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ENVIRONMENT



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PREDICT THE UNPREDICTABLE

INDEX

Climate change	2 - 6
Pollution	7 - 12
Biodiversity	13 - 25
Wildlife species	26 - 56
Wetlands & ramsar sites	57 - 61
Organizations, programmes and acts	62 - 65
Sustainable developments	66 - 74
Miscellaneous	75 - 78

CLIMATE CHANGE

“Fit for 55,”

Context:

- European officials are **preparing legislation to wean one of the world’s biggest and most polluting economies off fossil fuels** far more quickly than other nations have pledged to do.
- The 27-nation bloc has said **it will cut its emissions of greenhouse gases by 55% by 2030**, compared with 1990 levels.

“Fit for 55,”

- Fit for 55 is the European Union plan to reduce greenhouse gas emissions by 55% by 2030.
- The package was proposed in July 2021 by the European Commission. Under an accelerated legislative process, the plans may become law in 2022.
- Measures include additional support for clean transport, renewables, and a tariff called the Carbon Border Adjustment Mechanism on emissions for high-carbon imports from countries lacking sufficient greenhouse gas reduction measures of their own.
- It proposes to extend the Emissions Trading Scheme to transport and heat. Compared to the net-zero scenario from the International Energy Agency, the plan contains more measures to ensure that energy remains affordable.

Carbon Border Tax

Context:

- At the two-day G-20 ministerial meeting on environment and climate change in Italy, **developing countries, including India, raised their concerns over the European Union’s recent proposal on the first of its kind carbon border tax.**

What is it?

- A **carbon border tax is a tax on carbon emissions attributed to imported goods that have not been carbon-taxed at source.**
- This proposal is **part of the European Commission’s European Green Deal that endeavors to make Europe the first climate-neutral continent by 2050.**
- The border tax **would not take effect until 2026.**

Ozone pact

Context:

- India has ratified the Kigali Amendment to the 1989 Montreal Protocol for protection of the ozone layer.
- Montreal Protocol, 1989 is a **ozone-saving agreement that works an extremely potent weapon in the fight against ozone depletion and climate change.**
This is for phasing out compounds called HFCs, which happen to be powerful greenhouse gases.

Montreal Protocol

- The Montreal Protocol on Substances that Deplete the Ozone Layer, is an **international environmental treaty for protection of the Ozone Layer** by phasing out the production and consumption of man-made chemicals referred to as ozone depleting substances (ODS).
- **India became a Party** to the Montreal Protocol on Substances that Deplete the Ozone Layer on 19 June 1992 and since then has ratified the amendments to the Montreal Protocol.
- Though the present approval of the Cabinet, India will be ratifying the Kigali Amendment to the Montreal Protocol for phase down of Hydrofluorocarbons.
- India has successfully met the phase out targets of all the Ozone Depleting Substances as per the Montreal Protocol Schedule

The Kigali Amendment

- It was negotiated in the **Rwandan capital in October 2016**.
- It enables the **gradual phase-down of hydrofluorocarbons, or HFCs**, a family of chemicals used extensively in the air-conditioning, refrigeration and furnishing foam industry.
- HFCs are known to be **much worse than carbon dioxide in causing global warming**.
- According to the UN Environment Programme (UNEP), the average global warming potential of 22 of the most used HFCs is about 2,500 times that of carbon dioxide.
- The amendment has **already come into force from the start of 2019**.

The Kigali Agreement

- In 2016, countries agreed to **include HFCs in the list of controlled substances** under Montreal Protocol and decided on a schedule for its phase-down.
- Before the middle of this century, current HFC use has to be curtailed by at least 85 per cent.
- Countries have different timelines to do this.
- India has to **achieve this target by 2047** while the **developed countries have to do it by 2036**. China and some other countries have a target of 2045.
- While the reductions for the rich countries have to begin immediately, India, and some other countries, have to begin cutting their HFC use only from 2031.
- If implemented successfully, the Kigali Amendment is expected to **prevent about 0.5°C rise in global warming** by the end of this century.

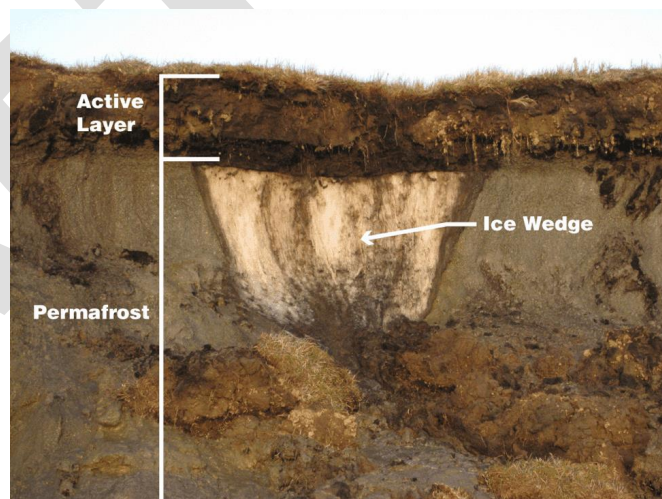
Permafrost

Context

- The latest IPCC report has warned that increasing global warming will result in reductions in Arctic permafrost and the thawing of the ground is expected to release greenhouse gases like methane and carbon dioxide.

What is Permafrost?

- Defined as **ground (soil, rock and any included ice or organic material) that remains at or below zero degree Celsius for at least two consecutive years**.
- Permafrost is spread across an area of over 23 million square kilometers, covering about **15% of the land area of the globe**.



What will be the immediate effects as permafrost melts due to increasing global temperatures?

- The first impacts that are very rapid will **affect countries where roads or buildings were constructed on permafrost**. The Russian railways are an example.
- Releasing of **carbon dioxide**, and **methane**, which is **about 25 to 30 times more potent as a greenhouse gas than carbon dioxide**.

- The total quantity of carbon that is now buried in the permafrost is estimated at about **1500 billion tonnes** and the top three meters of the ground has about **1000 billion tonnes**.

Global methane initiative

Context

- U.S. President Joe Biden announced the **Global Methane Pledge**, a U.S.–EU-led effort to cut methane emissions by a third by the end of this decade.

Methane

- Methane is a **greenhouse gas**, which is **80 times more potent** than carbon dioxide in terms of its global warming capacity.
- Approximately **40% of methane emitted is from natural sources** and about **60% comes from human-influenced sources**, including livestock farming, rice agriculture, biomass burning and so forth.

About Global methane initiative:

- The Global Methane Initiative (GMI) is a **voluntary, international partnership** that brings together national governments, private sector entities, development banks, NGOs and other interested stakeholders in a **collaborative effort to reduce methane gas emissions and advance methane recovery and use as a clean energy source**.
- As a **public-private initiative**, GMI creates an international platform to build capacity, development methane abatement strategies, **engage in technology transfer**, and remove political and economic barriers to project development for emissions reduction.
- **India is a party of this initiative.**

Conference of Parties (COP26)

Context

- India's big push at the COP26 will be to have more countries commit to a "net zero" deadline by mid-century.

Formation of COP

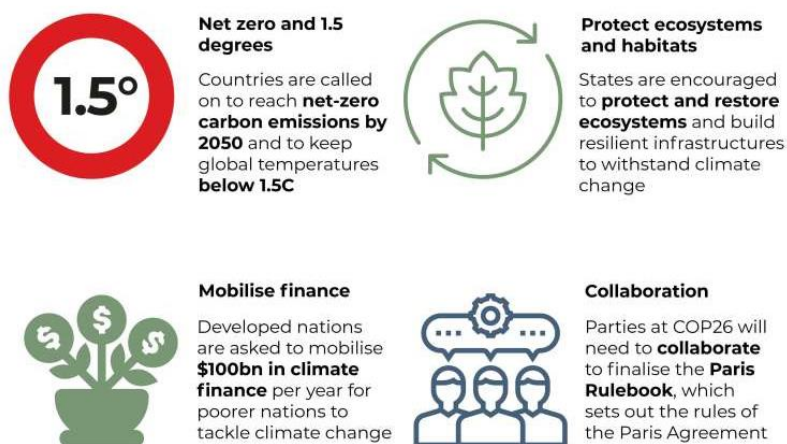
- The Conference of Parties comes under the United Nations Climate Change Framework Convention (UNFCCC) which **was formed in 1994**.
- The UNFCCC was established to work towards "**stabilization of greenhouse gas concentrations in the atmosphere.**"
- It laid out a list of responsibilities for the member states which included:
 - Formulating measures to mitigate climate change.
 - Cooperating in preparing for adaptation to the impact of climate change.
 - Promoting education, training and public awareness related to climate change.

COP1 to COP25

- COP members have been meeting every year since 1995.
- The UNFCCC has 198 parties including India, China and the USA.
- The first conference (COP1) was held in 1995 in Berlin.
- At **COP3** held in Kyoto, Japan, in 1997, the famous **Kyoto Protocol** was adopted. It commits the member states to **pursue limitation or reduction of greenhouse gas emissions**. It entered into force on **16 February 2005** and there are 192 Parties in the Kyoto Protocol.
- **India hosted the eighth COP** in 2002 at New Delhi.
- One of the most important conferences, COP21 took place in Paris, France, where member countries agreed to work together to **'limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels.'**

COP26 goals

- According to the UNFCCC, COP26 will work towards four goals:
 1. **Secure global net-zero by mid-century and keep 1.5 degrees within reach**
 2. **Adapt to protect communities and natural habitats**
 3. **Mobilise finance**
 4. **Work together to deliver**



The UK Presidency at COP26 has five priorities, aiming to ignite a similar level of progress through new alliances:

- **Adaptation and resilience:** 'Helping people, economies and the environment adapt and prepare for the impacts of climate change.'
- **Nature:** 'Safeguarding ecosystems, protecting natural habitats and keeping carbon out of the atmosphere.'
- **Energy transition:** 'Seizing the massive opportunities of cheaper renewables and storage.'
- **Accelerating the move to zero-carbon road transport:** 'By 2040, over half of new car sales worldwide are projected to be electric.'
- **Finance:** 'We need to unleash the finance which will make all of this possible and power the shift to a zero-carbon economy.'

'One Sun, One World, One Grid' Project

Context

- India, UK likely to announce 'One Sun, One World, One Grid' at COP26 UN climate change conference, scheduled to be held from 1 November to 12 November, at Scotland's Glasgow.

About OSOWOG project

- The ambitious OSOWOG **will connect 140 countries** through a common grid that will be used to transfer solar power.
- The concept of OSOWOG, which the **British have called a Green Grid**, has been pushed by Prime Minister Narendra Modi and also found a special mention in his Independence Day speech this year.
- The idea behind the concept is a **trans-national electricity grid supplying solar power across the globe**.

CRISP-M Tool

Context

- Climate Resilience Information System and Planning (CRISP-M) tool for Mahatma Gandhi NREG Scheme launched.
- The implementation of CRISP-M will **open up new possibilities for Rural communities to deal with climate change**
- Pilot project for Climate Resilient program started in **7 districts - Bihar, Chhattisgarh, Odisha, Rajasthan, MP, UP and Jharkhand**.

CRISP-M for MGNREGS

Climate Resilience Information System and Planning (CRISP-M) tool for integration of climate information in Geographic Information System (GIS) based watershed planning under Mahatma Gandhi NREGA

Integrating weather and climate information into planning can help MGNREGS to make more climate-smart decisions tailored to specific needs and specific locations, and based on real time monitoring

CRISP-M is a web and mobile phone based tool. It uses ten Geographic Information System (GIS) layers to map, manage and analyse data to support planning, implementation and monitoring of MGNREGS.

Community participation has been embedded in the CRISP-M that assists in identifying areas that need attention and prioritisation in the planning process.

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POLLUTION

Single-use plastic

Context

- A detailed report sheds light on who makes all this single-use plastic, 130 million tons a year at last count, and who makes money from it.

What are microplastics?

- Microplastics are **plastic debris smaller than 5mm in length**, or about the size of a sesame seed.
- They come from a variety of sources, one of them is when larger pieces of plastic degrade into smaller pieces, which are difficult to detect.

Plastic Waste Management Rules, 2016

- It aims to **increase minimum thickness of plastic carry bags from 40 to 50 microns**.
- Expand the jurisdiction of applicability from the municipal area **to rural areas**, because plastic has reached rural areas also.
- **Extended Producer Responsibility**: To bring in the responsibilities of producers and generators, both in plastic waste management system and to introduce collect back system of plastic waste by the producers/brand owners, as per extended producers responsibility
- **Introduced collection of plastic waste management fee** through pre-registration of the producers, importers of plastic carry bags/multilayered packaging and vendors selling the same for establishing the waste management system
- Promote **use of plastic waste for road construction** as per Indian Road Congress guidelines or energy recovery, or waste to oil etc. for gainful utilization of waste and also address the waste disposal issue.

Net Zero Producers Forum

Context

- **Saudi Arabia** joined the United States, Canada, Norway, and Qatar in forming 'Net Zero Producers Forum' for oil and gas producers to discuss how they can support the implementation of the Paris Agreement on climate change.
- Saudi Arabia, the **world's biggest crude exporter**, will be part of the new platform, which will discuss ways to **achieve net zero carbon emission targets to limit global warming**.
- In the past, Saudi Arabia's **aims to reduce its carbon emissions by generating 50% of the country's energy from renewables by 2030**.

The Net Zero Producers Forum

The Net Zero Producers Forum aims to develop pragmatic net zero emission strategies, including:



Methane abatement.



Advancing the circular carbon economy approach.



Development and deployment of clean-energy and carbon capture and storage technologies.



Diversification from reliance on hydrocarbon revenues.

Fly Ash

Context:

- NTPC Ltd has invited Expressions of Interest (EoI) for the sale of fly ash from the designated ports of the Middle East and other regions.
- The company aims to utilise 100 per cent of the fly ash generated as a by-product at its coal-fired power plants.

What is Fly ash?

- Fly ash is a **fine gray powder** consisting mostly of spherical, glassy particles that are produced as a byproduct in coal-fired power stations.
- Fly ash has pozzolanic properties, it **reacts with lime to form cementitious compounds.**
- It is commonly known as a **supplementary cementitious material.**
- Fly ash is also known as flue-ash or simply ash.

Health and environmental impact of fly ash

- Fly ash comprises **toxic heavy metals** like nickel, cadmium, arsenic, chromium, lead.
- Minute, poisonous fly ash particles can accumulate in the respiratory tract, and cause **gradual poisoning**
- 80,000–1,15,000 premature deaths in India in 2011–12 due to **emissions from coal power plants** -- of them 10,000 were children under the age of five
- 20 million cases of **respiratory ailments** can be directly linked to exposure to fly ash
- Fly ash contains 100 times **more radiation than nuclear waste**
- Ash sludge from coal power plants in the Rann of Kutch has led to **destruction** of mangroves, drastic reduction in crop yields, and pollution of groundwater

Application or uses of Fly Ash

Fly ash is suitable for a wide variety of applications and uses, including:

- Concrete
- Dams
- Flowable fill
- Mines
- Landfills
- Geopolymer concrete

Commission for Air Quality Management in National Capital Region and Adjoining Areas

Context

- To **focus on research, identification and resolution of problems** surrounding the **air quality index**, the government tabled in the Lok Sabha a bill on the **commission for air quality management in National Capital Region (NCR) and adjoining areas Bill, 2021.**
- It will apply to the NCR and the areas adjoining to the NCR in the States of Haryana, Punjab, Rajasthan and Uttar Pradesh, where any source of pollution is located, causing adverse impact on air quality in the NCR.
- The Commission for Air Quality Management in National Capital Region and Adjoining Areas Ordinance, 2020 was promulgated by the President of India on the October 28, 2020.
- The bill seeks to replace the ordinance, provides for the constitution of the commission for air quality management in NCR and adjoining areas.

NEW BOSS TO FIGHT BAD AIR



BEFORE CENTRAL BODY, WHO?

EPCA

- > Supreme Court-backed Environment Pollution (Prevention and Control) Authority on the job since 1998
- > Mandated to protect and improve quality of environment
- > Assisted SC in matters related to noise pollution, hazardous waste, etc, too
- > Drew power from the Environment (Protection) Act, 1986, and implemented various mitigation measures through CPCB

OTHERS

- > Several committees and task forces - both at Centre and NCR states - dealt with air pollution
- > Union environment ministry worked as a coordination body
- > High-level task force, led by principal secretary to PM, reviewed action taken

COMMISSION TO HAVE CHAIRPERSON PLUS 17 MEMBERS

Key Functions | Take mitigation measures through central/state agencies

Entertain complaints for protecting and improving air quality	Regulate or prohibit activities that may cause or increase air pollution	Lay down parameters for air quality and for emissions or discharge of pollutants	Restrict industrial operation that may cause air pollution
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DIRECT CLOSURE OF POLLUTING INDUSTRIES

STOP OR REGULATE SUPPLY OF WATER OR ELECTRICITY TO ERRING INDUSTRIES

CPCB AND SPCBS WILL CONTINUE TO DEAL WITH AIR POLLUTION. HOWEVER, THE COMMISSION'S ORDERS PREVAIL IN CASE OF CONFLICT

EPCA and all such committees now stand dissolved with the ordinance

The issue will now be handled by a powerful statutory authority - Commission For Air Quality Management in NCR and Adjoining Areas

COMMISSION TO ADDRESS THREE BROAD ISSUES

- Monitoring of air pollution
- Enforcement of laws after such monitoring
- Research and innovation

PENALTY PROVISIONS

- > Non-compliance punishable with a jail term up to 5 years or fine up to Rs 1 crore, or both
- > Appeal can be made only before NGT

Smog towers

Context

- Delhi CM Arvind Kejriwal inaugurated the first smog tower in the national capital.

What is a 'smog tower'?

- A smog tower is a structure designed to work as a **large-scale air purifier, fitted with multiple layers of filters, which trap fine dust particles suspended in the air** as it passes through them. It can help clean air within one-kilometer range.
- The smog tower is a 24 metre-high structure fitted with fans and air filters and it will draw in polluted air from the top and release purified air near the ground through fans fitted on sides.
- The tower has 40 big fans and 5,000 filters to clean the air.
- Towers would create "clean air zones" in the city. An estimate made of their impact on air quality shows a tower would reduce **50% of the particulate matter load**.

Sujalam' campaign

Context

- The **Jal Shakti Ministry** has launched this campaign to **create a million soak pits in villages** across the country over the next 100 days.
- It aims to **help manage grey water and prevent the clogging of water bodies**.
- Although the Central government does not have any comprehensive estimate of the total number of soak pits needed countrywide, the States have been asked to develop their own targets.

Need

- The household or community soak pit is the **simplest solution for grey water management**.
- Best solution for most villages which are generally dry, grey water can be **safely and inexpensively filtered through a soak pit**.

- A household soak pit could be constructed for about ₹3000-5000 in most cases.

Tarballs

Context

- The Brihanmumbai Municipal Corporation (BMC) has removed over 20,000 kg of tarballs from Juhu and Versova beaches.

What are tarballs?

- Tarballs are **dark-coloured, sticky balls of oil** that form when **crude oil floats on the ocean surface**.
- Tarballs are formed by weathering of crude oil in marine environments.
- They are transported from the open sea to the shores by sea currents and waves.
- Tarballs are **usually coin-sized** and are found strewn on the beaches. However, over the years, they have become as big as basketballs and can weigh as much as 6-7 kgs.

Leaded petrol

Context

- The use of **leaded petrol has been eradicated from the globe**.
- It will **prevent more than 1.2 million premature deaths** and save world economies over \$2.4 trillion annually, the UN Environment Programme (UNEP).
- The successful enforcement of the ban on leaded petrol is a huge milestone for global health and our environment.

What is leaded petrol?

- Leaded petrol - **gasoline treated with a lead compound to reduce motor knocks**.
- Combustion of leaded gasoline release lead into the air, where it could cause **lead poisoning**.
- Lead serves **two functions in engines**:
- It suppresses engine knock and, more importantly
- It extends the life of intake and exhaust valves inside the engine.

Concerns with leaded petrol

- Leaded petrol has caused **more exposure to lead** than any other source worldwide.
- It **contaminate air, dust, soil, drinking- water and food crops**, it has caused harmfully high human blood lead levels around the world, especially in children.
- It can cause **heart disease, cancer and stroke**, and has been linked to problems with **brain development in children**.

Electronic Waste Management

Context

- According to "Global E-waste Monitor 2020", Global e-waste will increase by 38 per cent in the decade between 2020 and 2030.
- The Global E-waste Monitor 2020 is a collaborative product of the Global E-waste Statistics Partnership, formed by the United Nations University, International Telecommunication Union, International Solid Waste Association, UN Environment Programme.

Key highlights of Global E-waste Monitor 2020

- There was **6 million tonnes of electronic waste in 2019** which is an average of 7.3 kg per capita. That is a nearly 21 per cent increase in just five years
- **Asia generated the greatest volume of e-waste** in 2019.
- **Less than 18 per cent of the e-waste generated in 2019 was collected and recycled.**
- The **number of countries that have adopted a national e-waste policy, legislation or regulation has increased from 61 to 78 and includes India.**

- It is far from the target set by the International Telecommunication Union to raise the percentage of countries with an e-waste legislation to 50 per cent.

E-Waste:

- E-Waste is short for **Electronic-Waste** and the term used to describe old, end-of-life or discarded electronic appliances.

E-Waste Management Rules, 2016:

- The **Ministry of Environment, Forest and Climate Change** notified the E-Waste Management Rules, 2016 in supersession of the E-waste (Management & Handling) Rules, 2011.
- **Over 21 products (Schedule-I) were included under the purview of the rule.** It included Compact Fluorescent Lamp (CFL) and other mercury containing lamps, as well as other such equipment.
- For the first time, the **rules brought the producers under Extended Producer Responsibility (EPR), along with targets.** Producers have been made responsible for the collection of E-waste and for its exchange.
- Various producers can have a **separate Producer Responsibility Organisation (PRO) and ensure collection of E-waste**, as well as its disposal in an environmentally sound manner.
- **Deposit Refund Scheme** has been introduced as an additional economic instrument.
- The **role of State Governments has been also introduced** to ensure safety, health and skill development of the workers involved in dismantling and recycling operations.
- A provision of penalty for violation of rules has also been introduced.
- **Urban Local Bodies (Municipal Committee/Council/Corporation) have been assigned the duty to collect and channelize the orphan products** to authorized dismantlers or recyclers.
- **Allocation of proper space to existing and upcoming industrial units for e-waste dismantling and recycling.**

National Clean Air Programme (NCAP)

Context

- Three years into the launch of India's National Clean Air Program (NCAP) in 2019, analysis of pollution data shows there has been a **marginal decrease in pollution levels** in targeted cities.
- **Insufficient expenditure of funds** by the states to ensure air pollution reduction. Several states failed to utilise the funds provided by the Centre under the national clean air programme (NCAP) to control air pollution in their respective states.

About NCAP:

- It was **launched in 2019.**
- **Aim:** to reduce pollution by 20-30 % by 2024, particularly in 132 non-attainment cities.
- **Fund allocation:** Under the NCAP, Rs 375.44 crore was provided to 114 cities from 2018-19 to 2020-2021 and Rs 290 crore allocated to 82 cities for 2021-2022. The programme has an allocation of Rs 700 crore envisaged for 2021-2026.
- **Fund utilization data:** Data presented at the NCAP's National Apex Committee recently, shows that most states have underutilised the funds allotted. Only Bihar and Chandigarh used 76% and 81% of the funds received towards NCAP. Uttar Pradesh, which has many of India's most-polluted cities, used 16% of the allocated Rs 60 crore.
- **Target to bring down pollution by 2024:**
- Country's current annual safe limits for PM 2.5 and PM 10 are 40 micrograms/per cubic metre (ug/m³) and 60 micrograms/per cubic metre.
- The NCAP has set a target of reducing key air pollutants PM10 and PM2.5 (ultra-fine particulate matter) by 20-30% by 2024, taking the pollution levels in 2017 as the base year.

BY 2024, POLLUTION CUT BY 30%	
NATIONAL CLEAN AIR PROGRAMME (NCAP)	BUILD CAPACITY BY SETTING UP:
Cities to be covered: 102	1 National emission inventory
GOAL: To meet annual average ambient air quality standards	2 Air Information Centre for data analysis
MID-TERM (5 YEARS) TARGET: Reducing air pollution by 20-30% by 2024, taking 2017 as base year	3 Source apportionment studies
HOW: Through city-specific air pollution abatement action plan	4 Guidelines for indoor air pollution
	5 Rural monitoring stations
INTERNATIONAL SUPPORT AGENCIES: World Bank, German development agency (GIZ), AFD (French funding agency), Swiss Development Corporation, Bloomberg Philanthropies	

- **Membership:** Apart from experts from the industry and academia, the programme is expected to be a collaboration between the Ministry of Road Transport and Highways, Ministry of Petroleum and Natural Gas, Ministry of New and Renewable Energy, Ministry of Heavy Industry, Ministry of Housing and Urban Affairs, Ministry of Agriculture, Ministry of Health, NITI Aayog, and Central Pollution Control Board.

Why NCAP fund are unutilized?

- It does not have a legal mandate but aims to achieve a 20% to 30% reduction in PM 2.5 (respirable pollution particles) concentrations over 2017 levels in over 100 cities by 2024.
- The number of cities showing improvement in air quality increased from 86 in 2019 to 96 in 2020.

AQUAMATION

Context

- The body of Nobel Peace Prize winning Anglican archbishop and anti-apartheid campaigner Desmond Tutu underwent aquamation.

What is aquamation?

- It is a green alternative to traditional cremation methods.
- This “flameless cremation” is considered to be an environmentally friendly way to dispose of a body, the process is also known as water cremation, green cremation or chemical cremation.
- In this alkaline hydrolysis process, body of the deceased is immersed for a few hours in a mixture of water and a strong alkali in a pressurized metal cylinder and heated to around 150 degree centigrade.
- The combination of gentle water flow, temperature and alkalinity accentuate the breakdown of the organic materials.
- The process leaves behind bone fragments and a neutral liquid called effluent.



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FOREST AND CONSERVATION AREAS

Van Vihar National Park

Context

- India's oldest sloth bear Gulabo dies at Bhopal's Van Vihar national park.

About Van Vihar National Park

- Location:** located on the banks of Bhopal's Upper Lake (Madhya Pradesh).
- It also runs a **rescue and breeding centre for sloth bears**.
- It is developed and managed as a **modern zoological park**.
- It categorises animals in two categories, **captive and herbivores**. **All carnivorous animals are kept inside enclosed areas and herbivores are allowed to roam freely.**

Sloth bear

- The sloth bear species are **native to the Indian subcontinent**.
- Habitation:**
- It mostly occurs in areas with forest cover, low hills bordering the outer range of the Himalayas from Punjab to Arunachal Pradesh.
- It is **absent in the high mountains** of Himachal Pradesh and Jammu and Kashmir, the northwestern deserts of Rajasthan, and a broad unforested swath in the south.
- Protection status:** It is listed as **Vulnerable** on the IUCN Red List.
- Threats:** habitat loss and degradation.

Sariska Tiger Reserve

Context

- With Better habitat management tiger population flourished in Sariska Tiger Reserve. Now it depicts an appropriate balance between the prey and predator.
- The tiger population in the wildlife sanctuary has gone up to 25.

About Sariska Tiger Reserve

- Located in:** This tiger reserve is located in **Rajasthan**.
- It became part of India's **Project Tiger in 1978**.
- Tiger relocation:** It is the first reserve in the world with successfully relocated tigers.
- It is an **important biodiversity area** in the Northern Aravalli leopard and wildlife corridor.
- It is **rich in mineral resources**, such as **copper**.
- It is a part of the **Aravalli Range and the Khathiar-Gir dry deciduous forests ecoregion**.

Indravati Tiger Reserve

Context

- At Indravati Tiger Reserve, where a tiger census is underway.
- The tiger census work will cover 400 square kilometres in Indravati Tiger Reserve in Chhattisgarh's Bijapur district.
- This is the first time tiger counting will be carried in such a large area of the reserve, which is a Maoist-affected area.
- The **connectivity between Tadoba Tiger Reserve and Indravati Tiger Reserve** makes the latter an important tiger habitat in central India.

About Indravati Tiger Reserve

- Located in: **Bijapur district of Chhattisgarh state in India.**
- Derives its name from the **Indravati River, which flows from east to west and forms the northern boundary of the reserve with the Indian state of Maharashtra.**
- One of three Project Tiger sites in Chhattisgarh, along with **Udanti-sitanadi**, and is home to one of the last remaining populations of the endangered wild water buffalo.

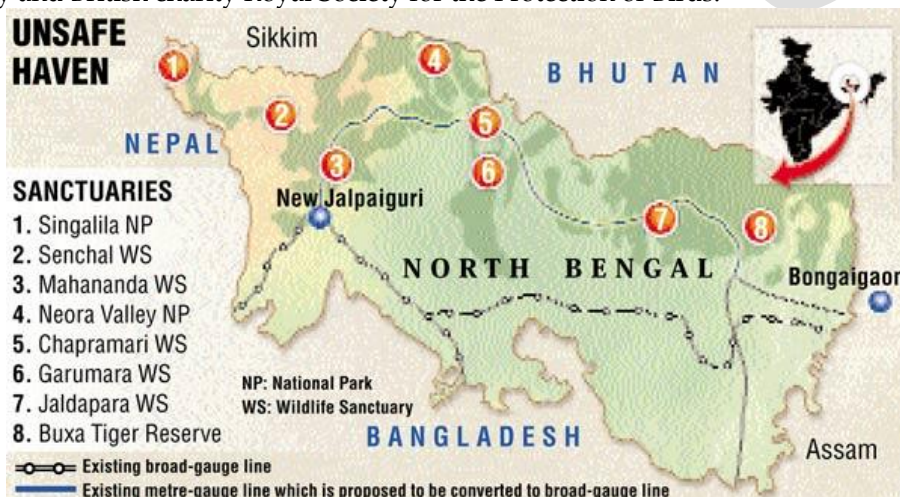
Buxa Tiger reserve

Context

- An increase in the forest density and the big cat prey base, especially deer, had attracted a Royal Bengal tiger, a first such sighting in 23 years, to the Buxa reserve in north Bengal.

About Buxa Tiger Reserve

- It was created in 1983 as the **15th tiger reserve in India.**
- Its **northern boundary runs along the international border with Bhutan.**
- The fragile "**Terai Eco-System**" constitutes a part of this reserve.
- **Rajabhatkhawa Vulture Breeding Centre** at Buxa Tiger Reserve for the breeding and conservation of endangered Indian vultures was established as the second such centre with the help of Bombay Natural History Society and British charity Royal Society for the Protection of Birds.



Guru Ghasidas Tiger Reserve

Context

- India's newest Tiger Reserve in Chhattisgarh will connect Jharkhand and Madhya Pradesh and will **provide a corridor for tigers to move between the Bandhavgarh and Palamau Tiger Reserves.**

More about news

- This will be the **fourth Tiger Reserve in Chhattisgarh**, after the **Udanti-Sitanadi, Achanakmar, and Indravati Reserves.**
- National Tiger Conservation Authority (NTCA) approved the Chhattisgarh government's proposal to declare the combined areas of the **Guru Ghasidas National Park and Tamor Pingla Wildlife Sanctuary** as a Tiger Reserve.
- The new Reserve is located in the northern part of the state, bordering Madhya Pradesh and Jharkhand.

Tamor Pingla Wildlife Sanctuary

- It was **identified as part of the Sarguja Jashpur Elephant Reserve in 2011.**
- The **Guru Ghasidas National Park** used to be **part of the Sanjay National Park in undivided Madhya Pradesh.** Both were identified as reserve forests, and had been in line to be notified as Tiger Reserve since 2011.

Significance, importance

- Guru Ghasidas National Park was the **last known habitat of the Asiatic cheetah in the country**.
- Originally part of the Sanjay Dubri National Park, Guru Ghasidas Park was **created as a separate entity in Chhattisgarh's Sarguja region after the formation of the state in 2001**.

Muttayapalem reserve forest

Context

- Environmentalists are opposing the proposal to alienate certain areas under Muttayapalem reserve forest area for development activities, stating that such activities are harmful to the coastal environment.
- The reserve forest area is **breeding ground for Olive Ridley turtles** and many species of migratory birds.

Muttayapalem Reserved Forest

- **Location:** This forest reserve is located in Andhra Pradesh.
- It is part of **Central Asian Flyway**, and many species of migratory birds, including the Whimbrel, come to this place during winter.
- "Forest area" is an area recorded as forest in the government records. Often this term is also written as "recorded forest area".

Sultanpur bird sanctuary

Context

- Homestays would soon be allowed in the villages around Sultanpur National Park in Gurugram to promote tourism and provide an opportunity to the visitors to catch a glimpse of rural life in Haryana.

About Sultanpur National Park

- **Location:** Sultanpur National Park (formerly Sultanpur Bird Sanctuary) is located at Sultanpur village in Haryana.
- It is a **Ramsar site**.
- It is part of **Central Asian Flyway**. Every year 50,000 birds of more than 100 species reach Sultanpur.

Bhitarkanika National Park

Context

- Environmentalists expressed concern over the massive **diversion of fresh water from the Brahmani river basin**, which could pose a grave threat to the famous mangrove vegetation in Odisha.
- The Talcher-Angul coal mines, steel and power plants as well as the Kalinganagar steel and power hub are drawing enormous quantities of fresh water from the Brahmani River.

About Bhitarkanika

- It is a **notified Ramsar wetland**.
- The national park is home to Saltwater crocodile
- Spread over 195 sq. km, it is home to 62 **mangrove species**.

Dugong conservation reserve

Context

- India's **first Dugong conservation reserve** will be built in **Tamil Nadu's Palk Bay** for the conservation of Dugong.
- **Dugong** is a **marine animal** that has been enlisted **vulnerable to extinction** on a global scale by the World Conservation Union (IUCN).

Dugong Conservation Reserve

- The reserve will **spread over an area of 500 km in Palk Bay** on the southeast coast of Tamil Nadu.
- **Palk Bay** is a **semi-enclosed shallow water body** with a water depth maximum of 13 meters.

- Located between India and Sri Lanka along the Tamil Nadu coast, the dugong is a flagship species in the region.

Dugong: The sea cow

- Dugong or the sea cow is the **State animal of Andaman & Nicobar Islands**.
- This **endangered marine species** survive on **seagrass and other aquatic vegetation** found in the area.
- It is the **only herbivorous mammal** that is **strictly marine** and is the **only extant species in the family Dugongidae**.
- Dugongs are usually about three-meter long and weigh about 400 kg.
- Dugongs have an expanded head and trunk-like upper lip.
- Elephants are considered to be their closest relatives. However, unlike dolphins and other cetaceans, sea cows have two nostrils and **no dorsal fin**.
- Distributed in **shallow tropical waters in the Indo-Pacific region**, in **India**, they are found in the **Gulf of Kutch, Gulf of Mannar, Palk Bay, and Andaman & Nicobar Islands**.

Guindy National Park

Context

- Guindy National Park serves as the green lungs to a great metropolitan city in Tamil Nadu.

About Guindy National Park

- It is India's **eighth-smallest national park**.
- It is one of the last remnants of the **tropical dry evergreen forests** of the Coromandel Coast.
- A large portion of the area is under **mixed dry deciduous scrub jungle**.
- The near threatened **blackbuck, considered the flagship species of the park**, was introduced in 1924 by Lord Willingdon, who later served as the 22nd Governor-General and Viceroy of India.
- The ecosystem services provided by this protected area are sequestration of carbon dioxide, release of oxygen, conserving soil, preventing floods, mitigating climate change, improving water quality, generation of employment opportunities, revenue generation in addition to recreational, aesthetic and spiritual benefits.
- The park has a role in both **ex-situ and in-situ conservation**.

PONG DAM LAKE WILDLIFE SANCTUARY

Context

- Over a lakh migratory water birds arrived at the Pong Dam Lake Wildlife Sanctuary in Himachal Pradesh this winter. Thousands of migratory birds died at the lake due to an outbreak of bird flu.

Maharana Pratap Sagar or Pong Reservoir or Pong Dam Lake

- It was created in 1975, by building the highest **earthfill dam in India** on the **Beas River** in the wetland zone of the Siwalik Hills of the state of Himachal Pradesh.
- Named in the honour of Maharana Pratap (1540-1597), the reservoir or the lake is a well-known wildlife sanctuary and one of the 27 international wetland sites declared in India by the **Ramsar Convention**.
- The **Pong Reservoir and Gobindsagar Reservoir** is the two most important fishing reservoirs in the Himalayan foothills of Himachal Pradesh.

Anamalai Tiger Reserve

Context

- Residents of two tribal settlements within the limits of the Anamalai Tiger Reserve (ATR), were gearing up for the annual festival of their local deity, Vairapattan.

Anamalai Tiger Reserve

- Aanimalai Tiger Reserve, earlier known as **Indira Gandhi Wildlife Sanctuary and National Park (IGWLS&NP)** and previously as Aanimalai Wildlife Sanctuary, is a protected area located in the **Anaimalai Hills of Tamil Nadu, India**.

- The IGWS has significant anthropological diversity with more than 4600 Adivasi people from six tribes of indigenous people living in 34 settlements.
- The tribes are the **Kadars, Malasars, Malaimalasar s, Pulaiyars, Muduvars and the Eravallan (Eravalar).**
- **It lies South of the Palakkad gap in the Southern Western Ghats.**
- The Anamalai Tiger Reserve falls within the Western Ghats mountain chain of South West India, **a region designated as one of 25 Global Biodiversity Hotspots.**

SACRED GROVES

Why in news?

- Many Sacred groves in the northern region are now fast deteriorating due to rapid urbanisation and land scarcity.

What are sacred groves?

- Sacred groves refer to a **piece of natural vegetation that is protected by a certain community due to religious reasons.**
- The area is **usually dedicated to a local deity.** As a result, local communities tend to take responsibility to protect and nurture the area.
- According to these protections, **hunting and deforestation in these areas are banned** but other activities with a more sustainable process such as honey and deadwood collection are allowed.
- The introduction of **Wild Life (Protection) Amendment Act, 2002, provides government protection to these lands.**

Distribution of Sacred groves in India:

State	No. of Sacred groves	Local Names
Andhra Pradesh	691	<i>Pavitraskhetralu</i>
Arunachal Pradesh	65	<i>Gumpa Forest</i> (since attached to monasteries)
Assam	40	<i>Than, Madaico</i>
Chhattisgarh	600*	<i>Sarna, Devlas, Mandar, Budhadev</i>
Goa	NA*	-
Gujarat	29*	-
Haryana	248	<i>Beed or Bid, Bani, Bann, Janglat, Shamlat</i>
Himachal Pradesh	5000	<i>Deobhumi</i>
Jharkhand	21*	<i>Sarna</i> more than 500 "Jaherthan" in Godda of Jharkhand
Karnataka	1424	<i>Devarakadu, Devkad</i>
Kerala	2000	<i>Kavu, SarpaKavu</i>
Maharashtra	1600	<i>Deorai / Devrai</i>
Manipur	365	<i>Gamkhap, Mauhak</i> (sacred bamboo reserves)
Meghalaya	79	<i>Law kyntang, Law Lyngdoh</i>
Orissa	322*	<i>Jahera, Thakuramma</i>
Puducherry	108	<i>KovilKadu</i>
Rajasthan	9*	<i>Oran, Kenkri, Vani, Shamlatdeh, Devbani, Jogmaya</i>
Sikkim	56	<i>Gumpa forests</i> (since attached to monasteries)
Tamil Nadu	503	<i>KovilKadu</i>
Telangana	65	-
Uttarakhand	18*	<i>Devbhumi, Bugyal</i> (sacred alpine meadows)
West Bengal	670*	<i>Garamthan, Harithan, Jahera, Sabitrithan, Santalburithan</i>

Source: Database at the CPR Environmental Education Centre.

* Started numbers are likely to increase

Eco Sensitive Zone (ESZ)

Context

- The ministry of Environment, Forest and Climate Change has notified 48.32 sq km around the **Thane Creek Flamingo Sanctuary (TCFS)** as an **eco-sensitive zone (ESZ).**

Thane Creek Flamingo Sanctuary (TCFS)

- It is on the western bank of the creek, between the Airoli and the Vashi bridges connecting Mumbai and Navi Mumbai.
- The TCFS has been attracting flamingos in large numbers since 1994.
- In all, 200 species have been reported, even **globally threatened species such as the greater spotted eagle and others such as osprey.**
- Other birds found here are the Pied avocet, western reef heron, black-headed ibis, common redshank, marsh sandpiper, common greenshank, curlew sandpiper, brown-headed gull, whiskered, gull-billed, Caspian and little terns.



Eco-Sensitive Zone

- Eco-Sensitive Zone means the **fragile area that exists within 10 kilometres of protected areas like National Parks and Wildlife Sanctuaries.**
- The purpose of marking an Eco-Sensitive Zone is **to create a kind of shock-absorber around the protected areas.**
- They are declared by the **Ministry of Environment Forests and Climate Change (MoEFCC), Government of India.**
- Commercial mining, stone quarrying, crushing units, setting up industries that cause pollution, establishment of hydro-electric projects, commercial use of firewood, solid waste disposal or wastewater disposal and many other activities are prohibited or banned around ESZ.

SITANADI UDANTI TIGER RESERVE

Context

- Thousands of tribals living in villages located in the core areas of Sitanadi Udanti Tiger Reserve are demanding that their Community Forest Resource rights be recognised.

Sitanadi Udanti Tiger Reserve

- It is located in **Chhattisgarh, India.**
- It was established in 1974 under Wildlife Protection Act of 1972.
- It is named after **Sitanadi River, which originates from this sanctuary and joins Mahanadi River near Deokhut.**

Kondapalli reserve forests

Context

- Tension mounted in Kondapalli reserve forests with the Telugu Desam Party (TDP) leaders planned to visit the forests, alleging illegal mining.

About the Kondapalli Reserve Forest:

- It is a reserved forest in the Krishna district of the Indian state of **Andhra Pradesh.**
- It is under the protection of Andhra Pradesh Forest Department.
- **Tella poniki softwood** is found in the forest, which is useful in making the **Kondapalli Toys.**

Kutch Bustard Sanctuary or Lala-Parjan Sanctuary

Context

- The government has said there are **no Great Indian Bustards in Kutch Bustard Sanctuary** in Gujarat Kutch, a claim that has raised eyebrows among conservationists and wildlife enthusiasts.

Great Indian Bustards and their habitats

- GIBs are the **largest among the four bustard species** found in India, the other three being **MacQueen's bustard, lesser florican and the Bengal florican.**

- GIBs' historic range included much of the Indian sub-continent but it has now shrunken to just 10 per cent of it.
- Among the **heaviest birds with flight**, GIBs prefer **grasslands as their habitats**.
- Being terrestrial birds, they **spend most of their time on the ground** with occasional flights to go from one part of their habitat to the other.
- They **feed on insects, lizards, grass seeds** etc.
- GIBs are considered the **flagship bird species of grassland** and hence barometers of the health of grassland ecosystems.

PRESENT GIB POPULATION

State	Birds
Rajasthan	128
Gujarat	10
Maharashtra	8
Karnataka & AP	10

THREATS

- Fatal collision with power-lines
- Nest predation by native predators (fox, mongoose, crow, monitor lizard) and free-ranging dogs
- Hunting in Pakistan
- Agricultural expansion
- Pesticide prevalence (food reduction and contamination),
- Grazing pressure
- Plantation of shrubs and tree species in grasslands,
- Poor land-use policies
- Habitat Loss



POPULATION DECLINE

- GIB population fell by 90% in the 50 years since 1969
- Population size was 1,260 individuals in 1969
- Fell to 745 in 1978
- 600 in 2000
- 250 around 2011
- Less than 150 GIB in 2019

Karlapat Sanctuary

Context

- The proposed auctioning of 11 mines in Odisha has evoked sharp reactions among environmentalists and citizen groups, who fear that the move could prove disastrous for wildlife as well as the ecosystem.
- **Karlapat bauxite block**, which is going to be auctioned, is the most controversial of all as it shares its border with Karlapat Sanctuary in Kalahandi district.
- Karlapat is a **designated elephant corridor**, besides being home to a range of wildlife.
- The mining would dry up 300 large and small streams flowing down from sanctuary.
- The biggest concern in the latest auction bid is **opening of virgin areas for mining**.
- Wildlife would be pushed into an existential crisis if the government goes ahead with further mining.

About Karlapat Wildlife Sanctuary

- It is a wildlife sanctuary located in Kalahandi district and a popular tourist attraction of **Odisha** in India.
- It lies within the **Eastern Highlands moist deciduous forests ecoregion**.
- This sanctuary is home to many wildlife species like tiger, leopard, sambar, nilgai, barking deer, mouse deer, a wide variety of birds like green munia, **Great Eared-nightjar** and various reptiles.

Peechi-Vazhany Wildlife sanctuary

Context

- A butterfly survey at the Peechi-Vazhani wildlife division has recorded a remarkable increase in the species' numbers.

Common species found are

- Southern Birdwing, the largest butterfly in India, and Grass Jewel, the smallest one.
- Buddha Peacock, the State butterfly of Kerala.

About Peechi-Vazhani wildlife sanctuary

- Located in: **Kerala**, India.
- **Consist of:** Palappilli- Nelliampathi forests including the area of **Chimmony Wildlife sanctuary**.
- **Fauna available:** Bengal tiger, gaur, elephants, dhole, and flying squirrels.

Aravalli Biodiversity Park

Context

- Aravalli Biodiversity Park in Gurugram declared as **India's first "other effective area-based conservation measures" (OECM) site**.
- The proposal to declare Aravalli Biodiversity Park an OECM site was sent by the **National Biodiversity Authority** to the IUCN in December 2020.

About other effective area-based conservation measures" (OECM) tag

- It is a conservation designation for areas that are achieving the effective **in-situ conservation of biodiversity outside of protected areas**.
- **Definition of OECM:** A geographically defined area other than a Protected Area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the in situ conservation of biodiversity, with associated ecosystem functions and services and where applicable, cultural, spiritual, socio-economic, and other locally relevant values.
- **Given by:** This tag is given by the **International Union for Conservation of Nature (IUCN)** to areas that are not protected but support rich biodiversity.
- **No legal implications:** OECM tag does not bring any legal, financial or management implications, but designates the area as a biodiversity hotspot on the international map.
- **Significance:** Help this biodiversity hotspot to get worldwide recognition.

About Aravalli Biodiversity Park:

- **Located in:** Gurugram, Haryana.
- It had several mining pits and large, barren valley-like spaces. That is restored with native plants that helped in **seasonal water accumulation**, making them special micro-habitats within the larger Aravalli landscape.
- The Aravallis, are one of the oldest mountain ranges in the world.
- **Vegetation:** The natural vegetation of the park falls within the Northern Tropical Dry Deciduous Forest and Northern Tropical Thorn Forest types recognised by **Champion and Seth**.
- The area is highly degraded due to **past mining** and infested with **Prosopis juliflora**.
- It has **medicinal plant conservatory** to promote conservation, education and awareness on the importance of plants in health care system.
- **Sacred Grove** has been developed in this park. Which have plant species with religious importance such as Ficus, Aegle, Nyctanthes arbor tristis, Sapindus, Madhuca etc.

India's Forest area gain

Context

- As per annual Economic Survey, India has **increased its forest area** in the past decade and **ranks third globally** in average annual net gain in forest area from 2010-2020. India added an average of 2,66,000 hectares of additional forest area every year during the period.

Key highlights:

- **Global scenario:** The top 10 countries account for 66% of the world's forest area are **Brazil** (59%), Peru (57%), Democratic Republic of Congo (56%) and Russia (50%).
- **India specific:**
- Forests covered **24% of India's total geographical area** accounting for **2% of the world's total forest area in 2020**.
- **Forest cover in terms of area under forests:** Among Indian States, **Madhya Pradesh** with 11% of India's total forest cover, had the largest area under forests in 2021, followed by **Arunachal Pradesh (9%), Chhattisgarh (8%), Odisha (7%) and Maharashtra (7%)**.
- **Forest cover to the geographical area:** **Mizoram (85%), Arunachal Pradesh (79%), Meghalaya (76%), Manipur (74%) and Nagaland (74%)** were the top five States in terms of highest proportion of forest cover to the geographical area of the State in 2021.
- India's increase in forest cover (2011-21) is attributed to enhancement in **very dense forest cover**, which rose by 20% during the period. Open forest cover also improved by 7% cent during the period.
- Most of the increases in India's forests have occurred outside areas traditionally marked as 'forest' and consists of **plantations and orchards**.

Forest Survey report 2021

Context:

- The 'India State of Forest Report (ISFR) 2021' released.

What is the India State of Forest Report?

- It is an **assessment of India's forest and tree cover**.
- It is **published every two years**.
- **Published by:** the Forest Survey of India under the Ministry of Environment, Forests and Climate Change.
- **First survey** was published in **1987**.
- ISFR 2021 is the **17th**.
- **Data collection method:** Data computed through **wall-to-wall mapping** of India's forest cover through **remote sensing techniques**.
- **Significance of the ISFR:**
- Provide information provides inputs for various global level inventories, reports such as **GHG Inventory, Growing Stock, Carbon Stock, Forest Reference Level (FRL) and international reporting to UNFCCC targets under CBD Global Forest Resource Assessment (GFRA)** for planning and scientific management of forests.
- Information given in the report would **provide valuable information for policy, planning and sustainable management of forest and tree resources in the country**.

What are the key findings of ISFR 2021?

- ISFR-2021 provides information on
- **forest cover and tree cover**
- **mangrove cover**
- **growing stock and carbon stock in India's forests**
- **forest fire monitoring**
- **forest cover in tiger reserve areas:**
- **above ground estimates of biomass using SAR data & climate change hotspots in Indian forests.**

MAJOR FINDINGS

1) Total forest and tree cover

- **Existing situation:** The **total forest and tree cover** of the country is 80.9 million hectare which is 24.62 percent of the geographical area of the country.
- **Bamboo forests** have grown from 13,882 million culms (stems) in 2019 to 53,336 million culms in 2021.
- **In comparison to 2019 report:**

- As compared to the assessment of 2019, there is an **increase of 2,261 sq km** in the total forest and tree cover of the country.
- Out of this, the increase in the forest cover has been observed as 1,540 sq km and that in tree cover is 721 sq km.
- Increase in forest cover has been observed in **open forest followed by very dense forest.**
- **Five states in the Northeast** – Arunachal Pradesh, Manipur, Meghalaya, Mizoram and Nagaland have all shown **loss in forest cover.**

- **Top three states:** showing increase in forest cover are
- **Andhra Pradesh (647 sq km) followed by**
- **Telangana (632 sq km) and**
- **Odisha (537 sq km).**

- **Top states in terms of Area-wise forest cover are**
- **Madhya Pradesh has the largest forest cover in the country followed by**
- **Arunachal Pradesh,**
- **Chhattisgarh,**
- **Odisha and**
- **Maharashtra**

- **Top states in terms of Forest cover as percentage of total geographical area are**
- Mizoram (84.53%)
- Arunachal Pradesh (79.33%)
- Meghalaya (76.00%)
- Manipur (74.34%) and
- Nagaland (73.90%)

- States and UT's that have **more than 75 percent forest cover** are
- Lakshadweep
- Mizoram
- Andaman & Nicobar Islands
- Arunachal Pradesh and
- Meghalaya

2) Mangrove cover:

- **Total mangrove cover** in the country is 4,992 sq km.
- **In comparison to 2019 report:** An **increase of 17 sq Km in mangrove cover** has been observed as compared to the previous assessment of 2019.
- **Top three states showing mangrove cover increase** are
- Odisha (8 sq km) followed by
- Maharashtra (4 sq km) and
- Karnataka (3 sq km).

3) Total carbon stock:

- **Total carbon stock** in country's forest is estimated to be 7,204 million tones.
- **In comparison to 2019 report:** There an increase of 79.4 million tonnes in the carbon stock of country as compared to the last assessment of 2019.

4) Forest fire:

- 35.46 % of the forest cover is prone to forest fires.
- Out of this, 2.81 % is extremely prone, 7.85% is very highly prone and 11.51 % is highly prone.
- The highest numbers of fires were detected in **Odisha, Madhya Pradesh and Chhattisgarh.**



5) Forest cover in the Tiger Reserve:

- FSI has included a new chapter related to the **assessment of forest cover in the Tiger Reserves, Corridors and Lion conservation area of India.**
- Change in forest cover, during the period between ISFR 2011 (data period 2008 to 2009) and the current cycle (ISFR 2021, data period 2019-2020) within each Tiger Reserves has been analysed.
- The forest cover in tiger corridors **has increased** by 37.15 sq km (0.32%) between 2011-2021, but decreased by 22.6 sq km (0.04%) in tiger reserves.
- Pakke Tiger Reserve** in Arunachal Pradesh has the **highest forest cover**, at nearly 97%.
- Importance:** Decadal assessment of change in forest cover within Tiger Reserves, Corridors and Lion conservation area helps in **assessing the impact of conservation measures** and management interventions that have been implemented over the years.

6) Above Ground Biomass

- FSI, in collaboration with **Space Application Centre (SAC), ISRO**, Ahmedabad, initiated a special study for estimation of Above Ground Biomass (AGB) at pan-India level, using L- band of Synthetic Aperture Radar (SAR) data.
- The results for the States of **Assam and Odisha** (as well as AGB maps), were presented earlier in ISFR 2019.

7) 'Mapping of Climate Change Hotspots in Indian Forests'

- FSI in collaboration with **Birla Institute of Technology & Science (BITS) Pilani, Goa Campus** has performed a study based on 'Mapping of Climate Change Hotspots in Indian Forests'.
- Objective was to map the climatic hotspots over the forest cover in India, using computer model-based projection of temperature and rainfall data, for the three future time periods i.e. year 2030, 2050 and 2085.

What kind of forests are growing?

- ISFR 2021 has shown an increasing trend in forest cover overall, the trend is not uniform across all kinds of forests.
- Three categories of forests are surveyed
- very dense forests** (canopy density over 70%)
- moderately dense forests** (40-70%) and
- open forests** (10-40%)

Scrubs (canopy density less than 10%) are also surveyed but not categorised as forests.

ISFR 2021 FINDINGS:

- Very dense forests:** increased by 501 sq km.
- Moderately dense forests**, or "natural forests: there is a 1,582 sq km decline.
- Open forest areas:** there is an increase of 2,621 sq km.
- Scrub area:** It has increased by 5,320 sq km.

COVER STORY				EXPLAINED
DENSE FOREST LOST				
	2019-21	2003-13	2013-21	
VDF to NF	150	288	982	VDF: Very dense forest (over 70% canopy)
MDF to NF	1,493	6,714	11,724	MDF: Medium dense forest (40-70% canopy)
Total	1,643	7,002	12,706	OF: Open forest (10-40% canopy)
GAINED IN PLANTATIONS				
	2019-21	2003-13	2013-21	
NF to VDF	37	43	427	NF: Non forest
NF to MDF	512	3,591	6,715	
Total	549	3,634	7,142	

All figures in sq km

What explains the decline in the Northeastern states?

- Northeast states account for 7.98% of total geographical area but 23.75% of total forest cover.
- Forest cover** in northeast states shown an overall decline of 1,020 sq km.
- Reason for decline in forested areas:** are natural calamities, particularly landslides and heavy rains, in the region as well as to anthropogenic activities such as shifting agriculture, pressure of developmental activities and felling of trees.
- Challenge:** Northeastern states follow a different ownership pattern – community ownership and protected tribal land – which makes conservation activities challenging.

What impact has climate change had?

- The report estimates that by 2030, **45-64% of forests in India** will experience the effects of climate change.
- Ladakh** (forest cover 0.1-0.2%) is likely to be the **most affected**.

How comprehensive a picture does the survey present?

- Survey results could be misleading as it **includes plantations** – such as coffee, coconuts or mango and other orchards – **under forest cover**.
- These plantations are distinctly different from natural forests where one hectare would be home to hundreds of species of trees, plants and fauna, whereas such plantations house only one species of tree.

Forest land in India

- The word '**forest**' is **not defined in any Central Forest Act**, namely the Indian Forest Act (1927), or the Forest Conservation Act (1980).
- The term '**forest**' is **yet to be defined by the Centre** as the Central government has not laid down any criterion to define forest.
- Out of the recorded forest area in the country, **4,34,853 sq km fall under the Reserved Forests category**, 2,18,924 sq km under the **Protected Forests category**, and 1,13,642 sq km are of **unclassed forests**.

Forest cover and tree cover

- The Ministry of Environment, Forest & Climate Change defines
 1. '**Forest cover**' in India as "all lands, more than one hectare in area with a tree canopy density of more than 10%", and
 2. '**Tree cover**' as "tree patches outside recorded forest areas exclusive of forest cover and less than the minimum mappable area of one hectare".
 3. '**Trees outside forest**', or TOF as "trees existing outside the recorded forest area in the form of block, linear & scattered size of patches". Since tree cover measures only non-forest patches that are less than 1 hectare, it is only a part of TOF.
 4. Forest also has legal connotation. An area of land recorded as forest in revenue records or proclaimed to be forest under a forest law or Act is also described as forest.
 5. Thus, "forest area" is an area recorded as forest in the government records. Often this term is also written as "recorded forest area".
- The recorded forest area is categorized into "**Reserved Forest**", "**Protected Forest**" and "**Unclassed Forest**".
 1. **Reserved Forest**: An area notified under the provisions of India Forest Act or the State Forest Acts having full degree of protection. In Reserved Forests all activities are prohibited unless permitted.
 2. **Protected Forest**: An area notified under the provisions of India Forest Act or the State Forest Acts having limited degree of protection. In Protected Forests all activities are permitted unless prohibited.
 3. **Unclassed Forest**: An area recorded as forest but not included in reserved or protected forest category. Ownership status of such forests varies from state to state.

Wasteland in India:

- As per the **Wasteland Atlas, 2019**, published by the **Ministry of Rural Development**, the total wasteland in the country is 5,57,665.51 sq km.
- Wasteland is defined not as desertified land, but **land that not used for agriculture, commercial use or as forest land**. For instance, it could use grasslands, that are used by communities for grazing.

State's Power

- **State are responsible for categorising forest land, and resolving dispute between these two departments.**
- The **Indian Forest Act, 1927** gives states the rights to notify **Reserved Forests** in their areas.

Kerala Bird Atlas

Context

- Kerala gets its first ever scientific bird atlas.

About Kerala Bird Atlas (KBA):

- It is first-of-its-kind state-level bird atlas in India.
- KBA was prepared based on systematic surveys held twice over 60 days a year during the wet (July to September) and dry (January to March) seasons between 2015 and 2020.

Significance:

- It has created solid **baseline data** about the distribution and abundance of various bird species across all major habitats giving an impetus for futuristic studies.
- It is Asia's largest bird atlas in terms of geographical extent, sampling effort and species coverage derived from the aggregation of 25,000 checklists.
- It is considered to be a **valuable resource for testing various ecological hypotheses** and suggesting science-backed conservation measures.

Key outcomes:

- It accounted for nearly three lakh records of 361 species, including 94 very rare species, 103 rare species, 110 common species, 44 very common species, and 10 most abundant species.
- Species count was higher during the dry season than in the wet season.
- Species richness and evenness were higher in the northern and central districts than in the southern districts.
- Most of the endemics were concentrated in the Western Ghats while the threatened species were mostly along the coasts.

Asian Waterbird Census

Context:

- **Asian Waterbird Census (AWC)**, an annual count of waterbirds, has found lower waterbird species diversity at East Delhi's **Sanjay Lake** compared to past three years.

AWC

- It is an **annual exercise to count the waterbirds** and monitor the wetlands for conservation of migratory birds and their habitats along the **Central Asian Flyway**.
- The census is being carried out across **Asia and Australasia simultaneously**.
- The AWC is conducted in January each year i.e annually.
- It is coordinated by the **Wetlands International South Asia** and the **Bombay Natural History Society**. It is part of the International Waterbird Census.
- It is being carried out across seven wetlands in the NCR that are
 - Hastinapur Wildlife Sanctuary
 - Dhanauri and Surajpur wetlands in Greater Noida
 - Delhi Zoo and Sanjay Lake
 - Okhla Bird Sanctuary
 - Najafgarh Jheel; and
 - Yamuna River.

Census showing decline:

- Only 13 species are recorded.
- The lower species diversity is a **sign of degradation of the lake**, since **waterbirds are an indicator of its health**.

Sanjay Lake:

- **Located in Delhi**.
- **Maintained by** the Delhi Development Authority.

WILDLIFE SPECIES

White-Cheeked Macaque

Context

- Scientists find White-Cheeked Macaque in Arunachal Pradesh.

Significance of this discovery:

- The rare species has **not been reported after a single sighting in 2015.**
- It marks a **new addition to mammals of India.**

White- Cheeked Macaques:

- **Habitation and distribution:** It is found only in Tibet and Arunachal Pradesh in northeastern India.
- They are distinct from other macaques found in the region by displaying white cheeks, long and thick hairs on the neck area, and a longer tail.
- **Conservation status:**
- This species' exact conservation status has not yet been determined
- It has **not been yet included** in the Wildlife (Protection) Act, 1972 of India.
- **Species of Macaque found in India:** White-Cheeked Macaques, Arunachal Macaque, Assamese Macaque (*Macaca assamensis*) and Rhesus Macaque (*Macaca mulatta*).
- **Threat to this species:** Hunting by locals for consumption and habitat degradation due to urbanisation and infrastructure development.



Black Percher

Context

- Black Percher a dragon fly species sighted in Seshachalam Hill for the first time.

About Black Percher or Black Ground Skimmer (*Diplacodes lefebvrii*):

- It is a species of dragon fly.
- **Conservation status:**
- It is labelled as of '**least concern**' the International Union for Conservation of Nature and Natural Resources (IUCN) Red List of threatened species.
- **Habitat and distribution:** It is a common species native of Africa and southern Eurasia. It can be found in almost any type of freshwater habitat.



Gee's golden langur

Context

- The Assam Forest Department move of converting the Kakoijana Reserve Forest into the Kakoijana Bamuni Hill Wildlife Sanctuary is opposed by Assam villagers.

About Kakoijana Reserve Forest:

- It is one of the better-known homes of the golden langur (*Trachypithecus geei*).
- It inhabited by the Koch-Rajbongshi, Boro, Garo, Rabha and Gorkha communities.
- Some of the areas inside the forest as sacred and its sanctity should be maintained.
- It is home to rarest & highly endangered species like Binturong, Jungle Fowl, Pangolin, Hornbill, Leopard, Porcupine, Python, Lesser Adjutant Stork etc.

About Golden langur:

- Gee's golden langur, also known as simply the golden langur, is an **Old World monkey**.
- **Endemic species:** It is found only in Assam and Bhutan.
- **Conservation status:**
- It is a **Schedule-I species** under the **Wildlife Protection Act of 1972**.
- It is listed as among the world's 25 most endangered primates.
- It is listed as "**rare species**" in the Red Data Book of International Union for Conservation of Nature.
- It is listed under the **Appendix I of CITES**.



Indian fruit bats

Context

- The Nilgiris' only colony of Indian fruit bats, one of the largest bat species in the world, is under threat from local residents who want the trees they roost on to be cut down.

Nipah virus scare

- Cases of Nipah virus were reported in Kerala, and fears that the bats carry zoonotic diseases that are transmissible to humans.

About Indian fruit bats:

- The bats, also known as **flying foxes**, have been seen in the same area in Coonoor for the last few years.
- The bats play a **crucial role in the health of local ecology as they are seed dispersers of many varieties of fruit-bearing trees**.
- This species is often regarded as **vermin** due to its destructive tendencies towards fruit farms, but the benefits of its pollination and seed propagation often outweigh the impacts of its fruit consumption.
- The Indian flying fox is found across the Indian Subcontinent, including in Bangladesh, Bhutan, India, Tibet, Maldives, Myanmar, Nepal, Pakistan and Sri Lanka.
- IUCN Status: **Least Concern**

SEA CUCUMBER

Context

- The Indian Coast Guard (ICG) team at Tamilnadu seized two tonnes of sea cucumber.

About sea cucumber:

- It is a banned marine species.
- Sea cucumbers are in **high demand in China and Southeast Asia**.
- Sea cucumber in India is treated as an **endangered species listed under schedule I of Wildlife Protection Act of 1972**.
- It is primarily smuggled from Tamil Nadu to Sri Lanka.



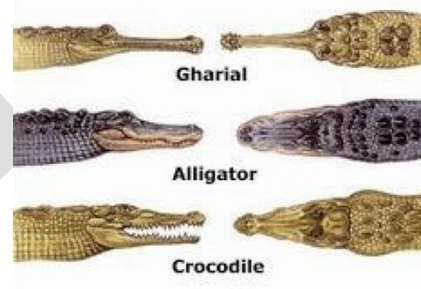
3 species of crocodilians

Context

- Odisha's Kendrapara became the **only district in India** to have all 3 species of crocodilians found in the country.
- **Bhitarkanika National Park** in the district is also the **home of saltwater crocodiles** (*Crocodylus porosus*).
- The crocodilian family consists of **27 different species** that are subdivided into three families: **True crocodiles, alligators and caimans and gharials**.
- All three species of crocodilians in the river systems of Odisha were on the verge of extinction by the 1970s.
- Piecemeal efforts were being made from the 1960s onwards to save them.
- The **gharial and saltwater crocodile conservation programme** was first implemented in Odisha in early 1975 and subsequently, the **mugger conservation programme** was initiated.
- Since 1984, more than 600 muggers have been captive-bred and released in Similipal.
- In 1975, the **Union ministry of forest and environment**, in collaboration with the **United Nations Development Programme**, had started a **crocodile breeding and rearing project** in Dangamala within the Bhitarkanika.

About 3 species of crocodiles:

- The **mugger (or marsh) crocodile** is found in lakes and rivers throughout the country. It is **India's most common species**. They are not as long as saltwater crocodiles. It is listed as **vulnerable by IUCN**.
- The **saltwater crocodile** is found along the eastern coast of the country (of Odisha, West Bengal, Andhra Pradesh and Tamil Nadu) and the Nicobar and Andaman Islands. It listed as **least concern by IUCN**.



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ALLIGATOR VERSUS CROCODILE

COMPARING THE 2 CROCODILIANS

CROC ESTIMATES

MUGGER CROCODILE: Muggers are reported from over ten states of the country. The wild population is tentatively estimated to be 2,500-3,500 individuals in India

SALTWATER CROCODILE: This species inhabits the eastern coast of India. Around 1,000 adults are estimated to be surviving in India

GHARIAL: It is estimated that there are just 500-550 adult individuals of this IUCN rated critically endangered species currently surviving in the country. It is found in the Ganges, Chambal, Ramganga and Mahanadi



HOW TO DISTINGUISH

Gharials are said to be easy to distinguish between all the crocodile species that are found in India. It has long and slender jaws and a ghara (pot like structure). Muggers crocodile also known as marsh crocodile, is a more broad-snouted than the saltwater crocodile.



- U-shaped rounded snout
- Live in freshwater
- Have wide jaws; upper jaw is wider than the lower jaw
- Only upper teeth is visible when the mouth is closed
- No functioning salt glands
- Sensory pits on scales around the jaw.



- V-shaped rounded snout
- Live in freshwater and saltwater
- Have narrow jaws; upper and lower jaws are of the same size
- Both upper and lower teeth is visible when the mouth is closed
- Functioning salt glands
- Sensory pits in every scale of the body

Pediaa.com

Gharial Context

- After almost 15 years, gharials mated in the Satkosia gorge and hatchlings were seen surrounding an adult gharial.

About gharials:

- The male gharial has a distinctive boss at the end of the snout, which resembles an earthenware pot known in Hindias. Hence, the name.

Habitat:

- Foremost flowing rivers with high sand banks that they use for basking and building nests
- Gharials once inhabited all the major river systems of the Indian Subcontinent, from the Irrawaddy River in the east to the Indus River in the west.
- Their distribution is now limited to only 2% of their former range
- They are found in **Girwa River, Chambal River, Ken River, Son River, Mahanadi River, Ramganga River**



Threats:

- Hunting for **skins, trophies and indigenous medicine** and their eggs collected for consumption.
- Decrease of riverine habitat as dams, barrages, irrigation canals and artificial embankments were built; siltation and sand-mining changed river courses

Conservation efforts in India:

- **Project Crocodile** for intensive captive breeding and rearing program began in 1975 (Government of India+ United Nations Development Fund + Food and Agriculture Organization)

Protected areas for gharial in India:

- National Chambal Sanctuary- Madhya Pradesh
- Katerniaghat Wildlife Sanctuary- Uttar Pradesh

Conservation Status:

- **Critically Endangered** – IUCN Red List.
- It is a **Schedule 1 species** under Indian wildlife act, 1972

Anaimalai flying frog

Context

- A critically endangered frog species, the *Racophorus pseudomalabaricus* or Anaimalai flying frog, is getting a new home.

Frog facts

- It is also known as the **False Malabar Gliding Frog**.
- **Endemic to the southern part of the Western Ghats**, the numbers of these frogs have declined rapidly due to the loss of habitat.



Chrysilla volupe spiders

Context

- Rare *Chrysilla volupe* spiders discovered at Puttenahalli lake.

About *Chrysilla volupe* spiders:

- The *Chrysilla volupe* was **believed to be extinct for 150 years**, until it was discovered at the **Wayanad Wildlife Sanctuary (WWS)** in 2018.
- The spider belongs to the family of jumping spiders (Salticidae) and scientifically named *Chrysilla volupe*.
- Male spiders are 5.44 mm long including stretched legs and 1.76 mm wide.
- They have a carapace in reddish orange colour with two iridescent blue stripes, stated PNLIT in the release.
- Females measure 2.61 mm long and 0.88 mm wide, and have a greyish carapace with grey eyebrows with all legs yellow in colour.



About Puttenahalli lake

- It is a **small, restored freshwater lake** located in **Bangalore**.
- The primary water sources are **rain and surface water** diverted to the lake through channels.
- The lake is currently maintained by Puttenahalli Neighbourhood Lake Improvement Trust (PNLIT).
- The lake was on the brink of extinction, but due to the efforts of PNLIT, is now a haven for bird-watchers and on its way to being completely restored.

About The Wayanad Wildlife Sanctuary

- It is an animal sanctuary in **Wayanad, Kerala, India**.
- Wayanad Wildlife Sanctuary is the **second largest wildlife sanctuary in Kerala**.
- Established in 1973, the sanctuary is now an **integral part of the Nilgiri Biosphere Reserve**.
- It is bounded by protected area network of **Nagarhole and Bandipur of Karnataka in the northeast, and on the southeast by Mudumalai of Tamil Nadu**.
- It is part of the Deccan Plateau and the vegetation is predominantly of the south Indian moist deciduous teak forests.
- Wayanad district has the largest population of Adivasi in Kerala. Scheduled tribes here include Paniyas, Kurumas, Adiyans, Kurichiyas, Ooralis and Kattunaikkans.
- The sanctuary is part of the **Nilgiri Biosphere Reserve**, which is a UNESCO World Heritage Site.

Blue whales

Context:

- Researchers have recorded, reportedly for the **first time from the waters off Kerala, the song of blue whales**.
- A hydrophone deployed off Vizhinjam to capture the sounds of migrating humpback whales had instead recorded the call of the endangered blue whale.
- While humpbacks are known for their high-frequency vocalisations, **blue whale songs are a series of short, low-frequency moans**.
- Whale sounds (moans, cries, chirps and cries) are essentially **communication tools**, for activities such as socialising and mating.
- So far, the presence of blue whales in the waters off Kerala have been reported through a few carcasses that beached. But the recording of their calls confirms their presence along this stretch of the western coast.

About blue Whales:

- The blue whale was once abundant in nearly all the Earth's oceans until the end of the 19th century.
- It was **hunted almost to the point of extinction by whalers until the International Whaling Commission banned all blue whale hunting in 1966**.
- **The International Union for Conservation of Nature** has listed blue whales as **endangered** as of 2018.
- It continues to face numerous threats, both man-made (ship strikes, pollution, ocean noise and climate change), and natural (killer whale predation).
- The blue whale is the **largest known animal to have ever existed**.

Pygmy blue whales

- Though the larger blue whale populations are found around Antarctica where krill, their favourite food, is available, the occurrence of **pygmy blue whales is reported in the Indian Ocean**.

Whale sharks

Context:

- Rare rescue mission led by the Andhra Pradesh Forest Department is an exemplary success story of active involvement of the local community in species conservation.

Facts about whale shark:

- Whale sharks (Rhincodon typus) are the **world's largest fish**.
- **Protection status:**

- Endangered in the IUCN Red list
- Schedule I of the Wild Life Protection Act
- Habitat and distribution:
- Found in **all the tropical oceans of the world**, whale sharks have white spotted colouration, which make these gentle giants easy to distinguish.
- Gujarat has the maximum density of whale shark population in the Indo-pacific region.
- Indicator species: The presence of whale sharks indicates the availability of plankton and the overall health of the oceans.

GANGETIC DOLPHIN

Context:

- U.P. youth beat endangered Gangetic dolphin to death.

About South Asian river dolphin (*Platanista gangetica*)

- It is an **endangered freshwater or river dolphin** found in the region of Indian subcontinent, which is split into two subspecies,
- the Ganges river dolphin and the Indus river dolphin
- Ganges river dolphin is primarily found in the **Ganges and Brahmaputra Rivers** and their tributaries in India, Bangladesh, and Nepal.
- Indus river dolphin is found **only in the main channel of the Indus River in Pakistan** and in the **River Beas** (a tributary of the Indus) in Punjab in India.

Save Dolphin to save Ganga

The Centre has declared the dolphin a national aquatic animal to save the rare freshwater species from disappearing from the country's aqua map

Know about **Platanista gangetica**

Length: **1.67 m**

Males grow up to **2.12 m** | Females grow up to **2.67 m**

Females give birth to only one calf, once in **2-3 yrs**

Generally blind, they catch their prey by emitting ultrasonic sound to gauge distance, mass etc

Assam, UP, MP, Rajasthan, Bihar, Jharkhand & W Bengal in the rivers **Chambal, Sone, Kosi, Brahmaputra** Prefer deep waters, in & around Indian river confluences

GANGETIC DOLPHIN: A rare specie almost extinct

Lost cousin: The Yangtze dolphin, Baiji, of China

Grim Future | Dwindling number due to killing, habitat fragmentation

Once counted in 10's of 1000's, the amount has reduced in last century to **1,500**

"Endangered" & placed in **Schedule-I of Wildlife (Protection) Act, 1972**

Ranges of the Ganges river dolphin and of the Indus river dolphin

- The Ganges river dolphin has been recognized by the government of India as its **National Aquatic Animal** and is the **official animal of the Indian city of Guwahati**.
- The Indus river dolphin has been named as the **National Mammal of Pakistan**.

Synonms

- **Ganges subspecies:** Gangetic dolphin, **Ganges susu**, shushuk (Being a mammal, the Ganges river dolphin cannot breathe in the water and must surface every 30–120 seconds. Because of the sound it produces when breathing, the animal is popularly referred to as the susu.
- **Indus subspecies:** **bhulan**, Indus dolphin, Indus **blind dolphin**

Distribution and habitat:

- The South Asian river dolphins are native to the freshwater river systems located in Nepal, India, Bangladesh, and Pakistan.

Conservation

- International trade is prohibited by the listing of the South Asian river dolphin on **Appendix I of the Convention on International Trade in Endangered Species**.
- It is protected under the **Indian Wildlife Act**.
- Both subspecies are listed by the IUCN as **endangered** on their Red List of Threatened Species.
- The species is listed on **Appendix I and Appendix II of the Convention on the Conservation of Migratory Species of Wild Animals**.

Major Threats

- Habitat loss / Degradation / Disturbances – Annual flood, Changing River course.
- Inland waterways / Movement of large cargo vessels.
- Various anthropogenic / religious activities.
- Excessive harvesting/hunting/food – subsistence use/ local trade.
- Directed killing/ poaching or Accidental killing – by catch/ fisheries related entanglements.
- Water pollution – Agriculture related or direct disposal of sewage – on both the banks of River/chemical.

Project Dolphin

- It aims at the **conservation and protection of the Dolphins in rivers and oceans** of the country.
- It involves conservation of Dolphins and the aquatic habitat through the use of **modern technology – specially in enumeration and anti-poaching activities**.
- It will **engage the fishermen** and other rivers and ocean dependent population and will strive for improving the livelihood of the local communities.
- It will help in the **mitigation of pollution in rivers and the oceans**.
- It will give a boost to biodiversity, create **employment opportunities** and act as a centre of **attraction for tourism**.

CARACAL

Context:

- The National Board for Wildlife and MOEFCC included the caracal in the list of **critically endangered species**. The **recovery programme for critically endangered species in India** now includes 22 wildlife species.

About caracal:

- Besides India, the caracal is found in several dozen countries across Africa, the Middle East, Central and South Asia.
- It is '**least concern**', in IUCN Red list.
- While it flourishes in parts of Africa, its numbers in Asia are declining.
- In India, it is called **siya gosh**.
- The caracal could be earlier found in arid and semi-arid scrub forest and ravines in Rajasthan, Delhi, Haryana, Punjab, Gujarat, Madhya Pradesh, Uttar Pradesh, Maharashtra, Andhra Pradesh, Telangana, Odisha, Jharkhand, and Chhattisgarh. Today, its **presence is restricted to Rajasthan, Kutch, and parts of MP**.
- **Threats:** The caracal is rarely hunted or killed, it is being captured to be sold as exotic pets, loss of habitat and increasing urbanisation. The loss of habitat also affects the animal's prey, which includes small ungulates and rodents.



Integrated Development of Wildlife Habitats' (IDWH)

- It is an on-going **Centrally Sponsored Scheme**.
- Under IDWH, the **financial assistance** is provided to State/UT Governments for protection and conservation of wildlife and its habitats in Protected Areas (PAs) as well as outside PAs and also for the recovery programmes of the critically endangered species.

Components of the scheme

- Support to Protected Areas (National Parks, Wildlife Sanctuaries, Conservation Reserves and Community Reserves)
- Protection of Wildlife Outside Protected Areas
- Recovery programmes for saving critically endangered species and habitats

Recovery programmes for saving critically endangered species

- So far, 21 species have been identified under the recovery programme. These are the Snow Leopard, Bustard (including Floricans), Dolphin, Hangul, Nilgiri Tahr, Marine Turtles, Dugongs, Edible Nest Swiftlet, Asian Wild Buffalo, Nicobar Megapode, Manipur Brow-antlered Deer, Vultures, Malabar Civet, Indian Rhinoceros, Asiatic Lion, Swamp Deer, Jerdon's Courser, the Northern River Terrapin, Clouded Leopard, Arabian Sea Humpback Whale and Red Panda.

Rare turtles rescued in Maharashtra return to Assam

Context:

- Rare turtles rescued in Maharashtra return to their native habitat in Assam after an 18-hour flight.
- The turtles belong to five species, including the spotted pond turtle and the crowned river turtle marked as endangered in the Red List of the International Union for Conservation of Nature.

Spotted pond turtle

- The black pond turtle also known as the spotted pond turtle or the Indian spotted turtle, is a species of freshwater turtle **endemic to South Asia**.
- It is found in southern **Pakistan (Indus and Ganges River drainages), northeastern India (Assam), Sri Lanka, and Bangladesh**.
- **IUCN Status:** Endangered



Crowned river turtle

- The brahminy river turtle or crowned river turtle is a species of turtle that is **endemic to South Asia**.
- It is found in northern India, Pakistan, and Bangladesh in the watersheds of the **Ganges, Brahmaputra, and Indus rivers**.
- **IUCN STATUS:** Endangered

Olive Ridley turtle

Context:

- Researchers of the Zoological Survey of India (ZSI) are carrying out **tagging of Olive Ridley turtles** at three mass nesting sites – **Gahirmatha, Devi River mouth and Rushikulya**.

More about news:

- The exercise was undertaken in Odisha in January 2021 **after a span of about 25 years** and 1,556 turtles had been tagged.

- The metal tags affixed to turtles are non-corrosive and they do not harm their body. The metal can be removed later.
- The tags are uniquely numbered containing details such as name of organisation, country-code and email address.
- If researchers in other countries come across the tagged turtles, they could email their location in longitude and latitude.

Significance:

- It would reveal the inter-rookery movement of turtles in Odisha.
- The migration pattern to other countries would be recorded in detail.

Olive Ridley

- **Protection status:**
- **Vulnerable under the International Union for Conservation of Nature's Red list.**
- All five species of sea turtles found in India are included in **Schedule I of the Indian Wildlife Protection Act, 1972**
- **Appendix I of the Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES)**, which prohibits trade in turtle products by signatory countries.

Threats to Olive Ridley turtles

- Three main factors that damage Olive Ridley turtles and their eggs –
- **heavy predation of eggs by dogs and wild animals**
- **indiscriminate fishing with trawlers and gill nets, and**
- **beach soil erosion.**
- **Dense fishing activity** along the coasts of Andhra Pradesh, Odisha and West Bengal, especially ocean-going trawlers, **mechanised fishing boats and gill-netters** pose a severe threat to turtles.



Nesting habits

- The Olive Ridley has one of the most extraordinary nesting habits in the natural world, including **mass nesting called arribadas**.
- The 480-km-long Odisha coast has three **arribada beaches at Gahirmatha, the mouth of the Devi river, and in Rushikulya**, where about 1 lakh nests are found annually.
- More recently, a new mass nesting site has been discovered in the **Andaman and Nicobar Islands**, with more than 5,000 nests reported in a season.

LEATHERBACK TURTLE

What is the issue?

- NITI Aayog's ambitious tourism vision and proposals for tourism and port development in the Andaman and Nicobar (A&N) Islands could overrun some of the most important nesting populations of the Giant Leatherback turtle in the Indian Ocean.
- This proposed intensive growth plan in islands contradicts **National Marine Turtle Action Plan**.

About Leatherback turtle:

- Leatherback turtles are named for their shell, which is leather-like rather than hard, like other turtles.
- It is **one of the largest** seven species of sea turtles on the planet.
- This is one of the **most long-ranging sea turtles** are found in all oceans **except the Arctic and the Antarctic**.
- Within the Indian Ocean, they **nest only** in Indonesia, Sri Lanka and the **Andaman and Nicobar Islands**.
- It is listed in **Schedule I of India's Wildlife Protection Act, 1972**.
- Globally, leatherback status according to IUCN is listed as **Vulnerable**.



Galathea Bay Wildlife Sanctuary

- It is a National Park located in the Union Territory of **Andaman and Nicobar Islands**, India.
- It is located on the island of Great Nicobar in the Nicobar Islands, which lie in the eastern Indian Ocean (Bay of Bengal).
- It forms part of the **Great Nicobar Biosphere Reserve**, which also includes the larger Campbell Bay National Park.

RED-EARED TURTLE

Context

- Red-eared slider turtle, a huge hit with pet lovers and an invasive species is posing a threat to the biodiversity of water bodies in Kerala.

About red-eared turtle

- It **grows fast** and is considered as one of the world's worst invasive species.
- They are omnivores and require lots of aquatic plants.
- This species is native from the area around the **Mississippi river and the Gulf of Mexico**, they live in still and warm water bodies such as ponds, lakes, streams, and slow- running rivers.
- They pose a major **threat to native turtle specials**, as they grow large, produce more offspring, and are aggressive.
- They can also **transfer diseases and parasites to native reptiles**.
- In Australia and the European Union, it is illegal to import and keep these turtles.
- **The International Union for Conservation of Nature (IUCN)** lists red eared slider turtle as a species of '**least concern**', mainly due to their large numbers in wild and stable population.



MANDARIN DUCK

Context:

- Considered the most beautiful duck in the world, the Mandarin duck made an appearance in the Maguri-Motapung beel in Assam after more than a century.

What is the Mandarin duck?

- This "small-exotic looking bird" **native to East Asia**.
- This migratory duck breeds in Russia, Korea, Japan and northeastern parts of China.
- It rarely visits India, as it does not fall in its usual migratory route.
- It is listed as **Least Concerned** species under the IUCN.



Maguri beel

- The Maguri Motapung wetland is an **Important Bird Area** as declared by the **Bombay Natural History Society**.
- It is located close to the Dibru Saikhowa National Park **in Upper Assam**.
- The entire ecosystem (grassland and wetland) is very important as it is home to a number of endemic birds like **Black-breasted parrotbill and Marsh babbler**.

Denison barb (Miss Kerala)

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.

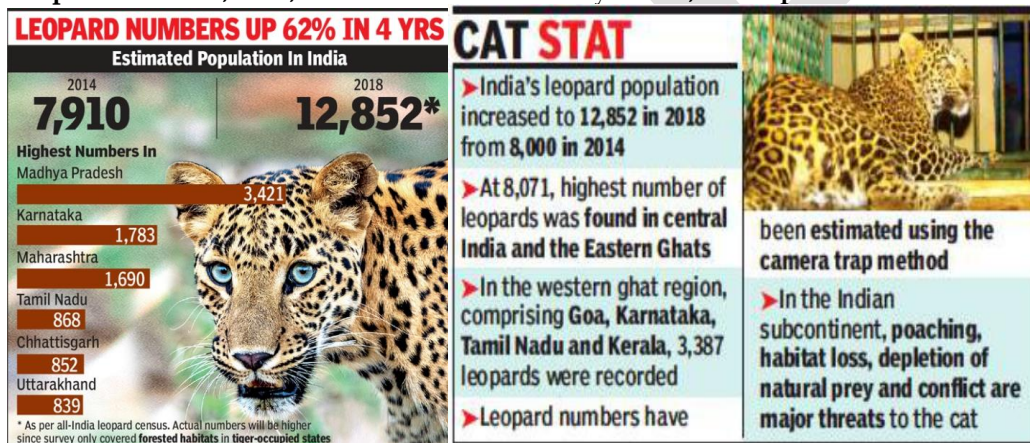
Leopards

Context:

- A rare melanistic leopard, popularly called black leopard, was spotted in the the Navegaon Nagzira Tiger Reserve (NNTR) in the Gondia district of Maharashtra.
- The high amount of pigmentation – melanin, causes the animal to appear black.

Status of leopards in India, 2018

- India's leopard population increased by 60% in 4 years", since 2014.
- Status of leopards in India, 2018, mentions that the country has 12,852 leopards.



About leopard:

SPOTTING LEOPARDS NEWSICLE

India has conducted its first leopard census and come out with a count of the feline species this month. Leopards are found pan-India, except deserts and the marshy Sunderbans, unlike the other big cats. Here's knowing leopards better without getting too close to them

India is the only country in the world to boast of five big cat species: the lion, tiger, Indian leopard, snow leopard and the clouded leopard

Indian leopard
Status | Near threatened. It is also called the common leopard. According to WWF, "within the 17 tiger-bearing states, the leopard occupies nearly double the area occupied by tigers"

Fast facts

- Leopards don't need much water. They survive from the moisture they get from eating their prey
- Leopards are great hunters and can run at a speed of 58kmph, jump forward 20 feet and leap 10 feet straight up
- Leopards are able to climb trees, even when carrying heavy prey. One reason why they sometimes take their prey up in the trees is to ensure lions or hyenas can't steal them
- Leopards can hear up to five times better than the average human
- Though classified as a roaring cat, leopards usually bark when they have something to say
- A leopard's spots are called rosettes because they look like roses. Their pattern is unique for every individual leopard, much like a human's fingerprints
- Black panthers actually leopards with melanism – wherein the entire coat of the animal, including the spots, is black – and not separate species as they are widely believed to be

Wild Love
During the National Geographic programme, 'Eye of the Leopard', a wild leopard killed a baboon in order to feed herself. However, upon noticing an infant baboon clinging to the dead baboon, the leopard amazingly carried the infant up to the safety of the tree to guard her from hyenas. She groomed and cuddled the baby throughout the night, caring for him/her as she would her own cub

- **Main threats:** Habitat loss due to mining and quarrying, poaching for body parts, mortality due to vehicular collisions, retaliatory killing due to human-leopard conflict and accidental deaths due to snares set for catching wild prey.

Nawegaon-Nagzira Tiger Reserve (NNTR)

- It was notified as 46th tiger reserve of India on 12th December, 2013.
- Its 5th Tiger reserve of Maharashtra.

Clouded leopard

Context

- A clouded leopard photographed near the summit of Mt Saramati in Nagaland's Thanamir village.

About clouded leopard (*Neofelis nebulosa*):

- **Local name:** In the local dialect of the indigenous Yimkhiung tribe, the clouded leopard is known as "Khephak", which means a greyish big cat.
- It uses its tail for balancing when moving in trees and is able to climb down vertical tree trunks head first.
- It rests in trees during the day and hunts by night on the forest floor.
- **Threats for its survival:** large-scale deforestation and commercial poaching for the wildlife trade.
- **Range:** This wild cat inhabiting dense forests from the foothills of the Himalayas through mainland Southeast Asia into South China.
- **Distribution or habitat in India:** In India, it occurs in Sikkim, northern West Bengal, Meghalaya subtropical forests, Tripura, Mizoram, Manipur, Assam, Nagaland and Arunachal Pradesh.
- **Protection status:**
- 'Vulnerable' under the IUCN Red List of Threatened Species.
- CITES: APPENDIX 1
- **Conservation efforts:** The Clouded Leopard Project is dedicated to the conservation of clouded leopards and their habitat by supporting field research, implementing education initiatives in range countries, and bringing global awareness to clouded leopard conservation issues.

Himalayan Mallard

Context

- Himalayan Mallard spotted in Hyderabad.

About Himalayan Mallard:

- **Scientific name:** *Anas platyrhynchos*, and commonly called the wild duck.
- **Habitat and distribution:**
- It prefers shallow inland waterways, such as ponds, lakes, rivers, reservoirs, and marshes.
- It is commonly seen in the colder regions of north India but not seen in the western and southern regions of the country.
- **Distinctive feature:**
- iridescent green or blue-headed plumage of the male.
- feeds on all aquatic plants and vegetation near the surface of the water as well as insects and snails.
- **Conservation status :** Least concern.. This duck is not the threatened species.

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 Andhra Pradesh.

More about news:

- **Cause of death:** Preliminary inquiry suggests that nematode infestation is the cause for the death of the spot-billed pelicans.
- The nematode parasite is suspected to be transferred through fish and snails in particular, when the birds prey in the aqua ponds.

About spot-billed pelican:

- **Habitat:**
- 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.
- It is **not migratory**, but is known to make local movements and are more widely distributed in the non-breeding season.
- **Conservation status:** Near Threatened under IUCN Red list.

Eastern swamp deer

Context

- The population of the **vulnerable eastern swamp deer**, extinct elsewhere in South Asia, has dipped in the Kaziranga National Park and Tiger Reserve.

Recent findings

- During the Eastern Swamp Deer Estimation a **decrease from 907 individuals in 2018 to 868 in 2019 and 2020 are found.**
- Earlier eastern swamp deer was endemic to Kaziranga but now has **moved to other areas such as Orang National Park and Laokhowa-Burachapori wildlife sanctuaries.**

About Swamp Deer

- The barasingha, also called swamp deer, is a deer species distributed in the Indian subcontinent.
- It differs from all other Indian deer species in that the **antlers carry more than three tines.**
- **Threats:** Poaching for antlers and meat, habitat loss.
- Barasingha is the **state animal** of the Indian states of **Madhya Pradesh and Uttar Pradesh.**

Three subspecies of swamp deer are:

- **Western swamp deer** is adapted to the flooded tall grassland habitat in the Indo-Gangetic plain and are found in the Sukla Phanta Wildlife Reserve of Nepal.
- **Southern swamp deer** has hard hooves and is adapted to hard ground in open sal forest with a grass understorey survives **only** in the Kanha National Park. It was reintroduced into Satpura Tiger Reserve.
- **Eastern swamp deer** is only found in Assam i.e. it is endemic to Assam.

Protection Status:

- It is listed as **Vulnerable in the IUCN Red list.**
- It is listed on **CITES Appendix I.**
- In India, it is included under **Schedule I** of the **Wildlife Protection Act of 1972.**

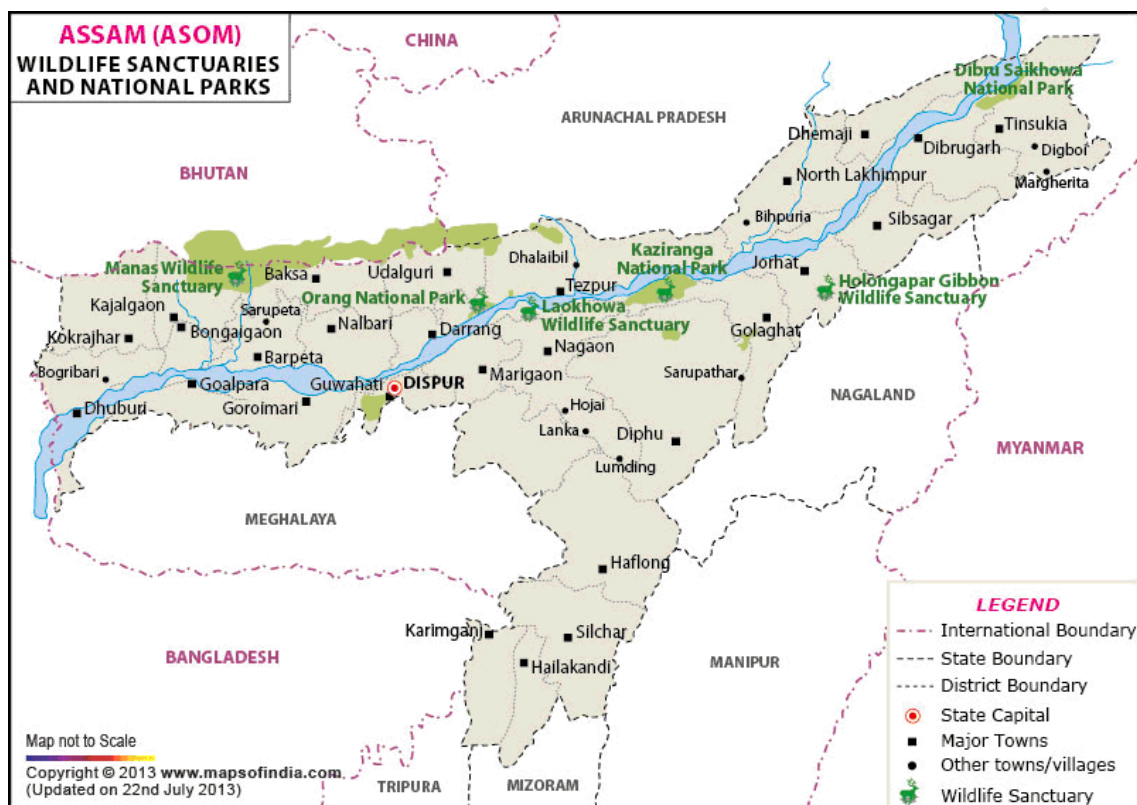
About KNP:

- It is located in **Assam.**
- Kaziranga National park's is home to more than 2200 Indian one-horned rhinoceros, approximately 2/3rd of their total world population.
- It is located in the edge of **the Eastern Himalayan biodiversity hotspots** – Golaghat and Nagaon district.
- 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**.
- It is considered to be an **ideal habitat for the Bengal florican**.

Other protected Areas of Assam:



Indian Desert Cat

Context

- An Indian Desert Cat has been spotted for the first time in Madhya Pradesh’s Panna Tiger Reserve (PTR)

About Indian Desert Cat:

- This cat is found in deserts and **can survive without water**.
- The toes of the species have cushion like hair which **help it balance the fluctuating desert temperatures**.
- The species is **highly adaptable** and can be found in **forests as well as arid and semi-arid regions**.
- It **preys on small rodents and reptiles** and is mostly a nocturnal creature.
- The species has a sandy-brown fur and small, round spots covering the upper part of its body.
- The cat has a long, slender and tapering tail with a black tip and spots at its base.
- The animal is in the ‘**Least Concern**’ category of the International Union for Conservation of Nature Red List of Threatened Species.
- Felis silvestris (Indian desert cat) has pug marks similar to that of wild cats.



About Panna Tiger Reserve

- Situated in the **Vindhyan mountain range** in the northern part of **Madhya Pradesh**.
- Flowing from the south to the north through the reserve is the **River Ken**. It is the lifeline of this reserve and is the least polluted of Yamuna's tributaries.
- These forests along with **Ken Gharial Sanctuary** form a significant part of the catchment area of this river.
- The reserve is also dotted with **two thousand year-old rock paintings**.
- Panna Tiger Reserve (PTR) in Madhya Pradesh (MP) included in the **global network of biosphere reserves by the United Nations Educational, Scientific and Cultural Organisation (UNESCO)** as a critical tiger habitat.

Pangolins

Context

- Researchers sequenced 624 pangolin scales, categorising the species

Pangolins in India

- Indian Pangolin (*Manis crassicaudata*) and the Chinese Pangolin (*Manis pentadactyla*) are found in India.
- Hunting and poaching for use as a **protein source and traditional medicine** and international trade for its meat and scales in East and South East Asian countries, particularly China and Vietnam are threat to Pangolins in India.
- Indian Pangolin are widely distributed in India, except the arid region, high Himalayas and the North-East. The species is also found in Bangladesh, Pakistan, Nepal and Sri Lanka.
- Chinese Pangolin are found in the Himalayan foothills in Eastern Nepal, Bhutan, Northern India, North-East Bangladesh and through Southern China.

Eight species of pangolin worldwide

Four Asian species

Critically endangered

Chinese
Malayan

Endangered

Indian
Philippine

Four African species

Vulnerable

African white-bellied
Giant ground

Temminck's ground
Long-tailed

Source: [CITES/savepangolins.org/IUCN/pangolins.org](https://www.cites.org/eng/species/savepangolins.org/IUCN/pangolins.org)

Protection Status

- Indian Pangolin: Endangered in IUCN Red list
- Chinese Pangolin: Critically Endangered in IUCN Red list.
- Both these species are listed under Schedule I, Part I of the Wildlife (Protection) Act, 1972.

Asian Elephants

Context

- Lightning kills herd of 18 **elephants** in Assam. The incident happened in Kandali Proposed **Reserve Forest**.

Asian Elephant

- It is distributed throughout the Indian subcontinent and Southeast Asia, from India in the west, Nepal in the north, Sumatra in the south, and to Borneo in the east.
- The Asian elephant is the **largest living land animal in Asia**.
- Since 1986, the Asian elephant has been listed as **Endangered** on the IUCN Red List, as the population has declined by at least 50 percent over the last three elephant generations, which is about 60–75 years.
- It is primarily threatened by **loss of habitat, habitat degradation, fragmentation and poaching**.
- The Asian elephant is listed on **CITES Appendix I**.
- CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora, also known as the Washington Convention) is a multilateral treaty to protect endangered plants and animals.

Project Elephant

- It is a **centrally sponsored scheme** launched in February 1992.

SAVE THE TUSKERS

- > Project Elephant launched in 1992
- > The scheme is run by both the governments sharing the fund, where in the Centre takes care of **60%** and state takes into account **40%**
- > The scheme is applicable to **16 states** including Andhra Pradesh
- > India has **32 elephant** reserves
- > AP has only one reserve
- > AP has around **90 elephants**
- > North Andhra has **10 elephants** while Rayalaseema has **80 elephants**

With meagre funds from the government we can provide only drinking water at the RER. These reserve forests can be a boost to tourism too but before that, they need to be developed

Tammineni Chakrapani | RAYALA ELEPHANT RESERVE

Vulture Conservation

Context

- Conservation plan chalked out after 150 vultures spotted in Bihar's Valmiki Tiger Reserve.

Indian Vulture

Declining population India has nine species of vultures, six of which are found in Assam

Vultures of the genus 'Gyps'

- Oriental white-backed (Assam, critically endangered)
- Long-billed (critically endangered)
- Slender-billed (Assam, critically endangered)
- Himalayan griffon (Assam, winter visitor from Himalayas)
- Eurasian griffon (Assam, winter visitor from Himalayas)

Single representative species


- Egyptian
- Bearded
- Cinereous (Assam)
- King (Assam, critically endangered)

BIRD'S EYE VIEW

9 RECORDED SPECIES:
Oriental white-backed, long-billed, slender-billed, Himalayan, red-headed, Egyptian, bearded, cinereous and the Eurasian Griffon.

(4 CRITICALLY ENDANGERED, 1 ENDANGERED, 3 NEAR THREATENED)

THE CRISIS:
A massive dip in vulture populations came into limelight in the mid-90s, and in 2004 the cause of the crash was established as diclofenac, a veterinary nonsteroidal anti-inflammatory drug.



WHAT NEXT AFTER 2006 PROJECT:

- Testing of nonsteroidal anti-inflammatory drugs on vultures, development of new NSAIDs
- Covering two more species in the breeding programme that earlier focussed on 3 critically endangered species
- Additional conservation breeding centres and four rescue centres planned across India
- Nationwide vulture survey once in four years

Asiatic lions

Context

- Eight Asiatic lions at Hyderabad's Nehru Zoological Park have tested positive for the deadly coronavirus, perhaps the **first known case of the human infecting the felines and making them sick in India.**

Nehru Zoological Park

- It is located in Hyderabad.
- It is one of the biggest zoos in Asia.

About Asiatic lions

- Habitat:** They are confined to **Gir National Park and its surrounding environs** in Gujarat's Saurashtra.
- Five protected areas currently exist to protect the Asiatic lion: **Gir Sanctuary, Gir National Park, Pania Sanctuary, Mitiyala Sanctuary, and Girnar Sanctuary.**
- Population:** As per the 14th Asiatic Lion Census 2005, the lion population was estimated at 523 individuals. In August 2017, surveyors counted 650 wild lions.
- Threats:**
 - The Asiatic lion currently exists as a single subpopulation, and is thus vulnerable to extinction from unpredictable events, such as an **epidemic or large forest fire.**
 - The Asiatic lion is confined only to the Gir protected area and its surrounding environs and thus faces the additional **threat of genetic homogeneity**, which makes the species susceptible to diseases.
- Expert suggestions:** Experts have called for the reintroduced of the species outside Gujarat for the long term conversation of the Asiatics lions. **Kuno Palpur Sanctuary in MP** is being considered by the ministry for reintroduction of lions.
- Conservation status:** It is categorised as **endangered** on the International Union for the Conservation of Nature Red List.

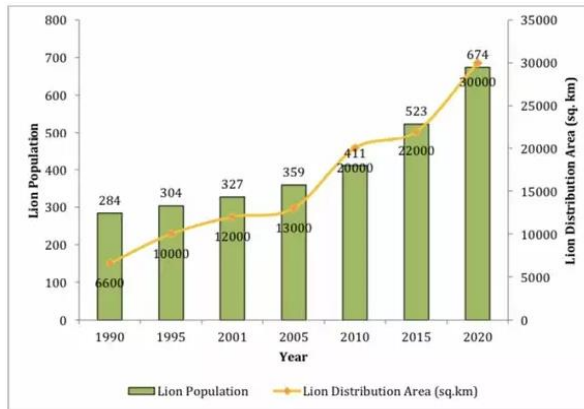


Figure 3: Population and distribution trend of Asiatic Lions.

Asiatic Lions Fact File

Asiatic lion (*Panthera leo persica*)

Status: Endangered

Found: In and around the Gir Forest, Gujarat, India

Body length: Up to 2.9 metres from nose to tail

Weight: males 160-190kg, females 110-120kg

Lifespan: 18-20 years

Diet: deer, antelope, boar and cattle

SAUROPODS

Context

- Researchers have identified fossil bone fragments of **long-necked dinosaurs called sauropods**, dating back to about 100-million-years from an area around **West Khasi Hills District in Meghalaya**.

More about news

- The finding **makes Meghalaya the fifth state in India after Gujarat, Madhya Pradesh, Maharashtra, and Tamil Nadu** to report Sauropod bones having titanosaurian affinity.
- The researchers noted that this is the first record of sauropods of probable Titanosaurian origin discovered in the region.

About Sauropods

- Sauropods had very **long necks, long tails, small heads relative to the rest of their body, and four thick, pillar-like legs**.
- They are notable for the enormous sizes attained by some species, and the group includes the largest animals to have ever lived on land.
- Titanosaurs were a diverse group of sauropod dinosaurs, including genera from Africa, Asia, South America, North America, Europe, Australia and Antarctica.

XYLOPHIS DEEPAKI

Context

- Herpetologist Deepak Veerappan has a snake named after him

Xylophis deepaki

- It is a **tiny snake of just 20 cm** length with iridescent scales.
- It is reported to be an **endemic species of Tamil Nadu** and has been sighted in a few locations in the southern part of the Western Ghats.
- The species is named in honour of Indian herpetologist Deepak Veerappan for his contribution in erecting a new subfamily Xylophiinae to accommodate **wood snakes**.

About Wood snakes

- Wood snakes are **harmless, sub-fossorial** and often found while digging soil in farms and under the logs in the Western Ghat forests.
- They **feed on earthworms** and possibly other invertebrates.



Crocidura narcondamica

Context

- Scientists from the Zoological Survey of India (ZSI) have discovered a new species of insectivorous mammal, a white-toothed shrew, from Narcondam Island of the Andaman and Nicobar group of islands.

About Crocidura narcondamica

- It is an **insectivorous mammal**, found in the volcanic and uninhabited island.
- **Shrews are small and mouse-like mammals, and they live in sub-leaf stratum in the forests.**
- **Insects are the primary diet** of these animals.



Narcondam island

- The discovery comes from one of **most remote and uninhabited islands, Narcondam island, of the Andaman and Nicobar archipelago.**
- Narcondam Island is located about 130 km east of North Andaman, and about 446 km of the west coast of Myanmar.

Oriental darters

Context

- Oriental darters have made a comeback in world-famous Bharatpur bird sanctuary (officially Keoladeo National Park) after a gap of 22 years.

Oriental darters

- It is also known as **snakebirds** as it has a long and slender neck which looks like a snake when it swims and dives into water to catch a fish.
- The darter hunts for fish while its body is submerged in the water.
- **Habitation:** It is a water bird of **tropical South Asia and Southeast Asia.**
- **Protection status:**
- **“Near-threatened”** by the International Union for Conservation of Nature.

About Keoladeo National Park (KNP):

- It is also known as the **Bharatpur Bird Sanctuary.**
- It is located in **Bharatpur, Rajasthan, India.**
- It was declared a protected sanctuary in 1971.
- It is also a **UNESCO World Heritage Site.**
- It is a **man-made and man-managed wetland** and one of the national parks of India.
- The reserve **protects Bharatpur from frequent floods, provides grazing grounds for village cattle.**
- It is a mosaic of **dry grasslands, woodlands, woodland swamps and wetlands.**

Himalayan yaks

Context

- The National Research Centre on Yak (NRCY) at Dirang in **Arunachal Pradesh’s** West Kameng district has tied up with the National Insurance Company Ltd. for **insuring their livestock.**

Yak population in India

- The total yak population in India is about 58,000.
- The Union Territories of **Ladakh and Jammu and Kashmir** have some 26,000, followed by 24,000 in **Arunachal Pradesh**, 5,000 in **Sikkim**, 2,000 in **Himachal Pradesh** and about 1,000 in **West Bengal and Uttarakhand.**
- A four-year-old report said the **number of yaks across the country declined by almost 24.7% between 2012 and 2019.**

Himalayan Yak:

- The Himalayan yak (*Bos grunniens*) is a **totemic animal of the high Himalayas**.
- The woolly yaks are **indicators of change in temperature on the mountains**. The animal finds it difficult to tolerate the conditions at below 7,000 feet above sea level.
- It is the **largest animal on the Tibetan plateau** – it can be as tall as 2.2 metres at the shoulder, and weigh up to a thousand kilogram's.
- The domestic yak is a long-haired domesticated cattle found throughout the Himalayan region of the Indian subcontinent, the **Tibetan Plateau, Northern Myanmar, Yunnan, Sichuan and as far north as Mongolia and Siberia**.
- Yak is a “**flagship species**”, and **indicates the health of the ecosystem** within which it lives.
- It is adapted to the climatic conditions of “**cold winter, low oxygen content, high solar radiation, and cyclical nutrition with short growing seasons**”
- **Reasons for their population declines**
- Harsh lives that the yak herders live. Yak herders come from the most marginalised of communities, and while the yak may be adapted to the conditions, humans prefer comfort.
- As wars and conflicts have led to the closing of borders, the yaks outside Chinese borders are “thought to be suffering from **inbreeding due to the lack of availability** of new yak germplasm from the original yak area, the Tibetan plateau.
- **Climate change** has led to uneven production of grass, the yak herders find themselves fenced into grasslands which are under greater pressure Plateau.



Greater Adjutant Storks (Garuda)

Context

- Bihar plans GPS trackers for endangered Greater Adjutant Storks to study their movements

About Greater Adjutant Storks:

- They are locally known as ‘**Garuda**’.
- Bhagalpur’s Kadwa Diara floodplains area is the **third-most popular breeding centre** for the greater adjutant stork in the world after **Assam and Cambodia**.
- The greater adjutant is one of the most threatened stork species of the world and is widely considered to be a rare bird.
- However, the global population of the Greater Adjutant Stork is estimated to be roughly not more than 1,500 now.
- The greater adjutant stork is classified as ‘**endangered**’ on the IUCN’s Red List 2004 of threatened species and **listed under Schedule IV of the Indian Wild Life (Protection) Act, 1972**.





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Leptoptilus dubius
Greater Adjutant Stork

Greater adjutant storks are named for their military officer-like gait. They're also called hargila in Assam, which means 'bone swallower', as they are known to consume carcasses completely

POPULATION
800-1,200, declining

LIFESPAN
Longest recorded is 43 years in captivity; unknown in the wild

GEOGRAPHIC RANGE
India and Cambodia (breeding); non-breeding populations in other countries

HABITAT
Forest, inland wetlands, riverine plains

PROTECTION STATUS: ENDANGERED ON THE IUCN RED LIST AND SCHEDULE 1 OF THE INDIAN WILDLIFE (PROTECTION) ACT OF 1972

FEED ON

- Scavengers. Often found near garbage dumps, landfills, or disposed carcasses
- Sometimes seen foraging near drying pools looking for insects, frogs, fish, crabs, and small birds

NESTING


- Great adjutant storks nest in colonies. The canopy of a single tree will usually have many nests. Prefer large, broad-limbed trees with sparse foliage, which helps in takeoff and landing
- Ideal nesting branches are claimed by males who then advertise their territory by perching on the branch with bills upward and exhibit bill-clattering (to attract females).
- Males present females with twigs as a courtship ritual

FEATURES

- Great adjutants are large birds, standing 120-152 cm, with a 250-cm wingspan
- Long, thick, yellow bill and a sparsely feathered, yellow-pink head and neck
- White underside feathers and tendency to retract their necks like a heron
- Thought to be the heaviest of the storks.
- They defecate on their legs and the evaporation helps lower body temperature in hot weather

THREATS

- Felling of nesting trees • Pollution of waterbodies
- Disease • Reduction in carrion disposal



WHO HELPS PROTECT THEM?
HARGILA ARMY – A VOLUNTARY GROUP OF WOMEN, LED BY PURNIMA DEVI BARMAN. THIS BRIGADE WORKS TOWARDS CONSERVING THE BIRD AND ITS NESTING SITES IN ASSAM.

PHOTO: ANURAG MEHA; ILLUSTRATION: PNGOF; TEXT: NISARG PRAKASH; DESIGN: DIVYA MEHA

Slender loris

Context

- In Karur, a conservation dilemma regarding the slender loris

More about news:

- The Kadavur hills in central Tamil Nadu's Karur district are home to the **Kadavur Reserve Forest**.
- These forests are home to the **shy and reclusive slender loris, a species of primate**.
- There is a conservation dilemma regarding these animals in the area currently.
- The wildlife census conducted during 2016-17 showed an appreciable population of 3,500 slender loris in the Kadavur Reserve Forest.

About the Slender loris (*Loris tardigradus*):

- It is **secretive and has nocturnal habits**.
- It usually travels from the canopy of one tree to another. But, at times, it also comes down to bushes at the ground level to feed.
- It sleeps by day in the foliage or in a hole or crevice. It comes out at dusk in search of prey.
- They are fond of lantana berries and also eat insects, lizards, small birds, tree frogs, tender leaves and buds.
- They play a key role in controlling agricultural crop pests.

Survival threats:

- As it is believed that **these animals have some medicinal properties, they are captured and sold**.
- There is great demand for keeping these **animal as pets**, they are illegally smuggled.
- Habitat loss, electrocution of live wires and road accidents are other threats that have caused its populations to dwindle.

Conservation Status:

- IUCN Status:** Endangered.
- It has been brought **under Schedule I of the Wild Life (Protection) Act, 1972** in order to provide the **highest level of legal protection**.

Ladakh adopts State animal and bird

Context

- Ladakh adopted two endangered species, **snow leopard and black-necked crane**, as State animal and State bird respectively of the UT of Ladakh.

Black-necked crane

- Black-necked cranes, considered loyal couples, are **only found in Ladakh's Changthang region**.

Grus nigricollis

BLACK-NECKED CRANE

11,000-13,500 POPULATION **13 years** LIFESPAN **135-139 cm** HEIGHT **5-6 kg** WEIGHT

ENDEMIC TO ASIA, THIS MIGRATORY BIRD IS THE ONLY ALPINE CRANE SPECIES

AKA
cha thung-thung
in Ladakhi

ADULTS
BLACK HEAD, UPPER NECK, LEGS, FEET, TAIL-BAND AND FLIGHT FEATHERS

JUVENILES
BUFF OR BROWN HEAD, NECK, AND MANTLE

RED CROWN

GREY BODY

GEOGRAPHIC RANGE
Ladakh, India, China, and Bhutan. Occasional reports of spotting from Sikkim, West Bengal, Arunachal Pradesh and Nepal

HABITAT
Summers are spent at high-altitude lakes, wetlands, and riverine marshes (3,000-5,000 m); winters in fallow cultivation and marshes

EAT
Feed on plant roots, earth-worms, insects, snails, shrimp, fish, frogs, lizards, rodents and other smaller creatures.

NESTS
MADE FROM MOUNDS OF SOIL AND GRASS. OFTEN BUILT ON PATCHES OF LAND AMIDST LAKES.

THREATS

- Conversion of grasslands to agricultural land
- Poaching
- Overgrazing of livestock
- Unregulated development and tourism
- Power lines, transportation, and service corridors
- Attacks from free-ranging stray dogs

PROTECTION STATUS

- Vulnerable on the IUCN Red List
- Schedule I of Wildlife Protection Act, 1972.
- Listed as endangered by China, in class 'A', the highest protection
- Listed in the Appendix I of CMS (Convention on Migratory Species)
- Appendix I of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora)

DANCE
ELABORATE COURTSHIP WITH SPECTACULAR DISPLAYS, DANCES, AND COLLABORATIVE NEST BUILDING, FOLLOWED BY MATING

ARRIVES IN LADAKH END-MARCH OR APRIL. WINTERS IN BHUTAN LATE-OCTOBER TO MARCH-APRIL

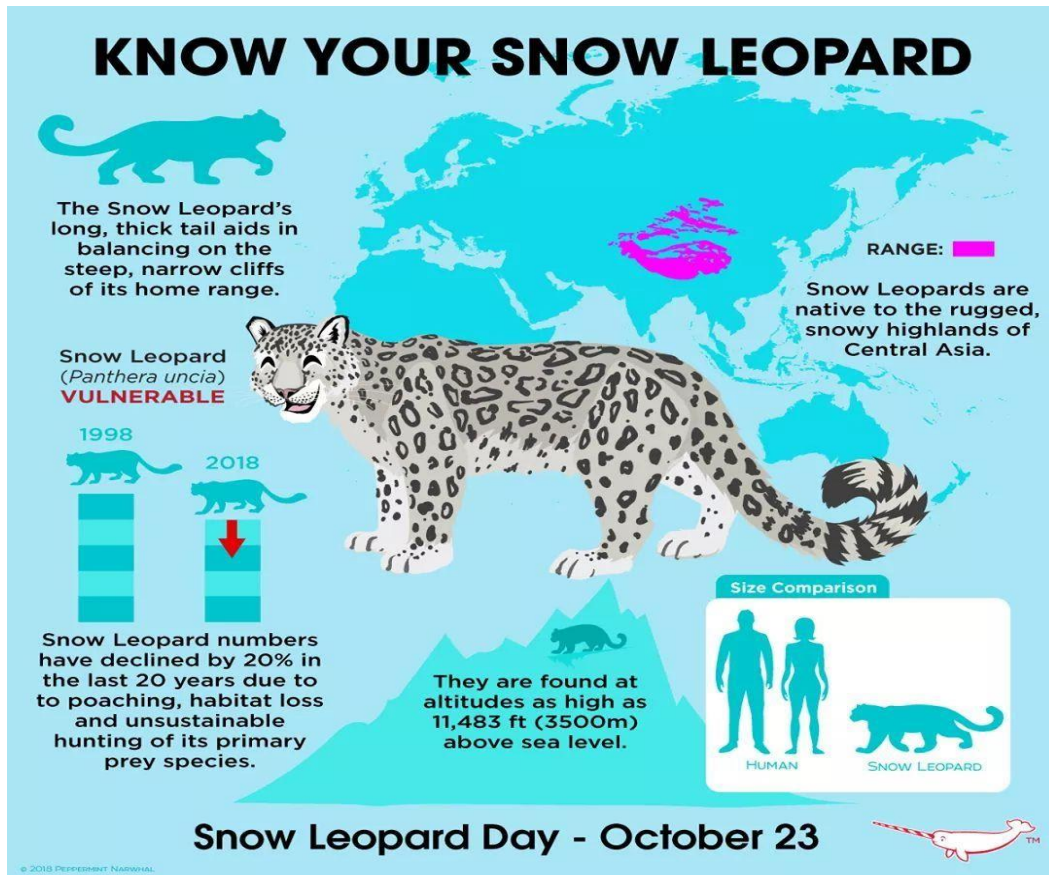
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Snow leopard

- They has been categorised as “vulnerable” in the International Union for Conservation of Nature Red List.



Bush frog, or *Raorchestes ponmudi*

Context

- Cardamom farmers welcome bush frog, or *Raorchestes ponmudi* frog species.

About *Raorchestes ponmudi* frog:

- It is **endemic to the Western Ghats**.
- The bush frog, or *Raorchestes ponmudi*, **eats up moths known to destroy cardamom's pseudo-stem, a major menace faced by farmers.**
- This frog species **eats up the shoot borer *Conogethes punctiferalis*** that enters through immature panicles and attacks the shoots and stems, thus destroying cardamom plants, often in a large-scale.
- Unlike other frog species, the **bush frog's life cycle is entirely different, and water sources are not primarily needed for the growth of its eggs.**



Killer whale

Context

- A Killer whale sighted again off Lakshadweep.
- Such sightings are rare, as **very little is known about killer whale occurrence, seasonal movements, habitat and prey preferences, and behaviour in the northern Indian Ocean.**
- Such records highlight the rich whale and dolphin biodiversity in Lakshadweep waters.

About killer whales (orca):

- Orcas belong to a **highly evolved group of toothed whales** under the suborder Cetacean and dolphin family and are **widely distributed in temperate and tropical waters.**

- They have **long life spans and are highly social, feeding cooperatively**, and with **complex vocal behaviours**.
- While most killer whale populations in other regions **show high site fidelity** and residence rates, resident populations are yet to be identified in the northern Indian Ocean.
- Given their **highly social and curious behaviour**, orcas often approach fishing vessels to assess if there is any fish in the net, or just to observe people on the vessel.
- In the wild, there are **no instances of killer whales fatally attacking humans**.

New species of blind freshwater eel

Context

The Indian New species of blind freshwater eel discovered from Mumbai well

More about news

- The new species is a 'hypogean freshwater eel' and is named as 'Rakthamichthys Mumba', after city Mumbai,"
- It is the **first completely blind subterranean freshwater fish species** to be described from Maharashtra and the northern Western Ghats.
- The species' name 'mumba' refers to the locality, the city of Mumbai.
- The word 'mumba' derives its roots from the Marathi language, which is a tribute to Mumba Aai, a deity worshipped by the inhabitants of this city.

Kyhytysuka sachicarum

Context

- An international team of researchers has discovered **a new marine reptile**.

About Kyhytysuka sachicarum:

- This **fossil specimen** has meter-long skull.
- **Kyhytysuka** means: 'one that cuts with something sharp.'





Lesser florican

Context

- Longest in-country migration route of lesser florican from Rajasthan tracked.

About lesser florican (*Sypheotides indicus*):

- It is one of three bustard species **endemic to India**, the others being the **Bengal florican and the Great Indian Bustard**.
- **Name in local language:** 'tanmor' on 'kharmor', derived from the root word 'mor' for peacock
- **Protection status:**
- listed as "**critically endangered**" on the International Union for Conservation of Nature's Red List of Threatened Species.
- **Appendix 2 of the Convention on International Trade in Endangered Species (CITES)** which "includes species not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilization incompatible with their survival."
- **protected under Schedule 1 of the Indian Wildlife Act.**
- **Availability range:** Rajasthan, Madhya Pradesh, Gujarat and some other regions during the monsoon season.

FACT-SHEET OF FLORICANS	
	<ul style="list-style-type: none"> ➤ Lesser florican is found only in India ➤ Only 600 birds remain in the country ➤ Velavadar national park is the abode of lesser floricans ➤ They come from south Indian states to Maharashtra, Gujarat and Rajasthan ➤ Density of birds is highest in Velavadar with 45 seen in 100 sq km area
	<p>WWI RECOMMENDATIONS</p> <ul style="list-style-type: none"> ➤ Clear stray dogs from lesser florican sites ➤ Develop a national captive conservation/breeding centre ➤ Promote practice of crops that could help breeding of floricans ➤ Stop cattle grazing in private land/villages where the birds breed in grasslands during July to September
<p>MAJOR THREATS</p> <ul style="list-style-type: none"> ➤ Poaching and stray dogs in prime breeding habitats ➤ Pesticide usage in breeding grounds that can potentially deplete in biomass and increase environmental toxicity 	<ul style="list-style-type: none"> ➤ Diversion of grasslands for infrastructure projects like wind turbines and power lines ➤ Mismanagement of agro-grasslands through untimely grass harvest ➤ Excessive livestock grazing
	

Chocolate-bordered Flitter

Context:

- The new species of butterfly, now named the **Chocolate-bordered Flitter** discovered from **Sikkim**.
Naming: Scientific name *Zographetus dzonguensis*, after Dzongu in north **Sikkim**, the place where it was discovered.
- The physical appearance of the species differ slightly and the internal structures of the males also differ slightly.



Issi saaneq

Context

- New dinosaur species Issi saaneq found, which roamed Greenland 214 mn years ago.

Story so far:

- In 1994, palaeontologists from Harvard University unearthed two **well-preserved dinosaur skulls** during an excavation in East Greenland.
- One of the specimens was originally thought to be from a **Plateosaurus**, a well-known long-necked dinosaur that lived in Germany, France and Switzerland.



About Issi saaneq:

- It was a **medium-sized, long necked herbivore** and a predecessor of the sauropods, the largest land animals ever to live.

Dholes or Asiatic wild dogs

Context:

- A new study has reported the presence of dholes or Asiatic wild dogs (*Cuon alpinus*) in the high mountains of Central Asia nearly 30 years after their presence was last recorded.

About Dhole

- **Native species of:** Central, South, East, and Southeast Asia.
- **Habitation and distribution:** The dhole occurs in most of India south of the Ganges, particularly in the Central Indian Highlands and the Western and Eastern Ghats. It is also present in Arunachal Pradesh, Assam, Meghalaya, and West Bengal and in the Indo-Gangetic Plain's Terai region.
- **Other names for the species:** Asian wild dog, Asiatic wild dog, Indian wild dog, whistling dog, red dog, and mountain wolf.
- **Conservation status:**
- It is listed as **Endangered on the IUCN Red List**.
- CITES Appendix II
- protected under **Schedule 2** of the Wildlife Protection Act, 1972.
- **Factors contributing to declining population:** habitat loss, loss of prey, competition with other species, persecution due to livestock predation, and disease transfer from domestic dogs.

Crimson Rose

Context

- Thousands of Crimson Rose butterflies fly across ocean from India towards Sri Lanka.

About Crimson Rose:

- It is a **large butterfly** with a mix of black, white and crimson colours on its wings and body.
- It is **known for crossing the sea to migrate to Sri Lanka**.
- Certain other butterfly species found in Tamil Nadu are also known for their migration in **response to the climate and food availability**.



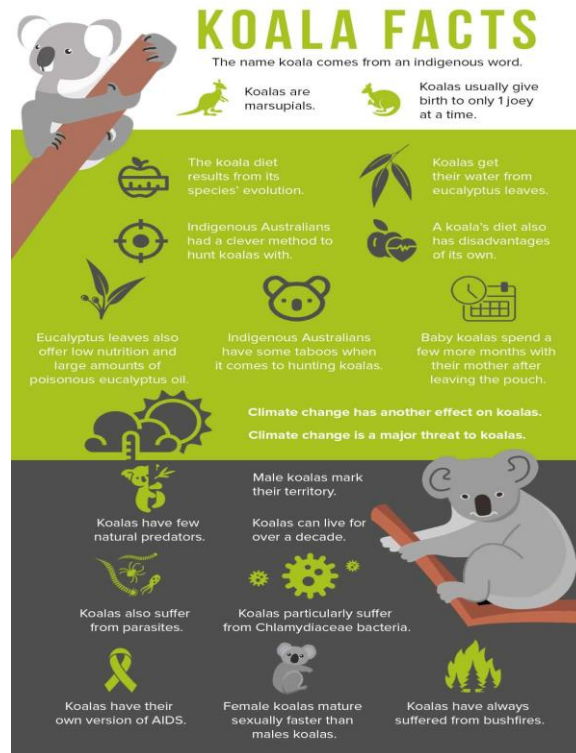
Koalas

Context

- Australia's koalas have officially been classified as 'endangered'. Government has upgraded the conservation status of the marsupials from 'vulnerable' to 'endangered'.

About koalas:

- **Koala bear (*Phascolarctos cinereus*)** is an arboreal herbivorous marsupial native to **Australia**.
- **Diet:** They survive on a **strict diet of up to a kilogram of eucalyptus leaves** every day.



T-15 Or Collarwali

Context

- T-15 Or simply "Collarwali, MP's **Pench tiger reserve** tigress died due to old age.

Royal Bengal Tiger:

- It forms a specific population of the *Panthera tigris tigris* subspecies that is **native to the Indian subcontinent**.
- Threats:** poaching, loss and fragmentation of habitat.
- IUCN Status:** Endangered.
- Protected under **schedule 1** of Wildlife Protection Act.

Action Plan for Introduction of Cheetah in India

Context

- At the 19th meeting of the National Tiger Conservation Authority (NTCA) Action Plan for Cheetah returning launched.

Need of re-introduction:

- Cheetah became the **only large carnivore to have gone extinct in India in the 1950s** due to **hunting and loss of habitat**.
- Action Plan for Introduction of Cheetah in India', is an effort to bring the **world's fastest cat back** to the country after 70 years.

Relocation details:

- Source:** Wildlife Institute of India and the Wildlife Trust of India, are translocating around 8-12 cheetahs from **South Africa, Namibia and Botswana** – which have the world's largest populations of the animal.
- Destination:** The big cats will live at **Kuno Palpur National Park in Madhya Pradesh** as it is most suitable for cheetah translocation in terms of habitat and an adequate prey base.

Kuno national park

- Located in:** Madhya Pradesh, India.
- Also known as **Kuno-Palpur and Palpur-Kuno Wildlife Sanctuary**.

About Cheetah:

- The cheetah (*Acinonyx jubatus*) is a **large cat native to Africa and central Iran**.
- It is the **fastest land animal**, capable of running at 80 to 128 km/h,
- **Habitat:** The cheetah occurs in a variety of habitats such as **savannahs in the Serengeti**, arid mountain ranges in the **Sahara and hilly desert terrain in Iran**.
- **Threats:** Habitat loss, conflict with humans, poaching and high susceptibility to diseases.
- **Protection status:** It is listed as Vulnerable on the IUCN Red List.
- **Re-introduction:** Cheetah was declared extinct from India in 1952 and is considered the only large mammal that has gone extinct since the country's independence. If the cheetah is reintroduced, **India would become probably the only country in Asia to have all the major big cats in the wild** (lions, tigers and leopards included).

Red Sanders

Context

- Red Sanders falls back in IUCN's 'endangered' category. It was classified as 'near threatened' in 2018

About Red Sanders (Red Sandalwood):

- The species, *Pterocarpus santalinus*, is an **Indian endemic tree species**.
- **Geographical range:** restricted in the Eastern Ghats. It is endemic to a distinct tract of forests in Andhra Pradesh
- **Protection status:** 'Endangered' category in the International Union for Conservation of Nature's (IUCN) Red List.
- **IUCN Red list:** The IUCN maintains a list called the Red List – of **flora and fauna species** and categorises them based on their conservation status.
- The status ranges from 'least concern' for the species that are abundant in numbers to 'extinct' for those that have completely disappeared from the planet.
- Species that come under 'critically endangered', 'endangered' and 'vulnerable' categories are considered threatened, according to the IUCN categorisation.

SANDAL VS SANDERS	
RED SANDERS	Highly valued in China, Japan and Middle East countries, it is used for decorative purposes and also traditional medicine. The wood costs between Rs 1,500 and 2,000 a kg. It is illegal to possess and sell it.
SANDALWOOD	Renowned for aromatic and cosmetic value, it is the second costliest wood after African Blackwood - a kilo cost up to Rs 10, 000. Individuals can grow the tree, but it is illegal to cut and harvest, use it or sell it in the open market.

Agarwood

Context

- The Tripura initiated steps to promote cultivation of Agar to transform the Economy.

About Agarwood:

- It is known as the **wood of the gods**; a product of the religious and cultural aroma.
- It is an **economically important and fast-growing evergreen tree species native to North East India**.
- It is creating a paradigm shift to explore new dynamics of access and benefit-sharing.
- Apart from India, the Agar tree's **distribution ranges from the foothills of the Himalayas to Papua New Guinea**.
- It is an **aromatic plant**.
- It have a **huge potential of creating an Economic Revolution in Tripura after Rubber, Bamboo, and other major forestry crops**.
- The Agar species are **critically endangered**.
- To promote Agar tree, Agarwood based industry, its plantation, it's sustainable harvesting, the Tripura government released the 'Tripura AgarWood Policy 2021,' which aims to **double agarwood plantation by the year 2025**.

Kendu

Context

- In May 2021, several children were seen collecting kendu leaves in the Odisha's Kalahandi district.

About Kendu:

- Kendu leaf is called the **green gold of Odisha**.
- It is a **nationalised product like bamboo** and sal seed.
- It is one of the most important **non-wood forest products** in Odisha.
- The leaves are used to **wrap bidis**, a popular smoke among the locals.
- The states producing bidi leaves in India comprises mainly **Madhya Pradesh, Chhatisgarh, Odisha, Andhra Pradesh, Jharkhand, Gujarat and Maharastra**.
- **Odisha** is the **third-largest producer of kendu leaf**, after Madhya Pradesh and Chhattisgarh.

Bryum Bharatiensis

Context

- The Indian scientists discover novel plant species in Antarctica, during an expedition to Antarctica, in 2017.

About the new species

- It is a **rare, dark green plant species**.
- The plant species was found at the Larsemann Hills, near one of the world's remotest research stations, Bharati.
- The plant species was later **recognized as mosses**.
- It is called as **Bryum Bharatiensis**, named after the **Hindu goddess, Bharati**, who also lends her name to India's research station in Antarctica.

About Moss:

- Mosses are **non-flowering plants**, which produce spores and have stems and leaves, but don't have true roots.
- Mosses, and their cousins liverworts and hornworts, are classified as **Bryophyta** (bryophytes) in the plant kingdom.
- Mosses are distributed throughout the world **except in salt water** and are commonly found in moist shady locations.

Acetabularia jalakanyakae

Context:

- New algal species with 'umbrella head' discovered from Andaman and Nicobar Islands.
- Measuring as small as 20 to 40 mm, the stunning bright green algae, resembling an umbrella or a mushroom, has grooves on its cap measuring 15 to 20mm in diameter.



More about news:

- Named after the imaginary sea mermaid, Acetabularia jalakanyakae is **very primitive and is a single-cell organism**.
- Its nucleus forms a rhizoid structure, which facilitates the algae to attach itself to shallow rocks.
- It is highly regenerative in nature. Even if one chops off the top portion, this algae can regrow.
- As it is **primarily a marine algae**, the projected sea level rise due to global warming is not as much of a direct threat to its existence.
- But due to climate change, the oceans are warming and there is increasing acidification – both of which could be harmful,"

Guduchi (*Tinospora cordifolia*)

Context

- Ministry of Ayush has recently noticed safety concerns on use of Guduchi (*Tinospora cordifolia*) that were published in social media and in some scientific journals.

More about news:

- This advisory confirm that Guduchi (*Tinospora cordifolia*) is safe to use but **some similar looking plants like *Tinospora crispa* may be harmful.**

About Guduchi:

- Guduchi is a **popularly known herb**, familiar as **Giloy** and is being used in therapeutics since long in AYUSH systems.
- There are good number of studies published in peer reviewed indexed Journals to substantiate safety and efficacy of Guduchi (*Tinospora cordifolia*).
- Its **hepato-protective properties** are also well established.
- Guduchi is known for its **immense therapeutic applications**.

Halodule uninervis- marine seagrass

Context

- Researchers have found strong anti-cancer activity in the ethyl acetate fraction of **Halodule uninervis**, a **species of seagrass** found in the coastal region of Tamil Nadu.

Halodule uninervis: This seagrass is abundantly available in the Gulf of Mannar.

About Seagrass:

- It is one of the **groups of marine angiosperms**.
- They often lives entirely submerged.
- Seagrasses are believed to be the **third most valuable ecosystem** in the world (only preceded by estuaries and wetlands).
- Usage:**
 - Traditional medicine:** used for a variety of therapeutic purposes such as wound-healing, fever, stomach aches, muscle pains and skin diseases.
 - Biomedical applications** such as anti-cancer, anti-diabetic, anti-inflammatory, anti-fungal, anti-bacterial and anti-viral activities.
 - Seagrasses are used to **fertilize fields, insulate houses, weave furniture, thatch roofs, make bandages, and fill mattresses** and even car seats.
 - It support **commercial fisheries and biodiversity**, clean the surrounding water and help take **carbon dioxide out of the atmosphere**.

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WETLANDS & RAMSAR SITES

'Wetlands of India' Portal

Context

- Minister of Environment, Forest and Climate Change launched 'Wetlands of India' Portal, a single point access to all information relating to wetlands.

About portal

- It is a **dynamic system for processing information and making it available to the stakeholders** in an efficient and accessible manner.
- It hosts **capacity building material, data repository, videos and information** for students.
- A dashboard for each State and UT has been developed to access the portal and populate it with information of wetlands in their administration.
- It enables **citizen engagement**.
- It has been developed under a Technical Cooperation project "Wetlands Management for Biodiversity and Climate Protection" (Wetlands Project) of Ministry of Environment, Forest and Climate Change (MoEFCC) in partnership with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

What are Wetlands?

- Wetlands are areas where **water covers the soil, or is present either at or near the surface of the soil all year or for varying periods of time during the year, including during the growing season.**
- Water saturation (hydrology)** largely determines how the soil develops and the types of plant and animal communities living in and on the soil.
- Wetlands may support both **aquatic and terrestrial species**.

Categories of wetlands

Two general categories of wetlands are recognized: **coastal or tidal wetlands and inland or non-tidal wetlands.**

Functions of wetland:

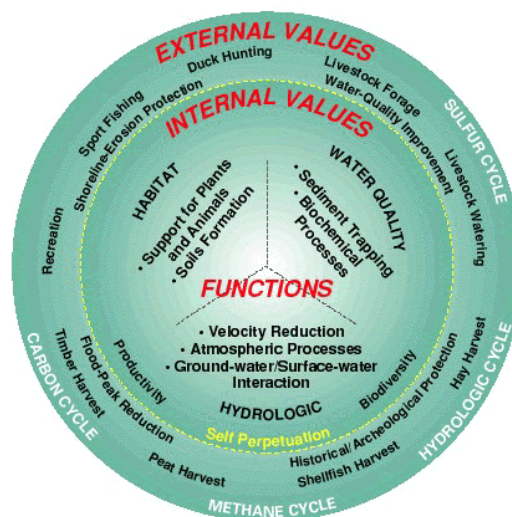


Figure 51. Wetland functions and internal and external values.

Basai wetlands

Context

- Environmentalists and enthusiasts seek protection for Basai wetlands, a 'bird paradise'.

About Basai Wetland:

- **Located in:** It is located in Gurgaon district in Haryana.
- It is recognised as an **Important Bird Area (IBA)** by the BirdLife International housing 20,000 birds of over 280 species including migratory birds and endangered birds.
- It is recognised as a **key biodiversity area** by the International Union for Conservation of Nature (IUCN), the Wildlife Institute of India.

It lies in one of the paleochannel of the **Sahibi River**, a **tributary of Yamuna**, which originates from the Aravalli

Sambhar Lake

Context

- Sambhar Lake in Rajasthan is **shrinking with degradation of soil and water quality**.

Why it is a cause of concern?

- Decline in the population of migratory birds.
- Needs a faster restoration for conservation of its wetland and salt brine worth \$300 million.
- Lake's ecology has deteriorated.

What all is leading to this?

- **'Mining menace'**: 30% of the Sambhar Lake's area had been lost to mining and other activities, including **the illegal salt pan encroachments**. It has also threatened the livelihoods of local people who have always lived in harmony with the lake and its ecology.

About Sambhar Lake:

- It is the **country's largest inland saline water body**, which attracts thousands of migratory birds every year.
- The death of more than 20,000 birds due to avian botulism, which migrate annually to the lake had made international headlines in 2019.
- The lake receives water from six rivers: **Mantha, Rupangarh, Khari, Khandela, Medtha and Samod**.
- Sambhar has been designated as a **Ramsar site** (recognized wetland of international importance) because the wetland is a key wintering area for tens of thousands of **pink flamingos** and other birds that migrate from northern Asia and Siberia.

Chilika lake

Context

- Lakhs of migratory birds fly down from other parts of the globe to Odisha's Chilika lake, the largest wintering ground for birds in the Indian subcontinent.
- In 2020, for the third successive year, the Chilika lake hosted over a million birds, and the area around it recorded more than 12 lakh mostly migratory birds.
- The lake hosts birds migrating from thousands miles away, including from the Caspian Sea, Lake Baikal, the Aral Sea, remote parts of Russia, the Kirghiz steppes of Mongolia, Central and Southeast Asia, and Ladakh and the Himalayas.

About Chilika lake

- It is a **brackish water lagoon**, spread over the Puri, Khurda 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.
- In 1981, Chilika Lake was designated the **first Indian wetland of international importance under the Ramsar Convention**.
- It has been listed as a tentative UNESCO World Heritage site.
- It is the **largest salt water lake** in India.

- The lagoon is also home to **rare and endangered Irrawaddy dolphins**.
- **Nalbana Island of Nalbana bird sanctuary** is the core area of this Ramsar designated wetlands of Chilika Lake.

Ramsar Convention

Context:

- Four more Indian sites - **two each from Haryana and Gujarat** - have been recognised as wetlands of international importance under the Ramsar Convention, taking the number of such sites in the country to **46**.
- Two wetlands in Haryana - **Sultanpur National Park in Gurgaon and Bhindawas Wildlife Sanctuary in Jhajjar and Thol and Wadhvana from Gujarat**

Bhindawas Wildlife Sanctuary

- It is a **human-made freshwater wetland**.
- It is also **the largest in Haryana**.
- Over 250 bird species use the sanctuary throughout the year as a resting and roosting site.
- The site supports more than 10 globally threatened species including the endangered Egyptian Vulture, Steppe Eagle, Pallas's Fish Eagle, and Black-bellied Tern.

Sultanpur National Park in Haryana

- It supports more than 220 species of resident, winter migratory and local migratory waterbirds at critical stages of their life cycles.
- More than 10 of these are globally threatened, including the **critically endangered sociable lapwing, and the endangered Egyptian Vulture, Saker Falcon, Pallas's Fish Eagle and Black-bellied Tern**.

Thol Lake Wildlife Sanctuary in Gujarat

- It lies on the **Central Asian Flyway** and more than 320 bird species can be found here.
- It supports more than 30 threatened waterbird species, such as the **critically endangered White-rumped Vulture and Sociable Lapwing, and the vulnerable Sarus Crane, Common Pochard and Lesser White-fronted Goose**.

Wadhvana Wetland in Gujarat

- It is **internationally important for its birdlife** as it provides wintering ground to migratory waterbirds, including over 80 species that migrate on the Central Asian Flyway.
- They include some threatened or near-threatened species such as the endangered Pallas's fish-Eagle, the vulnerable Common Pochard, and the near-threatened Dalmatian Pelican, Grey-headed Fish-eagle and Ferruginous Duck.

The Ramsar Convention

- It is an **international treaty for the conservation and wise use of wetlands**.
- It is named after the **Iranian city of Ramsar, on the Caspian Sea**, where the treaty was signed on February 2, 1971.
- 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".

Ramsar sites in India:

Sl. No.	Name of Site	State Location
1	Kolleru Lake	Andhra Pradesh
2	Deepor Beel	Assam
3	Kabartal Wetland	Bihar
4	Nalsarovar Bird Sanctuary	Gujarat

5	Thol Lake Wildlife Sanctuary	Gujarat
6	Wadhvana Wetland	Gujarat
7	Sultanpur National Park	Haryana
8	Bhindawas Wildlife Sanctuary	Haryana
9	Chandertal Wetland	Himachal Pradesh
10	Pong Dam Lake	Himachal Pradesh
11	Renuka Wetland	Himachal Pradesh
12	Wular Lake	Jammu & Kashmir
13	Hokera Wetland	Jammu and Kashmir
14	Surinsar-Mansar Lakes	Jammu and Kashmir
15	Tsomoriri Lake	Jammu and Kashmir
16	Asthamudi Wetland	Kerala
17	Sasthamkotta Lake	Kerala
18	Vembanad Kol Wetland	Kerala
19	Tso Kar Wetland Complex	Ladakh
20	Bhoj Wetlands	Madhya Pradesh
21	Lonar Lake	Maharashtra
22	Nandur Madhameshwar	Maharashtra
23	Loktak Lake	Manipur
24	Bhitarkanika Mangroves	Orissa
25	Chilka Lake	Orissa
26	Beas Conservation Reserve	Punjab
27	Harike Lake	Punjab
28	Kanjli Lake	Punjab
29	Keshopur-Miani Community Reserve	Punjab
30	Nangal Wildlife Sanctuary	Punjab
31	Ropar Lake	Punjab
32	Keoladeo Ghana NP	Rajasthan
33	Sambhar Lake	Rajasthan
34	Point Calimere Wildlife and Bird Sanctuary	Tamil Nadu
35	Rudrasagar Lake	Tripura
36	Nawabganj Bird Sanctuary	Uttar Pradesh

37	Parvati Agra Bird Sanctuary	Uttar Pradesh
38	Saman Bird Sanctuary	Uttar Pradesh
39	Samaspur Bird Sanctuary	Uttar Pradesh
40	Sandi Bird Sanctuary	Uttar Pradesh
41	Sarsai Nawar Jheel	Uttar Pradesh
42	Sur Sarovar	Uttar Pradesh
43	Upper Ganga River (Brijghat to Narora Stretch)	Uttar Pradesh
44	Asan Conservation Reserve	Uttarakhand
45	East Kolkata Wetlands	West Bengal
46	Sunderbans Wetland	West Bengal

Peat bog

Context

- A pair of cranes was spotted last year on a restored peat bog. The common crane is typically seen in Ireland during the winter, but is not sighted during the breeding season. Last year was the first time in over 300 years that they were spotted nesting in Ireland during this period.

What do we know about the cranes?

- Cranes stand at 4 feet tall with a wingspan of over 7 feet, and used to be the **largest birds in Ireland**.
- They are connected with the history and culture of the country, featuring in folklore tales and in the names of towns.
- Although they were once common, the destruction of their habitat saw them disappear around the 16th and 17th century.



Why is bog restoration important?

- Bogs are **soft, spongy wetlands that accumulate peat**– a fossil fuel that is used for heating homes and businesses in northern Europe.
- They are formed in northern climates, and take thousands of years to develop.
- Bogs also **act as carbon sinks**, sequestering around 200 million tons of carbon from the environment in Siberia and Scandinavia.

ORGANIZATIONS, PROGRAMMES AND ACTS

WILDLIFE CRIME CONTROL BUREAU (WCCB)

Context

- The Wildlife Crime Control Bureau (WCCB) has received the Asia Environmental Enforcement Award-2020 awarded by the United Nations Environment Programme (UNEP).

Wildlife Crime Control Bureau (WCCB)

- It is a **statutory body** established by the Government of India under the Ministry of Environment, Forest and Climate Change to combat organised wildlife crime.
- Under Section 38 (Z) of the **Wild Life (Protection) Act, 1972**, it is **mandated to**
- collect and collate intelligence related to organized wildlife crime activities and to disseminate the same to State and other enforcement agencies for immediate action.
- establish a **centralized wildlife crime data bank**;
- co-ordinate actions by various agencies in connection with the enforcement of the provisions of the Act;
- assist foreign authorities and international organization concerned to facilitate co-ordination and universal action for wildlife crime control;
- capacity building of the wildlife crime enforcement agencies for scientific and professional investigation into wildlife crimes and assist State Governments to ensure success in prosecutions related to wildlife crimes; and
- advise the Government of India on issues relating to wildlife crimes having national and international ramifications, relevant policy and laws.
- assists and advises the Customs authorities in inspection of the consignments of flora & fauna as per the provisions of Wild Life Protection Act, CITES and EXIM Policy governing such an item.

Wildlife Crime Control Bureau (WCCB) led operations

- Operation "Save Kurma" : to focus on the **poaching, transportation and illegal trade of live turtles and tortoises**.
- "Operation Turtshield- I" and Operation Turtshield-II" : to tackle the illegal trade of live turtles.
- Operation "Lesknow", "Lesknow-II" and Operation "Lesknow-III": to gain attention of enforcement agencies towards the **illegal wildlife trade in lesser-known species of wildlife**.
- Operation Clean Art": to **drag attention of enforcement agencies towards illegal wildlife trade in Mongoose hair brushes**.
- "Operation Softgold": to **tackle Shahtoosh Shawl (made from Chiru wool) illegal trade and to spread awareness among the weavers and traders engaged in this trade**.
- Operation Birbil to **curb illegal trade in wild cat and wild bird species**.
- "Operation Wildnet", "Operation Wildnet-II", "Operation Wildnet-III" and "Operation Wildnet-IV" to draw the attention of the enforcement agencies within the country to **focus their attention on the ever increasing illegal wildlife trade over internet using social media platforms**.
- "Operation Freely" on **illegal trade of live birds** and "Operation Wetmark" to ensure prohibition of sale of **meat of wild animals in wet markets across the country**.

United Nations Environment Programme (UNEP)

- It is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system.
- It serves as an **authoritative advocate for the global environment**.
- **Mission:** provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations.

United Nations Environment Assembly

- It is the **world's highest-level decision-making body on the environment**, with a universal membership of all 193 Member States.
- The Assembly meets **biennially in Nairobi**, Kenya, to set priorities for global environmental policies and develop international environmental law.
- It provides leadership, catalyzes intergovernmental action on the environment, and contributes to the implementation of the UN 2030 Agenda for Sustainable Development.
- The UN Environment Assembly is also the **governing body of the UN Environment Programme**.

NATIONAL TIGER CONSERVATION AUTHORITY OF INDIA

Context

- For the first time in the country, the **Periyar Tiger Reserve (PTR)** has taken up the **training of a tiger cub** to equip it to naturally hunt its prey in the forest environment.
- The training is given as per the **National Tiger Conservation Authority of India (NTCA) guidelines**.

National Tiger Conservation Authority was established in 2005 following a recommendation of the Tiger Task Force, to reorganise management of Project Tiger and the many Tiger Reserves in India. It is the overarching body for conservation of tigers in India.

Structure of NTCA:

- **Environment Minister is the Chairman of the NTCA.**
- Below chairman are **eight experts** or professionals having qualifications and experience in wildlife conservation and welfare of people including tribals, apart from three Members of Parliament (1 Rajya Sabha, 2 Lok Sabha).
- The Inspector General of Forests, in charge of project Tiger, serves as ex-officio Member Secretary.

Functions

- Its main administrative function is **to approve the Tiger Conservation Plan prepared by the State Governments** and then evaluate and assess various aspects of sustainable ecology and disallow any ecologically unsustainable land use such as, mining, industry and other projects within the tiger reserves.
- As per the WLPA, every State Government has the authority to notify an area as a tiger reserve.
- However, the Tiger Conservation Plans sent by state government need to be approved by the NTCA first.
- Alternatively, Central Government via NTCA may advise the state governments to forward a proposal for creation of Tiger Reserves.

Periyar National Park

- Periyar National Park and Wildlife Sanctuary (PNP) is a protected area located in the districts of **in Kerala, India**.
- It is notable as an **elephant reserve and a tiger reserve**.
- The park is a repository of **rare, endemic and endangered flora and fauna** and forms the major watershed of two important rivers of Kerala, the **Periyar and the Pamba**.
- The park is located high in the **Cardamom Hills and Pandalam Hills** of the south Western Ghats along the border with Tamil Nadu.

India and its Tiger's

- India's strategy of tiger conservation attaches topmost importance to involving local communities.
- India is **home to over 70% of the tiger population globally**.
- India is **home to 51 tiger reserves spread across 18 States and the last tiger census of 2018 showed a rise in the tiger population**.
- India achieved the **target of doubling of tiger population four years ahead of schedule of the St. Petersburg Declaration on tiger conservation**.

Tiger census

- The detailed report of the **4th All India Tiger Estimation** is unique in the following ways;
- **Abundance index of co-predators** and other species has been carried out, which hitherto was restricted only to occupancy.
- **Sex ratio of tigers** in all camera trap sites has been carried out for the first time.
- Anthropogenic effects on tiger populations have been elaborated in a detailed manner.
- Tiger abundance within pockets in tiger reserves has been demonstrated for the first time.
- The report compares information obtained from tiger surveys of 2006, 2010 and 2014 with data obtained from the 2018-19 review to estimate population trends at country and landscape scales, patch colonization and extinction rates.

About the survey:

- The **quadrennial** tiger estimation is steered by the **National Tiger Conservation Authority** with technical support from the Wildlife Institute of India and implemented by state forest departments.
- The All India Tiger Estimation 2018 has entered the Guinness World Record for being the world's largest camera trap wildlife survey.

Project Tiger:

- This tiger conservation programme launched in April **1973** by the Government of India during Prime Minister **Indira Gandhi's tenure**.
- **Aim:** Ensuring a viable population of Bengal tigers in their natural habitats, protecting them from extinction, and preserving areas of biological importance as a natural heritage forever.
- From 9 tiger reserves since its formative years, the Project Tiger coverage has increased to **50** at present, spread out in 18 of our tiger range states.
- The tiger reserves are constituted on a **core/buffer strategy**.
- **Core areas** have the **legal status of a national park or a sanctuary**.
- Whereas, **buffer or peripheral** areas are a mix of forest and non-forest land, managed as a **multiple use area**.
- The government has set up a **Tiger Protection Force** to combat poachers and funded relocation of villagers to minimize human-tiger conflicts.

Global Tiger Initiative (GTI)

- The Global Tiger Initiative (GTI) was launched in 2008 as a **global alliance** of governments, international organizations, civil society, the conservation and scientific communities and the private sector, with the **aim of working together to save wild tigers from extinction**.
- In 2013, the scope was broadened to **include Snow Leopards**.
- The GTI's founding partners included the World Bank, the Global Environment Facility (GEF), the Smithsonian Institution, Save the Tiger Fund, and International Tiger Coalition (representing more than 40 non-government organizations).
- The initiative is led by the 13 tiger range countries (TRCs).

Global Tiger Forum

- The Global Tiger Forum (GTF) is the **only inter- governmental international body** established with members from willing countries to embark on a global campaign to protect the Tiger.
- The GTF was formed in 1993 on recommendations from an international symposium on Tiger Conservation at New Delhi, India.

The GTF is focused on saving the remaining 5 sub-species of Tigers distributed over 13 Tiger Range countries of the world.

Global Conservation Assured | Tiger Standards (CA | TS)

Context

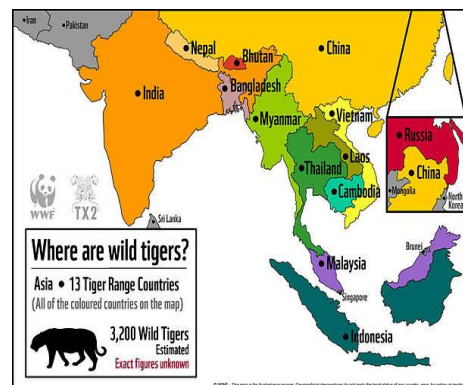
- India's 14 Tiger Reserves in India which received the accreditation of the Global Conservation Assured | Tiger Standards (CA | TS).


Details

- The 'Status of Leopards, Co-predators and Megaherbivores-2018' report is released, stating the fact that conservation of tigers leads to the conservation of entire ecosystem.
- Tiger Conservation a Symbol of Conservation of Forests.
- During all India tiger estimation 2018, leopard population was also estimated within the forested habitats in tiger occupied states of the country.
- The overall leopard population in tiger range landscape of India in 2018 was estimated at 12,852 (SE range 12,172 - 13,535).
- The 14 tiger reserves which have been accredited are
- Manas, Kaziranga and Orang in Assam
- Satpura, Kanha and Panna in Madhya Pradesh
- Pench in Maharashtra
- Valmiki Tiger Reserve in Bihar
- Dudhwa in Uttar Pradesh
- Sunderbans in West Bengal
- Parambikulam in Kerala
- Bandipur Tiger Reserve of Karnataka and
- Mudumalai and Anamalai Tiger Reserve in Tamil Nadu.


Conservation Assured | Tiger Standards (CA | TS)

- It has been agreed upon as accreditation tool by the global coalition of Tiger Range Countries (TRCs).
- It has been developed by tiger and protected area experts.
- Officially launched in 2013, it sets minimum standards for effective management of target species and encourages assessment of these standards in relevant conservation areas.
- Of the 13 tiger range countries Nepal, India, Bangladesh and Russia have registered and rolled out CA|TS, whilst discussion is ongoing with Bhutan, Indonesia, Thailand, Malaysia and China.
- CA | TS is a set of criteria, which allows tiger sites to check if their management will lead to successful tiger conservation.
- CA | TS is an important part of Tx2, the global goal to double wild tiger numbers by the year 2022.






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SUSTAINABLE DEVELOPMENTS









Biodiesel made from used cooking oil

Context

- Indian Oil Corporation has kicked-off the supply of diesel that is blended with biodiesel made from used cooking oil.

RUCO (Repurpose Used Cooking Oil) Initiative

- This is an initiative launched by FSSAI that will enable collection and conversion of used cooking oil to bio-diesel.

National Policy on Biofuels 2018			
Salient features			
 <p>An indicative target of 20% blending of ethanol in petrol and 5% blending of biodiesel in diesel is proposed by 2030.</p>	 <p>With a thrust on Advanced Biofuels, the Policy indicates a viability gap funding scheme for 2G ethanol Bio refineries of Rs.5000 crore in 6 years in addition to additional tax incentives, higher purchase price as compared to 1G biofuels.</p>	 <p>Categorization of Biofuels into Basic Biofuels - First generation(1G) Bioethanol & biodiesel and "Advanced Biofuels"- Second Generation(2G) ethanol, drop-in fuels, algae based Third Generation(3G) Biofuels.</p>	 <p>Increase scope of raw material for ethanol procurement by encouraging intermediate (B-Molasses), Sugarcane Juice, other Sugar containing materials and damaged as well as surplus food grains.</p>
 <p>Develop National Biomass repository by conducting appraisal of biomass across the Country.</p>	 <p>Bio diesel production to be encouraged from non edible oilseeds, used cooking oil, short gestation crops and development of supply chain mechanisms.</p>	 <p>Thrust on research, development and demonstration in the field of Biofuel feedstock production, advanced conversion technologies from identified feedstock.</p>	 <p>Setting up of National Biofuel coordination committee (NBCC) under Ministry of Petroleum & Natural Gas and Working Group on Biofuels.</p>

Generations of biofuels:

- 1G Bioethanol **plants utilize** sugarcane juice and molasses, byproducts in the production of sugar, as raw material.
- 2G plants **utilize** surplus biomass and agricultural waste to produce Bioethanol.
- Third generation biofuels** - These are produced from **micro-organisms** like algae.
- Fourth generation biofuels** - These are produced from **genetically modified (GM) algae** to enhance biofuel production.
- The prices of both sugarcane and bio-ethanol are set by the central government.
- Viable gap funding (VGF)** for commercial scale 2G ethanol plants under **Pradhan Mantri JI-VAN Yojana**
- Financial assistance for demonstration scale 2G integrated bioethanol under Pradhan Mantri JI-VAN Yojana.
- Grants for research and development from DBT to 5 Centres for Excellence in the Bioenergy area.
- The **National Policy on Biofuels 2018** specifically promotes advanced biofuels to achieve a target of 20% blending of biofuels with fossil-based fuels by 2030.

National Green Tribunal

Context:

- The National Green Tribunal (NGT), has appointed a joint committee to look into allegations of unauthorised construction activity taking place in Mekedatu, where the Karnataka government had proposed to construct a dam across the Cauvery River.

Mekedatu dam Project:

- The project **aims to store and provide 4.75 tmcft of drinking water to Bengaluru** and surrounding areas, apart from generating 400 MW of hydroelectricity at an estimated cost of Rs 9,000 crore.
- It is an extension of a protracted battle between **Karnataka and Tamil Nadu** states have waged over sharing the **Cauvery water**.

About NGT:

- The National Green Tribunal Act, 2010 is an Act of the Parliament of India, which enables creation of a special tribunal to handle the expeditious disposal of the cases pertaining to environmental issues.
- It draws inspiration from the India's constitutional provision of (Constitution of India/Part III) Article 21 Protection of life and personal liberty, which assures the citizens of India the right to a healthy environment.
- Powers
 - Power: The NGT has the power to hear all civil cases relating to environmental issues and questions that are linked to the implementation of laws listed in Schedule I of the NGT Act. These include the following:
 1. The Water (Prevention and Control of Pollution) Act, 1974;
 2. The Water (Prevention and Control of Pollution) Cess Act, 1977;
 3. The Forest (Conservation) Act, 1980;
 4. The Air (Prevention and Control of Pollution) Act, 1981;
 5. The Environment (Protection) Act, 1986;
 6. The Public Liability Insurance Act, 1991;
 7. The Biological Diversity Act, 2002.
- Importantly, the NGT has not been vested with powers to hear any matter relating to the Wildlife (Protection) Act, 1972, the Indian Forest Act, 1927 and various laws enacted by States relating to forests, tree preservation etc. Therefore, specific and substantial issues related to these laws cannot be raised before the NGT.
- Principles of Justice adopted by NGT: The NGT is not bound by the procedure laid down under the Code of Civil Procedure, 1908, but shall be guided by principles of natural justice. Further, NGT is also not bound by the rules of evidence as enshrined in the Indian Evidence Act, 1872.
- The Chairperson of the NGT is a retired Judge of the Supreme Court, Head Quartered in Delhi. Other Judicial members are retired Judges of High Courts. Each bench of the NGT will comprise of at least one Judicial Member and one Expert Member.

TREE CITY OF THE WORLD

Context

- Hyderabad city is recognized as the 'Tree Cities of the World' by the **Arbor Day Foundation** jointly with the **Food and Agriculture Organization of the United Nations Organization**.
- Hyderabad is the only city in the country to have been selected for this recognition in response to its **commitment to growing and maintaining urban forestry**.

What are the Tree Cities of the World?

- The Tree Cities of the World programme is an international effort to recognize cities and towns committed to ensuring that their **urban forests and trees are properly maintained, sustainably managed and duly celebrated**.
- To be recognized as a Tree City, a **community must meet five core standards** that illustrate a commitment to caring for its trees and forest.

Lowering Emissions by Accelerating Forest Finance (LEAF) Coalition

Context

- At Leaders' Summit on Climate, LEAF Coalition, came up with a \$1 billion fund plan that shall be offered to countries committed to arrest the decline of their tropical forests by 2030.

About LEAF Coalition plan:

- LEAF Coalition's proposal is a **step forward in saving forests, indigenous peoples**.
- It is a **collective of the United States, United Kingdom and Norway governments**.
- LEAF was **supported by transnational corporations (TNCs)** like Unilever plc, Amazon.com, Inc, Nestle, Airbnb, Inc as well as Emergent, a US-based non-profit.
- It is a step towards **concretising the aims and objectives of the Reducing Emissions from Deforestation and Forest Degradation (REDD+) mechanism**.
- REDD+ was created by the **United Nations Framework Convention on Climate Change (UNFCCC)**.

- REDD+ monetised the value of carbon locked up in the tropical forests of most developing countries, thereby propelling these countries to help mitigate climate change.
- It will incentivise the developing countries to capture extensive deforestation and provide livelihood opportunities to forest-dependent populations.
- It seeks to help developing countries in battling the double-edged sword of development versus ecological commitment.

Project BOLD

Context

- KVIC's Unique Project BOLD to Boost Tribals' Income and Bamboo-based Economy in Rajasthan.

Project BOLD (Bamboo Oasis on Lands in Drought):


- It is a unique scientific exercise to serve the combined national objectives of reducing desertification and providing livelihood and multi-disciplinary rural industry support.
- It has been initiated by Khadi and Village Industries Commission (KVIC).
- It seeks to create bamboo-based green patches in arid and semi-arid land zones.
- It will boost self-employment in the region.
- It will benefit a large number of women and unemployed youths in the region by connecting them to skill development programs.

KASEZ: first green industrial city

Context

- Gujarat's Kandla Special Economic Zone (KASEZ) becomes 'first green industrial city' in India.
- In KASEZ, 1000-odd acres has 3.5 lakh trees. Most of these trees have been planted post 2019, using the Miyawaki forestation method.

About Miyawaki forestation method

WHAT IS THE MIYAWAKI METHOD?	
<ul style="list-style-type: none"> ➤ Named after Japanese botanist Akira Miyawaki who invented it 	
<ul style="list-style-type: none"> ➤ It involves planting of several species very close together in a small pit 	
<ul style="list-style-type: none"> ➤ Plants draw nutrients from each other and become healthy 	
<ul style="list-style-type: none"> ➤ A dense forest, which grows naturally in 300 years is created in 30-35 years 	
<ul style="list-style-type: none"> ➤ Trees grow 10 times faster, and absorb 30 times more carbon dioxide 	
<ul style="list-style-type: none"> ➤ Density is 30 times that of normal tree plantations 	
MIYAWAKI FORESTS IN VADODARA	
Private farm, Sun Pharma Road Area 12,000 square feet Number of trees planted 3,500	VMC's Rajivnagar STP, Harni Area 16,000 square feet Number of trees planted 4,000
Bhoj village, Padra Forest department's demonstration plot Area 30 x 10 metre Number of trees planted 831	

Earth Overshoot Day

Context

- **Earth Overshoot Day** has shifted back to July 29, says the World Wide Fund for Nature (WWF).
- This means **humanity has used all biological resources that the Earth regenerates during the entire year by July 29**, the same date as in 2019.

Earth has overshoot its resources budget

Humanity has used up this year's allowance of natural resources by July 29, a Global Footprint Network study says

EARTH OVERSHOOT DAY
Calculated since 1986 by the think tank Global Footprint Network, Earth Overshoot Day is the day on which humanity's consumption of resources, such as water, soil and clean air, for the year far exceed Earth's capacity to regenerate those resources in the same year

EARLIEST IN TWO DECADES
The 2019 Earth Overshoot Day is the earliest ever with the day moving up by two months every year in the past two decades. In 1993, it fell on October 21, in 2003 on September 22, and in 2017 on August 2

1.75 PLANETS REQUIRED
At current consumption pace, the equivalent of 1.75 planets would be required to produce enough to meet humanity's needs

SEVERE CONSEQUENCES
According to the report, the cost of this global ecological overspending is evident in the form of "deforestation, soil erosion, biodiversity loss, or the buildup of carbon dioxide in the atmosphere"



Not enough resources for everyone's greed. AFP

INCREASED CO2 EMISSIONS
A major cause of the date falling earlier and earlier was growing amounts of CO2 emissions which contributes to "climate change and more frequent extreme weather events"

"We have only got one Earth - this is the ultimately defining context for human existence. We can't use 1.75 (earths) without destructive consequences."

Corporate Average Fuel Efficiency (CAFE) standards

Context

- Under the shadow of COVID-19 and uncertainty over sales, India's automotive sector has been protesting that scheduled implementation of higher standards of emissions and fuel efficiency next year, and enhanced vehicle safety goals, are deeply affecting the prospects of the industry.
- **These fuel efficiency norms have a bearing on carbon dioxide (CO2) emissions**, which are now under scrutiny to meet the goals of the Paris Agreement on climate change

What is the point of contention?

- The car industry must comply with the **Corporate Average Fuel Efficiency (CAFE) standards**, which represents the emissions profile of the models sold by a company, and was first introduced in 2017.

What are Corporate Average Fuel Efficiency (CAFE) standards?

- CAFE or Corporate Average Fuel Efficiency/Economy regulations **are in force in many advanced as well as developing nations, including India.**
- They **aim at lowering fuel consumption** (or improving fuel efficiency) of vehicles by lowering carbon dioxide (CO2) emissions, thus serving the twin purposes of **reducing dependence on oil for fuel and controlling pollution.**
- Corporate Average refers to **sales-volume weighted average for every auto manufacturer.**
- The norms are applicable for **petrol, diesel, LPG and CNG passenger vehicles.**

- CAFE regulations in India came into force from April 1, 2017. Under this, average corporate CO2 emission must be less than 130 gm per km till 2022 and below 113 gm per km thereafter.

CAFÉ vs BS-VI

- While CAFE regulations focus on reducing CO2 emissions, BS VI focusses on **other harmful exhaust from vehicles**.
- The BS IV-compliant fuel currently in use has **50 parts per million (ppm) sulphur**, but BS VI stipulates a **low 10 ppm**.
- Besides, under BS VI, particulate matter emission for diesel cars and **nitrogen oxide levels** are expected to be substantially lower than in BS IV.

Blue flag Beach

Context

- International eco-label "Blue Flag", has accorded the Blue Flag Certification for 2 new beaches this year - Kovalam in Tamil Nadu and Eden in Puducherry beaches.
- It's recognition of India's commitment to **protect and conserve the pristine coastal and marine ecosystems through holistic management of the resources**.
- **Foundation for Environment Education in Denmark (FEE)** which accords the globally recognized eco-label - Blue Flag certification, has also given re-certification for 8 nominated beaches **Shivrajpur-Gujarat, Ghoghla-Diu, Kasarkod and Padubidri-Karnataka, Kappad-Kerala, Rushikonda- Andhra Pradesh, Golden-Odisha and Radhanagar- Andaman and Nicobar**, which were awarded the Blue Flag certificate last year.
- This was aimed for achieving the globally recognized and the coveted International eco-label "Blue Flag" , accorded by International Jury comprising of members from **IUCN, UNWTO, UNEP, UNESCO etc.**
- FEE Denmark conduct regular monitoring & audits for strict compliance of the **33 criteria** at all times.
- A waving "**Blue Flag**" is an **indication of 100% compliance** to these 33 stringent criteria and **sound health of the beach**.

About BEAMS program:

- The Ministry of Environment, Forest and Climate Change flagship program **Beach Environment & Aesthetics Management Services (BEAMS)** is one of the initiatives under ICZM approach undertaken for the sustainable development of coastal regions of India, with a prime objective **to protect and conserve the pristine coastal and marine ecosystems through holistic management of the resources**.
- The objective of BEAMS program is **to abate pollution in coastal waters, promote sustainable development of beach facilities, protect & conserve coastal ecosystems & natural resources, and seriously challenge local authorities & stakeholders to strive and maintain high standards of cleanliness, hygiene & safety for beachgoers in accordance with coastal environment & regulations**.

Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)

Context

- India has extended support for protecting the Antarctic environment and for co-sponsoring the proposal of the European Union for designating **East Antarctica and the Weddell Sea as Marine Protected Areas (MPAs)** at a high-level ministerial meeting.

About MPA:

- An MPA is a **marine protected area** that provides protection for all or part of its natural resources.
- Certain activities within an MPA are limited or prohibited to meet specific conservation, habitat protection, ecosystem monitoring, or fisheries management objectives.

About Commission for the Conservation of Antarctic Marine Living Resources:

- It is an **international treaty** to manage Antarctic fisheries with the goal of **preserving species diversity and stability of the entire Antarctic marine ecosystem**.

- The Convention for the Conservation of Antarctic Marine Living Resources was established in 1982.
- It was established in response to concerns that increasing krill fishing activities could have a deleterious impact on the Southern Ocean ecosystem.
- It is an international treaty between 25 nations that seeks to manage Antarctic fisheries with the goal of preserving species diversity and stability of the entire Antarctic marine ecosystem.
- Although the aim of the Convention is to conserve marine life of the Southern Ocean, it does not prohibit reasonable harvesting.
- India has been a permanent member of the CCAMLR since 1986.
- Work pertaining to the CCAMLR is coordinated in India by the Ministry of Earth Sciences through its attached office, the Centre for Marine Living Resources and Ecology (CMLRE) in Kochi, Kerala.
- India is part of the Antarctic Treaty System.

Namami Gange Programme

Context

- Chacha Chaudhary Declared Mascot For Namami Gange Programme.

National Mission for Clean Ganga (NMCG)

- NMCG has been focusing on youth as part of its outreach and public communications efforts as they are the impellers of change.
- NMCG has tied-up with Diamond Toons to develop and distribute comics, e-comics and animated videos.
- The content will be designed with the objective of bringing about behavioral change amongst children towards Ganga and other rivers.
- The total estimated budget for the project is Rs. 2.26 Cr.
- Chacha Chaudhary can be useful in ground-level activation for Ganga rejuvenation.
- Initially, the comics will be launched in Hindi, English and Bengali.

Namami Gange Programme'

- It is an Integrated Conservation Mission, approved as 'Flagship Programme' by the Union Government in June 2014 with budget outlay of Rs.20,000 Crore to accomplish the twin objectives of effective abatement of pollution, conservation and rejuvenation of National River Ganga.
- Main pillars of the Namami Gange Programme are:-
 - Sewerage Treatment Infrastructure
 - River-Front Development
 - River-Surface Cleaning
 - Bio-Diversity
 - Afforestation
 - Public Awareness
 - Industrial Effluent Monitoring
 - Ganga Gram
- Its implementation has been divided into
 - Entry-Level Activities (for immediate visible impact),
 - Medium-Term Activities (to be implemented within 5 years of time frame) and
 - Long-Term Activities (to be implemented within 10 years).

Project RE-HAB

Context

- Khadi and Village Industries Commission (KVIC) Rolls Out Project RE-HAB in Assam to Prevent Elephant - Human Conflicts Using Tiny Bees.

About Project RE-HAB (Reducing Elephant-Human Attacks using Bees):

- KVIC has launched Project RE-HAB for areas, which severely grapples with elephant-human conflicts.
- Under Project RE-HAB, "Bee-fences" are created by setting up bee boxes in the passage ways of elephants to block their entrance to human territories.

- The **boxes are connected with a string** so that when elephants attempt to pass through, a tug or pull causes the bees to swarm the elephant herds and dissuade them from progressing further.
- It is a **cost-effective way of reducing human-wild conflicts without causing any harm to the animals.**
- Elephants also fear that the bee swarms can bite their sensitive inner side of the trunk and eyes. The collective buzz of the bees is annoying to elephants that force them to return.
- It is prove to be a **sustainable solution to the human-elephant conflicts** that are very common in Assam.
- Project RE-HAB is a **sub-mission of KVIC's National Honey Mission.** Honey Mission is a programme to increase the bee population, honey production and beekeepers' income by setting up apiaries.
- In just 6 months, this project has reduced elephant attacks by over 70%.

Kasturirangan Committee on Western Ghats

Context

- Karnataka Chief Minister informed the Centre that the state is **opposed to the Kasturirangan Committee** report on Western Ghats.
- As **declaring Western Ghats as ecologically sensitive zone would adversely affect the livelihood of people in the region.**

Recommendations of the Kasturirangan committee report

- It proposes **37 per cent of the total area of Western Ghats**, which is roughly 60,000 square kilometres, to be declared as **eco-sensitive area (ESA).**
- It recommended a **blanket ban on mining, quarrying, setting up of red category industries and thermal power projects.**
- It also stated that the impact of infrastructural projects on the forest and wildlife should be studied before permission is given for these activities.
- It also stated that the **UNESCO Heritage tag is an opportunity to build global and domestic recognition of the enormous natural wealth** that exists in the Western Ghats.
- The 39 sites are located across the Western Ghats and distributed across the states (Kerala 19), Karnataka (10), Tamil Nadu (6) and Maharashtra (4).
- The boundary of the sites, are in boundaries of the legally demarcated national parks, wildlife sanctuaries, tiger reserves and forest divisions and therefore, already accorded with high level of protection.
- The Eco-Sensitive Area mapping and demarcation done by the committee also indicates that all sites are within this area.
- The state governments should view this development and build a plan to protect, conserve and value the resources and opportunities of the region. The **state of Karnataka has the highest percentage of the ESA-46.50 per cent.**

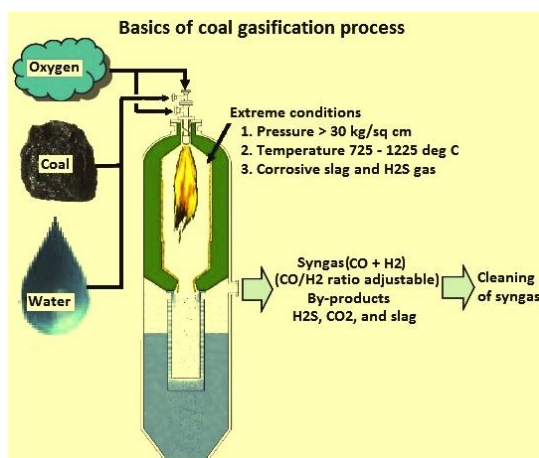
Coal gasification

Context

- As per Union budget 2022-23, four pilot projects for coal gasification and conversion of coal into chemicals required for the industry will be set up for technical and financial viability.

What is Coal gasification?

- Coal gasification is the process of converting coal into synthesis gas (also called **syngas**), which is a **mixture of hydrogen (H₂), carbon monoxide (CO) and carbon dioxide (CO₂).**
- The syngas can be used in a variety of applications such as in the **production of electricity and making chemical products, such as fertilisers.**
- Even low-grade coal can be used in the process.
- Coal gasification is prominent in China. **China has the biggest number of coal gasification projects** in the world.



One Ocean Summit

Context

- France hosted the 'One Planet' Summit dedicated to the Ocean, called the One Ocean Summit.

Key details of Summit:

- **Aims/ Goal:**
 1. to mobilize the international community and take concrete action to reduce adverse effects on the ocean, raising its level of ambition on maritime issues.
 2. to raise the collective level of ambition of the international community on marine issues and to translate shared responsibility to the ocean into tangible commitments.
- It focused on the **protection of marine ecosystems and sustainable fisheries, the fight against pollution (especially plastic), climate change, and ocean governance.**
- It was held in the context of the **French Presidency of the Council of the European Union**, with the support of the **United Nations.**
- It brought together determined group of Heads of State and Government, leaders of multilateral institutions, business leaders and civil society policymakers to take ambitious commitments.
- **Initiatives taken for:** marine ecosystem protection and sustainable fisheries, fight plastic pollution, climate change, improved governance of the oceans.

Green Hydrogen

Context

- India & Denmark agreed to initiate joint research and development on green fuels including green hydrogen, during the Joint S&T Committee meeting.





Key highlights of the Joint Committee:

- It emphasized on development of bilateral collaboration on mission-driven research, innovation, and technology development, including climate and green transition, energy, water, waste, food and so on.
- **Green Strategic Partnership – Action Plan 2020-2025** adopted.

About Hydrogen

- There are **no natural hydrogen deposits on earth**, it has to be extracted from other compounds by a chemical process.
- The vast majority of industrial hydrogen is currently produced from natural gas through a process known as **steam methane reforming or SMR.**
- Producing hydrogen in this way is sometimes referred to as **brown or grey or even blue hydrogen.**

Types of Hydrogen:

Color	GREY HYDROGEN	BLUE HYDROGEN	TURQUOISE HYDROGEN*	GREEN HYDROGEN
Process	SMR or gasification	SMR or gasification with carbon capture (85-95%)	Pyrolysis	Electrolysis
Source	Methane or coal 	Methane or coal 	Methane 	Renewable electricity 

Note: SMR = steam methane reforming.

* Turquoise hydrogen is an emerging decarbonisation option.

Green National Highway Corridor Project

Context

- The Government had signed **loan agreement with the World Bank** to develop Green National Highway Corridors (GNHCP).
- The project include Upgradation of about 781 km length of various National Highways passing through the states of **Rajasthan, Himachal Pradesh, Uttar Pradesh and Andhra Pradesh**.
- The schedule date of completion is December, 2025.



MISCELLANEOUS

Biofloc method for Vannamei farming

Context

- The Kerala University of Fisheries and Ocean Studies (Kufos) is looking to deploy the biofloc method to farm Vannamei shrimp even as COVID-19 restrictions and job losses are turning more and more people to self-employment in agriculture and allied activities.

More about news:

- It has found acceptance among aquaculturists with the Department of Fisheries offering support for the programme.
- The fish that is now being widely cultivated using the technology is the **genetically-modified farmed tilapia (GIFT)**.
- Such ventures can be turned into economically-remunerative ones for farmers by switching the candidate species to Vannamei shrimp.

Biofloc technology

- It is an **intensive aquaculture system** and is considered to hold an advantage over conventional systems, as the normally **harmful waste produced in conventional aquaculture can be turned into feed for fish**.
- Those with **limited land area** could take up fish culture using the technology.
- The exotic whiteleg shrimps are native to the Eastern Pacific Ocean and have been found to be suited to the brackish water conditions in Kerala.
- Extensive culture of Vannamei has been undertaken in **Andhra Pradesh, West Bengal, Orissa, and Tamil Nadu, among other coastal States**.
- Biofloc system was developed **to improve the environmental control over the aquatic animal production**.
- In aquaculture, the strong influential factors are the **feed cost (accounting to 60% of the total production cost) and most limiting factor is the water/land availability**.
- Biofloc system is a **wastewater treatment which has gained vital importance as an approach in aquaculture**.
- The **principle of this technique is the generation of nitrogen cycle by maintaining higher C: N ratio** through stimulating heterotrophic microbial growth, which assimilates the nitrogenous waste that can be exploited by the cultured species as a feed.
- The biofloc technology is not only effective in treating the waste but also grants nutrition to the aquatic animal.
- The higher C : N is maintained through the addition of carbohydrate source (molasses) and the water quality is improved through the production of high quality single cell microbial protein.
- In such condition, dense microorganisms develop and function both as bioreactor controlling water quality and protein food source.
- The biofloc technology has been implemented in shrimp farming due to its bottom dwelling habit and resistance to environmental changes.

Kyasanur forest disease

Context

- ICMR-NIV develops new point-of-care testing for Kyasanur forest disease.

About Kyasanur Forest disease:

- This disease was **first identified in Kyasanur forest of Shimoga district in Karnataka** during an investigation of monkey mortalities in 1957.
- It is a **zoonotic disease**.
- The disease is caused by a **Kyasanur Forest disease virus**, which primarily **affects humans and monkeys**.
- In nature, the **virus is maintained mainly in hard ticks, monkeys, rodents and birds** and transmitted via the **bite of Haemaphysalis ticks and contact with carcasses of dead monkeys**.

- The disease is characterised by chills, frontal headache, body ache, and high fever for five to 12 days with a case fatality rate of 3 to 5 per cent.

Threat to humans:

- Humans **can get the disease form an infected tick bite** or by contact with an infected animal, such as sick or recently dead monkey.
- Available epidemiological data **does not suggest any human-to-human transmission.**

Treatment:

- **No specific treatment for KFD is available.**

Vaccination

- There is limited availability of information on KFD vaccine for human use in India.
- State Government of **Karnataka is following KFD vaccination policy in the KFD endemic area.**

Monkey B virus

Context

- China has reported the first human infection case with Monkey B virus (BV) after a Beijing-based veterinarian was confirmed with the same a month after he dissected two dead monkeys
- The vet's case marks the first human infection case with BV identified in China.
- First identified in 1932, the virus is learnt to have infected only 50 people till 2020, of which 21 died.

What is Monkey B virus?

- It is an **alphaherpesvirus enzootic** in macaques of the genus *Macaca*.
- B virus is the **only identified old-world-monkey herpesvirus** that displays severe pathogenicity in humans.
- The infection can be transmitted via **direct contact and exchange of bodily secretions** of monkeys and has a fatality rate of 70 per cent to 80 per cent.
- Macaque monkeys **commonly have this virus**, and it can be found in their saliva, feces (poop), urine (pee), or brain or spinal cord tissue.
- The first indications of B virus infection are typically **flu-like symptoms** such as fever and chills, muscle ache, fatigue and headache, following which an infection person may develop small blisters in the wound or area on the body that came in contact with the monkey.
- **Currently, there are no vaccines** that can protect against B virus infection.
- The virus might pose a **potential threat to laboratory workers, veterinarians, and others who may be exposed to monkeys** or their specimens.
- Till date, only one case has been documented of an infected person spreading B virus to another person.

H5N1 avian influenza

Context:

- An 11-year-old boy died of H5N1 avian influenza in Delhi.
- This is the **first recorded death due to the bird flu in India** in 2021.

What is bird flu?

- Bird flu or avian influenza is a disease caused by **avian influenza Type A viruses** found naturally in wild birds worldwide.
- The virus can **infect domestic poultry** including chickens, ducks, turkeys and there have been reports of H5N1 infection among pigs, cats, and even tigers in Thailand zoos.

Bird flu: Infection in humans

- There have been **reports of avian and swine influenza infections** in humans including A(H1N1), A(H1N2), A(H5N1), A(H7N9), etc.
- The first report of human H5N1 infection was in 1997 and currently, over 700 human cases of Asian Highly Pathogenic Asian Avian Influenza A (HPAI) H5N1 virus have been reported to the World Health Organisation from 16 countries.
- The **infection is deadly as it has a high mortality rate of about 60%**.
- The **most common route of virus transmission is direct contact – when a person comes in close contact with infected birds, either dead or alive.**
- Humans can also be affected if they come in contact with **contaminated surfaces or air near the infected poultry.**
- There is **no sufficient evidence suggesting the spread of the virus through properly cooked meat.**

Cryptogamic garden

Context:

- India's first cryptogamic garden opens in **Dehradun**.

More about news:

- Around 50 species have been grown in the garden at Deoban in Chakrata at a commanding height of 9,000 ft.
- It is housing nearly **50 species of lichens, ferns and fungi** was inaugurated in Uttarakhand's Dehradun district.
- It is spread over three acres and its low pollution levels and moist conditions are conducive for the growth of these species.
- Deoban has pristine majestic forests of **Deodar and Oak** which create a natural habitat for cryptogamic species.

Cryptogamae

- It means **"hidden reproduction"** referring to the fact that **no seed, no flowers are produced**. Thus, cryptogams represent the **non-seed bearing plants**.
- Algae, bryophytes (moss, liverworts), lichens, ferns and fungi are the best-known groups of cryptogams that require moist conditions to survive.
- **Algae** comprises the **most primitive organisms** which are predominantly aquatic, both in marine as well as freshwater habitats.
- **Bryophytes** are the **simplest and primitive land plants** that occupy an intermediate position between algae and pteridophytes.
- **Lichens are a complex life form** that is a symbiotic partnership of two separate organisms, a fungus and an algae
- **Ferns** are the **largest living group of primitive vascular plants** while fungi is a kingdom of usually multicellular eukaryotic organisms that are heterotrophs.

FERNERY

Context:

- Largest open air fernery inaugurated in Uttarakhand.

More about news:

- India's largest open-air fernery inaugurated in Uttarakhand's Ranikhet.
- The **fernery is home to a large number of fern species**, some of which are **endemic to the state**, some hold **medicinal value** while some are threatened species that demand care and conservation.
- This center has been developed for **conservation of fern species** and also to **create awareness** about their ecological role and promote further research.
- It has been developed by the Research Wing of Uttarakhand Forest Department over a period of three years, under Central Government's CAMPA scheme.

Ambergris

Context

- Forest Department officials seized 8.013 kg of ambergris in Tiruvarur district.

About Ambergris:

- It is used for making perfumes.
- It is produced in the **stomach of sperm whales** when indigestible parts move into the intestines and bind together.
- They slowly become a solid mass, growing over many years.
- When the animal vomits the mass, it floats a foot below the surface of the sea. Only those with knowledge of it can collect it.



In the modern-day perfume industry, ambergris is used as a stabiliser in fine perfumes. Today, one kg of ambergris could fetch the fancy price of Rs 1 crore.

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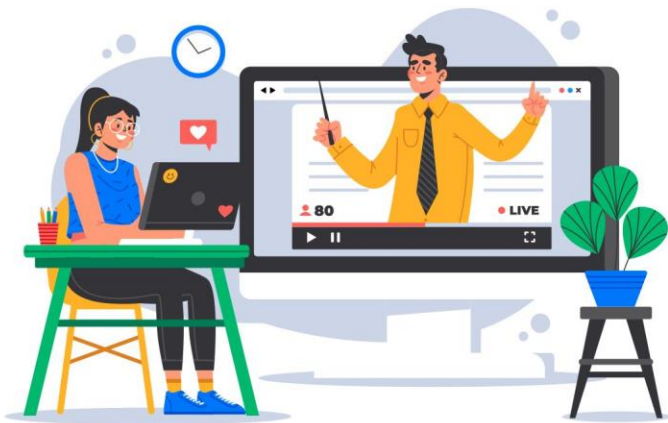
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