also reported from shallow waters unlike zooxanthellate corals that are restricted to shallow waters.
- Azooxanthellate corals are a group of hard corals. Hard corals are the prime and intrinsic part of the coral reef ecosystem.

55. Red Weaver Ants

- In Odisha, red weaver ants are consumed in the form of a Chutney known as 'Kai Chutney' and scientists have sought a GI tag for the dish.
- It helps in getting rid of flu, common cold, whooping cough, to increase appetite, enhance vision and eyesight naturally.
- The tribal healers also prepare medicinal oil, which is used as baby oil and externally used to cure rheumatism, gout, ringworm and other skin diseases.
- These ants live in colonies consisting of multiple nests on trees. These ants are indigenous to Mayurbhanj, Odisha.

56. Varroa Mite

- It is an external parasitic mite that attacks and feeds on the honey bees.
- The disease caused by the mites is called varroosis.
- It can reproduce only in a honey bee colony.
- It attaches to the body of the bee and weakens the bee by sucking fat bodies.

57. Chenkurinji

- It is a species of a tree, endemic to the Agasthyamala Biosphere Reserve.
- It was once abundant in the hills on the southern parts of the Aryankavu Pass in Kerala's Kollam district.
- It is very susceptible to climate change and the present condition of the species is quite bad with low regeneration performance.
- It has medicinal properties and is used to lower blood pressure and treat arthritis.

58. Eoscansor cobrensis

- A team of researchers published paper on its fossil discovery.
- It is a reptile, belonging to Pennsylvanian subperiod of Carboniferous period, around 305 million years ago.
- It used to live in area around present-day New Mexico.
- The species belong to Varanopidae, which is an extinct family of reptiles.
- They were similar to monitor lizards.
- The ancient reptile was 24.5 cm in length and 58.3 g in weight.

59. Monarch Butterfly

- It has been recently classified endangered in the **International Union for Conservation of Nature (IUCN) Red List.**
- Most of these butterflies are found in winter in the California coast and forests in central Mexico.
- A smaller population of the species is also found in countries like Australia, Hawaii and India.
- They breed in only one particular plant The Milkweeds.

60. Snow Leopard

- It is a large member of the cat family native to the mountain ranges of Central and South Asia.
- It acts as an indicator of the health of the mountain ecosystem in which they live.
- It is the **State animal of Himachal Pradesh.**
- **Hemis National Park in Ladakh**, is famous as the Capital of Snow Leopard in India.
- It is listed as **Vulnerable in the IUCN Red List and Schedule I on Indian Wildlife (Protection) Act 1972.**

61. Cornechiniscus mystacinus

- In the recent study, it was found that, one tardigrade (diverse group of microscopic invertebrates) represented a previously undiscovered species, called Cornechiniscus Mystacinus.
- The species are commonly found in mountains of Tashkomur in Jalalabat region of northern Kyrgyzstan.
- It is found in yellow to dark orange colour.
- Tardigrades can survive for up to 30 years, without food or water & even in extreme conditions.

62. Great Indian Bustard (GIB)

- It is one of the heaviest flying birds in the world.
- It is usually found in dry grasslands and scrublands on the Indian subcontinent.
- Its largest populations are found in the Indian state of Rajasthan.
- It is the state bird of Rajasthan.
- It is listed as Critically Endangered on the IUCN Red List and Schedule I of the Indian Wildlife (Protection) Act, 1972.

63. Vilayati Kikar

- It is an invasive tree species introduced under the British Empire as part of development of Delhi.
- It is native to Mexico, South America and the Caribbean.

- The tree does not let any other tree or shrubs survive around it.
- These trees can dry up underground aquifers through its deep-root system, going as far as 20 metres or more in search of water.

64. Megalodon

- It is an extinct species of mackerel shark which used to exist millions of years ago.
- It roamed the oceans an estimated 23 million to 2.6 million years ago.
- It was the largest shark to ever swim through Earth's oceans.
- It would have weighed around 70 tonnes and have length around 50 feet from nose to tail.

65. Tasmanian Tiger

Context: Recently, the Texas-based biotechnology company Colossal announced their plans to use genetic engineering to recreate the Tasmanian Tiger and return it to the Arctic tundra, its original natural habitat.

About: Tasmanian Tiger

- Also known as the thylacine (a dog headed pouched dog), it was a carnivorous marsupial group thought to be extinct.
- Marsupials are mammals whose members are born incompletely developed and are usually carried and sucked in a pouch on the mother's abdomen.
- It was native to the Australian mainland and the islands of Tasmania and New Guinea.
- The last known thylacine died in captivity 80 years ago, in 1936 at the Hobart Zoo in Tasmania.
- It disappeared mainly due to over-hunting by humans, diseases and competition from the dingo, a wild dog native to Australia.

66. Sea Cucumber

- It is a marine invertebrate that live on the seafloor found generally in tropical regions.
- They are crucial to maintain the balance of ocean habitats.
- Major threats to this species are illegal Trading and smuggling for food and traditional medicine.
- It has no limbs or eyes, or blood.
- Lakshadweep has created the world's first conservation area for sea cucumbers.
- It is listed under Schedule I in the Wildlife Protection Act, 1972.

67. Moringa

- It is a fast-growing, drought-resistant, deciduous trees that are native to India and Bangladesh.
- It is often called the drumstick tree, the miracle tree, the ben oil tree, or the horseradish tree.
- It has been used for centuries due to its medicinal properties and health benefits.
- It also has antifungal, antiviral, antidepressant, and anti-inflammatory properties.
- It is also used for water purification.
- It has various healthy compounds such as vitamins, important elements such as Iron, Magnesium etc. and is extremely low on fats and contains no cholesterol.

68. Red-Eared Slider Turtle

- It is a very popular aquatic turtle, native to South-Eastern USA and Mexico.
- It is classified as controlled pest animal under the Victorian Catchment and Land Protection Act 1994.
- It emerges from the water for basking on rocks and logs.
- When basking, red-eared sliders commonly pile on top of each other.
- They can tolerate a wide range of habitats and are sometimes found in estuaries and coastal wetlands with brackish water.
- It is listed as **Least Concern in the IUCN Red List.**

69. Caracal

- It is a medium-sized and locally threatened cat species.

- It has been widely reported to be on the brink of extinction in India.
- It is also known by its persian name Siyahgosh or 'black ears'.
- In India it is found mostly in Rajasthan, Gujarat and Madhya Pradesh.
- Besides India, it is found in several dozen countries across Africa, the Middle East, Central and South Asia.
- It is listed as Least Concern in **IUCN Red List and under Schedule I in Wildlife Protection Act, 1972.**

70. Spotted Deer

- It is also known as chital or axis deer.
- It is sexually dimorphic, males are larger than females, and antlers are present only on males.
- The upper parts are golden to rufous, completely covered in white spots.
- It is listed as **least concern in the IUCN Red List and under Schedule III of the Indian Wildlife Protection Act (1972).**

71. Tomistoma

- It is a freshwater large, slender-snouted crocodilian species native to south-east Asia.
- It is distributed across part of Borneo, peninsular Malaysia and Sumatra.
- It is frequently associated with peat swamp forest.
- It shares its habitat with two other types of crocodilians.
- The saltwater crocodile and the Siamese crocodile.
- It is listed as **Endangered in IUCN Red List**.

72. Ghatiana Dwivarna

- A new Crab Species has been discovered from Karnataka.
- It is the 75th crab species to be found in India.
- The name of this new species of crab is derived from a Sanskrit word 'dwivarna' which means two-colored.
- It is a venomous and non-edible species of crab.

73. Neelakurinji

Context:
- Recently, the Ministry of Environment, Forest and Climate Change (MoEF) has listed Neelakurinji under Schedule III of the Wildlife (Protection) Act, 1972, including it on the list of protected plants.

- According to the recent orders, those who uproot or destroy the plant will invite a fine of ₱25,000 and three years' imprisonment. The cultivation of this and its possession is not allowed,
- Neelakurinji has been included on the list when the Centre expanded the earlier protected list of six plant species to 19.

About Neelakurunji

- Neelakuruj is scientifically known as Strobilanthus Kunsthaus,
- It is a shrub that grows in the shola forests of the Western Ghats in South India.
- The plant is named after the famous Kunthi River which flows through Kerala's Silent Valley National Park, where the plant occurs abundantly.
- It is found at an altitude of 1,300-2,400 metres.
- This flower blooms once in 12 yearsas the pollination of flowers needs a longer period.
- It is mainly found in the states of Kerala, Tamil Nadu, and Karnataka.

74. Bannerman's turaco

Context:
- Bannerman's Turaco bird has come under serious threat at Kilum-Ijim Mountain Forest of Cameroon's northwest region.
- The Kilum-Ijim Mountain Forest, spanning some 20,000 square kilometers, is one of the last remaining homes of the endemic Bannerman's Turaco bird.

About Bannerman's Turaco

- Bannerman's turaco is a species of bird in the family Musophagidae.
- It is endemic to Cameroon. Its scientific and common names honor the ornithologist David Armitage Bannerman.
- This bird has a deep cultural value for the people in the Cameroon grassfields.
- Its natural habitat is subtropical or tropical moist montane forests.
- It is threatened by habitat destruction and the International Union for Conservation of Nature has listed it as an "endangered species".
- **Threats:** Habitat destruction due to clearing of forests for agricultural land.

75. Allmania multiflora

Context: A new species of the genus Allmania has been recently identified on the granite hillocks of Palakkad, Kerala. The discovery has come 188 years after the genus and the first species were described by botanists.

About: Allmania multiflora

- It is named Allmania multiflora.
- The species is quite special from both the botanical and conservation points of view.
- Allmania multiflora is only the second species of this genus identified so far anywhere.
- It is an annual herb that grows to a height of about 60 cm, erect, with branches arising from the base.
- The stem is red to violet at the base and green above.
- Found at heights ranging between 1,000 to 1,250 metres.
- Shorter tepals and wider gynoecium (parts of the flower), shorter bracts and in the diameter of the seeds are among the characteristics that distinguishes it from Allmania nodiflora.
- Flowering and fruiting occurs from May to September.
- Allmania multiflora has been so named for having a higher number of florets within an inflorescence.
- It has assessed **as Critically Endangered IUCN Red List**.

76. Tokhu Emong Bird Count (TEBC)

Context: Nagaland hosted the first edition of the Tokhü Emong Bird Count (TEBC) between November 4 to 7, a four-day documentation event to list birds in the state.

About: Tokhu Emong Bird Count (TEBC)

- It is the first avian documentation exercise taken by Nagaland to go beyond Amur falcons.
- The event is being held during the Tokhü Emong post-harvest festival of the Lotha Nagas to spread awareness about Nagaland's bird diversity.
- This event is being organised in collaboration with the Wokha Forest Division and the Divisional Management Unit, Nagaland Forest Management Project (NFMP), Wokha, and Bird Count India.
- The TEBC falls within the Salim Ali Bird Count, a nationwide event conducted by the Bombay Natural History Society.

77. Amur falcon

Context: Amur falcons, the world's longest travelling raptors, began to arrive in Manipur's Tamenglong district as part of its annual routine migration.

Migration Journey:

- Locally known as Akhuipuina, the bird arrives mainly in Manipur and Nagaland on its southbound migration from breeding grounds in North China, Eastern Mongolia and far-east Russia en-route to its wintering grounds in South Africa.
- The one-way journey via India is about 20,000 km long and the birds do this twice a year.

Conservation efforts:

- Amur falcon is **protected under the Wildlife Protection Act 1972** and included under **Schedule IV.**
- Hunting of the birds or possessing its meat is punishable with imprisonment up to three years or a fine up to Rs 5,000.
- In 2018, the forest department started a conservation programme by radio-tagging the birds to study their migratory route.
- These species of birds come under the category of **Least Concern under the International Union for Conservation of Nature (IUCN) Red List.**

78. Harlequin Frog

Context: Researchers confirmed that many harlequin frogs once believed to be extinct are persisting.

- The harlequin frog genus was hit exceptionally hard by the fungus and over the past four decades, experts believed that upwards of 80 per cent of its species were driven to extinction.

About Harlequin frogs

- They are typically **small to medium-bodied** and many of them have bright and contrasting warning colours **advertising potent skin toxins.**
- They are typically diurnal and many of them occur in the vicinity of streams all year long, while others are found inside the forest
- They occur in a diverse array of habitats, from tropical wet forests along the Pacific coast and the **Amazon basin** to the montane regions and **paramos of the Andes**
- They are particularly sensitive to habitat modification, environmental changes, and infectious diseases, potentially making them important sentinel species in the terrestrial and freshwater ecosystems where they occur.
- Their presence is an indicator of water quality and healthy ecosystems, and their demise might be an early warning to humans of critical environmental conditions.

79. Indian Skimmer

Context: Indian skimmer is seen in huge flocks during winter in Coringa wildlife sanctuary (Kakinada).

About: Indian Skimmer

- A thick, orange-yellow bill with a slightly longer lower mandible (jaw) is one of the most striking features of the Indian skimmer (Rynchops albicollis).
- The Indian skimmer grows to a length of 40-43 cm.

Distribution:

- More widespread in winter, the Indian skimmer is found in the coastal estuaries of western and eastern India.
- It occurs primarily on larger, sandy, lowland rivers, around lakes and adjacent marshes and, in the non-breeding season, in estuaries and coasts.
- About 20% of the total population of fewer than 2,500 birds nest along river Chambal.

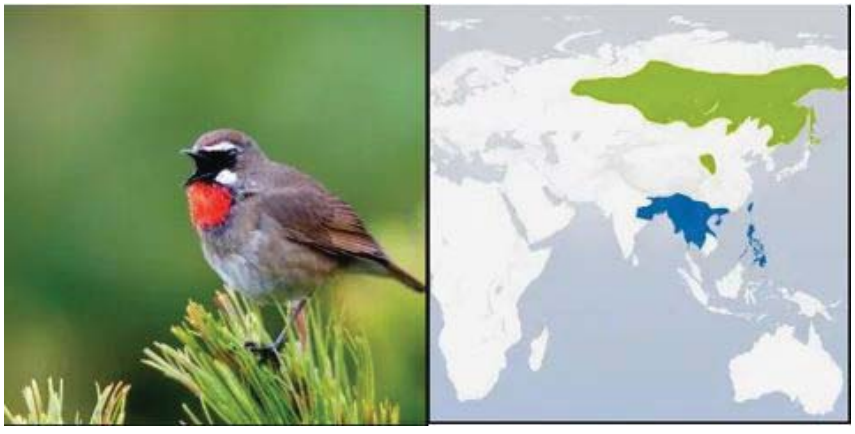
Conservation:

- IUCN: Endangered
- In 2020, Bombay Natural History Society (BNHS) have initiated a 'Guardians of the Skimmer' programme, which is a community-based conservation initiative.
- BNHS in collaboration with Bird Count India have also initiated 'Indian Skimmer Count'-a citizen science initiative.

80. Siberian rubythroat

Context: A rare winter migrant, Siberian rubythroat has been recorded in the Nilgiris.

About: Siberian rubythroat



- Siberian rubythroat (Calliope calliope) is a ground-loving songbird.
- The male has a red throat edged with a narrow black border and a broad white border.

- Females lack brightly coloured throat and borders.
- Distribution - During the breeding season the species is found in lowland taiga and subalpine shrubbery.
- The bird breeds in the coniferous forests of Siberia.
- The species is migratory, wintering in south-east Asia (Thailand, India, Indonesia and Bangladesh)
- Food - Insectivorous. Eats flies and their larvae, ants, wasps and beetles.

Conservation

- IUCN - Least Concern
- CMS - Appendix II

81. Greybellied Wren Babbler

Context: According to the recent findings of birdwatchers published by Indian BIRDS, a peer-reviewed journal of South Asian ornithology, they recorded a rare and elusive grey-bellied wren babbler.

About: Greybellied Wren Babbler

- Grey bellied wren babbler is a specie of songbird named after the Lisu, the local community.
- This is mostly found in Myanmar with some birds occurring in adjoining China and Thailand.
- **IUCN Status**: Least Concern
- **Habitat:** Subtropical moist montane forest.

Features:

- Dark edges to its back and crown feathers give it a scaly-looking quality.
- Forages on ground and in undergrowth, almost always under heavy cover and rarely emerging into the open.

82. Dactylorhiza hatagirea

- Dactylorhiza hatagirea (Salampanja) is a species of orchid generally found growing in the Himalayas.
  - It is locally called **'salam panja' or 'hatta haddi'.**
  - It is called **'panchaule'** in Nepali and Himalayan regions.
- It is threatened by habitat loss, livestock grazing, deforestation, and climate change.
- It is extensively used in **Ayurveda, Siddha, Unani** and other alternative systems of medicine to cure dysentery, gastritis, chronic fever, cough and stomach aches.

83. Asian Giant Tortoise

Context: Ten captive-bred Asian Giant Tortoise (Manouria emys) juveniles were released into a protected area of Nagaland's Intanki National Park.

About: Asian Giant Tortoise

- The soft release of Asian Giant Tortoise is an attempt to boost conservation and repopulating the species. The soft release is a process of gradually releasing captive-raised species into the wild.
- Distribution: They are found in Bangladesh, India, Indonesia, and Malaysia and other places.
- Diet: Bamboo shoots, tubers and other juicy vegetation and some invertebrates and frogs.
- Threats: Hunting for consumption, habitat loss, anthropogenic activities like construction and slash and burn.

Conservation Status

- IUCN :Critically Endangered
- CITES :Appendix II
- Indian Wildlife (Protection) Act of 1972 : Schedule IV

Intanki National Park:

- It is also known as the Ntangki National Park, which was established by British administrators in the year 1923.
- **Flora:** it has thick rain forests which creates natural habitat for many animals.
- **Fauna**: Wild buffaloes, Hoolok gibbo ,Tigers, Sloth bear, Wild dogs and flying squirrels.

84. A Rare Dragonfly spotted in Kerala

Context A species of **Spiny Horntail- Dragonfly** is seen in **Kottiyoor forests** of Kannur district of Kerala.

About

- This species is endemic to Western Ghats, earlier found in Maharashtra this year.
- In India, they are found in three types of species in genes Burmagomphus.
- **Cauvericus** – restricted to certain areas of Western Ghats
- **Pyramidalis**- Western Ghats as well as in Peninsular India.
- **Laidlawi**- Found in whole of Western Ghats

- Other than these species all species of the genus are found in the **Western and Eastern Himalayas**.
- The new species is separated from its congeners by the markings on the lateral thorax and peculiar shape of anal appendages.

Dragonfly

- Dragonflies are predatory insects from the order Odonata (an order of flying insects that includes the dragonflies and damselflies) and characterized by;
  - large eyes
  - transparent wings
  - Most colourful patches in body

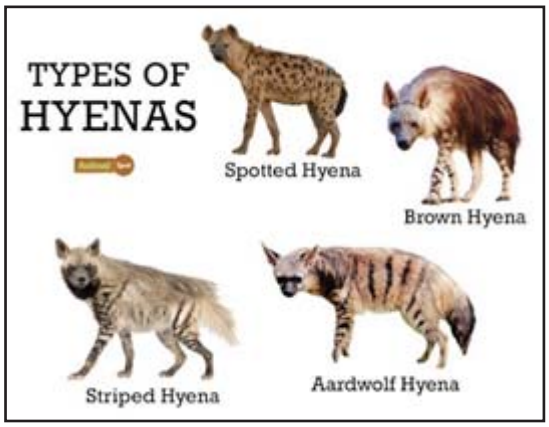
Other major species in India

- Ditch jewel dragonfly
- Diplacodes trivialis (ground skimmer): Most abundant species.
- Red Groundling
- Potamarcha congener- Common chaser

85. India's striped hyenas

Context A nocturnal animal, Indian Striped Hyena is capable of hunting even during the no moon days.

About



- Striped hyenas can be seen over an extensive range in the north and northeast Africa, from the Middle East to southern Siberia as well as the Indian subcontinent.
- Hyenas are carnivorous beasts found chiefly in Africa and are known for being scavengers.
- With only four living members of their genus existing in the present times, they are among the smallest family of mammals alive, the fifth smallest to be exact.
- **Scientific Classification:**
- **Kingdom:** Animalia
- **Phylum:** Chordata
- **Class:** Mammalia
- **Order:** Carnivora

86. Four new corals were recorded from Indian waters

Context Scientists have recorded four species of **azooxanthellate corals** for the first time from Indian waters.

About

- The non-reef building, solitary corals were found in the waters of **Andaman and Nicobar Islands.**
- These groups of corals are deep-sea representatives, with the majority of species reporting from between **200 m to 1000 m.**
- The new records have been published in Thalassas- **An International Journal of Marine Sciences.**
- About 570 species of hard corals are found in India and about **90%** of them are found in the waters around Andaman and Nicobar Islands.
- Andaman and Nicobar are one of the ancient and oldest ecosystems of corals that share less than 1% of the Earth's surface but they provide a home for about 25% of marine life.

The four species found are:

- Truncatoflabellum crassum
- T. incrustatum
- T. Irregular
- T. Krasum

What are azooxanthellate corals?

- **Azooxanthelate** corals are a group of corals that do not contain zooxanthellae and derive nutrition not from the sun but by capturing various forms of plankton.

Corals in India

- India is recorded to have around 7,517 km of coastline but only 6,100 km represents the mainland coastline. The three major types of coral reefs found in India are **fringing, barrier and atolls.**
- Coral reefs in India are found in a lot of areas including the **Gulf of Kutch, Gulf of Mannar, Palk Bay, Andaman & Nicobar and Lakshadweep Islands.** The Gulf of Kutch in the northwest has some of the most northerly reefs in the world.
- Patches of coral reefs are also found in **Ratnagiri, Malvan and Redi, south Bombay** and at the Gaveshani Bank located in the west of Mangalore.

Types of coral reefs in India

- India has three major prevailing types of coral reefs:
- **Fringing reefs**: Fringing reefs evolve and develop near the continent and remain close to the coastline. These reefs are separated from the coastline by small, shallow lagoons. They are the most commonly found reefs in the world.
- **Barrier reefs**: Barrier reefs are found offshore on the continental shelf. They usually run parallel to the coastline at some distance. A deep and wide lagoon is located between the coastline and the barrier reef.
- **Atolls**: Atolls are formed on mid-oceanic ridges. They are shaped circularly or elliptically and are surrounded by seas on all four sides and have shallow waters in the center called a lagoon.

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3 WETLANDS/LAKES/ WILDLIFE SANCTUARY/ NATIONAL PARK/ RESERVES

Wildlife Sanctuary	Biosphere Reserve	National Park
⊙ A place where neglected animals live freely without any external interruption. ⊙ It is reserved exclusively for wildlife use. ⊙ Certain human activities are allowed **There are many wildlife sanctuaries in India, nearly 553.**	⊙ A protected area where sustainable development of plants and animals happens. ⊙ It also protects and preserves the traditional life tribal people live around the reserve. ⊙ There are three zones in the biosphere reserve ➤ the core area ➤ the buffer zone ➤ a transition zone or 'area of cooperation **18 biosphere reserves in India are well protected.**	⊙ A place where animals live freely in their natural environment. ⊙ It is strictly regulated by the laws and the rules of the government. ⊙ National parks in India are IUCN category II protected areas. ⊙ Activities like grazing, hunting, forestry or cultivation etc. are strictly prohibited. No human activity is permitted. **There is 104 national park in India**

Other important Conservation Sites

- **Tiger reserves** – Tiger Reserve is a legally declared protected area dedicated to the conservation of striped big cats. Project Tiger was launched by the Government of India in the year 1973 to save the endangered species of tiger in the country. **There are 53 tiger reserves in India, Guru Ghasidas National Park is the 53rd Tiger Reserve in India as of 2023.**
- **Elephant reserves:** Project Elephant was launched in 1992 by the Government of India Ministry of Environment and Forests to provide financial and technical support to wildlife. **In India, there are 33 elephant reserves.**
- **UNESCO World Heritage Sites (Natural, Cultural and Mixed)** – Places listed by the United Nations Educational, Scientific and Cultural Organization as of special cultural or physical significance.
- **Marine Protected Areas:** Marine protected areas in India are specific regions of oceans and estuaries that are maintained for the conservation of indigenous wildlife. **There are 31 marine protected areas in India.**
- **Important Bird Areas:** An Important Bird and Biodiversity Area is an area identified using an internationally agreed set of criteria as being globally important for the conservation of bird populations.

1. Bird Census in Delhi's biodiversity parks

Context A bird census conducted at the seven biodiversity parks in Delhi counted 159 species of birds. This was the first such census conducted systematically together across all biodiversity parks in the city.

Key-highlights

- A total of 23,907 birds were counted.
- The highest number of species, 99, was recorded at Delhi's oldest biodiversity park — the Yamuna Biodiversity Park, near Wazirabad, which was set up in 2002, and has both forest and wetland ecosystems.
- This was followed by the Aravalli Biodiversity Park, near Vasant Kunj, where 92 species of birds were recorded.

Delhi has seven biodiversity parks

- Yamuna Biodiversity Park
- Aravali Biodiversity Park
- Neela Hauz Biodiversity Park
- Kamla Nehru Biodiversity Park
- Tilpath Valley Biodiversity Park
- Tughlakabad Biodiversity Park
- Kalindi Biodiversity Park

2. Water Bird Status Survey -2022 conducted in the Chilika lake

Context: According to the **Water Bird Status Survey-2022**, **Chilika Lake** saw a million birds including an uncommon **Mongolian gull** visiting the water body this year.

Water Bird Status Survey-2022

- The Survey was conducted in Chilika Lake.
- It was undertaken jointly by the **Odisha State Wildlife Organization**, the **Chilika Development Authority** (CDA) and the **Bombay Natural History Society**.

Chilika Lake

- Chilika Lake is a **brackish water lagoon**, spread over the *Puri, Khordha and Ganjam* districts of Odisha state on the east coast of India, at the mouth of the Daya River, flowing into the Bay of Bengal.
- It is the biggest lake of India after **Vembanad Lake.**

Key findings of the Water Bird Status Survey-2022

- Around 10.7 lakh birds belonging to the 107 bird species were counted in Chilika Lake. (In 2021, the number of birds counted was over 12 lakh).
- The lake reported a rare sighting of the uncommon **Mongolian gull**.
- **Birds at Nalabana Bird Sanctuary:** A total of 3.5 lakh birds were counted in Nalabana Bird Sanctuary inside Chilika. This is a decrease of 65,000 from the previous year.
- The decrease is attributed to high water levels and the presence of water in cultivated fields in adjoining areas. Waterbirds love to flock on large mudflats.
- There was also an increase in numbers for the greater **flamingo at Nalabana mudflat**. This indicates that the restoration at Nalabana is effective. This year's greater flamingo count was the highest in the last decade.

- However, there was also a marginal decrease in the number of species such as the gadwall, Eurasian wigeon, northern shoveler, tufted duck and red-crested pochard.

Mongolian Gull

- Mongolian Gull (*Larus mongolicus*) is large gull of the herring gull/lesser black-backed gull complex which breeds in North-east Asia.
- There are several sub-species however, Mongolian gull vary by its back and wings.

3. Asian Waterbird Census (AWC)

Context: Recently, in the Asian Waterbird Census has found lower waterbird species diversity at East Delhi's Sanjay Lake when compared to the count from the past three years.

About AWC

- It is an integral part of the **global waterbird monitoring programme**, the **International Waterbird Census (IWC)**, coordinated by Wetlands International.
- AWC is held in the **month of January every year.**
- The major regions covered under AWC are **Southeast Asia, Australasia, East Asian – Australasian Flyway, region between Afghanistan and Japan.**
- It was initiated in 1987 in the Indian subcontinent.
- In India AWC is jointly coordinated by the **Bombay Natural History Society (BNHS)** and Wetlands International.
- During the census, the volunteers visit the wetlands and count the waterbirds.

4. Behali Reserve Forest

Context:
- Researchers in the **Behali Reserve Forest** located the **carcasses of five primates**, believed to be capped langurs.
- Presumably these primates were killed by poachers for their skin, bones and tails.

About Behali Reserve Forest

- Located in the Biswanath district of Assam in the foothills of the Eastern Himalayas, it was declared as a reserved forest in 1917.
- It is a part of the greater **Sonitpur Elephant Reserve.**
- It lies between the two famous protected areas, the **Nameri National Park** on its west and **Kaziranga National Park on its south.**
- It is also recognized as an **Important Bird Area** in 1994 and a **Key Biodiversity Area** in 2004.
- **Borgang and Buroi** are the main tributaries flowing through **Behali Reserve Forest** and drains in the **Brahmaputra.**

5. Orang National Park

Context: The government is pursuing a policy for the reintroduction of the gharial in the **Orang national park**.

About Orang National Park

- It is located on the northern bank of the Brahmaputra River in the **Darrang and Sonitpur** districts of Assam.
- It was established as a sanctuary in 1985 and declared a national park in 1999.
- The Park has a rich flora and fauna, including great Indian rhinoceros, pygmy hog, Asian elephant, Bengal tiger and many more.

Fauna and Flora in Orang National Park

- **Mammal:** Rhinoceros, Tiger, Maljuria Elephants (male elephants in group), Hog Deer, Wild Pig, Civet Cat, Porcupine and Gangetic Dolphin.
- **Birds :** 222 species of Birds have so far been recorded, some of which are Spot Billed Pelican, White Pelican, Greater Adjutant Stork, Lesser Adjutant Stork, Brahminy Duck, Pintail Duck, Bengal Florican (2nd.highest concentration) etc.
- **Reptiles:** Indian Rock Python, Black Krait, King Cobra, Cobra, Monitor Lizard.
- **Turtles:** Seven species of Turtle and Tortoise.

6. Asola Bhatti Wildlife Sanctuary

Context: A study is being undertaken to document the mammals at the Asola Bhatti Wildlife Sanctuary.

About Asola Bhatti Wildlife Sanctuary

- It lies on **Delhi-Haryana border**, covering 32.71 km^2 area on the southern Delhi Ridge of Aravalli hill range.
- It is the part of the Northern Aravalli leopard wildlife corridor, which starts from the **Sariska National Park** in Rajasthan and ends at Delhi Ridge.
- This is an important habitat for the Indian leopard, Sambar deer, hog deer, nilgai, blackbuck and spotted deer.
- Bird species include the **Booted Eagle, Greater Spotted Eagle, Steppe Eagle, Egyptian Vulture, and BlackWinged Kite.**

Sariska Tiger Reserve

- Sariska Tiger Reserve is a tiger reserve in Alwar district, Rajasthan, India.
- It comprises scrub-thorn arid forests, dry deciduous forests, grasslands, and rocky hills.
- This area was a hunting preserve of the Alwar state and was declared a wildlife sanctuary in 1958.

7. Pench Tiger Reserve

Context: Tigress named **Collarwali,** also known as the **queen of Pench** and a Super Mom who birthed 29 cubs died at **Pench Tiger Reserve.**

About Pench Tiger Reserve

- It lies in the southern slopes of the **Satpura range** on the southern border of Madhya Pradesh. It derives its name from the **River Pench.**
- It was declared a **National Park by the Government of Maharashtra** in 1975. It received the **official status of Tiger Reserve of India** in February 1999.
- It is spread over two states, the Seoni and Chhindwara districts of Madhya Pradesh and Nagpur district of Maharashtra.
- This area is considered one of the most prime & critical tiger habitat remaining in central India.

8. Keoladeo National Park

Context: This former duck-hunting reserve of the Maharajas is one of the major wintering areas for large numbers of aquatic birds from **Afghanistan, Turkmenistan, China and Siberia**. Some 364 species of birds, including the rare Siberian crane, have been recorded in the park.

About Keoladeo National Park

- Formerly known as the **Bharatpur Bird Sanctuary, Rajasthan.**
- It became a bird sanctuary in the year 1976 and then became a Ramsar site in the year 1981.
- It was declared a national park in 1982 and then later tagged as a World Heritage Site by UNESCO in 1985.
- The park is home to over 370 species of birds and animals and flora species.

9. Ramgarh Vishdhari Tiger Reserve (RVTR)

Context: 4th Tiger Reserve of Rajasthan, National Tiger Conservation Authority (NTCA) has given the nod to **Ramgarh Vishdhari Sanctuary of Rajasthan for the Tiger Reserve.**

About Ramgarh Vishdhari Tiger Reserve (RVTR)

- The 1,052.12 sq. km RVTR in Bundi district is Rajasthan's fourth tiger reserve and 52nd for the nation.
- It links the Ranthambore Tiger Reserve in the Northeast and the Mukundra Hill Tiger Reserve on the Southern side.
  - Other three tiger reserves of Rajasthan are Ranthambore Tiger Reserve (RTR) in Sawai Madhopur, Sariska Tiger Reserve (STR) in Alwar, and Mukundra Hills Tiger Reserve (MHTR) in Kota.

10. Biligiri Ranganathaswamy Temple (BRT) Tiger Reserve

Context: The tiger estimation is underway at **Biligiri Ranganathaswamy Temple (BRT) Tiger Reserve.**

About BRT Tiger Reserve

- It is located in **Chamarajanagar district of Karnataka State.**
- The habitat is situated in the middle of the bridge between the Western Ghats and the Eastern Ghats.
- It derives its name from the white rocky cliff on the top of which is a temple of Lord VISHNU locally known as **Rangaswamy.**
- The site was declared as a **Tiger Reserve in 2011.**
- In 2018 Census, 52 to 80 tigers were found there.

11. India's First Geological Park- Lamheta village

Context: The Geological Survey of India (GSI) approved the establishment of the c**ountry's first Geo Park at Lamheta village** on the banks of river **Narmada** in Jabalpur district of Madhya Pradesh.

Key Highlights:

- The park will be set up at Lamheta village on the banks of river Narmada, Jabalpur district.
- Significantly, this site is already present in the tentative list of UNESCO's geo-heritage for the protection of natural heritage.
- Fossils of many dinosaurs were found in the Narmada valley, especially in the **Bhedaghat-Lamheta Ghat region of Jabalpur.** The first dinosaur fossil was collected from the Lamheta Bed by Indian Civil Service officer William Sleeman in 1828 AD.
- A science center will also be built at Bhedaghat, which is known for its white marble rock structure, at a cost of Rs 15.20 crore, the cost of which will be shared by the central and state governments.

What is a Geopark?

- According to UNESCO, geoparks are single, unified geographical areas where sites and landscapes of international geological significance are managed with a holistic concept of protection, education, and sustainable development.
- The local community is included to foster conservation with sustainable development.

12. Khijadiya wildlife sanctuary

Context: The National Green Tribunal (NGT) has raised concerns about environmental norms being violated by a shipbuilding yard at Sachana that lies close to **Khijadiya Wildlife Sanctuary**, a freshwater wetland that became a Ramsar site.

In 2022, on World Wetlands Day it was declared as a Ramsar site.

About: Khijadiya wildlife sanctuary

- This freshwater wetland near the coast of the **Gulf of Kutch in Gujarat State** was formed following the creation of a **bund (dike)** in 1920 to protect farmland from saltwater ingress.

- As one of the **important waterbird habitats** in North-West India, the Site provides breeding, feeding and roosting grounds for a wide range of resident aquatic and also land-based birds.
- It provides habitat for over 310 bird species, including 125 waterbirds; over 165,000 individual waterbirds have been counted. These include the endangered Pallas's fish-eagle (*Haliaeetus leucoryphus*) and Indian skimmer (*Rynchops albicollis*), and the vulnerable common pochard (*Aythya ferina*).
- The Site also regularly supports more than 1% of the south and south-west Asian population of Dalmatian pelican (*Pelecanus crispus*), more than 2% of greylag goose (*Anser anser*) and more than 20% of common crane (*Grus grus*).
- More than 180 plant species are present, including the critically endangered Indian bdellium-tree (*Commiphora wightii*).

Wetlands

- Wetlands include almost any habitat where water is key to the environment and its wildlife.
- Wetlands include swamps, marshes, billabongs, lakes, salt marshes, mudflats, mangroves, coral reefs, fens, peat bogs, or bodies of water - whether natural or artificial, permanent or temporary.
- On 30 August 2021 the **UN General Assembly adopted Resolution 75/317** that established 2 February as '**World Wetlands Day**'.

The Ramsar Convention:

- The Ramsar Convention is an **international treaty** for the conservation and wise use of wetlands.

Wetlands in India

Recently, India has added 11 new wetlands to the list of Ramsar sites and with that, the total number of Ramsar sites in India has reached to total of 75 Ramsar sites.

- It is named after the **Iranian city of Ramsar**, on the Caspian Sea, where the treaty was signed on **2 February 1971.**
- **Objective**: 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.
- The convention entered into force in India on 1 February 1982.

What is Montreux Record?

- Montreux Record is a **register of wetland sites on the Ramsar list**, which are facing immediate challenges.
- India's two wetlands find a place in the Montreux Record. They are:
  - **Keoladeo National Park, in Rajasthan**, was designated a Ramsar site in 1981 and listed in the Montreux Record in 1990.
  - **Loktak Lake in Manipur** was declared a Ramsar site in 1990 and indexed in the Montreux Record in 1993.

Ramsar Sites of India

	Ramsar Site	State	Designated Year
1	**Kolleru Lake**	**Andhra Pradesh**	2002
2	**Deepor Beel**	**Assam**	2002
3	Kanwar (Kabar) Taal	Bihar	2020
4	Nanda Lake	Goa	2022
5	Khijadia WLS	Gujarat	2021
6	**Nalsarovar BS**	**Gujarat**	2012
7	Thol Lake	Gujarat	2021
8	Wadhvana Wetland	Gujarat	2021
9	Bhindawas WLS	Haryana	2021
10	**Sultanpur NP**	**Haryana**	2021
11	**Chandra Taal**	**Himachal Pradesh**	2005
12	**Pong Dam Lake**	**Himachal Pradesh**	2002
13	Renuka Lake	Himachal Pradesh	2005
14	**Ranganathituu BS**	**Karnataka**	2022
15	**Ashtamudi Wetland**	**Kerala**	2002
16	**Sasthamkotta Lake**	**Kerala**	2002
17	**Vembanad-Kol Wetland (Longest Lake in India)**	**Kerala**	1905
18	Bhoj Wetland	Madhya Pradesh	2002
19	Sakhya Sagar	Madhya Pradesh	2022
20	Sirpur wetland	Madhya Pradesh	2022
21	Yashwant Sagar	Madhya Pradesh	2022
22	**Lonar Lake (Impact Crater Lake)**	**Maharashtra**	2020
23	**Nandur Madhameshwar**	**Maharashtra**	2019
24	**Thane Creek**	**Maharashtra**	2022
25	**Loktak Lake**	**Manipur**	1990
26	Pala Wetland	Mizoram	2021
27	Ansupa Lake	Odisha	2021
28	**Bhitarkanika Mangroves**	**Odisha**	2002
29	**Chilika Lake (Oldest Ramsar Site in India)**	**Odisha**	**1981**
30	**Hirakud Reservoir**	**Odisha**	2021

31	**Satkosia Gorge**	**Odisha**	2021
32	Tampara Lake	Odisha	2021
33	**Beas CnR**	**Punjab**	2019
34	**Harike Wetland**	**Punjab**	1990
35	Kanjli Wetland	Punjab	2002
36	Keshopur-Miani CmR	Punjab	2019
37	**Nangal WLS**	**Punjab**	2019
38	Ropar Wetland	Punjab	2002
39	**Keoladeo National Park**	**Rajasthan**	**1981**
40	**Sambhar Lake**	**Rajasthan**	1990
41	Chitrangudi BS	Tamil Nadu	2021
42	**Gulf of Mannar Marine BR**	**Tamil Nadu**	2022
43	Kanjirankulam BS	Tamil Nadu	2022
44	Karikili BS	Tamil Nadu	2022
45	Koonthankulam BS	Tamil Nadu	2021
46	Pallikaranai Marsh Reserve Forest	Tamil Nadu	2022
47	**Pichavaram Mangrove**	**Tamil Nadu**	2022
48	Point Calimere WLS & BS	Tamil Nadu	2002
49	Suchindram Theroor Wetland Complex	Tamil Nadu	2022
50	Udhayamarthandapuram BS	Tamil Nadu	2022
51	Vaduvur BS	Tamil Nadu	2022
52	Vedanthangal BS	Tamil Nadu	2022
53	Vellode BS	Tamil Nadu	2022
54	Vembannur Wetland Complex	Tamil Nadu	2022
55	Rudrasagar Lake	Tripura	2005
56	**Hokera Wetland**	**UT of JK**	2005
57	Hygam Wetland CnR	UT of JK	2022
58	Shallbugh Wetland CnR	UT of JK	2022

59	Surinsar-Mansar Lakes	UT of JK	2005
60	**Wular Lake**	**UT of JK**	1990
61	**Tso Kar (High Altitude Ramsar Site)**	**UT of Ladakh**	2020
62	**Tsomoriri (High Altitude Ramsar Site)**	**UT of Ladakh**	2002
63	Bakhira WLS	Uttar Pradesh	2021
64	Haiderpur Wetland	Uttar Pradesh	2021
65	Nawabganj BS	Uttar Pradesh	2019
66	Parvati Arga BS	Uttar Pradesh	2019
67	Saman BS	Uttar Pradesh	2019
68	Samaspur BS	Uttar Pradesh	2019
69	Sandi BS	Uttar Pradesh	2019
70	Sarsai Nawar Jheel	Uttar Pradesh	2019
71	Sur Sarovar (Keetham Lake)	Uttar Pradesh	2020
72	Upper Ganga River (Brijghat to Narora)	Uttar Pradesh	2005
73	Asan Barrage	Uttarakhand	2020
74	East Kolkata Wetlands	West Bengal	2002
75	**Sundarban Wetland (Largest Ramsar Site in India)**	**West Bengal**	**2019**

13. Udaipur's 'bird village' to be declared wetland

Context Menar in Udaipur district is proposed to be notified as Rajasthan's new wetland.

About

- The two lakes in the village – the **Brahma and Dhandh** – play host to a large number of migratory birds in the winter season every year.
- The State government's Forest Department has initiated the process for notification of Menar as a wetland, which will recognise its role in the storage of sediment and nutrients and enable the local authorities to maintain the Brahma and Dhandh lakes.
- With the status of wetland, the two lakes will be strengthened for increasing vegetation of aquatic plants and protecting biodiversity.

Other Ramsar Sites in Rajasthan:

At present, Rajasthan has two wetlands recognised as Ramsar sites –

- Keoladeo Ghana in Bharatpur district
- Sambhar Salt Lake in Jaipur district.

- **Observed Species:**
- More than 150 species of local and migratory birds inhabit the two lakes in the winter season.
- They include Greater Flamingo, White-tailed Lapwing, Pelican, Marsh Harrier, Bar-headed Goose, Common Teal, Greenshank, Pintail, Wagtail, Green Sandpiper and Red-wattled Lapwing.
- Bird lovers and tourists flock to the village after the arrival of migratory birds from as far as Central Asia, Europe and Mongolia.

14. Aravalli Biodiversity Park

Context The Aravalli Biodiversity Park was declared India's first "other effective area-based conservation measures" (OECM) site on the occasion of World Wetlands Day (February 2).

What is an 'OECM'?

- 'Other effective area-based conservation measures' (OECMs) are areas that are achieving the long term and effective in-situ conservation of biodiversity outside of protected areas.
- The OECM tag is given by the International Union for Conservation of Nature (IUCN).
- The tag is conferred upon areas that have achieved effective in-situ conservation of biodiversity, but are outside protected areas like national parks and sanctuaries.

In-situ conservation means the conservation of a species in its natural habitat and the maintenance and recovery of viable population of species in their original place.

The proposal to declare **Aravalli Biodiversity Park** an OECM site was sent by the **National Biodiversity Authority to the IUCN in 2020.**

About Aravalli Biodiversity Park

- The Aravalli Biodiversity Park is located in Gurugram.
- It has **semi-arid vegetation** with lots of native plants, trees, shrubs and several species of birds.
- The park was transformed into a city forest from a 40-year-old mining site through the efforts of citizens, ecologists and scientists along with the help of the urban local body of Gurugram.
- The Aravalli Biodiversity Park is spread across 390 acres and has semi-arid vegetation, with around 300 native plants, 101,000 trees, 43,000 shrubs, and several species of birds.

15. Kaziranga Become Net Carbon Emitter

Context: Recently a research published, which showed that Kaziranga National Park in Assam, is releasing more carbon than it is absorbing.

Key highlights:

- As the planet warms further, the ability of the Kaziranga National Park (KNP) to absorb carbon would further decrease.
- Earlier, it was found that the Amazon rainforest is now emitting more carbon dioxide than it is able to absorb.

- Researchers found that Kaziranga absorbed the most amount of carbon dioxide during the pre-monsoon season of March, April and May.
- A forests, or trees in a forest, take up carbon dioxide for the process of photosynthesis and release carbon dioxide when they breathe.

Key Points related to KNP

- **Location:** It is located in the State of Assam and covers 42,996 Hectare (ha). It is the single largest undisturbed and representative area in the Brahmaputra Valley floodplain.
- **Legal Status:** It was declared as a National Park in 1974. It has been declared a tiger reserve since 2007. It has a total tiger reserve area of 1,030 sq km with a core area of 430 sq. km.
- **International Status:** It was declared a UNESCO World Heritage Site in 1985. It is recognized as an **Important Bird Area by BirdLife International.**
- **Biodiversity:**
  - It is the home of the **world's most one-horned rhinos.**
  - Pobitora Wildlife Sanctuary has the highest density of one-horned rhinos in the world and second highest number of Rhinos in Assam after Kaziranga National Park.
  - Much of the focus of conservation efforts in Kaziranga are focused on the 'big four' species - Rhino, Elephant, Royal Bengal tiger and Asiatic water buffalo.
  - Kaziranga is also home to 9 of the 14 species of primates found in the Indian subcontinent.

16. Sariska Tiger Reserve

Context: After successful reintroduction of tigers at the Sariska Tiger Reserve (STR), the forest department is planning to relocate a pair of sloth bears at the reserve.

About Sariska Tiger Reserve (STR):

- **Location**: It is located in the Aravalli hills in the **Alwar district of Rajasthan**
- This area was a hunting preserve of the erstwhile Alwar state.

Sloth Bear:

- Sloth bears are one of the eight bear species found across the world.
- **Scientific name:** *Melursus ursinus*
- **Distribution:** They mainly inhabit the region of India, Nepal, Sri Lanka and Bhutan.

Features:

- They have long, shaggy dark brown or black fur and curved claws, which are the longest out of any of the bear species.
- It feeds on fruits, ants and termites.

Conservation Status:

- **IUCN:** "Vulnerable"
- **Indian Wildlife Protection Act, 1972:** Schedule 1

- It was declared as a wildlife reserve in 1955 and then a Tiger Reserve in 1978 under Project Tiger.
- It is the first reserve in the world which successfully relocated tigers.

- Sariska is also famous for old temples, palaces and lakes such as **Pandu Pol, Bhangarh Fort, Ajaibgarh, Pratapgarh, Siliserh Lake and Jai Samand Lake.**
- **Topography:** Grasslands, dry deciduous forests, cliffs, and rocky landscapes.
- **Flora:** salar, kadaya, dhak, gol, ber , Banyan , gugal , bamboo , kair , adusta etc
- **Fauna:** Bengal tigers, leopard, jungle cat, Indian jackal, chital, chinkara, four-horned antelope, Indian peafowl, grey partridge, Indian peafowl, Indian eagle-owl etc.

17. Black Sea Biosphere Reserve

Context: The **Black Sea Biosphere Reserve** is a **biosphere reserve** that is located in Ukraine's littoral zone or nearshore of the coast of the northern Black Sea. It covers the region of the **Mykolaiv and Kherson Oblasts** and also includes the **Yahorlyk Bay** and the **Gulf of Tendra.**

About: Black Sea Biosphere Reserve

- This reserve is part of **Ukraine's National Academy of Sciences** (It is the largest in Ukraine.).
- On 14th July 1927, the biosphere was established as part of the **Trans-Maritime Preserve.**

Black Sea

- Black Sea is an inland sea between Eastern Europe and Western Asia.
- It is bounded by the **Eastern European Plain to the north, the Balkans to the west, the Caucasus Mountains to the east, and the Anatolian Peninsula (or Asia Minor, the largest part of Turkey) to the south.**
- There are six countries with coastlines on the Black Sea (clockwise): **Ukraine, Russia, Georgia, Turkey, Bulgaria, and Romania.**

- In the year 1933 the preserve became an independent research institution.
- In the year 1973 the Kinski islands in Yahorlyk Bay, the Danube floodplains, and the **Gulf of Tendra's** shallow portion was added to this reserve.
- In 1974 the Yahorlyk reserve was also annexed.
- In the year 1981 the Danube floodplains were declared to become an independent preserve.
- In the year 1984 this reserve was included in the **World Network of Biosphere Reserves**.
- This territory has also been included in the International list of **Ramsar Convention.**

Habitats found in this reserve

- This reserve is a haven for thousands of migrating birds. Over 1,20,000 birds including rare species like red-breasted merganser, the white-tailed eagle, and black-winged stilt can be found in the protected waters and wetland of this reserves.
- In this reserve, Black Sea bottlenose dolphin, sandy blind mole rat, along with mollusks, rare flowers, and dozens of species of fish are also found.

Damage due to the Russia-Ukraine war

- In March 2022, this reserve was damaged during the Russian invasion of Ukraine. During the invasion, this area witnessed severe fighting that caused several fires in this region.

18. Ranipur Tiger Reserve

Context: In 2022, **53rd tiger reserve** in India was declared in Ranipur Wildlife Sanctuary, Uttar Pradesh, and the State's fourth tiger reserve.

Ranipur Wildlife Sanctuary

- Ranipur Wildlife Sanctuary was founded in 1977. It is one of the attractions of **Chitrakoot district** in Uttar Pradesh.
- It is spread over 230 km^2.
- It is the natural habitat of several animals, including **Tigers, Leopards, Sloth bears, Sambars, Blackbucks, Peafowl, Spur fowl, Jungle Fowl, Painted partridges, fishing cats, and Chinkaras.**

About: Ramgarh Vishdhari Sanctuary

- The Ramgarh Vishdhari Sanctuary in Rajasthan was notified as India's 52nd tiger reserve.
- This is Rajasthan's fourth tiger reserve after Ranthambore, Sariska and Mukundra.
- Ramgarh Vishdhari Wildlife Sanctuary and adjoining areas as tiger reserves on July 5 last year.
- The newly notified tiger reserve includes the tiger habitat between Ranthambore Tiger Reserve in the northeast and Mukundra Hills Tiger Reserve on the southern side and facilitates dispersal of tigers from Ranthambore Tiger Reserve.
- According to "Status of Tigers in India" report released in 2019, there are 2,967 tigers in 20 states across the country.

Tiger Reserve

- Tiger Reserve is a legally declared protected area dedicated to the conservation of striped big cats.
- A tiger reserve, on the other hand, could be a national park or wildlife sanctuary.
- India is home to 80 percent of tigers in the world.

19. Pantanal Wetland

Context The world's largest wetland, known as the Pantanal, in South America is at risk of collapse.

- This is due to a series of local and seemingly minor decisions that fail to account for their cumulative impact on one of Earth's most biodiverse ecosystems.

About Pantanal Wetlands

- The Pantanal is a **natural region encompassing** the world's largest tropical wetland area, and the world's largest flooded grasslands.
- It is located mostly within Brazil and extends to some portions of **Bolivia and Paraguay.**
- It is fed through the **Paraguay River and tributaries**.
- It sprawls over an area estimated at between 140,000 and 195,000 square kilometers.
- Roughly **80% of the Pantanal floodplains** are submerged during the rainy seasons, nurturing a biologically diverse collection of aquatic plants and helping to support a dense array of animal species.
- It is designated a **National Heritage by the Brazilian Constitution** and a restricted-use region whose use should be ecologically sustainable.

20. Hasdeo Forest

Context: Various conflicts arose due to government's decision to allow coal mining in Chhattisgarh's Hasdeo forest (Parsa East-Kete Basan (PEKB) coal block).

About: Hasdeo forest

- Hasdeo Arand is a forest in the Indian state of Chhattisgarh in central India.
- It is termed as the "largest un-fragmented forests in Central India consisting of pristine Sal (Shorea robusta) and teak".
- It is known for its biodiversity and also its coal deposits.
- The forest falls under **Korba, Sujapur and Sarguja districts with sizeable tribal population.**
- The Hasdeo river, a tributary of Mahanadi, flows through it.

21. Protect Elephants

Context:
- On World Elephant Day (12 August), PM Modi said that India is home to about 60% of all Asian elephants and reaffirmed India's commitment to protecting the jumbos.
- Also, the Government of India declared the establishment of a new elephant reserve - Agasthyamalai (Tamil Nadu), and resolved to take a number of steps to address human-elephant conflict situations.

Important facts on Elephant

- The Indian elephant **Elephas maximus** occurs in the central and southern Western Ghats, North-east India, eastern India and northern India and in some parts of southern peninsular India.
- It is included in **Schedule I** of the Indian Wildlife (Protection) Act, 1972 and in **Appendix I of the Convention on International Trade in Endangered Species of Flora and Fauna (CITES).**

- Indian Elephant has also been listed in the **Appendix I** of the **Convention of the Migratory species** in the recently concluded **Conference of Parties of CMS 13** in **Gujarat in 2020.**
- It occurs in **16 of the 28 states in the country** and is showing an increasing trend across its distributional range.

Population Update

- According to the latest elephant census conducted in 2017, the population of elephants in India has reached up to about **27,312.**
- According to the 2017 census, **Karnataka had the highest number of elephants** (6,049), followed by Assam (5,719) and Kerala (3,054).

Project Elephant

- **Project Elephant** was launched by the Government of India in the year 1992 as a Centrally Sponsored Scheme with following objectives:
  - To protect elephants, their habitat & corridors
  - To address issues of man-animal conflict
  - Welfare of captive elephants

About New Reserve

- Agasthyamalai Elephant Reserve (ABR) is situated at the southern-most end of the Western Ghats and spread over two southern states Kerala and Tamil Nadu.
- It is named after the Agastya Mala peak that rises up to almost 1868 metres above sea level, in Thiruvananthapuram, Kerala.

22. Bandhavgarh Tiger Reserve

Context: The Archaeological Survey of India (ASI) has recently reported 26 Buddhist caves in **Madhya Pradesh's Bandhavgarh Tiger Reserve.**

Bandhavgarh Tiger Reserve

- Bandhavgarh National Park is in the central Indian state of Madhya Pradesh.
- This biodiverse park is known for its large population of royal Bengal tigers, especially in the central Tala zone. Other animals include white tigers, leopards and deer.
- The mix of tropical forest, Sal trees and grassland is home to scores of bird species, including eagles. To the south are the remains of the ancient Bandhavgarh Fort.
- Bandhavgarh was declared a national park in 1968 and became a tiger reserve in 1993.
- Tala, Khitauli and Magadhi comprise the three main zones of the national park, which together cover an area of 716 km.

Highlights of the discoveryc

- The 26 caves that were found are associated with the **Mahayana sect of Buddhism.**

- These date back to the same time as the **Ajanta caves in Aurangabad**, a **UNESCO World Heritage Site.**
- Besides the caves, the ASI team also found the remains of 26 temples, two mathas, two stupas, 46 idols and sculptures, 26 fragments and 19 water bodies.
- ASI also mentioned a Buddhist pillar fragment containing a miniature stupa carving, dating to the 2nd-3rd century CE, and 24 Brahmi inscriptions from the 2nd-5th century CE.
- The temples are from more recent times — the Kalachuri period (9th-11th century), while the water bodies range between 2nd-15th centuries CE.
- The places Kaushami, Mathura, Pavata (Parvata), Vejabharada and Sapatanaairikaa are mentioned in the Brahmini inscriptions, while the inscribed names of kings include Shri Bhimsena, Maharaja Pothasiri and Bhattadeva.

23. Sukapaika River

Context: Odisha Government has started working on Sukapaika River revival plan following a recent direction from the National Green Tribunal (NGT).

Key Highlights:

- This is probably the first serious attempt being made to restore a river to its original shape in Odisha.
- The problem has started in 1952, when the state government blocked the starting point of the Sukapaika with an embankment to save the villages around it from floods.
- Subsequently, in 1957, two major projects — Hirakud Dam in Sambalpur district and Naraj barrage at Cuttack — were built upstream on the Mahanadi, ostensibly to control floods in it.
- The river dried up due to the development of the Taladanda Canal System, a major canal of the State.

Sukapaika River:

- Sukapaika is one of the several distributaries of the mighty Mahanadi river in Odisha.
- It branches away from the Mahanadi at Ayatpur village in Cuttack district and flows for about 40 kilometres (km) before rejoining its parent river at Tarapur in the same district.
- In the process, it drains a large landmass comprising over 425 villages under 26 gram panchayats in three blocks — Cuttack Sadar, Nischintakoili and Raghunathpur.

24. Tamil Nadu's 1st Biodiversity Heritage Site- Arittapatti village

Context:
- Recently, the Tamil Nadu Government issued a notification declaring **Arittapatti in Melur block**, Madurai district, a **Biodiversity Heritage Site (BHS).**
- It is Tamil Nadu's first and **India's 35th Biodiversity Heritage Site.**

Key Facts about Arittapatti

- Arittapatti village is rich in ecological and historical significance, it houses around 250 species of birds including three important raptors, birds of prey namely:
  - Laggar Falcon
  - Shaheen Falcon
  - Bonelli's Eagle
- It is also home to wildlife such as the Indian Pangolin, Slender Loris and Pythons.
- The biodiversity-rich area is surrounded by a chain of seven hillocks or inselbergs that serve as a watershed, charging '72 lakes, 200 natural springs and three check dams.'
- The Anaikondan Lake, built during the reign of Pandiyan kings in the 16th century is one among them.
- Several megalithic structures, rock-cut temples, Tamil Brahmi inscriptions and Jain beds add to the historical significance of the region.

Biodiversity Heritage Sites (BHS)

- Biodiversity Heritage Sites are rich Biodiversity Areas and are important components of local ecosystems which are being conserved and managed by the society.
- As per provision under Section 37(1) of 'Biological Diversity Act, 2002', The State Government may, from time to time in consultation with the local bodies, notify in the Official Gazette, areas of biodiversity importance as biodiversity heritage sites under this Act.

First BHS of India:

- **Nallur Tamarind Grove in Bengaluru, Karnataka** was the first Biodiversity Heritage Site of India, declared in 2007.

Last Five Additions to BHS:

- Debbari or Chabimura in Tripura (September 2022)
- Betlingshib & its surroundings in Tripura (September 2022)
- Hajong Tortoise Lake in Assam (August 2022)
- Borjuli Wild Rice Site in Assam (August 2022)
- Amarkantak in Madhya Pradesh (July 2022)

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4 CLIMATE CHANGE

1. Budget promoting Clean Energy

Context In the Union Budget 2023-24, Green hydrogen, clean energy storage and transmission are the key drivers of the government's "Green Growth" priority sector.

Key initiatives:

- **National Green Hydrogen mission:** With an outlay of Rs. 19,700 crore, the mission will facilitate the transition of the economy to low carbon intensity, reduce dependence on fossil fuel imports and make the country assume technology and market leadership
- **Energy transition investment:** The FM has announced an outlay of Rs 35,000 crore for energy transition investment.
- **Battery storage capacity:** The government will support setting up of battery storage capacity of 4,000 MWH in India with viability gap funding. The aim is to touch green hydrogen production of 5 million tonnes by 2030.
- **Green credit programme:** A green credit programme will be notified under the Environment Protection Act.
- **GOBARdhan scheme:** 500 new 'waste to wealth' plants under GOBARdhan (Galvanizing Organic Bio-Agro Resources Dhan) scheme will be established for promoting circular economy.
- **CBG plants:** These will include 200 compressed biogas (CBG) plants, including 75 plants in urban areas, and 300 community or cluster-based plants at total investment of ` 10,000 crore.
- **5% compressed biogas:** The government plans to introduce a 5 percent compressed biogas mandate for all entities marketing natural gas in India.
- **National apprenticeship scheme**: To provide support to 47 lakh youths in 3 years, a Direct Benefit Transfer under a **pan India national apprenticeship scheme** will be rolled out.

Schemes launched:

- **PM Vishwa Karma Kaushal Samman:** PM Vishwa Karma Kaushal Samman-package of assistance for traditional artisans and craftspeople has been conceptualised, will enable them to improve quality, scale & reach of their products, integrating with MSME value chain.
- **Free food scheme to continue till 2024:** From January 1, 2023, a scheme to supply free food grain to all **Antyodaya** and **priority households** for one year under **PM Garib Kalyan Ann Yojana** is underway.
- **Pradhan Mantri Awas Yojana:** The Budget 2023-24 allocated Rs 79,000 crore for the Pradhan Mantri AwasYojana (PMAY), giving a further boost to the government's programme to provide housing to the urban poor.
- **MISHTI scheme:** The government will take up mangrove plantations along the coastline under the new MISHTI scheme. The Mishti scheme is aimed at preserving mangroves.

- **Atmanirbhar Clean Plant Programme**: The Rs 2,200 crore programmes to improve the availability of disease-free, quality planting material for high-value horticultural crops will raise their cultivation area from a low 15%.
- **Pradhan Mantri Kaushal VikasYojana 4.0:** The government will launch Pradhan Mantri Kaushal VikasYojana 4.0.
- **PM Azaz Yojana**: The outlay for PM Azaz Yojana is being increased by 66% to over Rs 79,000 crore.
- **Amrit Dharohar:** The scheme aims to encourage optimal use of wetlands, and enhance bio-diversity, carbon stock, eco-tourism opportunities and income generation for local communities.
- **National Apprenticeship Promotion Scheme:** To provide stipend support to 47 lakh youth in three years, Direct Benefit Transfer under a pan-India National Apprenticeship Promotion Scheme will be rolled out.
- **National Financial Information Registry:** It will be set up to serve as the **central repository of financial and ancillary information**. This will facilitate efficient flow of credit, promote financial inclusion, and foster financial stability.
- **Azadi Ka Amrit Mahotsav Mahila Samman Bachat Patra:** For commemorating Azadi Ka Amrit Mahotsav, a one-time new small savings scheme, Mahila Samman Savings Certificate, will be made available for a two-year period up to March 2025.
- **PM VIshwakarma KAushal Samman (PM VIKAS):** It is a package of assistance for traditional artisans and craftspeople. This will greatly benefit the Scheduled Castes, Scheduled Tribes, OBCs, women and people belonging to the weaker sections.

2. Carbon bombs

Context: A group of environmentalists, lawyers, and activists have come together to identify and 'defuse carbon bombs'– coal, oil and gas projects that have the potential to contribute significantly to global warming.

About: Carbon Bombs

- The usage of the term 'carbon bombs' picked up after an investigative project of The Guardian from May 2022.
- **Definition:** The Guardian said that it is "an oil or gas project that will result in at least a billion tonnes of CO2 emissions over its lifetime."
- Whenever coal, oil, or gas is extracted it results in pollution and environmental degradation. Further, carbon emissions take place in particularly large amounts when fuel is burned.
- In total, around 195 such projects have been identified world over, including in the US, Russia, West Asia, Australia and India. According to the report, they will collectively overshoot the limit of emissions that had been agreed to in the Paris Agreement of 2015.

Leave It in the Ground Initiative (LINGO)

- The network working towards this goal of 'defusing' carbon bombs is called Leave It In the Ground Initiative (LINGO).
- Its mission is to "leave fossil fuels in the ground and learn to live without them."
- It believes the root of climate change is the burning of fossil fuels, and the 100% use of renewable energy sources is the solution.
- LINGO aims to organise ground support for protesting such projects, challenge them through litigation, and conduct analysis and studies for the same.

3. World Overshoot Day: World has already overshot nature's budget for rest of the year

Context This year's Earth Overshoot Day was observed (28th July) a day before it was celebrated in year 2021 on July 29. It indicates that humanity's demand for natural resources exceeds what the Earth can provide.

About

- The concept of Earth Overshoot Day was first conceived by Andrew Simms of the UK think tank New Economics Foundation, which partnered with Global Footprint Network in 2006 to launch the first global Earth Overshoot Day campaign.
- At that time, Earth Overshoot Day fell in October.

Global Footprints Network (GFN)

- Global Footprint Network is an international non-profit organization founded in the year 2003.
- Its key strategy has been to make available robust Ecological Footprint data.
- It was established as a charitable not-for-profit organization in each of three countries namely, United States, Belgium and Switzerland.

- World-Wide Fund for Nature (WWF), the world's largest conservation organization, has participated in Earth Overshoot Day since

India's stand

- India finds itself in a much better position compared to the other countries.
- India, with the second-largest population count in the world, still has a per capita consumption rate that is not at all in the danger area of getting unsustainable.

4. Arctic Amplification

Context A new study shows that the Arctic has warmed nearly four times faster than the rest of the world over the past 43 years. This means the Arctic is on average around 3 degree warmer than it was in 1980.

Arctic amplification:

- The phenomenon, called Arctic amplification, is caused by the heat-trapping emissions from burning fossil fuels.
- The pace of the temperature increase around the North Pole in recent decades was four times higher than the rest of the planet.

Key highlights about Arctic warming:

- The Arctic is heating four times faster than the rest of the planet.
- The warming is more concentrated in the Eurasian part of the Arctic, where the Barents Sea north of Russia and Norway is warming at an alarming rate — seven times faster than the global average.
- The Arctic is more sensitive to global warming than previously thought.

5. Urban Flooding

Context: After the sweltering heat wave, the monsoons have finally hit India. However, monsoon has brought with it new problems in the form of flash floods in the different parts of the country.

What is Urban Flooding?

- Urban flooding is the inundation of land or property in a built environment, particularly in more densely populated areas (like cities), caused by rainfall overwhelming the capacity of drainage systems.
- Unlike rural floods (Heavy rain over a flat or low-lying area), urban flooding is not only caused by just higher precipitation but also unplanned urbanisation (catchments) that:
  - Increases the flood peaks from 1.8 to 8 times
  - Increases the flood volumes by up to 6 times.

Causes of Urban Flooding in India	Impacts of Urban Flooding

• **Encroachments on Drainage Channels**
• **Climate Change**
• **Unplanned Tourism Activities**
  ▸ **Example:** Ashtamudi Lake in Kollam, Kerala polluted from oil spillage from boats.
• **Uninformed Release of Water from Dams**
  ▸ **Example:** Chennai Floods 2015 due to release of water from Chembarambakkam Lake.
• **Illegal Mining Activities**:
  ▸ **Example:** Jaisamand Lake- Jodhpur, Cauvery river- Tamil Nadu.
	• Loss of Life and Property
	• Ecological Impacts
	• Impact on Animal and Human Health
	• Psychological Impacts

6. Marine Heatwave

Context: According to a study, **marine heat waves** - or the ones that form on oceans - have been on the rise in the waters around India.

Key Highlights:

- Emerging studies have reported their occurrence and impacts in the global oceans, but are little understood in the tropical Indian Ocean.
- Also, according to the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6), the sea surface temperature over the Indian Ocean is likely to increase by 1 to 2 °C when there is 1.5°C to 2°C global warming.

About Marine Heatwaves

- Marine heatwaves are periods of extremely high temperatures in the ocean.
- These events are linked to coral bleaching, seagrass destruction, and loss of kelp forests, affecting the fisheries sector adversely.
- Study showed that 85% of the corals in the **Gulf of Mannar near the Tamil Nadu** coast got bleached after the marine heatwave in May 2020.
- The most common drivers of marine heatwaves include ocean currents which can build up areas of warm water and air-sea heat flux, or warming through the ocean surface from the atmosphere.

- Winds can enhance or suppress the warming in a marine heatwave, and climate modes like El Niño can change the likelihood of events occurring in certain regions.

What are Kelp Forests?

- Kelp forests are **large brown algae** that live in cool, relatively shallow waters close to the shore. They grow in dense groupings much like a forest on land.
- These underwater towers of kelp provide food and shelter for thousands of fish, invertebrates, and marine mammal species.
- Among the many mammals and birds that use kelp forests for protection or feeding are seals, sea lions, whales, sea otters, gulls, terns, snowy egrets, great blue herons, cormorants, and shore birds.
- These dense canopies of algae generally occur in cold, nutrient-rich waters. Because of their dependency upon light for photosynthesis, kelp forests form in shallow open waters and are rarely found deeper than 49-131 feet.
- Like trees in a forest, these giant algae provide food and shelter for many organisms.

7. Wet Bulb Temperature

Context:
- The Third part of IPCC's Sixth Assessment Report which talks about the possibilities of reducing emissions has been released. It emphasised on the trend in the 'Wet Bulb' Temperature in South Asia.
- The first part, centered around climate change' scientific basis, was released last August. The second instalment, which talked about climate change impacts, risks and vulnerabilities, and adaptation options has been released in March 2022.

About Wet Bulb Temperature

- Wet bulb temperature is the lowest temperature to which air can be cooled by the evaporation of water into the air at a constant pressure.
- WBT is a limit that considers heat and humidity beyond which humans cannot tolerate high temperatures.
- A wet-bulb temperature of 31°C is exceedingly harmful to humans, while a temperature of 35°C is unsurvivable for more than 6 hours.

Important Terms

- **Overshoot:** It refers to global temperatures crossing the 1.5°C threshold temporarily, but then being brought back down using technologies that suck CO2 out of the atmosphere.
- **Net Emission:** It refer to emissions accounted for after deducting emissions soaked up by the world's forests and oceans.
- **Anthropogenic Emission**: It refer to emissions that originate from human-driven activities like the burning of coal for energy or cutting of forests.

Impact on India:

- Lucknow and Patna, were among the cities predicted to reach wet-bulb temperatures of 35°C if emissions continued to rise, while Bhubaneswar, Chennai, Mumbai, Indore, and Ahmedabad are 'at risk' of reaching wet-bulb temperatures of 32°C-34°C with continued emissions.
- With continuing emissions, parts of central India including Vidarbha are at risk of exceeding wet bulb temperatures of 32-34°C.

About IPCC:

- The Intergovernmental Panel on Climate Change (**IPCC**) is the international body for **assessing the science related to climate change**.
- The IPCC was set up in 1988 by the World Meteorological Organization (**WMO**) and United Nations Environment Programme (**UNEP**).
- It aims to provide **policymakers** with **regular assessments** of the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation.

8. Carbon Market

Context: A Bill to amend a 20-year law, the Energy Conservation Act, was introduced in Parliament recently. The Bill empowers the central government to specify a carbon credit trading scheme.

About: Energy Conservation (Amendment) Bill, 2022:

- The Bill seeks to amend the Energy Conservation Act, 2001.
- The Act promotes energy efficiency and conservation. It provides for the regulation of energy consumption by equipment, appliances, buildings, and industries.
- Need: to facilitate the achievement of more ambitious climate change targets and ensures a faster transition to a low-carbon economy.

Carbon trading:

- The Bill empowers the central government to specify a carbon credit trading scheme.
- Carbon credit implies a tradable permit to produce a specified amount of carbon emissions.

Concept of Carbon trading globally:

- Under the **Kyoto Protocol,** the predecessor to the Paris Agreement, carbon markets have worked at the international level as well.
- **Europe:** Domestic or regional carbon markets are already functioning in several places, most notably in Europe, where an emission trading scheme (ETS) works on similar principles.
- **China**, too, has a domestic carbon market.
- India: A similar scheme for incentivising energy efficiency has been running in India for over a decade now.
  - This BEE scheme, called PAT, (or perform, achieve and trade) allows units to earn efficiency certificates if they outperform the prescribed efficiency standards.

9. Geomagnetic Storm

Context Space-monitoring agencies have predicted that a strong geomagnetic storm is likely to hit the earth.

About: Geomagnetic storm

- A geomagnetic storm is a disturbance in the earth's magnetosphere, which is the area around the planet controlled by its magnetic field.

- The earth's magnetosphere protects its inhabitants from most of the particles emitted by the sun.
- When a **coronal mass ejection (CME)** or a high-speed stream reaches the earth, it strikes the planet's magnetosphere.
- If the incoming solar magnetic field is directed southwards, it interacts strongly with the earth's own magnetic field that is opposite in direction, causing disturbances.
- The changes produced in the earth's magnetic field as a result of this interaction allow solar wind particles to stream down the magnetic field lines and hit the atmosphere near the poles.
- Solar winds deeply impact the shape of the earth's magnetosphere, and variations in solar winds cause geomagnetic storms on earth.
- At the surface of the earth, a geomagnetic storm can result in a rapid decline in the earth's magnetic field strength. This decrease can last for around 6 to 12 hours and gradually recovers over several days.
- Sunspots are dark areas on the solar surface and contain strong, shifting magnetic fields. These are formed when areas on the surface of the sun cool slightly – from around 6,000 °C to about 4,200 °C — due to strong magnetic fields that emerge through the solar surface. Sunspots appear as dark spots against the otherwise bright sun.

Coronal Mass Ejection (CME):

- A coronal mass ejection is a large expulsion of plasma and magnetic field from the sun's corona.
- Plasma is the highly ionised gas present on the sun, while corona is the outermost part of the sun's atmosphere.
- The corona is structured by strong magnetic fields. If these fields are closed, the solar atmosphere can release sudden, violent bubbles of gas and magnetic fields which constitute the CME.
- One large CME is capable of containing a billion tonnes of matter.
- CMEs can travel at varying speeds – as slow as 250 km per second to as high as 3,000 km per second.

What is a Solar Storm?

- Solar storms are magnetic plasma ejected at great speed from the solar surface.
- They occur during the release of magnetic energy associated with sunspots ('dark' regions on the Sun that are cooler than the surrounding photosphere), and can last for a few minutes or hours.
- Solar storms can hit operations of space-dependent services like global positioning systems (GPS), radio, and satellite communications.

10. Urban Heat Island

Context: Recently, several parts of India are experiencing severe heat waves. Urban areas and cities are the places which have higher temperatures than rural places. This phenomenon is referred to as **'Urban Heat Island'.**

What is an Urban Heat Island?

- Urban heat island may be defined as the local and temporary phenomenon in which certain pockets within a city are experiencing higher heat load than its surrounding area.

- This rise of heat basically happens due to buildings and houses of cities made up of concrete where the heat is trapped and not able to dissipate easily.
- Urban heat island is basically induced due to trapped heat between establishments made up of concrete.
- The temperature variation can range between 3 to 5 degrees Celsius.

What are the Causes of Urban Heat Island?

- Dark surfaces of buildings
- Air conditioning
- Urban Architecture
- Need for mass transportation system
- Lack of Trees and green areas

11. Deep and Shallow Ecologism

Context: India continues to face with the unrelenting heatwave. Although, heat waves are known to have been a reality for hundreds of years. But more extreme, frequent and prolonged heat waves in recent has exposed the long-term effects of climate change which have exacerbated them.

Concept of Ecologism

- The concepts emerged in the 1970s, when Norwegian philosopher Arne Næss sought to look beyond the popular pollution and conservation movements of his milieu to address environmental degradation.
- In his study, he viewed nature and themselves as two competing entities, therefore, established a master-slave dynamic. There are two strands of environmental philosophy that reinvent the relationship between nature and humans.

Two styles of ecologism

- **Shallow ecologism**: Also referred to as weak ecologism, refers to the philosophy wherein the present lifestyle is continued, but with specific tweaks to minimise the damage to the environment. He termed this powerful and fashionable fight against pollution and resource depletion as shallow ecologism or environmentalism.
  - For example, using vehicles that cause less pollution or air conditioners that do not release chlorofluorocarbons (CFCs).
- **Deep ecologism**: It refers to the philosophy wherein the exponents believe that humans should radically change their relationship with nature. It rejects shallow ecologism as it prioritises humans above nature. It aims to preserve nature subsequent to environmental destruction.
  - For instance, the wealthier countries are responsible for a majority of carbon emissions. For instance, the US constitutes only 5% of the world's population, but consumes 17% of the world's energy consumption. In addition,

12. Zombie Ice

Context A new study finds that Greenland has more than 120 trillion tons of ice that can be thought of as zombie ice that's going to raise sea level globally by at least 10 inches.

About Zombie Ice

- Zombie Ice referred to as **dead or doomed ice.**
- It is one that is not accumulating fresh snow even while continuing to be part of the parent ice sheet.
- Such ice is "committed" to melting away and increasing sea levels.
- It's dead ice. It's just going to melt and disappear from the ice sheet.
- This ice has been consigned to the ocean, regardless of what climate (emissions) scenario we take now.
- **Medium-density amorphous (MDA) ice** is the name given to the new ice. The molecules of the recently-discovered ice are disorganised rather than perfectly ordered as they are in regular, crystalline ice, making it amorphous. The most common type of ice in space is amorphous ice, while being uncommon on Earth.

13. Climate Reparations

Context: In 2022, Pakistan witnessed the worst flooding disaster in its history; therefore it has begun demanding **reparations, or compensation**, from the rich countries that are mainly responsible for causing climate change.

What is Climate Reparation?

- Climate reparations refer to a call for money to be paid by the developed countries to the developing countries as a means of addressing the historical contributions that the Developed countries have made (and continue to make) toward climate change.

What did the International Conventions say about Climate Responsibility?

- **Admission of Responsibility**: The UN Framework Convention on Climate Change (UNFCCC), the 1994 international agreement that lays down the broad principles of the global effort to fight climate change, explicitly acknowledges this differentiated responsibility of nations.
- It makes it very clear that rich countries must provide both finance and technology to developing nations to help them tackle climate change.
- The rich countries agreed to provide USD 100 billion to the developing world every year as a result of this mandate.
- **Present Status**: The promise of USD 100 billion in assistance to developing countries is yet to be completed.

14. Dvorak Technique

Context: Recently, the American meteorologist Vernon Dvorak passed away, on whom Dvorak Technique was named to forecast Weather.

What is the Dvorak technique?

- The Dvorak technique is a Cloud Pattern Recognition Technique (CPRT) based on a concept model of the development and decay of the tropical cyclone.
- It was first developed in 1969 and tested for observing storms in the **northwest Pacific Ocean**.

- In this methodology, available satellite images obtained from polar orbiting satellites are used to examine the features of the developing **tropical storms (hurricanes, cyclones and typhoons).**
- During day time, images in the visible spectrum are used while at night, the ocean is observed using infrared images.
- From the satellite images the technique helps forecasters do a pattern recognition from the observed structure of the storm, locate its eye and estimate the intensity of the storm.
- Although it cannot help make any predictions, measure wind or pressure or any other meteorological parameters associated with the cyclone, it is a guide to estimate the storm's intensity and possible intensification which is crucial for local administration in planning evacuation measures of coastal or other nearby residents.

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5 ENVIRONMENTAL POLLUTION

1. Microplastics discovered in fresh Antarctic snow for first time

Context Microplastics have been found in freshly fallen snow in Antarctica for the first time.

What are microplastics?

- They are defined as plastics less than **five millimeters in diameter**—smaller in diameter than the standard pearl used in jewelry. It can be harmful to our ocean and aquatic life.
- There are **two categories of microplastics**: primary and secondary.
  - **Primary Microplastics:** They are tiny particles designed for commercial use and microfibers shed from clothing and other textiles. E.g. Microbeads found in personal care products, plastic pellets and plastic fibres.
  - **Secondary Microplastics**: They are formed from the breakdown of larger plastics such as water bottles.

India-Specific Initiatives to end plastic:

- **Elimination of Single Use Plastic:** In 2019, the Prime Minister of India pledged to eliminate all single-use plastic in the country by 2022, with an immediate ban in urban Delhi.
- **Important Rules:** Plastic Waste Management Rules, 2016 state that every local body has to be responsible for setting up infrastructure for segregation, collection, processing, and disposal of plastic waste.
- **Plastic Waste Management (Amendment) Rules 2018** introduced the concept of Extended Producer Responsibility (EPR).
- **Un-Plastic Collective:** Un-Plastic Collective (UPC) is a voluntary initiative launched by the UNEP-India, Confederation of Indian Industry and WWF-India.

2. World Oceans Day: Marine litter

Context: The United Nations designated **June 8 as World Ocean Day** to raise awareness about ways to safeguard the seas.

World Maritime Day is observed every year on the **last 'Thursday'** of every September. This year it is observed on September 29.

World Ocean Day:

> **Theme:** The theme for World Ocean Day 2022 is "Revitalisation: Collective Action for the Ocean".

- The idea of World Ocean Day was first proposed by Canada's International Centre for Ocean Development (ICOD) and the Ocean Institute of Canada (OIC) in 1992.
- But only after global collaboration between The Ocean Project and the World Ocean Network, and various other scientific institutes and organisations did the UN official recognise June 8 as World Ocean Day in 2008.

3. World Bank Report on Air Pollution

Context:
- Recently, the World Bank released a **report titled 'Striving for Clean Air: Air Pollution and Public Health in South Asia'.**
- The report **details how persisting with policies currently being implemented** (largely since 2018) will yield results but not to the desired level.

Airsheds:

- Six large airsheds exist in South Asia, where the air quality in one can affect the air quality in another. They are:
  - **West/Central Indo-Gangetic Plain (IGP)** that included Punjab (Pakistan), Punjab (India), Haryana, part of Rajasthan, Chandigarh, Delhi, Uttar Pradesh.
  - **Central/Eastern IGP:** Bihar, West Bengal, Jharkhand, Bangladesh
  - **Middle India:** Odisha/Chhattisgarh
  - **Middle India:** Eastern Gujarat/Western Maharashtra
  - **Northern/Central Indus River Plain:** Pakistan, part of Afghanistan; and
  - **Southern Indus Plain and further west:** South Pakistan, Western Afghanistan extending into Eastern Iran.
- When the wind direction was predominantly northwest to the southeast, **30% of the air pollution in Indian Punjab came from the Punjab Province in Pakistan** and, on average, 30% of the air pollution in the largest cities of Bangladesh (Dhaka, Chittagong, and Khulna) originated in India. In some years, substantial pollution flowed in the other direction across borders.

Exposure to PM 2.5:

- Currently over **60% of South Asians are exposed to an average 35 µg/m3 of PM2.5 annually.**
- In some parts of the **IGP** it spiked to as much as 100 µg/m3 – nearly 20 times the upper limit of 5 µg/m3 recommended by the **World Health Organisation (WHO).**

Dominant Sources of Air Pollution:

- Large industries, power plants and vehicles are dominant sources of air pollution around the world, but in South Asia, other sources make substantial additional contributions.
- These include **combustion of solid fuels for cooking and heating, emissions from small industries such as brick kilns,** burning of municipal and agricultural waste, and cremation.

4. Pharmaceutical Pollution

Context According to a research paper, Pharmaceutical Pollution is an overlooked but urgent issue that needs coordinated action from across the pharmaceutical, healthcare, and environmental sectors.

Details:

- The research paper highlighting the important issues of Pharmaceutical Pollution was published in the journal The Lancet Planetary Health.
- Almost half or 43% of the world's rivers are contaminated with **Active Pharmaceutical (API) Ingredients** in concentrations that can have disastrous ramifications on health.

Active Pharmaceutical (API) Ingredients:

- **Active ingredients** are the substances in drugs that are responsible for the beneficial health effects experienced by consumers.
- The active ingredient in a pharmaceutical drug is called an **active pharmaceutical ingredient (API).**
- The active ingredient in a biological drug is called a **bulk process intermediate (BPI**).

What is Pharmaceutical Pollution?

- It is mainly a form of water pollution, caused by pharmaceutical drugs and their molecules which reach the aquatic environment (groundwater, rivers, lakes, and oceans) through wastewater.

Government Initiatives:

- **National Action Plan for Antimicrobial Resistance 2017:** It was proposed to tackle the problem related to limits on antibiotics in industrial waste.
- **Zero Liquid Discharge Policy:** Central Pollution Control Board (CPCB) has introduced guidelines to various pharma industries to achieve zero liquid discharge.
- **Continuous Monitoring of Effluents**: The Ministry of Environment, Forest, and Climate Change (MoEFCC) has also announced that industries must install devices to monitor the effluent continuously.

5. CCUS Policy Framework and its Deployment

Context:
- Recently, **NITI Aayog** has released a study report, titled **'Carbon Capture, Utilisation, and Storage (CCUS) Policy Framework and its Deployment Mechanism in India'.**
- The report explores the importance of Carbon Capture, Utilisation, and Storage as an emission reduction strategy to achieve deep decarbonization from the hard-to-abate sectors.

What are Carbon Capture, Utilization, and Storage?

- CCUS encompasses **methods and technologies to remove CO_2 from the flue gas and from the atmosphere,** followed by recycling the CO_2 for utilization and determining safe and permanent storage options.

- CO_2 **captured using CCUS technologies are converted into fuel** (methane and methanol), refrigerants and building materials.
- CCUS is considered an important tool to help countries halve their emissions by 2030 and reach net-zero by 2050.
  - These goals are crucial to meet the **Paris Agreement targets** for restricting global warming to 2 degrees Celsius (°C), and preferable to 1.5°C, over pre-industrial levels.

6. Forever Chemicals

Context According to a recent study, rainwater from many places across the globe is contaminated with "per- and polyfluoroalkyl substances," (PFAs), which are called "forever chemicals" because of their tendency to stick around in the atmosphere, rainwater and soil for long periods of time.

Per- and polyfluoroalkyl substances (PFAs):

- The per-and polyfluoroalkyl substances (PFAS) are a group of **chemicals used to make fluoropolymer coatings and products** that resist heat, oil, stains, grease, and water.
- PFAs can migrate to the soil, water and air during their production and use. Since most PFAs do not break down, they remain in the environment for long periods of time.
- Many PFAS, including perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA), are a concern because they:
- **do not break down in the environment**,
- **can move through soils a**nd contaminate drinking water sources,
- build up **(bioaccumulate)** in fish and wildlife.
- PFAS are found in rivers and lakes and in many types of animals on land and in the water.

7. Banning Single-Use Plastic

Context: The Centre banned the use of **'single-use-plastic'** from **July 1** 2022.

What is single-use plastic?

- As the name suggests, **it refers to plastic items that are used once and discarded**. E.g., plastics used in packaging of items, bottles (shampoo, detergents, cosmetics), polythene bags, face masks, coffee cups, cling film, trash bags, food packaging etc.

Status:

- **As per the Minderoo Foundation report (2021)**: single-use plastics account for a **third of all** plastic produced globally, with **98% manufactured from fossil fuels**.
- **India features in the top 100 countries** of single-use plastic waste generation – at rank 94 (the top three being Singapore, Australia and Oman).
- India's domestic production of SUP is **8 million metric tonnes** annually, and its import of **2.9 MMT.**
- India's per capita generation is **4 kg**.
- The largest share of single-use plastic is that of **packaging** – with as much as **95%** of single-use belonging to this category – from toothpaste to shaving cream to frozen foods.

How are other countries dealing with single-use plastic?

- **Consensus on SUP in UN**: This year, 124 countries, parties to the United Nations Environment Assembly, including India, signed a resolution to draw up an agreement which will in the future make it **legally binding for the signatories to address the full life of plastics from production to disposal**, to end plastic pollution.
  - **68 countries** have plastic bag bans with varying degrees of enforcement
- **Bangladesh**: Bangladesh became the first country to **ban thin plastic bags** in 2002.
- **China**: China issued a ban on plastic bags in 2020 with a phased implementation.
- **EU**: EU bans certain single-use plastics for which alternatives are available.

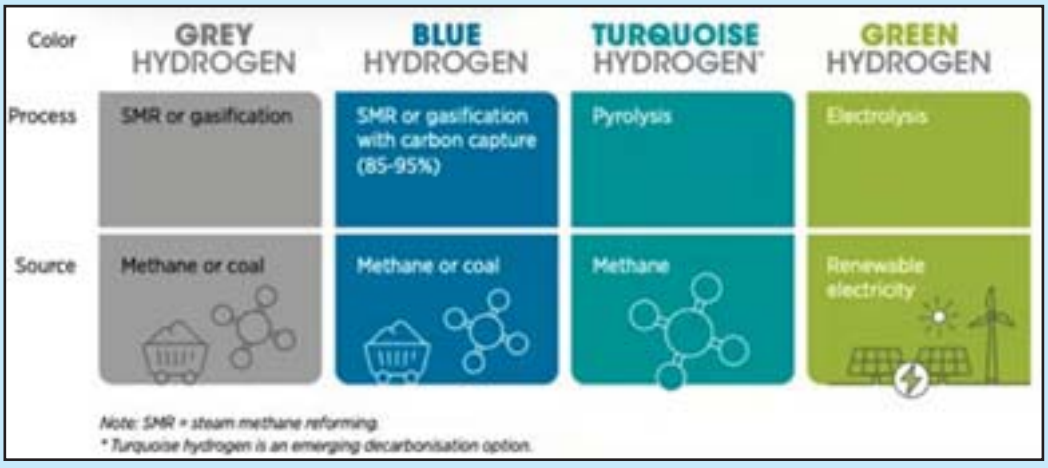
8. Green Hydrogen

Context At the World Economic Forum in Davos, Switzerland Minister of Petroleum and Natural Gas said that India will emerge as the leader of green hydrogen by taking advantage of the current energy crisis across the globe.

Green hydrogen:

- Green Hydrogen is **colourless, odourless, tasteless, non-toxic and highly combustible gaseous**
- Hydrogen is the **lightest, simplest and most abundant** member of the family of chemical elements in the universe.
- Green hydrogen is **produced through electrolysis** using renewable sources of energy such as solar, wind or hydel power.

- Grey hydrogen is generated through fossil fuels such as coal and gas and currently accounts for 95% of the total production in South Asia.
- Blue hydrogen is produced using electricity generated by burning fossil fuels but with technologies to prevent the carbon released in the process from entering the atmosphere.



Green hydrogen is India:

- Under the **Paris Agreement** (a legally binding international treaty on climate change with the goal of limiting global warming to below 2°C compared to pre-industrial levels) of 2015, India is committed to **reducing its greenhouse gas emissions by 33-35% from the 2005 levels**.

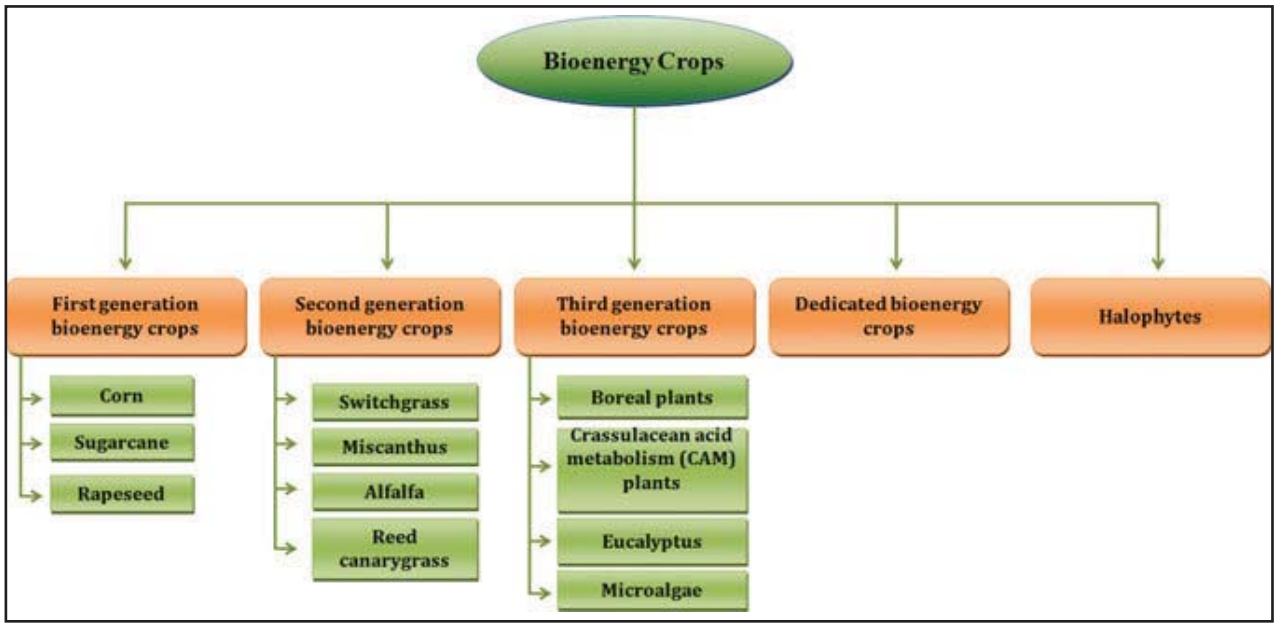
- At the **2021 Conference of Parties in Glasgow**, India **reiterated its commitment** to move from a fossil and import-dependent economy to a **net-zero economy by 2070**.
- In order to become **energy independent by 2047**, the government stressed the need to **introduce green hydrogen as an alternative fuel** that can make India the global hub and a major exporter of hydrogen.
- India has just begun to generate green hydrogen with the objective of raising non-fossil energy capacity to 500 gigawatts by 2030.
- In April 2022, the public sector **OIL,** which is headquartered in eastern Assam's Duliajan, **set up India's first 99.99% pure green hydrogen pilot plant** in keeping with the goal of "making the country ready for the pilot-scale production of hydrogen and its use in various applications".
- The plant was set up at the petroleum exploration major's **Jorhat pump station**, also in eastern Assam.
- Powered by a 500 KW solar plant, the **green hydrogen unit has an installed capacity to produce 10 kg of hydrogen per day and scale it up to 30 kg per day.**

9. Bioenergy Crops - can induce a cooling effect on the areas

Context: A new study has found that converting annual crops to perennial bioenergy crops **can induce a cooling effect on the areas** where they are cultivated.

Bioenergy Crops

- Crops from which Biofuels are produced or manufactured are called Biofuel crops or Bioenergy Crops. **"Energy crops" is a term used to describe biofuel crops.**
  - Wheat, corn, main edible oilseeds/edible oils, sugarcane, and other crops are among them.
- Biofuels have a number of advantages over fossil fuels, including the ability to burn cleaner and emit fewer pollutants and greenhouse gases, such as carbon dioxide, into the sky. They're also environmentally friendly, and energy corporations frequently mix Biofuels with gasoline.



10. Global Treaty to Cut Plastic Production

Context: The report on the impacts of plastics on climate, biodiversity, human health and environment was released ahead of the second part of UNEA 5 in Nairobi, Kenya.

What is UNEA?

- United Nations Environment Assembly (UNEA) is hosted by the UN Environment Programme.
- It brings together representatives of the 193 Member States of the UN, businesses, civil society and other stakeholders to agree on policies to address the world's most pressing environmental challenges.

What the draft report recommends?

- **Prioritise policies that address multiple threats acting at different timescales. This includes**
  - Measures to urgently eliminate the discharge of plastics into the environment,
  - Phase plastic production down to sustainable levels in alignment with the SDG 12
  - Promote the upscaling of reuse, refill and traditional packaging systems tailored to national contexts.
- **Peru and Rwanda resolution**
  - UNEA member states need to support the convening of an intergovernmental negotiating committee to develop a new global plastics treaty.
- **Meeting nationally determined contributions**
  - Parties need to work toward reducing the climate impact from extraction, processing, cracking and polymerisation through targeted measures in their NDCs to reduce greenhouse gas emissions in tandem with the rapid phase-out of fossil fuels in the energy sector.
- **Global Biodiversity Framework**
  - Member states must ensure that the proposed target to eliminate plastic waste discharges by 2030 is upheld and harmonised with the objectives of a new global plastics treaty

11. Plastic Park

Context: Chemicals and Fertilizers Minister DV Sadananda Gowda informed Rajya Sabha that the government has approved setting up of **six plastic parks** in different parts of the country.

About: Plastic Park

- These parks will have an ecosystem with infrastructure building and enabling the common facility to consolidate and synergize the capacities of the domestic downstream plastic processing industry.
- **Funding:** Under the scheme, the government provides grant funding up to 50 per cent of the project cost.
  - The remaining project cost is to be funded by State Government beneficiary industries and by a loan from financial institutions.
- **Location:** These parks are located in **Assam, Madhya Pradesh, Odisha, Jharkhand and Tamil Nadu.** Out of them, the plastic park at Tamot in Madhya Pradesh is functional.

- Four new plastic parks have also been given in-principle approval for establishment in **West Bengal, Haryana, Uttarakhand and Chhattisgarh.**

12. Solar Waste

Context: While India ramps up its solar power capacity, the nation does not yet have a firm policy on managing waste that results from used solar panels or from the manufacturing process.

About: Solar Waste

- According to the **International Renewable Energy Agency (IRENA),** the cumulative waste generated by India's total installed solar capacity could be as high as **325 kilotonnes by 2030**.
- It has also estimated that the global value of recoverable materials from solar PV waste could exceed USD15 billion.
- India currently considers solar waste a part of electronic waste and does not account for it separately.

13. Volatile Organic Molecules (VOC)

Context

- A new study predicts that India can slash emissions of volatile organic molecules (VOC) by 76% by 2030.
- This can be done by swapping all two- and three-wheelers with electric vehicles and all diesel-fuelled ones with **Compressed Natural Gas (CNG).**

What are Volatile Organic Compounds (VOCs)?

- Volatile Organic Compounds (VOCs) are a large group of carbon-based chemicals that easily evaporate at room temperature.
- VOCs are both natural and Man-made:
- VOCs can have a natural origin, too. Plants emit these chemicals to attract pollinators, defend themselves from pests and predators and adapt to environmental stress.
- Man-made VOCs can be released by a number of products such as from burning gasoline or coal, glues, dry-cleaning products etc.
- Volatile organic compounds can be found in household products or items commonly used in contemporary society. Some of their uses are:
  - paint thinners
  - degreasers
  - aerosol cans
  - dry-cleaning products
  - paints
  - photographic supplies
  - printers and photocopying machines and supplies

14. Nanoplastic

Context A team of researchers has analysed how light breaks down **polystyrene**, a non-biodegradable plastic from which packing peanuts, DVD cases and disposable utensils are made.

Findings

- When exposed to light, the nanoplastics derived from **polystyrene** unexpectedly facilitated the **oxidation** of **aqueous manganese ions**.
- The formation of manganese oxide solids that can affect the fate and transport of organic contaminants in natural and engineering water systems.
- It showed how the photochemical reaction of nanoplastics through light absorption **generates peroxyl and superoxide radicals** on nanoplastic surfaces, and initiates oxidation of manganese into **manganese oxide solids**.

Nanoplastics are particles unintentionally produced (i.e. from the degradation and the manufacturing of the plastic objects), within the size range from 1 to 1000 nm.

15. Mercury Pollution

Context Consensus is building among various stakeholders meeting in Bali, Indonesia, to adopt a non-binding declaration that will enhance international cooperation and coordination for **combatting illegal trade in mercury.**

About Mercury:

- Mercury (Hg) is a **global pollutant** that affects human and ecosystem health.

- Mercury occurs **naturally in the earth's crust**, but human activities, such as **mining and fossil fuel combustion, have led to widespread global mercury pollution.**
- Mercury emitted into the air eventually settles into water or onto land where it can be washed into water.
- Once deposited, certain microorganisms can change it into **methylmercury,** a highly toxic form that builds up in fish, shellfish and animals that eat fish.
- Most human exposure to mercury is from eating fish and shellfish contaminated with methylmercury.
- Mercury **is poisonous in all forms** - inorganic, organic or elemental.
- **Methyl mercury is a neurotoxicant**: it can damage the developing brain as it crosses the placental and blood-brain barriers easily.

About the Minamata Convention:

- The Minamata Convention on Mercury is a **multilateral environmental agreement** that addresses specific human activities which are **contributing to widespread mercury pollution**.
- The Minamata Convention on Mercury is the most recent global agreement on environment and health, **adopted in 2013**.
- Since it entered into **force on 16 August 2017**, Parties have been working together to control the mercury supply and trade, reduce the use, emission and release of mercury, raise public awareness, and build the necessary institutional capacity.

16. Sujlam 2.0 Campaign

Context: On the **World Water Day (22nd March),** the Ministry of Jal Shakti launched a **countrywide project to reuse grey water, or run-offs from kitchens, bathing and laundry.**

What is Grey water?

- Grey water is defined as **wastewater that is produced from household processes** (e.g. washing dishes, laundry and bathing).
- Grey water can **contain harmful bacteria and even faecal matter** that contaminates soil and groundwater.

What is 'Sujalam 2.0' Grey Water Recycling Project?

- The campaign would focus on the c**reation of institutional level greywater management assets** in **Panchayat Ghar, healthcare facilities, schools, Anganwadi Centres (AWCs), community centres** and other government institutions.
- Creation of individual and community greywater management assets **will be encouraged.**
- With active participation from all States and local communities' great success was achieved under the **Sujlam 1.0 campaign** which was started in August 2021.
  - **More than 1 million soak pits were built** at household and community level across the country.

What are the Related Initiatives?

- **Jal Shakti Abhiyan: Launched in 2019** to cover **water stressed districts, in 2021** it was taken to all rural and urban districts.
- **Atal Bhujal Yojana:** Launched in 2019, it is being **implemented in select areas of 7 States** wherein the people prepare their water security plan detailing out how they are getting water, amount of water being consumed, type of water conservation method applied and how one can moderate its usage.

World:

- The **Global Water System Project,** which was launched in 2003 as a joint initiative of the **Earth System Science Partnership (ESSP) and Global Environmental Change (GEC) programme**, epitomises global concern about the human-induced transformation of fresh water and its impact on the earth.

17. Lead Poisoning

Context: A report by **Niti Aayog** and the **Council of Scientific & Industrial Research (CSIR)** has found that India bears the world's highest health and economic burden due to lead poisoning.

About: Lead Poisoning

- Lead is a **highly toxic metal** and a very strong poison.
- Lead poisoning is a serious and sometimes **fatal** condition. It occurs when lead builds up in the body.

Common Sources of Lead Exposure:

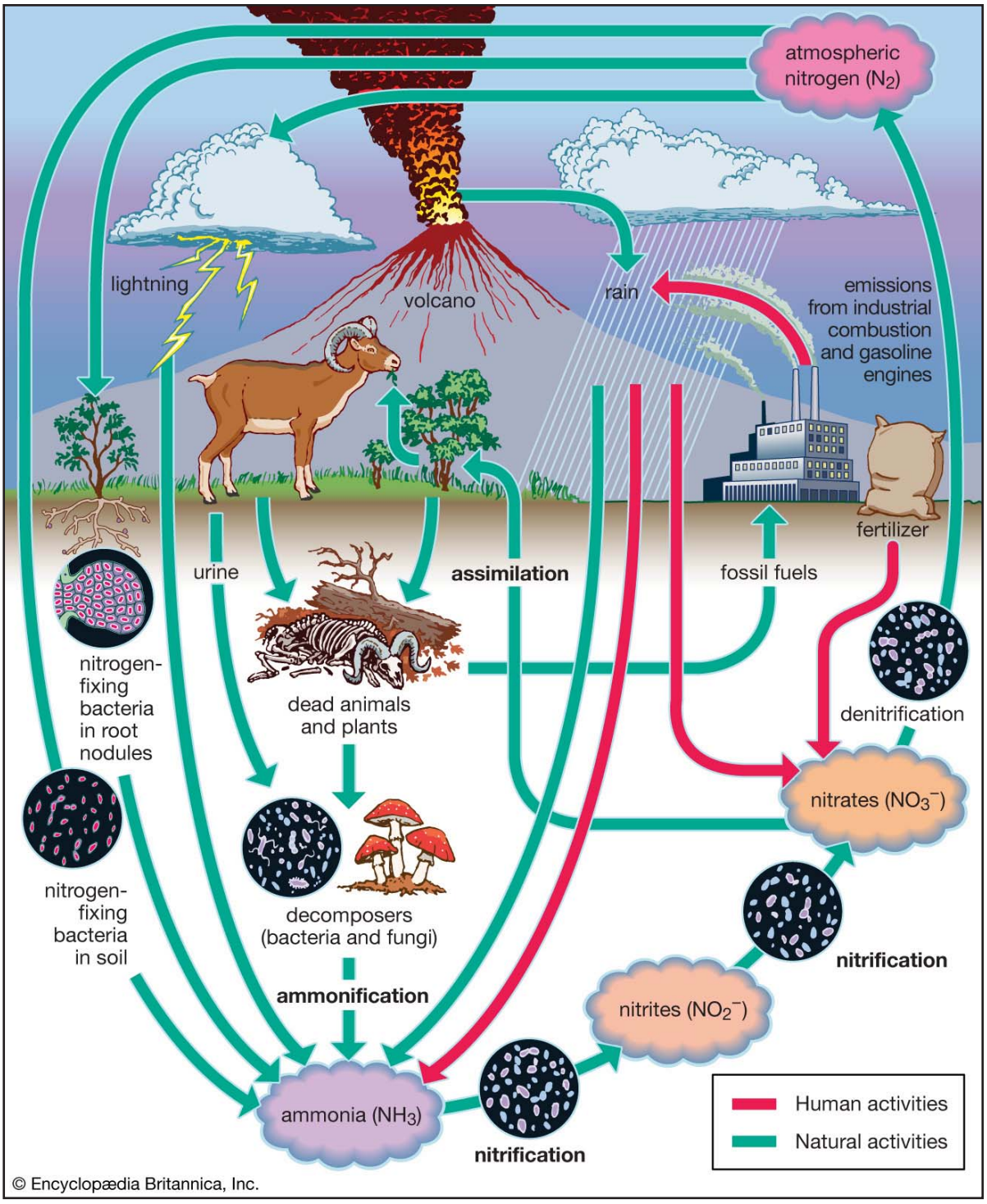
- Lead in water from the use of **leaded pipes**;
- Lead from active industry, such as mining and the unsound recycling of **used lead-acid batteries (ULABs);**
- Lead-based **paint and pigments**;
- Leaded gasoline (which has declined considerably in recent decades, but was a major historical source);
- Lead solder in food cans; and
- Lead in spices, cosmetics, ayurvedic medicines, toys and other consumer products.
- Children are also exposed to lead **in-utero through exposure of their mothers**, with adverse impacts on neurobehavioural development.

18. Declining Nitrogen Levels

Context: According to a new Report, Nitrogen levels are on a decline in the 'nitrogen-rich world' and plants and animals may face consequences.

Declining nitrogen in natural ecosystems

- Nitrogen (N) availability is key to the functioning of ecosystems and the cycling of nutrients and energy through the biosphere.



- The productivity of ecosystems and their capacity to support life depends on **access to reactive nitrogen**.
- Over the past century, humans have more than doubled the global supply of reactive N through industrial and agricultural activities.
  - However, long-term records demonstrate that N availability is declining in many regions of the world.
  - Reactive N inputs are not evenly distributed, and global changes—including elevated atmospheric carbon dioxide (CO2) levels and rising temperatures—are affecting ecosystem N supply relative to demand.

Nitrogen Cycle

- It is the circulation of nitrogen in various forms through nature.
- Nitrogen, a component of **proteins and nucleic acids**, is essential to life on Earth. Although 78 percent by volume of the atmosphere is nitrogen gas, this abundant reservoir exists in a form unusable by most organisms.
- Through a series of **microbial transformations**, however, nitrogen is made available to plants, which in turn ultimately sustain all animal life.
- The steps, which are not altogether sequential, fall into the following classifications:
  - nitrogen fixation
  - nitrogen assimilation
  - ammonification
  - nitrification
  - denitrification

19. Carbon Sequestration

Context:
- According to a recent study conducted in Maharashtra and Odisha, soil carbon sequestration may help fight **climate change.**
- Studying is aligned with **Sustainable Development Goal** 13 (SDG 13: Climate Action) which is on taking urgent action to combat climate change and its impacts.
- The study revealed how the right combination of fertiliser, biochar, and irrigation could potentially increase soil carbon by as much as 300% and help mitigate climate change.

What is Carbon Sequestration?

- Carbon sequestration is the **long-term storage of carbon in plants, soils, geologic formations, and the ocean.**
- Carbon sequestration occurs both naturally and as a result of anthropogenic activities and typically refers to the storage of carbon.

Types:

- **Terrestrial Carbon Sequestration:**
  - Terrestrial carbon sequestration is the **process through which CO_2 from the atmosphere is absorbed by trees and plants** through photosynthesis and stored as carbon in soils and biomass (tree trunks, branches, foliage, and roots)
- **Geologic Carbon Sequestration:**
  - **CO_2 can be stored, including oil reservoirs, gas reservoirs, unmineable coal seams,** saline formations and shale formations with high organic content.
- **Ocean Carbon Sequestration:**
  - **Oceans absorb, release and store large amounts of CO_2** from the atmosphere. This can be done in two ways- enhancing productivity of ocean biological systems through Iron fertilization, and injecting CO_2 into the deep ocean.
  - The dumping of iron stimulates phytoplankton production, which in turn leads to enhanced photosynthesis from these microorganisms, helping in CO_2 absorption

Different Methods of Carbon Sequestration

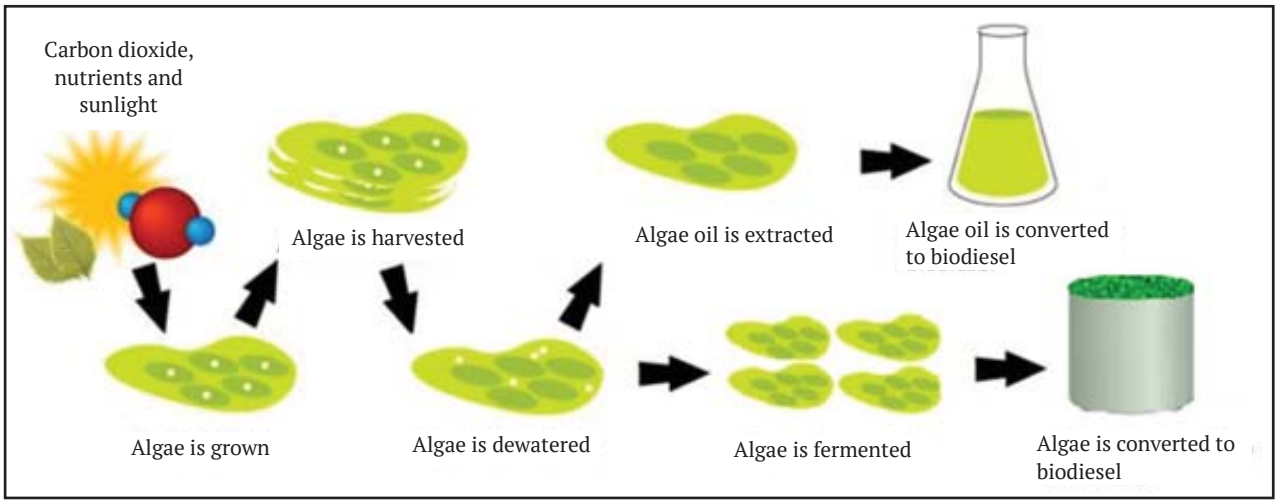
- **Natural Carbon Sequestration:**
  - It is the **process by which nature has achieved a balance of carbon dioxide in our atmosphere** suitable for sustaining life. Animals expel carbon dioxide, as do plants during the night.
- **Artificial Carbon Sequestration:**
  - Artificial carbon sequestration refers to a **number of processes whereby carbon emissions are captured at the point of production** (e.g., Factory Chimneys) and then buried.

20. Biofuels

Context Big industries and startups around the globe have been working to commercialise algae-based biofuel processes to reduce dependence on conventional fossil fuels like petrol and diesel.

Algae biofuel:

- Algae are sometimes grown to make algae biofuels, which make up the **third generation of biofuels.**
- Many types of algae can be used and processed to become a biofuel. **Biofuel** is a fuel made from living things, or the waste of a living thing, also known as biomass.
- The **algae oils can be converted to biodiesel** and the remaining material can be used to create
- Both biodiesel and bioethanol are developing biofuels. **Biodiesel is a renewable fuel made from seed oils.**
- Bioethanol is an **alcohol made from algae, corn, sugar cane or other sugar containing feedstock.** It is usually blended with gasoline and used in internal combustion engines.
- Algae can **synthesise large volumes of oil** (20 times more than that of mustard per acre), **grow fast** (10 times quicker than terrestrial plants) **and capture carbon dioxide** (CO_2).
- **Microalgae** are excellent at converting CO_2 and sunlight into oil-rich biomass, especially when compared to land-based crop plants like oil palm and soy.



Algae biofuel industry in India:

- India's **Reliance Industries Ltd** has been successfully running large algae raceway ponds the last five years at their facility near Jamnagar, to convert sunshine, CO2 and seawater into bio-oil.

- It also displayed the utilisation of **catalytic hydrothermal liquefaction technology** to convert algae biomass to oil.

Catalytic Hydrothermal Liquefaction Technology:

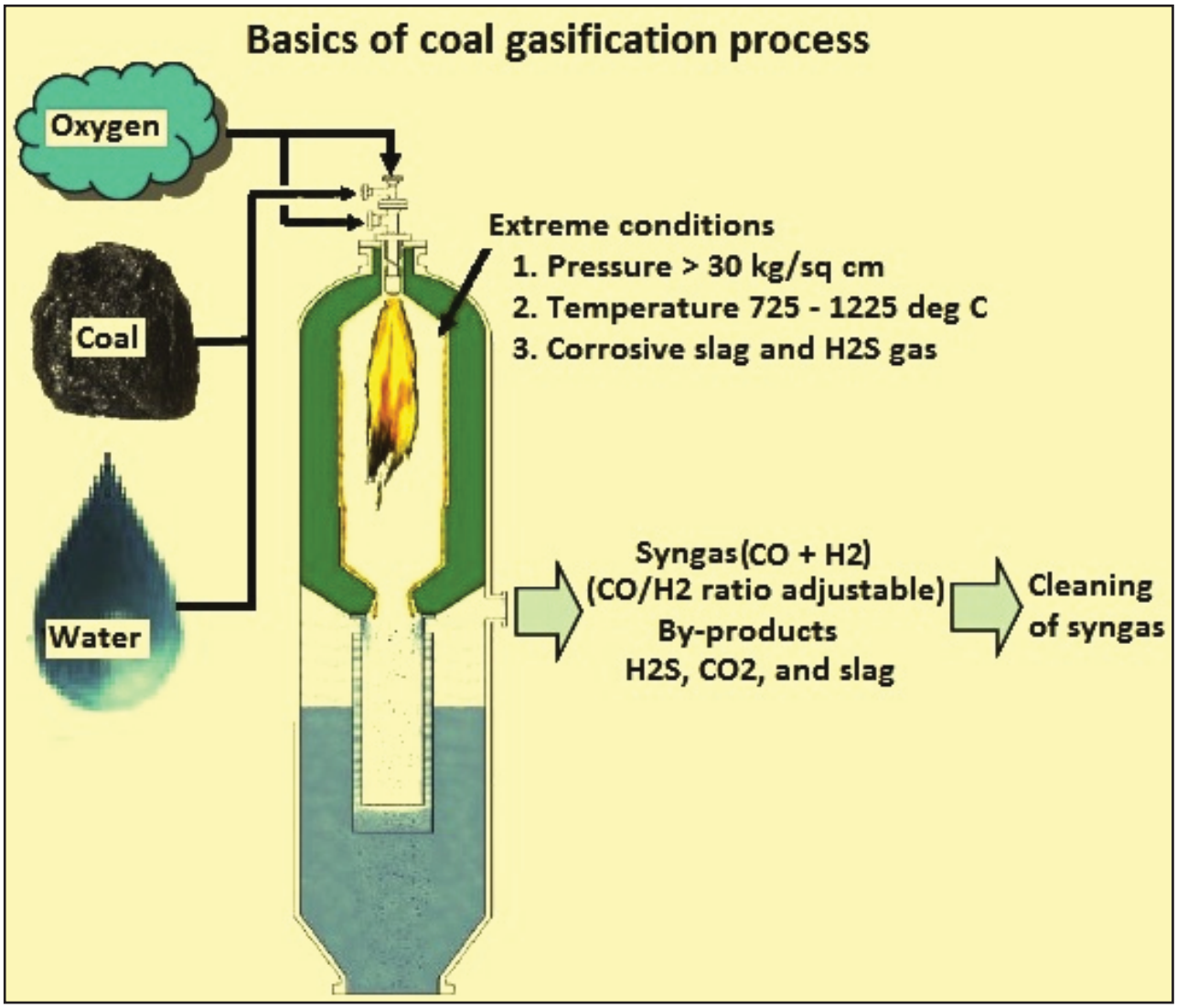
- Under this process, **water is used as solvent under high temperature and pressure** to extract oil from the biomass.
- The benefits of this technology include **direct utilisation of wet biomass** without any need for drying and conversion of every organic fragment of biomass into oil and without any wastage.

21. Coal Gasification

Context: The Ministry of Coal has prepared a **National Mission document to achieve 100 MT (Million Tonnes) Coal Gasification by 2030.**

What is Coal Gasification?

- **Process:** Coal gasification is a process in which **coal is partially oxidised with air, oxygen, steam or carbon dioxide to form a fuel gas.**



- This gas is then used instead of piped natural gas, methane and others for deriving energy.
- **In-situ gasification of coal – or Underground Coal Gasification (UCG) – is the technique of converting coal into gas** while it is still in the seam and then extracting it through wells.

- **Production of Syngas:** It produces Syngas which is a **mixture consisting primarily of methane (CH_4), carbon monoxide (CO), hydrogen (H_2), carbon dioxide (CO_2) and water vapour (H_2O).**
  - Syngas can be used to **produce a wide range of fertilizers**, fuels, solvent and synthetic materials.

What is the Hydrogen Economy?

- It is an economy that relies on hydrogen as the commercial fuel that would deliver a substantial fraction of a nation's energy and services.
  - Hydrogen is a zero-carbon fuel and is considered an alternative to fuel and a key source of clean energy.
  - It can be produced from renewable sources of energy such as solar and wind.
- The different pathways to use hydrogen economy include hydrogen production, storage, transport and utilization.
  - In 1970, the term 'Hydrogen Economy' was coined by John Bockris.

22. Biomass Co-firing

Context: Unavailability of Biomass Pellets of agricultural residues is slowing down the implementation of the Ministry of Powers' direction to **Co-Fire biomass with coal** in thermal power plants.

What is Biomass?

- Biomass is **plant or animal material used as fuel to produce electricity or heat.** Examples are wood, energy crops and waste from forests, yards, or farms.
- Biomass has **always been an important energy source** for the country considering the benefits it offers.

What is Biomass Co-firing?

- Biomass co-firing is **the practice of substituting a part of the fuel with biomass** at **coal thermal plants.**
- Biomass co-firing stands for adding biomass as a partial substitute fuel in high efficiency coal boilers.
  - **Coal and biomass are combusted together in boilers** that have been designed to burn coal. For this purpose, the existing coal power plant has to be partly reconstructed and retrofitted.
  - Co-firing is **an option to convert biomass to electricity, in an efficient and clean way,** and to reduce **GHG (Green House Gases) emissions** of the power plant.
- Biomass co-firing is **a globally accepted cost-effective method for decarbonizing a coal fleet.**
- India is a country **where biomass is usually burnt on the field which reflects apathy towards resolving the problem of clean coal** using a very simple solution that is readily available.

23. Oceans Great Dying 2.0

Context Scientists warn an imminent **mass annihilation of marine species** similar to one 250 million years ago that wiped out most lives in oceans.

What is mass extinction?

- Mass extinctions are defined as any substantial increase in the amount of extinction (lineage termination) suffered by more than one geographically wide-spread higher taxon during a relatively short interval of geologic time, resulting in an at least temporary decline in their standing diversity.

Major mass extinction events in the geological history of Earth:

- **Ordovician-Silurian extinction 485 to 444 million years ago:** killed about 85% of all species.
- **Late Devonian extinction - 383-359 million years ago**: wiped out about 75% of the world's species.
- **Permian-Triassic extinction - 252 million years ago:** also known as the Great Dying caused the extinction of over 95% of all species.
- **Triassic-Jurassic extinction - 201 million years ago:** eliminated about 80% of Earth's species, including some dinosaurs.
- **Cretaceous-Paleogene extinction - 66 million years ago**

Key-highlights

- The planet's **biggest mass extinction** of species had wiped out most newly evolved lives in the oceans.
- The Permian era, a period spanning **9 million-252.2 million years ago**, was a time before the dinosaurs ruled the planet.
- **Global ocean temperatures were 10 degrees higher than today**. **Oxygen levels were 80 per cent lower.**
- During this period, land masses collided to form the supercontinent Pangaea. The **supercontinent was arid**; only a few parts received rainfall round the year.
- However, the large **Panthalassic Ocean**, which covered much of Earth, was home to many sponge and coral species, ammonites (tiny shelled organisms), brachiopods (invertebrate animals closely related to starfish) and fusulinid foraminifera (single-celled organisms closely associated with modern amoebas). Reptiles began to flourish. Sharks and bony fishes also thrived.
- Towards the end of the era, a **series of volcanic eruptions** occurred in central Siberia, injecting massive amounts of greenhouse gases (GHG) into the atmosphere. Then, as now, the **uncontrolled GHG emissions triggered climatic changes**.
- The change in climate after the volcanic eruptions was a death knell for the flourishing and diverse life forms.
- Many long-lived lineages vanished. **Roughly 96 per cent of marine species and 70 per cent of land species went extinct.** Thus, scientists refer to this period as the '**Great Dying**'.

24. Groundwater Contamination

Context: India has 16% of the global population but only 4% of the freshwater resources. Several reasons intensify groundwater depletion which is detailed below.

Groundwater Contamination:

- Ground water contamination is the presence of certain pollutants in ground water that are in excess of the limits prescribed for drinking water

Extent of Groundwater Contamination in India:

Arsenic:

- West Bengal, Bihar, Chhattisgarh, Assam and Uttar Pradesh.
- **The permissible limit according to the Indian standards for drinking water is 1.5ppm/l**

Fluoride:

- Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal.
- **Permissible limit according to Indian standards is 50ppb/l**

Iron:

- Assam, West Bengal, Orissa, Chhattisgarh, and Karnataka. Localized pockets in Bihar, UP, Punjab, Rajasthan, Maharashtra, Madhya Pradesh, Jharkhand, Tamil Nadu, Kerala and North Eastern States

Uranium:

- 16 states in north western, southern and south-eastern India. High prevalence in Rajasthan and Andhra Pradesh
- WHO and US Environmental Protection Agency (EPA) standards for uranium level for safe drinking water: 30 micrograms of uranium/litre
- However, in India Uranium is not included in list of contaminants monitored in drinking water specifications provided by the Bureau of Indian Standards

Nitrate:

- Andhra Pradesh, Bihar, Delhi, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa. Punjab, Tamil Nadu, Rajasthan, West Bengal and Uttar Pradesh.
- Permissible level is 45 ppm/l

Salinity:

- Inland: Rajasthan, Haryana, Punjab and Gujarat; to a lesser extent in Uttar Pradesh, Delhi, Madhya Pradesh Maharashtra, Karnataka, Bihar and Tamil Nadu.
- Coastal: Minjur area of Tamil Nadu, Saurashtra Coast, Subarnrekha, Salandi, Brahamani outfall regions of Odhisa, Pondicherry, Sundarban region.

25. Shoonya Campaign

Context NITI Aayog commemorated the one-year anniversary of Shoonya, India's zero pollution e-mobility campaign.

Shoonya Campaign:

- The Shoonya campaign **aims to improve air quality** in India by accelerating the deployment of electric vehicles (EVs) for ride hailing and deliveries.
- The Shoonya campaign **brings together consumers and industry**, to reduce emissions from the commercial passenger and urban freight sector by promoting EV adoption.

- The campaign is **administered by NITI Aayog and RMI** in partnership with leading industry players.
- The goal of the campaign is **to raise awareness about EVs among consumers** and recognise industry efforts through an integrated combination of corporate branding, impact assessment and consumer awareness.

26. Shallow-water Mining

Context: Recently, a group of researchers has suggested that **Shallow Water Mining** is in direct conflict with **Biodiversity Conservation and Sustainability Goals**, as the activity poses **severe environmental risks.**

What is Shallow Water Mining?

- Shallow-water mining takes place **at depths less than 200 metres** and it has been touted as **less destructive than terrestrial mining** and less risky than mining in **Deep-Water** Ecosystems.

- It is considered a relatively low-risk and low-cost option to satisfy the demand for metals and minerals. Also, technology for shallow-water mining already exists.
- Shallow-water mining projects are already underway in **Namibia and Indonesia, and projects have been proposed in Mexico, New Zealand, and Sweden.**

27. Fly Ash

Context In a new notification, the Union **Ministry of Environment, Forests and Climate Change (MoEF&CC)** clarified the compliance dates for the complete utilisation of fly ash for **thermal power plants (TPP)** and the areas where fly ash is stored can also be reclaimed by setting up solar and wind power plants, along with plantations.

About the notification:

- It stated that adding **solar and wind power** plants will exempt TPPs from **fly ash utilisation.**
- It has also extended the time for utilisation to **three years** from a year starting April 1, 2022.

The thermal power plants are mandated to use fly ash bricks waste from Thermal Power Plants (TPPs) and reduce greenhouse emissions by reducing dependency on red bricks that use topsoil and pollute the environment.

What is Fly ash?

- Fly ash is a particulate material produced from the **combustion of coal** in thermal power plants.
- Fly ash finds its potential in **wastewater treatment** owing to its chemical composition and its physical properties such as surface area, porosity, and particle size distribution.
- Fly ash acts as a **good neutralizer** due to its alkaline nature.

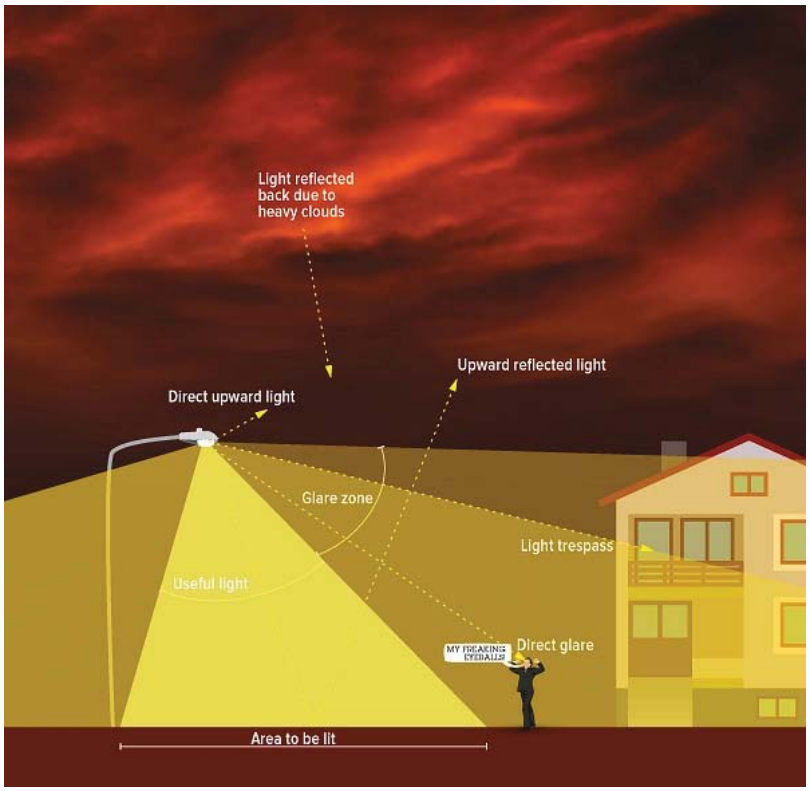
How it is managed by Thermal power plants?

- **Used for reclamation of degraded land:** Fly ash (FA), a coal combustion residue of thermal power stations—has been recognized as a soil ameliorator throughout the world.
- It contains essential **plant micro- and macronutrient**s and unique physicochemical properties.
- Besides, several hazardous substances, such as metal (loid) s, organic pollutants, and radioactive elements, are present in Fly Ash.
- FA disposal on land leads to unwanted changes in soil systems, including contamination with hazardous pollutants.
- The practical value of FA application in the land offers extensive chances in soil systems, **mainly for nutrient supplementation, pH correction, and ameliorating soil physical conditions.**
- **For making brick:** Fly ash brick (FAB) is composed primarily of a mixture of FA and lime which gains strength via the **pozzolanic reaction** between the materials to produce hydration products.
- FAB could also be cured in an autoclave or via steam curing to accelerate the strength gain.

28. Light Pollution

Context: In 2022, the district administration of Ladakh in India created the **Hanle Dark Sky Reserve (HDSR)** which is the first International Dark Sky Reserve in India. The HDSR comprises six hamlets within the **Changthang Wildlife Sanctuary.**

- The **reserve thus had a responsibility to keep the skies dark**, particularly for the astronomical observatories located in the area.



What is a Dark Sky Reserve?

- It refers to an area designated **as free from light pollution**. It's a public or private land possessing an **exceptional or distinguished quality of starry nights and nocturnal environment that is specifically protected for its scientific, natural, educational, cultural, heritage and/or public enjoyment** [IDA-International Dark-Sky Association].

What exactly is light pollution and how bad is it?

- Light pollution is **excessive, misdirected or obtrusive artificial (usually outdoor) light** that obstructs starlight in the night sky, interferes with astronomical research, disrupts ecosystems, has adverse health effects and wastes energy.
- Visible light emitted by many sources (except lasers) is **divergent**, so the light emitted could find its way into the sky.

What is the situation in India?

- A recent study reported that **19.5% of India's population** – the lowest among G20 countries – experiences a level of skyglow that keeps the Milky Way out of sight and makes it impossible for human eyes to adjust to the dark.
- The effects include **stimulating the cone cells** (which activate in a well-lit environment/during the day) **in human eyes**.

What are the consequences?

- **Harms wildlife and disrupts ecosystems**
- **Adverse effects on human health:**
- **Energy wastage**

29. Green Methanol

Context: State-owned power generation company NTPC has recently partnered with Tecnimont to explore green methanol production at a commercial scale.

About: green methanol

- The green methanol project involves **capturing carbon from NTPC power plants** and converting it into a green fuel.
- The objective of the partnership was to demonstrate technologies for firing a higher percentage of **Torrefied Biomass** in NTPC's coal fired units, Methanol Firing and Ammonia Firing.
- Green methanol is methanol that is produced renewably and without polluting emissions, one of its variants being generated from green hydrogen.
- It is a low-carbon fuel that can be made from either biomass gasification or renewable electricity and **captured carbon dioxide (CO2).**
- This chemical compound can be used as a low-carbon liquid fuel and is a promising alternative to fossil fuels in areas where decarbonisation is a major challenge, such as maritime transport.
- Grey methanol is obtained by **synthesis reaction from methane present** in natural gas (or in some cases, as in China, still from coal). It is therefore not a renewable or clean energy.
- Blue methanol is also obtained by synthesis derived from natural gas, but includes as part of the process the capture and storage of the carbon generated during its production, converting it into a less polluting product.

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6 CONSERVATION

1. Joshimath: the Sinking Land

Context Joshimath, the ancient Uttarakhand town has become a cause of concern. Though the town of Joshimath has been witnessing cracks emerging for the past two decades, things have escalated over a few days when the area was declared a disaster prone region.

Journey of Joshimath Town's development:

- Joshimath is a busy town in **Chamoli district.**
- The region is the part of the Himalayan ecosystem.

- Despite a population of only about 23,000, it has been heavily built-on, with hotels, resorts, and a bustling market that caters mainly to tourists, pilgrims, trekkers and personnel of the army and the Indo-Tibetan Border Police (ITBP).
- After the **1962 India-China war**, Joshimath emerged as a place of strategic importance.

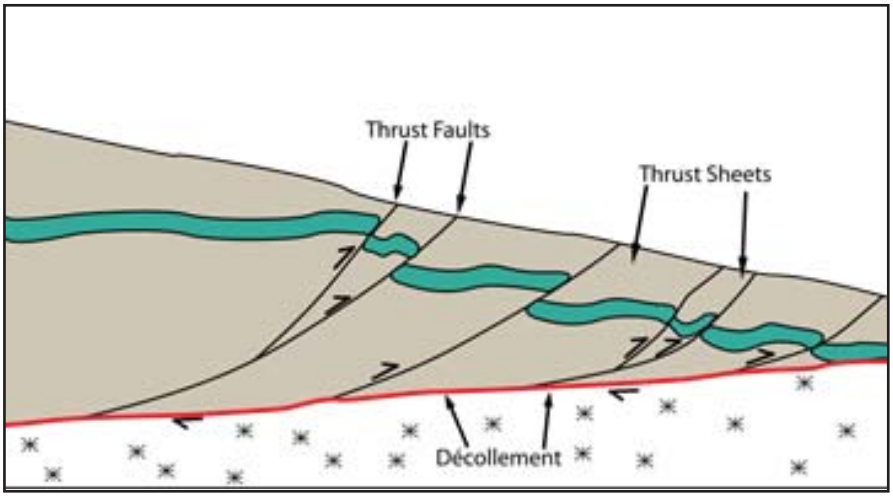
- It leads to villages along the **India-China border** and is also en route to Barahoti, a disputed territory along the border.
- The town is also a gateway to noted sites such as;
- The pilgrimage – **Badrinath for Hindus** and **Hemkund Sahib for Sikhs;**
- The **international skiing site of Auli;** and
- The **Valley of Flowers**, a UNESCO World Heritage site.
- Today, Joshimath is overly burdened with structures built without any regard for the land's load-bearing capacity.
- The signs of sinking first appeared in October 2021, when cracks continued to appear around town and residents resorted to repairs.
- The situation became particularly alarming towards the end of 2022 and the beginning of 2023, when large parts of the town experienced sudden land-sinking and several houses developed major cracks as well.

Reasons for Vulnerability of region:

- Joshimath is built on the deposits of an **old landslide**, which means the slopes can be destabilised even by slight triggers.
- The town is also in **Zone V,** denoting highest risk, in India's seismic zonation scheme.
- It lies between two thrusts, the **Main Central Thrust (MCT) and the Vaikrita Thrust (VT),** and thus occupies a seismically active terrain.

Main Central Thrust (MCT) line:

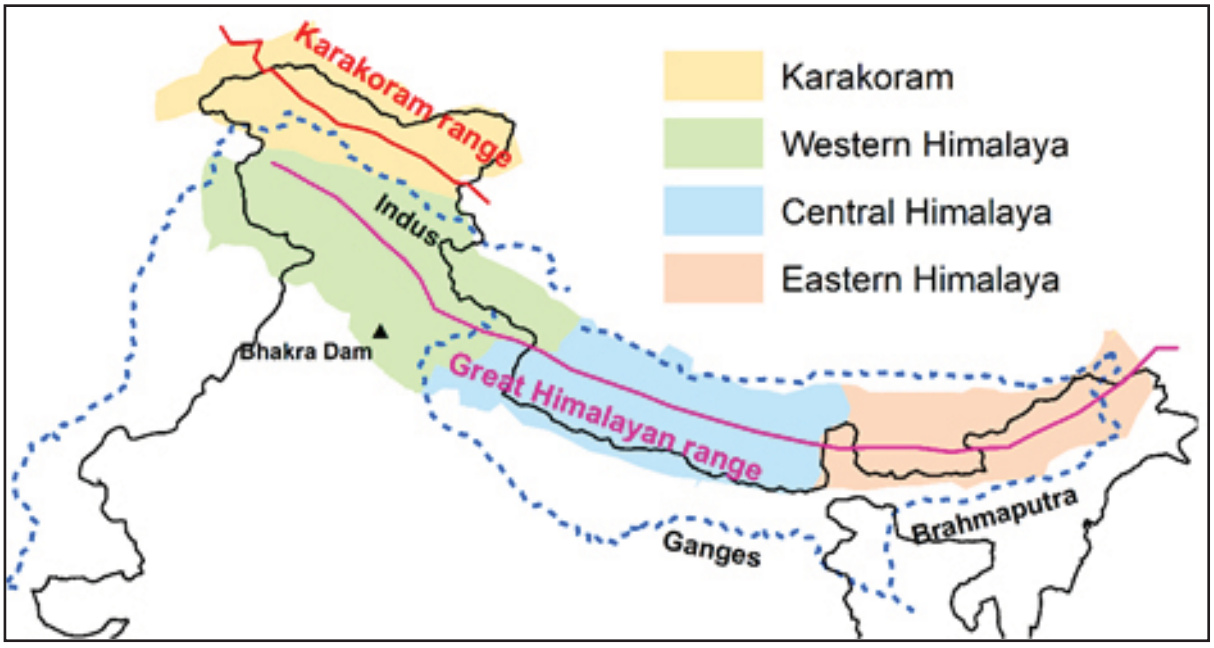
- In simplest terms, the MCT is a crack or geological fault in Himalayas.
- It is formed due to the collusion of Indo-Australian plate and Eurasian plate.
- The area underneath the MCT is particularly very fragile due to frequent tectonic activities.
- And, therefore, seismic activities are very common in MCT areas.
- The MCT extends for over 2200 km across the Himalayas in northwest-southeast direction. Joshimath is located above the MCT.



The M.C. Mishra **committee's report of 1976** warned against heavy and unscientific construction in the town mentioning that, "Joshimath is a deposit of sand and stone, hence was not a suitable place for the coming up of a township. Vibrations produced by blasting and heavy traffic will also lead disequilibrium in natural factors."

Contributing factors for disasters in the region:

- **Role of NTPC:** Locals have blamed the **NTPC's 520-MW Tapovan Vishnugad hydropower project**, under construction in the area, for exacerbating the Joshimath land subsidence.
- **Char Dham project:** The 6-km **Helang-Marwari bypass**, being built by the Border Roads Organisation (BRO), is also under scrutiny for weakening slopes and further destabilising the local topography.
- **Inadequate drainage and wastewater disposal:** The 2022 USDMA report pointed to a lack of drainage and wastewater disposal systems as being part of the subsidence problem.



Why Himalayan region is susceptible to disasters?

- The Hindu Kush Himalayan region is prone to numerous types of disasters because of its
- Steep terrain
- fragile geology
- intense and variable precipitation
- Common incidents of floods and landslides
- neo-tectonic mountain-building process, like earthquakes, landslides, floods, etc
- **Other factors:**
  - **Overexploitation of the ecosystem**(tourism, increased consumerism)
  - **Exploitative development projects:**The indiscriminate exploitation of the fragile Himalayan region in the name of development projects has extracted a heavy price in terms of environmental damage.
  - **Fragmentation of natural resources:**String of hydroelectric and road projects in the Himalayan States have already resulted in the fragmentation of natural systems.

2. The Geo-heritage value of Ram Setu

Context The Supreme Court (SC) has given the Centre four weeks' time to file a response clarifying its stand on seeking national heritage status for the '**Ram Setu'.**

What is Ram Setu?

- The Ram Setu or the Adam's Bridge is a limestone trail connecting **Pamban island** off the coast of Tamil Nadu to **Mannar island** off the coast of Sri Lanka.
- Coral reefs are **massive structures made of limestone deposited by coral polyps**. Often referred to as the "**rainforests of the sea**," coral reefs support approximately **25 percent** of all known marine species.
- The limestone-based bridge is 48 kilometers long.

The proposed project and issues

- In 2005 the **Sethusamudram Ship Channel Project (SSCP)** was inaugurated.
- Under the project, an 83-km-long deep water channel was to be created, linking the **Gulf of Mannar** with Palk Strait, by extensive dredging and removal of limestone shoals.
- Two channels will be created –
- one across Ram Setu, south-east of Pamban Island
- another through the shallows of Palk Bay, deepening the Palk Strait
- The SSCP is expected to considerably reduce the navigation time between the east and west coasts of India.
- However, the project has been surrounded by several comments arguing the stability of the proposed channel and its environmental impact.

3. ONGC to map India's geothermal resources

Context The Oil and Natural Gas Corporation (ONGC) plans to map the geothermal energy sources of India in search of clean energy.

What is Geothermal Energy?

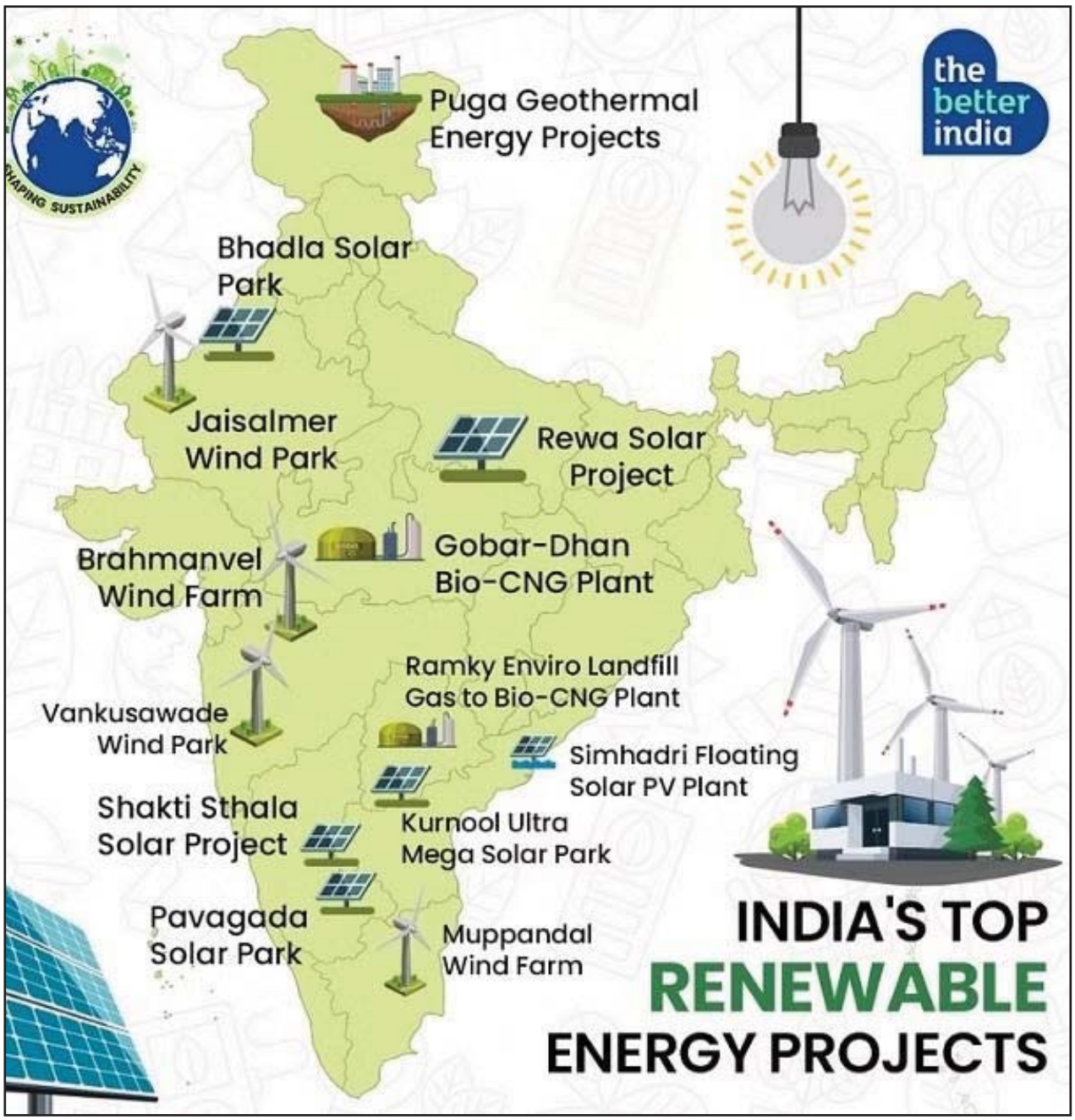
- Geothermal energy is heat that is generated within the Earth.
- Geothermal energy is stored in the form of heat beneath the earth's surface
- **Type:** Renewable resource
- **Source:** It is contained in the rocks and fluids beneath the earth's crust and can be found as far down as the earth's hot molten rock, magma.
- **Impact on environment:** clean and carbon-free.
- **Process: A** series of wells is used to generate steam from the Earth's internal heat energy and fed to the power plant to generate electricity

India's Top Renewable Energy Projects:

- Puga Geothermal Energy Project, Ladakh
- Bhadla Solar Park, Rajasthan
- Jaisalmer Wind Park, Jaisalmer
- Rewa Solar Project, Madhya Pradesh
- Brahmanvel Wind Farm, Maharashtra
- Gobar Dhan BioCNG Plant, Indore
- Vankusawade Wind Park, Maharashtra
- Ramky Enviro Landfill, Gas to Bio CNG Plant, Hyderabad
- Shakti Sthala Solar Project, Karnataka
- Simhadri Floating Solar PV Plant, Andhra Pradesh
- Kurnool Ultra Mega Solar Park, Andhra Pradesh
- Pavagada Solar Park, Karnataka
- Muppandal Wind Farm, Tamil Nadu

Geothermal Energy in India:

- **Geothermal province:** There are seven geothermal provinces and a number of geothermal springs in India.
- **Total potential:** According to the ministry of new and renewable energy, India has the potential to generate 10 gig watts (GW) of geothermal power.
- **Major regions:** Ladakh (Puga and Chumathang regions) has been identified as the most resource-rich region in terms of geothermal energy in the country.
  - Apart from Ladakh, there is abundant potential in Himachal Pradesh too which has several sources of geothermal energy along the rivers Alaknanda, Sutlej, Beas and Bhagirathi.
  - Efforts are also underway to utilize geothermal energy from oil and gas wells in the Gandhar oil field of ONGC's Ankleshwar asset in Gujarat.



4. Wild Life (Protection) Amendment Bill, 2022

Context The **Wildlife (Protection) Amendment Bill, 2022,** which seeks to strengthen the protection of endangered species and enhance punishment for illegal wildlife trade, has been passed in **Rajya Sabha by a voice vote**.

Wildlife Protection Act 1972:

Schedules in WPA, 1972:

It has six schedules which give varying degrees of protection.

- **Schedule I and part II of Schedule II:** Absolute protection – offenses under these are prescribed the highest penalties.
- **Schedule III and Schedule IV**: Species are protected, but the penalties are much lower.
- **Schedule V:** Animals (e.g. common crows, fruit bats, rats, and mice), are legally considered vermin and may be hunted freely.
- **Schedule VI**: Specified endemic plants are prohibited from cultivation and planting.

- The Wildlife (Protection) Amendment Bill, attempts to amend the Wildlife (Protection Act (WLPA), 1972.
- Wildlife Act 1972 preserves the country's wild animals, birds, and plants in order to ensure ecological and environmental security.
- This act has laid down restrictions on hunting various kinds of animal species.
- It also includes provisions related to harvesting and various other ancillary matters connected thereto.

Key provisions of the new Bill:

- There were 50 amendments to the Act proposed in the Bill.
- The words "**protection of wild animals, birds, and plants**", mentioned under the Wild Life (Protection) Act, 1972 have been substituted with the words "**conservation, protection and management of wildlife**".
- **Rationalising schedules**:
  - Currently, the Act has six schedules for specially protected plants (one), specially protected animals (four), and vermin species (one).
  - **Bill reduces it to four by:**
  - Reducing the number of schedules for specially protected animals to two (one for greater protection level)
  - Removes the schedule for vermin species
  - Inserts a new schedule for specimens listed in the Appendices under CITES (scheduled specimens).
- **Obligations under CITES**: The Bill authorizes the central government to designate
  - **Management Authority:** which grants export or import permits for the trade of specimens, and
- **Invasive alien species**: It empowers the central government to regulate or prohibit the import, trade, possession, or proliferation of invasive alien species.
- **Control of sanctuaries**: The Present Act entrusts the Chief Wildlife Warden to control, manage and maintain all sanctuaries in a state.

5. Green Steel

Context With climate change threatening the globe, governments and industries are looking at sustainable ways of production across industries to reduce carbon emissions, and there is a major focus on the green steel.

What is Green Steel?

- Green Steel is the manufacturing of steel without the use of fossil fuels.
- This can be done by using low-carbon energy sources such as hydrogen, coal gasification, or electricity instead of the traditional carbon-intensive manufacturing route of coal-fired plants.

6. India's coal production to surpass a billion tonnes by 2025: IEA annual report

Context International Energy Agency (IEA) in its annual report has predicted that India's coal production will surpass a billion tonnes by 2025.

Key Highlights of the Report

- **India's coal consumption has doubled** since 2007 at an annual growth rate of 6 per cent.
- India and China are the only two countries where **investment in the coal sector has gone up.**
- Domestic production has been ramped up in both countries to **reduce external reliance.**
- With the present trend, **Coal's global phaseout is also nowhere in sight.**

Why coal is becoming a huge concern?

- **CO_2 emission:**India's coal-based thermal power sector is one of the country's biggest emitters of carbon dioxide (CO2).

India produces 1.8 metric tonnes of carbon emissions per capita against 15.2 metric tonnes produced by the U.S. High-income countries in general emit over 50 times as much carbon as low-income countries and over six times as much carbon as lower middle-income countries.

- **GHG emission:** It spews out 1.1 gigatonne of CO2 every year; this is 2.5 per cent of global GHG emissions, one-third of India's GHG emissions, and around 50 percent of India's fuel-related CO2 emissions.
- **Ash content:** Indian coal is known to contain 30-50% ash, meaning that for every two units of coal burned, one unit of ash could be produced.
- **Danger to public health, adverse effect on vulnerable section:** Coal mining continues to have, many adverse effects on India's people, although vulnerable and marginalised communities have borne the brunt.
  - **For example**- In Chhattisgarh, tribal communities have been resisting coal-mining in **Hasdeo Aranya** but the Centre accorded permitsfor mining in yet another section of the forests last month.

Distribution of coal in India is in the following two categories:

- **Gondwana Coalfields (**250 million years old**)-**
  - Makes up 98% of the total coal reserves in India

- Makes up 99% of the coal production in India.
- Coal from here is free from moisture and contains phosphorus and sulfur.
- The carbon content in Gondwana coal is less than the Carboniferous coal that is 350 million years old which is almost absent in India because of its much younger age.

Tertiary Coal Fields (15 to 60 million years old)-

- Its Carbon content is low but still, the coal is rich in moisture and sulfur.
- These are mainly confined to extra-peninsular regions
- Some major areas encompass Assam, Meghalaya, Nagaland, Arunachal Pradesh, Jammu and Kashmir, the Himalayan foothills of Darjeeling in West Bengal, Rajasthan, Uttar Pradesh, and Kerala.

International Energy Agency (IEA):

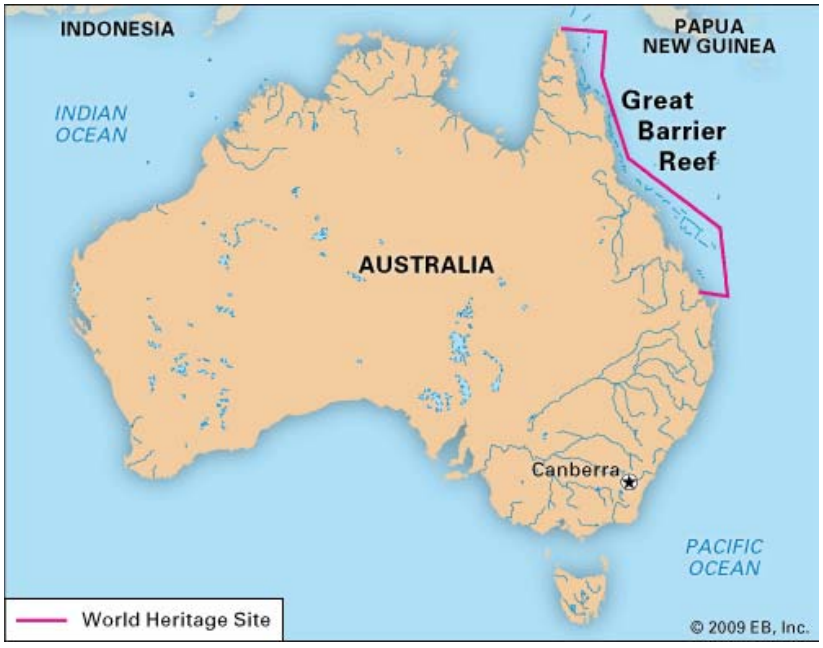
- The International Energy Agency is an autonomous Intergovernmental Organisation.
- The IEA was established in 1974 by developed countries - under the auspices of the Organization for Economic Co-operation and Development (OECD) - in response to the oil embargo.
- IEA is made up of 30 **member countries** and eight associate nations. Four countries are seeking accession to full membership - Chile, Colombia, Israel and Lithuania.
- India became an **Associate member of IEA** in March 2017 but it was in engagement with IEA long before its association with the organization.

7. Australia's Reef 2050 Plan

Context The Reef 2050 Plan is Australia's overarching framework for protecting and managing the Great Barrier Reef to 2050.

The Great Barrier Reef (GBR):

- It is the **World's most extensive and spectacular *"Coral Reef"* ecosystem** composed of over 2,900 individual reefs and 900 islands.



- The reef is located in the **Coral Sea (North-East Coast),**off the coast of Queensland, Australia.
- This reef structure is **composed of and built by billions of tiny organisms, known as coral polyps.**
- It was selected as a **World Heritage Site** in 1981.

What is a world heritage site?

- World Heritage Sites are cultural and/or natural sites considered being of '**Outstanding Universal Value,** which has been inscribed on the World Heritage List by the World Heritage Committee.

8. Coral Bleaching

Context Global warming poses a more significant threat to coral growth and reef accretion than ocean acidification (OA), according to a new study.

What is Coral Bleaching?

- It occurs when abnormal environmental conditions, such as warmer sea temperatures, cause coral polyps to expel algae (zooxanthellae) living in their tissues, causing the coral to turn completely white.
- Normally, coral polyps live in an endosymbiotic relationship with this algae crucial for the health of the coral and the reef as the algae provides up to 90% of the coral's energy.
- When a coral bleaches, it is not dead. Corals can survive a bleaching event, but they are under more stress and are subject to mortality.
- Corals can recover if the water temperature drops and the algae are able to recolonise the coral reefs.

Understanding the terms:

- **Heat Stress:** Thermal stress is a term to describe a temperature change that is severe enough to cause unfavourable and even lethal conditions to aquatic organisms, their populations, community structure, or the ecosystem.
- **Ocean acidification:** Ocean acidification describes the lowering of seawater pH and carbonate saturation that results from increasing atmospheric CO_2 concentrations.

9. Project Dolphin

Context PM Modi announced 'Project Gangetic Dolphin' on the occasion of India's 74th Independence day, for the conservation of the Gangetic Dolphins — as part of the conversation on the riverine dolphin.

About Project Dolphin:

- Project Dolphin is **on the lines of Project Tiger**, which has helped increase the tiger population.
- **Implementing Agency:** Ministry of Environment, Forest and Climate Change.
- Special Conservation program needs to be taken up for **Gangetic Dolphin which is a national aquatic animal and also indicator species** for the river Ganga spread over several states.

Gangetic River Dolphin

- The Gangetic River Dolphin has her home in the waters of the Ganga and Brahmaputra.
- It is also found in the Meghna and Karnaphuli river systems (outside the Indian territory — in Nepal and Bangladesh).
- Reportedly, the freshwater dolphins in the Indian territory account for 80 per cent of the total dolphin count.
- The Gangetic dolphin is among the subspecies of the South Asian River Dolphin.

Status of Conservation:

- In the **First Schedule** of the **Indian Wildlife (Protection), Act 1972.**
- **Endangered** by the **International Union for the Conservation of Nature (IUCN).**
- **Appendix I** (most endangered) of the **Convention on International Trade in Endangered Species (CITES).**
- **Appendix II (**migratory species that need conservation and management or would significantly benefit from international co-operation) of the **Convention on Migratory Species (CMS).**

- The Indus Dolphin — one of the two subspecies — is found in the Beas river., the species of freshwater dolphins found mainly in the Ganga, has been spotted in Uttar Pradesh, Bihar, Jharkhand, West Bengal, and Assam.

10. Eco-Sensitive Zones (ESZ)

Context

- Farmers in Kerala continue to protest across several high ranges of the state against the Supreme Court's recent order to establish 1 km Eco-Sensitive Zones around all protected areas, wildlife sanctuaries and national parks.
- The aim of ecologically sensitive zones (ESZ) was to adopt a community-specific conservation approach but the government has adopted one size fit for all approach.

About Eco-sensitive zones:

- As per the National Wildlife Action Plan (2002-2016), issued by the Union Ministry of Environment, Forest and Climate Change, **land within 10 km of the boundaries of national parks and wildlife sanctuaries is to be notified as eco-fragile zones or Eco-Sensitive Zones (ESZ).**
- While the 10-km rule is implemented as a general principle, the extent of its application can vary.
- Areas beyond 10 km can also be notified by the Union government as ESZs, if they hold larger ecologically important "sensitive corridors."
- The Eco-Sensitive Zones are envisaged as a **cushion or shock absorbers for 'protected areas'.**
- They are supposed to act as transition zones from areas of high protection to less protection.
- They are like an **ecotone- the transition between two biological communities or ecosystems,** and it is crucial for the protection of protected areas like wildlife sanctuaries and forests.
- **Objective:** to reduce the impact of human intervention in the core protected area

Who notifies them?

- They are notified by the Ministry of Environment, Forests and Climate Change, Government of India around Protected Areas, National Parks and Wildlife Sanctuaries.

Recent Supreme Court order on Eco-sensitive zones:

- Supreme Court directed that every protected forest, national park and wildlife sanctuary across the country should have a mandatory eco-sensitive zone (ESZ) of a minimum of one km starting from their demarcated boundaries.

ESZ Guidelines classify activities under three categories:

- **Prohibited**: Commercial Mining, Setting of Saw Mills, Setting of industries causing pollution, the establishment of major hydroelectric projects etc.
- **Regulated:** Felling of Trees, Establishment of hotels and resorts, erection of electrical cables, drastic change of agricultural systems etc.
- **Permitted:** Ongoing agriculture and horticulture practices by local communities, rainwater harvesting, organic farming etc.

11. Flex Fuel Vehicle (FFV)

Context India's first 'flex fuel' car, a Toyota sedan that can run on one or multiple fuel types and developed as part of a new pilot aimed at deleveraging the country's dependence on imported fossil fuels for transportation, is set for an unveiling this month.

Flex fuel technology:

- A flex fuel, or flexible fuel, vehicle has an **internal combustion engine (ICE**), but unlike a regular petrol or diesel vehicle, this can run on **more than one type of fuel**, or even a mixture of fuels.
- The most common versions use a **blend of petrol and ethanol or methanol**, but these engines are also equipped to run on 100 per cent petrol or ethanol as well.
- This is made possible by equipping the engine with a fuel mix sensor and an engine control module (ECM) programming that senses and **automatically adjusts for any ratio of designated fuels.**
- It was **first developed in the early 1990s** and used in the mass-produced 1994 Ford Taurus, according to Car Bibles. By 2017, there were approximately 21 million flex-fuel vehicles on the road.

12. Blue Flag Certification

Context
- Two more Indian Beaches enter the coveted list of Blue Beaches. India now has 12 Blue Flag beaches, an eco-label given to the cleanest beaches in the world
- The two new beaches – Minicoy Thundi Beach and Kadmat Beach- both are in Lakshadweep.

About Blue Flag' certification

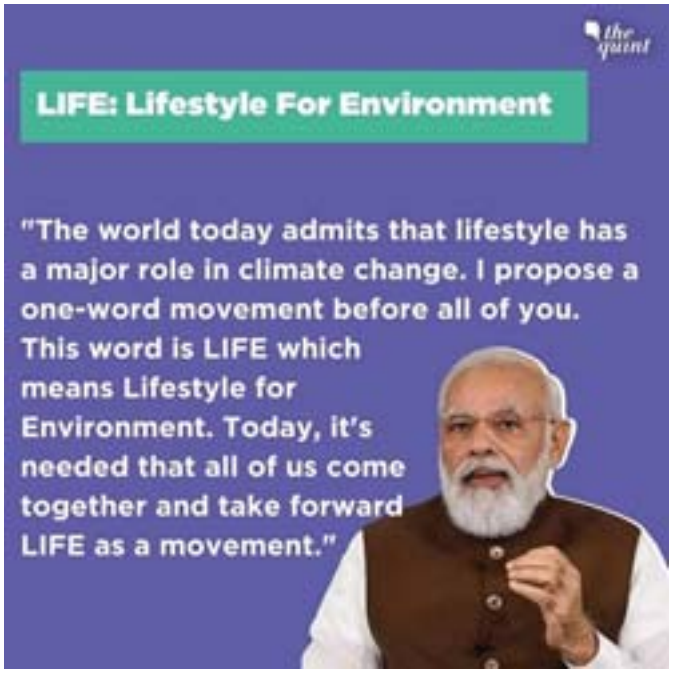
- **The Blue Flag programme** was started in **France in 1985 and in areas outside of Europe in 2001.**
- Globally recognised eco-label accorded on the basis of **33 stringent criteria in four major heads which are-**
  - Environmental education and information
  - Bathing water quality
  - Environmental management
  - Conservation and safety and services in the beaches
- It can be obtained by a beach, marina or sustainable boating tourism operator, and serves as an eco-label.
- The certification is awarded by the **Denmark-based non-profit Foundation for Environmental Education (FEE).**
  - It is awarded annually to beaches and marinas in **FEE member countries.**

- It is accorded by the international jury composed of eminent members -
  - **United Nations Environment Programme(UNEP)**
  - **United Nations World Tourism Organisation (UNWTO)**
  - **Denmark-based NGO Foundation for Environmental Education (FEE)**
  - **International Union for Conservation of Nature (IUCN)**
- **Forty-eight countries** currently participate in the program, and **5042 beaches, marinas, and boats have this certification.**

13. Mission LiFE (Lifestyle for Environment)

Context Prime Minister Narendra Modi has launched the 'Lifestyle for the Environment (LiFE) Movement', a global initiative, and asserted that its vision is to live a lifestyle that is in tune with our planet

Background



- The idea of LiFE was introduced by the Prime Minister during the 26th United Nations Climate Change Conference of the Parties COP-26 in Glasgow last year.

What is the aim of the LiFE movement?

- The LiFE Movement aims to bring positive change in the environment by collective action.
- It aims to persuade individuals across the world to undertake simple climate-friendly actions in their daily lives or adoption of environment-conscious lifestyle.
- Global leaders have applauded India for focusing on individual behaviour change towards Climate Change
- It also seeks to make the best use of social networks to influence social norms surrounding climate.

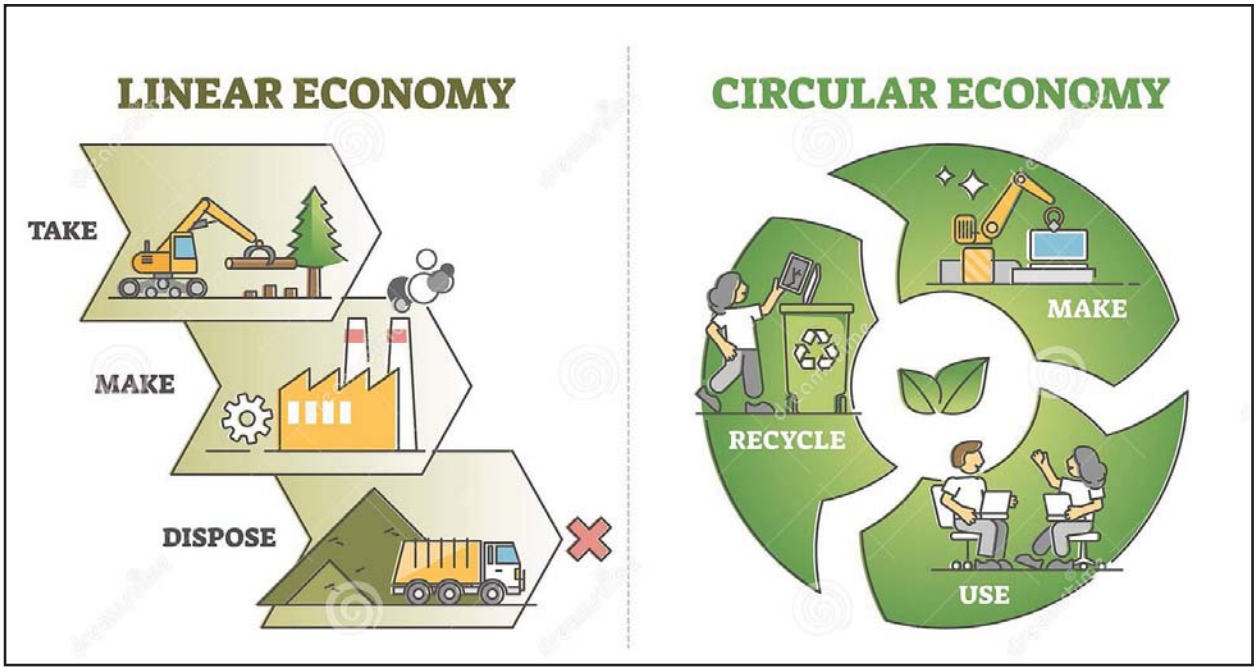
What is P3 in LiFE movement?

- The Mission plans to create and nurture a global network of individuals, namely 'Pro-Planet People' (P3)
- P3 will have a shared commitment to adopt and promote environmentally friendly lifestyles.
- Through the P3 community, the Mission seeks to create an ecosystem that will reinforce and enable environmentally friendly behaviors to be self-sustainable.

What is one of the most important objectives of LiFE?

- The Mission envisions replacing the prevalent '**use-and-dispose' economy with a circular economy.**
- 'Use and dispose' economy is governed by mindless and destructive consumption whereas circular economy is defined by mindful and deliberate utilization.

- The circular economy is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible.
- In this way, the life cycle of products is extended. In practice, it implies reducing waste to a minimum.



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7 NATIONAL/ INTERNATIONAL ORGANISATIONS

1. Global Registry of Fossil Fuels

Context A database for tracking the world's fossil fuel production, reserves, and emissions launched.

About

- The Global Registry of Fossil Fuels is the **first open-source database** that translates **fossil fuel reserves** and production data into **greenhouse-gas emissions** expressed in CO2 equivalents.
- It was built using data for more than 50,000 fields in 89 countries, which covers about 75% of global reserves, production, and emissions.
- It is developed jointly by **Carbon Tracker,** an independent financial think tank, and the **Global Energy Monitor,** which tracks global energy projects.

Reserves are areas where the existence of fossil fuels is "proven, probable, or possible" and where their extraction from the ground is technologically and economically feasible.

Carbon Tracker

- **Founded in:** 2009
- Carbon Tracker is a London-based not-for-profit think tank researching the impact of climate change on financial markets.

Global Energy Monitor

- **Founded in:** 2008
- Global Energy Monitor is a **San Francisco-based non-governmental organization** which catalogs fossil fuel and renewable energy projects worldwide.
- GEM shares information in support of clean energy and its data and reports on energy trends are widely cited by governments, media, and academic researchers.

2. Global Offshore Wind Alliance

Context Nine new countries sign up for Global Offshore Wind Alliance at COP27.

- **Nine new countries:** Belgium, Colombia, Germany, Ireland, Japan, the Netherlands, Norway, the UK, and the US.
- Australia announces to sign up with global offshore wind alliance.

What is Global Offshore Wind Alliance (GOWA)?

- Aim: established to "remove barriers" to the energy and to ramp up of offshore wind in order to tackle the climate
- It was set up by the International Renewable Energy Agency (IRENA), Denmark and the **Global Wind Energy Council.**

International Renewable Energy Agency

- **Founded:** 26 January 2009
- **Headquarters:** Masdar City, United Arab Emirates
  - The International Renewable Energy Agency is an intergovernmental organization mandated to facilitate cooperation, advance knowledge, and promote the adoption and sustainable use of renewable energy.

Global Wind Energy Council

- GWEC was established in 2005 to provide a credible and representative forum for the entire wind energy sector at an international level.

3. India Wind Energy Market Outlook 2022-2026

Context According to a recent report released by the **Global Wind Energy Council (GWEC),** the annual installation of new wind power projects in India will peak by 2024 and likely decline thereafter.

India currently has the fourth highest wind installed capacity in the world with total installed capacity of 39.25 GW (as on 31st March 2021).

Key Finding of the report:

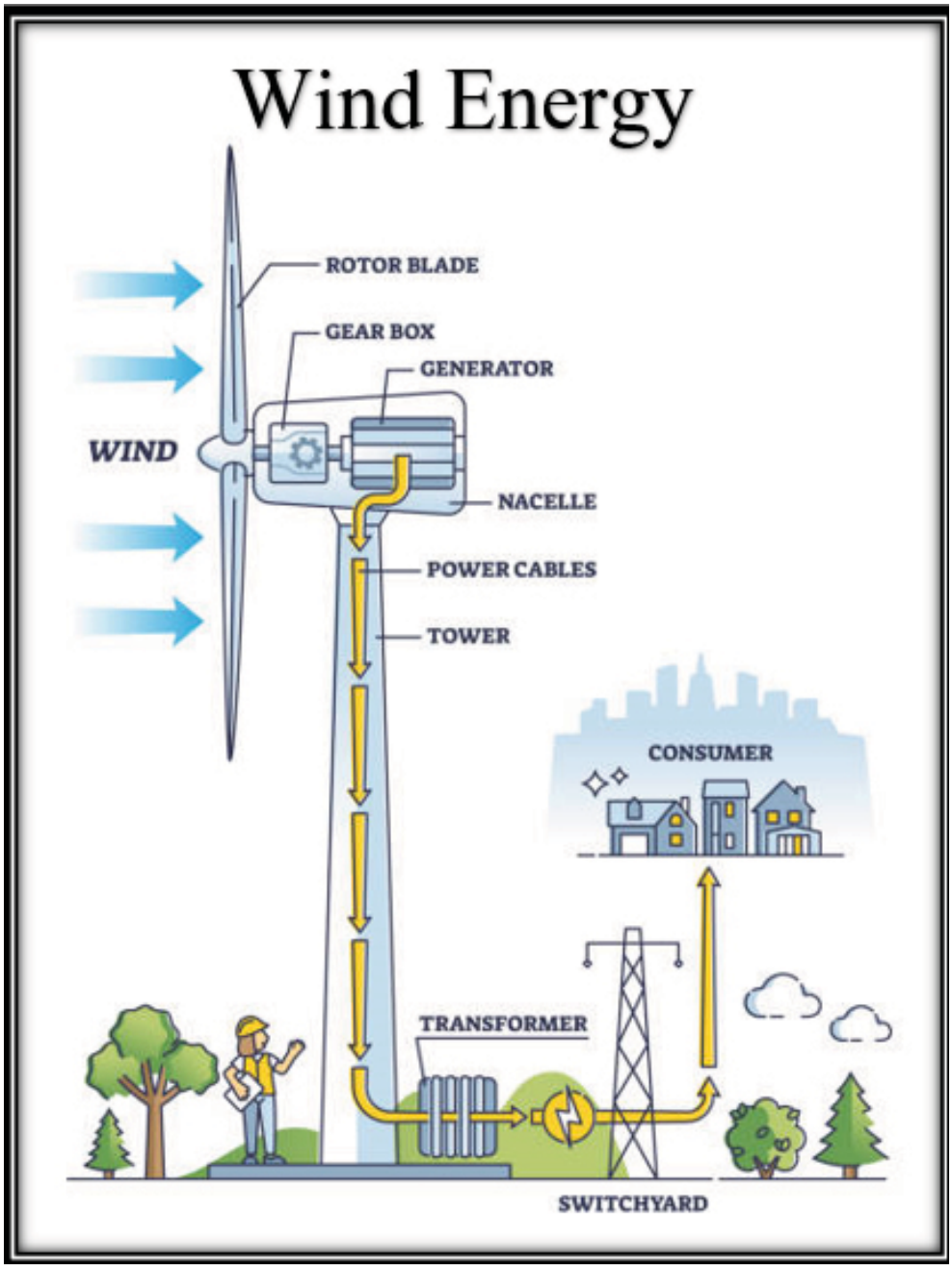
- **Report Title:** "India Wind Energy Market Outlook 2022-2026".
- India currently has **4 GW of prospective projects in wind energy**, which are expected to drive installations until 2024 in the market.

Recent Government Initiatives

- **National Wind-Solar Hybrid Policy:** The main objective of the National Wind-Solar Hybrid Policy, 2018 is to provide a framework for the promotion of large grid-connected **wind-solar PV hybrid systems** for optimal and efficient utilization of wind and solar resources, transmission infrastructure, and land.
- **National Offshore Wind Energy Policy**: The National Offshore wind energy policy was notified in October 2015 with the objective to develop **offshore wind energy** in the Indian **Exclusive Economic Zone (EEZ)** along the Indian coastline of 7,516.6 km.
- **Financial incentives:** Accelerated Depreciation benefit; concessional custom duty exemption on certain components of wind electric generators.
- **PM-KUSUM Scheme**

- India is expected to add **2 GW in 2022, and 4.1 GW in 2023 peaking at 4.6 GW in 2024**, thereafter declining to 4 GW and 3.5 GW in the next two years, respectively.

- After 2024, fresh projects are likely to be wind-solar hybrid projects (where both systems are installed on a piece of land to generate power throughout the day).



4. Stockholm+50

Context 2022 marked fifty years since the first United Nations conference on the human environment – the **1972 Stockholm Conference.**

United Nations Conference on the Human Environment (Stockholm Conference):

- Stockholm Conference marked the **first global effort to treat the environment as a worldwide policy issue** and define the core principles for its management.

- It was first worldwide convergence on planetary environment, with the theme **'Only One Earth'.**
- Participating 122 countries essentially committed to 26 principles and an action plan that set in a multilateral environmental regime.
- One of the overarching principles was that **sovereignty should be subject to not causing harm to the environment of other countries as well.**

- Until 1972, no country had an environment ministry.
- In 1968, when **Sweden first proposed the idea of the Stockholm conference** (this is why it was referred to as the Swedish Initiative).

5. One Ocean Summit: UNESCO Pledges to have at least 80% of the Seabed Mapped by 2030

Context

- Around **80 per cent** of the world's ocean floors will be mapped by **2030**, pledged the United Nations Educational, Scientific and Cultural Organization (**UNESCO**).
- According to UNESCO, only **20 per cent** seabed has been mapped and studied.

Background

- UNESCO started working towards this goal in **2017** when it joined hands with Japan's **Nippon Foundation**, a non-profit that works on marine resource development among other projects, to launch the **Seabed 2030 program**.

Seabed 2030 Project:

- Seabed 2030 is a collaborative project between the **Nippon Foundation** of Japan and the General Bathymetric Chart of the Oceans (**GEBCO**).
- It aims to bring together all available **bathymetric data** to produce the definitive **map of the world ocean floor** by 2030 and make it available to all.
- The project was launched at the United Nations (UN) **Ocean Conference** in June 2017 and is aligned with the UN's **SDG 14** to conserve and sustainably use the oceans, seas and marine resources.

6. Global Carbon Budget 2022 Report

- Global Carbon Budget 2022 report was released by the Global Carbon Project – a group of scientists who track carbon emitted by human activities.

Key-findings

- The global carbon emissions are expected to reach 40.6 billion tonnes of carbon dioxide into the atmosphere in 2022.
- There is no sign of carbon emission decline required for limiting the global warming to 1.5 degree Celsius.
- India is expected to witness the highest increase in carbon emissions in the world in 2022 when compared with the previous year.

A global carbon budget **determines the input of CO_2 to the atmosphere by emissions from human activities, balanced by output (storage) in the carbon reservoirs on land or in the ocean**.

7. Climate Performance Index 2023

Context
- **India has ranked 8th in the** Climate Change Performance Index (CCPI) **2023.**
- India ranked 10th in CCPI, 2022.

About CCPI

- It is an independent monitoring tool for tracking the climate protection performance of **59 countries and the European Union.**
  - **Published by**: Germanwatch, the **New Climate Institute** and the **Climate Action Network** annually since **2005.**
  - **Criteria:**
- The CCPI looks at four categories, with 14 indicators: **GHG Emissions (40% of the overall score), Renewable Energy (20%), Energy Use (20%), and Climate Policy (20%).**

8. Methane Alert and Response System (MARS) (COP 27)

Context A new **satellite-based Methane Alert and Response system**has been launched at the **27th Conference of Parties (COP27)** to help governments **detect methane emissions and tackle them.**

Methane Alert and Response System (MARS):

- **MARS** is a part of global efforts to slow climate change by **tackling global warming gas.**
- It will use **state-of-the-art satellite** data to identify significant emission events, notify relevant stakeholders, and support and track mitigation progress.
- MARS will **integrate data from the rapidly expanding system** of methane-detecting satellites to include lower-emitting area sources and more frequent detection.
- Data on coal, waste, livestock, and rice will be added gradually to MARS to support the **Global Methane Pledge**
- **India has not signed up for the Global Methane Pledge.**

About Methane:

- Methane is a rapidly accelerating part of the climate problem.
- It is the **primary component of natural gas**, and it **warms the planet more than 80 times as quickly** as a comparable volume of atmospheric CO2 over a comparable amount of time.
- **Sources of Methane:**
  - Biological Sources
  - Agriculture
  - Paddy rice cultivation
  - Emissions from Fuel and Industries

Steps taken to Curb Methane Emissions:

- **COP 26 Pledges**: At COP26 in Glasgow, over 100 countries signed an agreement to cut methane emissions by 30% by 2030.

- **Global Methane Pledge**: It is a US-EU-led effort to cut methane emissions by a third by the end of this decade.
- **MethaneSAT:** Controlling methane emissions will require further scrutiny of its sources. To this end, satellites that will track methane leakage such as ***MethaneSAT***have been planned to launch.
- The **International Energy Forum (IEF**) launched the **IEF Methane Initiative in June 2021** to develop a methane emissions measurement methodology.

9. India and the Ivory Tussle between CITES and African Countries

Context The four African Countries namely **Namibia, Botswana, South Africa, and Zimbabwe**, has approached CITES for removal for elephant from **Appendix II conservation status** for regulation of controlled ivory trade from the region to generate revenue.

What is an Ivory mean?

- It is the hard white substance that the tusks of an elephant are made of.
- Across the world, ivory is viewed as a status symbol.
- Historically, it was used to produce **ornaments, figurines, and small carvings**, as well as items like **jewellery, piano keys, and chess sets**.
- Traditional medicine also views ivory as a healing element, using ivory powder to create medicine for a variety of illnesses.

CoP is the **supreme decision-making body of CITES** which applies a set of biological and trade criteria to evaluate proposals from parties to decide if a species should be in Appendix I or II.

- CITES **Appendix I** list species threatened with extinction — import or export permits for these are issued rarely and only if the purpose is not primarily commercial.
- CITES **Appendix II** includes species not necessarily threatened with extinction but in which trade must be strictly regulated.

India and ivory trade:

- The **endangered Asian elephant** was included in CITES Appendix I in 1975, which banned the export of ivory from the Asian range countries.
- In 1986, India amended **The Wild Life (Protection) Act, 1972** to ban even domestic sales of ivory.
- After the ivory trade was globally banned, India again amended the **law to ban the import of African ivory in 1991.**
- In 1981 when New Delhi **hosted CoP3**, India designed the **iconic CITES logo** in the form of an elephant.
- Over the years, India's stand has been **unequivocal** on the ivory issue.

10. COP 27 and L&D Fund

Context: In the COP 27 summit, parties agreed to a **Loss and Damage fund (L & D)** providing financial support to developing countries for low-carbon transformations, building resilience to inevitable climate impacts, and other steep challenges.

What is loss and damage (L&D)?

- The term '**losses and damages'** refer to the **economic and non-economic impacts of climate change**, including extreme and slow onset events, in developing countries that are particularly vulnerable to the adverse effects of climate change.
- It's destructive, irreversible, and cannot be addressed by mitigation and adaptation measures.

L&D was brought up as a demand in 1991 by the island country of Vanuatu, which was representing the **Alliance of Small Island States** (AOSIS). Thirty-one years and 26 COPs later, this demand has not been realized.

11. E-Waste (Management) Rules 2022

Context The Ministry of Environment, Forestry, and Climate Change has notified the E-Waste (Management) Rules, 2022, in supersession of the E-Waste (Management) Rules, 2016, which shall come into force on April 1, 2023.

About

- The new rules have introduced the concept of a modified Extended Producer Responsibility (EPR) and focus completely on a market-based model, with all procedures being online and seamless.
  - EPR is a policy-based approach wherein responsibility is casted over the producers of specific category of waste for the treatment and safe disposal of such waste.

What is E-Waste?

- E-Waste is short for Electronic-Waste and the term is used to describe old, end-of-life or discarded electronic appliances. It includes their components, consumables, parts and spares.
- It is categorised into 21 types under two broad categories:
- Information technology and communication equipment.
- Consumer electrical and electronics.

12. Global Forest Declaration Assessment Report (2022)

Context: The 2022 Forest Declaration Assessment said that the **Deforestation** rates worldwide declined only modestly in 2021 by 6.3 % compared to the 2018-20 baseline.

Key-findings

- Not a Single Global Indicator is on Track' to Reverse Deforestation by 2030.
- A 10% annual reduction is needed to be on course to halt deforestation completely by 2030

- While afforestation and restoration efforts have been commendable, more forest area is being lost than gained.
- Global **forest loss decreased in 2021,** but the crucial climate goal of stopping deforestation by 2030 would still be missed.

13. COP15 to Convention on Biological Diversity

Context: At Convention on Biological Diversity (CBD), the COP15 biodiversity conference in Montreal, India highlighted the burden of implementing the targets for conservation on developing nations and the need for a dedicated fund to help them.

About COP-15

- The 15th Conference of Parties COP15, to the UN Convention on Biological Diversity, is the most important gathering on biodiversity in a decade.
- It aims at achieving a historic deal to halt and reverse biodiversity loss on par with the 2015 Paris Agreement on climate change. Its precise commitment is:
- Holding the increase in the global average temperature to well below 2? above pre-industrial levels
- To pursue efforts to limit the temperature increase to 1.5? above pre-industrial levels.
- ***"Kunming-Montreal Global Biodiversity Framework" (GBF)*** was adopted. GBF includes 4 goals and 23 targets for achievement by 2030.
- The U.N. biodiversity conference was concluded in Canada Montreal.

What are the Key Targets of the GBF?

- **30x30 Deal**
- **Restore 30% of degraded ecosystems** globally (on land and sea) by 2030.
- **Conserve and manage 30% of areas** (terrestrial, inland water, and coastal and marine) by 2030.
- **Stop the extinction of known species, and by 2050** reduce tenfold the extinction risk and rate of all species (including unknown)
- **Reduce risk from pesticides by at least 50% by 2030** Reduce nutrients lost to the environment by at least 50% by 2030
- **Reduce pollution risks and negative impacts of pollution** from all sources by 2030 to levels that are not harmful to biodiversity and ecosystem functions
- **Reduce the global footprint of consumption by 2030,** including through significantly reducing overconsumption and waste generation and halving food waste
- **Sustainably manage areas under agriculture, aquaculture, fisheries, and forestry** and substantially increase agroecology and other biodiversity-friendly practices
- Tackle climate change through **nature-based solutions**
- **Reduce the rate of introduction and establishment of invasive alien species** by at least 50% by 2030
- Secure the safe, legal and sustainable **use and trade of wild species** by 2030
- Green up **urban spaces**

Other important Global Climate Funds

- **Green Climate Fund (GCF):** It was established to limit or reduce Greenhouse Gas (GHG) emissions in developing countries and to help vulnerable societies adapt to the unavoidable impacts of climate change.

- **Adaptation Fund (AF):** It was established under the Kyoto Protocol in 2001 and has committed USD 532 million to climate adaptation and resilience activities.
- **Global Environment Fund (GEF):** GEF has served as an operating entity of the financial mechanism since the Convention came into force in 1994.
  - It is a private equity fund focused on seeking long-term financial returns through investments in clean energy under climate change.

About Global Environment Facility (GEF)

- The **Global Environment Facility (GEF)** is the key source of funding for biodiversity conservation.
  - It caters to multiple conventions, including the **UNFCCC and UN Convention** to Combat Desertification.
  - It remains the only source of funding for biodiversity conservation.

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8 MISCELLANEOUS

1. Indian Environment Service

- The Supreme Court recently asked the Centre whether it was planning a dedicated **'Indian Environment Service'** in the national bureaucratic set-up, as recommended by a committee headed by former **Cabinet secretary TSR Subramanian** in 2014.

Main environmental laws in India

- **Water (Prevention and Control of Pollution) Act 1974 (Water Act),** which also initially identified the powers, functions and hierarchy of the environmental agencies, the CPCB and the SPCBs.
- **Air (Prevention and Control of Pollution) Act 1981 (Air Act)**
- **Environment (Protection) Act 1986 (EP Act).** This umbrella law enables the central government to take measures it deems necessary to protect and improve the environment, and to prevent, control and abate environmental pollution. A wide range of rules and notifications have been adopted under it, such as the:
  - **E-Waste (Management) Rules 2016**, as amended in 2018 (E-Waste Rules)
  - **Batteries (Management & Handling) Rules 2001** (and the proposed draft Battery Waste Management Rules 2020)
  - **Bio-Medical Waste Management Rules 2016**
  - **Plastic Waste Management Rules 2016** (and a proposed draft 2021 amendment)
  - **Solid Waste Management Rules 2016**
  - **Construction and Demolition Waste Management Rules 2016**
  - **Hazardous and Other Waste** (Management and Transboundary Movement) Rules 2016, as amended in 2019 (HW Rules)
  - **Manufacture, Storage and Import of Hazardous Chemicals Rules 1989** (MSIHC Rules)
  - **Coastal Regulation Zone Notification 2019** (and related 2021 procedure for violation of the CRZ Notification)
  - **Environment Impact Assessment Notification 2006**.

Key regulatory authorities:

- Ministry of Environment, Forests and Climate Change (MoEFCC)
- Central Pollution Control Board (CPCB)
- State Pollution Control Board (SPCB)
- District Level Authorities (that is, municipal corporations)

- **Wild Life (Protection) Act 1972**
- **Forest (Conservation) Act 1980**
- **Public Liability Insurance Act 1991**
- **Biological Diversity Act 2002**
- **National Green Tribunal Act 2010**

2. Erra Matti Dibbalu

- Citizens join hands to preserve the geological marvel of Erra Matti Dibbalu in Visakhapatnam

About Erra Matti Dibbalu

- Located between **Visakhapatnam and Bheemunipatnam**, the Erra Matti Dibbalu are **rare red sand dunes**.
- They are a reminder of the million years of geological processes, and among the 34 notified **National Geological Heritage Monument Sites** of India by the **Geological Survey of India**.
- The width of the dunes, which runs for five kilometres along the coast, varies from 200 metres to two kilometres.
- Located at a distance of 16 kilometres from Visakhapatnam, the towering red sand dunes with patches of greenery is like a meandering maze.

Such sand deposits have been reported only from three **low latitude tropical regions** in South Asia —

- Teri Sands of Tamil Nadu
- Erra Matti Dibbalu in Andhra Pradesh
- Red Coastal Sands of Sri Lanka

3. Bedti-Varada Interlinking

Context The Union Ministry of Jal Shakti (water resources), under the 'National Perspective Plan', had called for proposals to transfer water from water surplus basins to water deficit basins

About

- National Water Development Agency (NWDA) had identified 30 links in the country that included 16 peninsular rivers.
- There were two sensitive proposals among the six Karnataka proposals.
- These were the Bedti-Dharma-Varada and Aghanashini-Varada river links.

About Bedti-Varada river inter-linking project:

- The Bedti-Varada project was envisaged in 1992 to supply drinking water.
- The plan aims to link the Bedti, a river flowing west into the Arabian Sea, with the Varada, a tributary of the Tungabhadra River, which flows into the Krishna, which in turn flows into the Bay of Bengal.
- A massive dam will be erected at Hirevadatti in Gadag district.

- A second dam will be built on the Pattanahalla River at Menasagoda in Sirsi, Uttara Kannada district.
- Both dams will take water to the Varada via tunnels.
- The pre-feasibility report of the 'Bedti-Varada link proposal' was submitted by NWDA in August 2021.
- It envisaged the diversion of 242 million cubic metres (mcm) from the Bedti Basin to the water-scarce Tungabhadra sub-basin to irrigate 60,200 hectares (ha) in the Tungabhadra Project command Area of Raichur district.
- The draft detailed project report (DPR) of the Bedti-Dharma-Varada link and the drawings submitted by NWDA to the Government of Karnataka in February 2022, cover parts of the Bedti-Conservation Reserve and Shalmala Riparian Conservation Reserve.
- These are in the Western Ghats, which is eco-sensitive and a biodiversity hotspot.

4. World Bank Report on India's Cooling Sector

Context A new report by the World Bank suggests India could soon become one of the first places in the world to experience heatwaves that break the human survivability limit.

Key highlights of the Report

- **Report title:** *Climate Investment Opportunities in India's Cooling Sector*
- India is experiencing higher temperatures that arrive earlier and stay far longer.

What are heat waves?

- The India Meteorological Department qualitatively describes heatwave as a condition of air temperature which becomes fatal to the human body when exposed.
- Quantitatively, it is defined based on the temperature thresholds over a region in terms of actual temperature or its departure from normal.
- **Declaration**
- **Heatwave:** A heatwave is declared when an area logs a maximum temperature of 45 degrees Celsius.
- **Severe heatwave:** A severe heatwave is declared if the maximum temperature crosses 47 degrees.
- For coastal regions, the heat waves may be described provided the actual maximum temperature is 37 degrees or more.

5. International Day of Biodiversity

Context International Day for Biological Diversity is an annual event that takes place on May 22.

The International Day for Biological Diversity (IDB):

- The **United Nations** has proclaimed **May 22** as the International Day for Biological Diversity (IDB) to increase understanding and awareness of biodiversity issues.
- It is an initiative taken by the United Nations **to protect the earth and the variety of lives on it.**
- **Theme for 2022**: Building a shared future for all life

6. World Turtle's Day

Context World Turtle Day is observed on May 23.

About World Turtle Day:

- The day is celebrated to make people aware of turtle and tortoise and their habitats. This year is the 20th anniversary of World Turtle Day.
- Every year since 2000, American Tortoise Rescue (ATR), a nonprofit organization established in 1990, sponsors the celebrations for World Turtle Day.

7. Largest known plant in the world is 4,500 years old

Context Researchers have discovered what is now believed to be the largest plant in the world: an ancient specimen of an incredibly resilient seagrass that stretches across 180km and is estimated to be at least 4,500 years old.

About

- The single plant of **Posidonia Australis** was discovered in the shallow waters of the **World Heritage Area** of **Shark Bay in Western Australia.**
- Posidonia Australis stretches **across 180km** and is estimated to be **at least 4,500 years old.**
- The plant is so large because it **clones itself**, creating genetically identical offshoots.
- This process is a way of reproducing that is rare in the animal kingdom although it happens in certain environmental conditions and occurs more often among some plants, fungi and bacteria.

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PRACTICE MCQS

1. Bleaching or the paling of coral color occurs when:

1. The densities of zooxanthellae decline.
2. The concentration of photosynthetic pigments within the zooxanthellae fall.

Which of the above statements is/are correct?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

2. With reference to the Green Climate Fund (GCF), consider the following statements:

1. It supports only climate change mitigation projects in developing countries.
2. It is the only stand-alone multilateral financing entity whose sole mandate is to serve UNFCCC.
3. NABARD is the first entity from India to be accredited as Direct Access Entity to GCF.

Which of the above statements are correct?

(a) 1 and 2 only

(b) 1 and 3 only

(c) 2 and 3 only

(d) 1, 2 and 3

3. With reference to the Ramsar Convention, consider the following statements:

1. It is the only global environmental treaty that deals with a particular ecosystem.
2. It is not affiliated with any of the United Nations system of multilateral environmental agreements.
3. Montreux Record is a register of those wetland sites where adverse changes in ecological character have occurred and is maintained as part of the Ramsar List.

Which of the above statements is/are correct?

(a) 1 and 2 only

(b) 1 and 3 only

(c) 1, 2 and 3

(d) 3 only

4. The term 'Bioremediation' refers to:

(a) Use of microbes to clean up contaminates soil and groundwater.

(b) Use of plants to remove contaminants from soil and water.

(c) Breakdown of contaminants through the activity of proteins and enzymes.

(d) Supply of air and nutrients through wells to contaminated soil to stimulate the growth of indigenous bacteria.

5. Consider the following pairs:

	Tiger Reserve	**-**	***State***
1.	Melghat	–	Madhya Pradesh
2.	Kawal	–	Telangana
3.	Namdapha	–	Assam

Which of the above pair(s) is/are ***incorrectly*** matched?

(a) 1 and 2 only

(b) 2 only

(c) 1 and 3 only

(d) 3 only

6. With reference to Global Methane Pledge, consider the following statements:

1. It is an international public-private partnership focused on reducing barriers to the recovery and use of methane as a clean energy source.
2. India has not signed the Global Methane Pledge.
3. While methane has a much shorter atmospheric lifetime, it is a much more potent greenhouse gas than carbon dioxide.

Which of the above statements is/are ***incorrect***?

(a) 1 only

(b) 2 only

(c) 1 and 3 only

(d) 2 and 3 only

7. With reference to Eco-Sensitive Zones (ESZs), consider the following statements:

1. ESZs are areas around the Protected Areas (PA) and wildlife corridors declared as ecologically fragile under Wildlife Protection Act, 1972.
2. ESZs are declared through notification by a state government.
3. Activities like commercial mining are regulated in ESZs.

Which of the above statements is/are ***incorrect***?

(a) 1 and 2 only

(b) 2 only

(c) 3 only

(d) 1, 2 and 3

8. Consider the following statements:

1. Mugger or marsh crocodiles are the only crocodile species in India that is listed as Critically Endangered in the IUCN Red List.
2. Odisha's Kendrapara district is the only district in India where all three species of crocodiles are found.

Which of the above statements is/are correct?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

9. Consider the following statements:

1. Fly Ash primarily consists of oxides of silicon and aluminium.
2. Pradhan Mantri Gram Sadak Yojana (PMGSY) encourages the use of fly ash for road construction.
3. Fly ash bricks are light in weight and offer high strength and durability

Which of the above statements is/are correct?

(a) 1 only

(b) 1 and 3 only

(c) 2 only

(d) 1, 2 and 3

10. With reference to Blue Flag Beaches, consider the following statements:

1. A Blue Flag beach is an eco-restoration model that prohibits tourism and other related activities.
2. India is the only country in Asia-Pacific region to have multiple blue flag beaches.
3. Ministry of Environment launched 'BEAMS Program' for achieving the globally recognized and the coveted International eco-label "Blue Flag".

Which of the above statements is/are ***incorrect***?

(a) 1 and 2 only

(b) 1 and 3 only

(c) 2 and 3 only

(d) 2 only

11. Which of the following pairs is are correctly matched?

	Tiger Reserve	—	***State***
1.	Rajaji	—	Uttar Pradesh
2.	Sathyamangalam	—	Andhra Pradesh
3.	Pakke	—	Arunachal Pradesh
4.	Bandhavgarh	—	Madhya Pradesh

Select the correct answer using the code given below:

(a) 1 and 2 only

(b) 2 and 3 only

(c) 2 and 4 only

(d) 3 and 4 only

12. Consider the following statements:

1. Methanol is a low carbon, hydrogen carrier fuel that can be produced from high ash coal, agricultural residue and natural gas.

2. Methanol offers higher energy content than petrol and diesel.
3. NITI Aayog's 'Methanol Economy' programme is aimed converting coal reserves and municipal solid waste into methanol.

Which of the above statements is/are ***incorrect***?

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

13. 'EV100' recently seen in news is an initiative of which of the following organizations?

(a) United Nations Environment Programme
(b) The Energy and Resources Institute
(c) Climate Group
(d) International Solar Alliance

14. Which of the following is/are the effect(s) of ocean warming on fishes?

1. Fish will start to migrate polewards or to deeper waters.
2. Some fishes will become smaller in size and not be able to move to better environments.

Select the correct answer using the code given below:

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

15. National Biofuel Coordination Committee is chaired by:

(a) Minister of New and Renewable Energy
(b) Prime Minister
(c) Minister of Petroleum and Natural Gas
(d) Minister of Environment, Forest and Climate Change

16. Which of the following statements is/are correct with respect to Vembanad Lake?

1. It is the only wetland of international importance in Kerala as defined by Ramsar Convention.
2. It is the longest lake in India.
3. Mangalavanam Bird Sanctuary, an ecologically sensitive area is located on the banks of Vembanad Lake.

Select the correct answer using the code given below:

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

ANSWER KEY

1. (c)	2. (c)	3. (c)	4. (a)	5. (c)
6. (a)	7. (d)	8. (b)	9. (d)	10. (a)
11. (d)	12. (b)	13. (b)	14. (c)	15. (c)
16. (d)				

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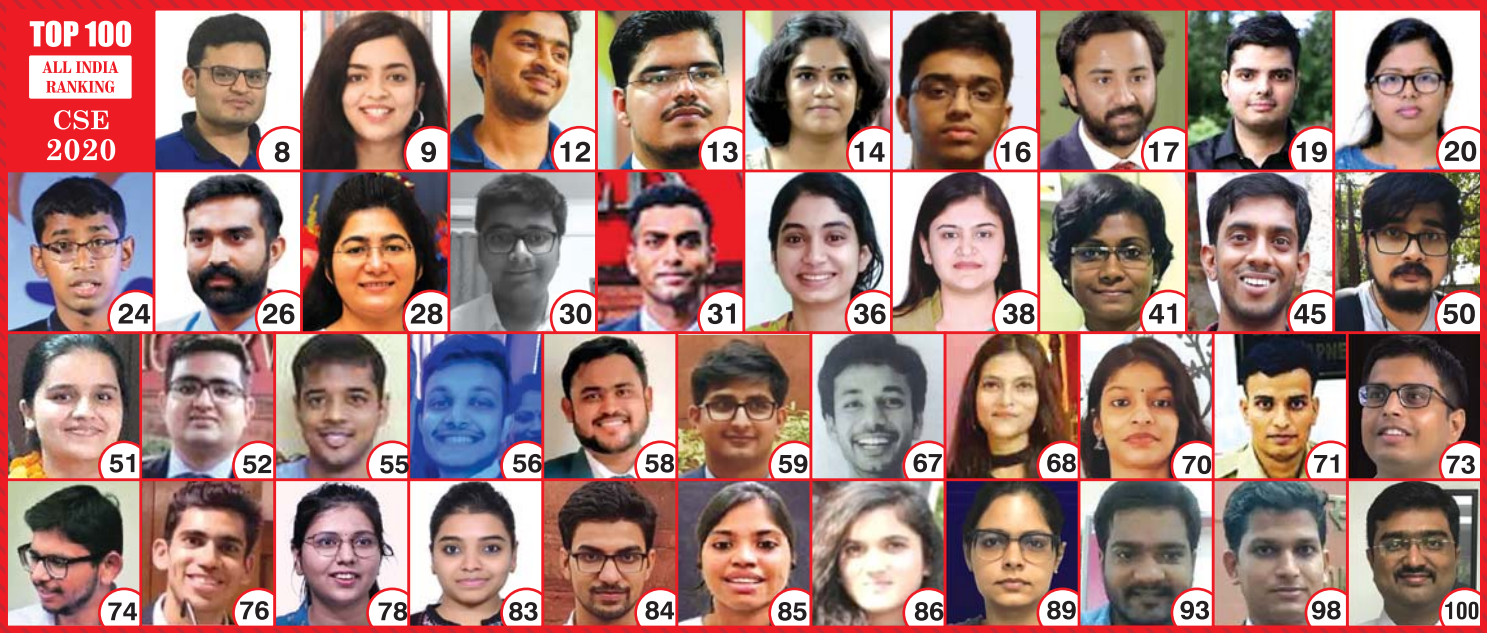

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