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1 ENVIRONMENTAL GOVERNANCE

1 Net zero by 2060: China's bold new carbon emissions goal

Context: In a latest announcement, China has announced it plans to boost country's **Paris climate accord** target and called for a **green revolution**.

What is net zero?

- While there is no standard definition of net zero, the broad understanding is that it involves a combination of approaches targeted at reducing and removing emissions.
- The idea is to maintain a balance between greenhouse gas (GHG) emissions produced and removed from the atmosphere.

Carbon neutrality

- The term "carbon neutrality" means releasing no additional CO2 into the atmosphere.
- Though technically it allows countries to keep emitting if they ensure that an equal amount is captured again in some form.

Background

- China's announcement came just minutes after US President Donald Trump blasted Beijing for "rampant pollution".
  - The US and China have been hit this year by extreme weather of the kind predicted by scientists to accompany climate change.
  - In China, heavy rains over the summer unleashed the most punishing flood season in about 30 years, while the US is facing one of its busiest hurricane seasons at the same time that record wildfires ravage western states.
- European officials were also expected to press China to toughen its climate goals.
- The EU wanted Chinese emissions to peak by 2025 instead of the country's target date of 2030.

What steps China needs to take?

- China needs to mount a concerted effort throughout its economy.
- It must adopt, a 1.5°C pathway to carbon reduction of 75% to 85% by 2050.

Stronger set of goals under the Paris Agreement

- Along with the pledge to be carbon neutral by 2060, China also announced to submit a stronger set of goals under the Paris agreement.

- China would aim to peak carbon emissions before 2030, upping the commitment from "around" 2030.

Will it be a challenge for China?

- The goal will be a challenge for China, which relies heavily for its **electricity on coal**, one of the most **carbon-intensive fossil fuels**.
- China released the equivalent of 10 billion tons of carbon dioxide, or CO2, into the atmosphere in 2018, according to the **Global Carbon Project** that tracks emissions worldwide.

2 Pilibhit Tiger Reserve Gets Global Award for Doubling Tiger Population

Context: The Pilibhit Tiger Reserve (PTR) has bagged international award TX2 for doubling the number of tigers in the past four years. The number of tigers in the reserve area has gone up to 65 from 25 in the period of just four year.

About

- **The Pilibhit Tiger Reserve**
- The Pilibhit Tiger Reserve is situated in Uttar Pradesh, forming part of the **Terai Arc Landscape**, in the **upper Gangetic Plain Biogeographic Province**.
- It lies along the India-Nepal border in the foothills of the Himalayas and the plains of the Terai in Uttar Pradesh.
- It is one of India's 51 Project Tiger reserves.
- **Rivers:** Some river originating from the reserve, which is also the catchment of several others like Sharda, Chuka and Mala, Khannot.
- **Forest:** The habitat is characterized by Saal Forests, tall grasslands and swamp maintained by periodic flooding from rivers.
- The ShardaSagar Dam extending up to a length of 22 km is on the boundary of the reserve.

Tiger Population in India

- Recently, India's tiger census of 2018 entered the Guinness Book of World Records for being the largest ever camera-trap wildlife survey conducted anywhere in the world.
- According to the survey, the country was home to an about 2,967 tigers.
- Of all the big cats, 2,461 (around 83%) have been photo-captured.
- The country's tiger population increased by roughly one-third, from 2,226 in 2014 to 2,927 in 2018 following efforts that included better corridors between isolated pockets of tiger territory, reduced poaching and building up prey numbers through habitat restoration.
- India now has nearly 70 per cent of the global tiger population and 50 tiger reserves. The tiger tally in the country stands at 2,967.
  - The tiger population in the country has grown from 1,400 in 2014 to 2,967 in 2019.
  - Madhya Pradesh has the maximum number of tigers at 526.
  - Corbett Tiger Reserve in Uttarakhand has the highest number of 231 big cats in the country.

The Award

- Set in 2010 by the 13 tiger range countries, the goal known as **TX2** is credited with reversing the downward decline of tigers from a low.

- **13 Tiger range countries:** India, Nepal, China, Russia, Bangladesh, Thailand, Vietnam, Malaysia, Bhutan, Indonesia, Laos, Cambodia and Myanmar.
  - PTR was the first to receive the award among 13 tiger range countries.
- **Key international organization:** UNDP, Global Tiger Forum, International Union for Conservation of Nature, World Wide Fund for Nature, Conservation Assured/Tiger Standards and the Lion's Share.

3 Eight Beaches awarded the Blue Flag Certification

Context: Eight beaches in India have been awarded the coveted 'Blue Flag' certification by an eminent international jury, which comprises members of the-

- United Nations Environment Programme (UNEP)
- United Nations World Tourism Organization (UNWTO)
- Foundation for Environmental Education (FEE)
- International Union for Conservation of Nature (IUCN)

About the 'Blue Flag' certification

- The 'Blue Flag' is a certification that can be obtained by a beach, marina, or sustainable boating tourism operator, and serves as an eco-label.
  - The Blue Flag programme was started in France in 1985 and in areas out of Europe in 2001.
  - Forty-seven countries currently participate in the program, and 4,573 beaches, marinas, and boats have this certification.

In its July 2019 notification, the Environment Ministry identified the following beaches in India for Blue Flag certification: Shivrajpur (DevbhumiDwarka, Gujarat), Bhogave (Sindhudurg, Maharashtra), Ghoghla (Diu, Daman and Diu), Miramar (Panjim, Goa), Kasarkod (Karwar, Karnataka), Padubidri (Udupi, Karnataka), Kappad (Kozhikode, Kerala), Eden (Puducherry), Mahabalipuram (Kanchipuram, Tamil Nadu), Rushikonda (Visakhapatnam, Andhra Pradesh), Golden (Puri, Odisha), and Radhanagar (Port Blair, Andaman & Nicobar).

- The certification is awarded by the Denmark-based non-profit Foundation for Environmental Education, which sets stringent environmental, educational, safety-related and access-related criteria that applicants must meet and maintain.
- It is awarded annually to beaches and marinas in FEE member countries.

Criteria for certification

- Blue Flag certification is granted based on 33 criteria under four heads –
  - environmental education and information
  - bathing water quality
  - environment management and conservation
  - safety and services at the beaches

Which beaches are selected for certification?

- **The beaches selected for the certification are:**
- Kappad (Kerala)
- Shivrajpur (Gujarat)
- Ghoghla (Diu)
- Kasarkod and Padubidri (Karnataka)
- Rushikonda (Andhra Pradesh)

- Golden (Odisha)
- Radhanagar (Andaman & Nicobar Islands)

Blue Flag beaches in other part of the world

- India is the only country that has received the Blue Flag certification in 2 years' time.
- apan, South Korea and UAE are the only other Asian nations that have been conferred with a couple of Blue Flag beaches in a time frame of about 5 to 6 years.
- With the feat, India is now in the league of 50 'Blue Flag' countries.
- Spain tops the list with more than 560 such beaches; Greece and France follow.

4 Karnataka to soon declassify forest

Context: Karnataka has planned to **soon declassify 6.64 lakh hectares** of the 9.94 lakh hectares of deemed forests in the state (nearly 67%) and hand it over to Revenue authorities.

What are deemed forests?

- A deemed forest fits "dictionary meaning" of a forest, "irrespective of ownership".
- In other words, these are thickly wooded areas recommended to be taken over by the government for preservation as forests but not notified.

Re-definition of forest: SC

A Supreme Court Judgement in 1996 re-defined the meaning of forests to include all areas with natural forests irrespective of their ownership as well as those that came under the 'dictionary' meaning of forest.

The Supreme Court in the case of **T N GodavarmanThirumalpad (1996)** accepted a wide definition of forests under the Act.

- "The word 'forest' must be understood according to its dictionary meaning. This description covers all statutorily recognised forests, whether designated as reserved, protected or otherwise for the purpose of Section 2 (1) of the Forest Conservation Act," the Supreme Court said in its December 12, 1996 order.
- "The term 'forest land' occurring in Section 2 will not only include 'forest' as understood in the dictionary sense, but also any areas recorded as forest in the government record irrespective of the ownership. The provisions enacted in the Forest Conservation Act 1980 for the conservation of forest and the matters connected therewith must apply clearly to all forest so understood irrespective of the ownership or classification thereof,".

How much land in Karnataka is protected under the Forest Act?

- Reports by expert committees in 1997 and 2002 identified 43.18 lakh hectares of forest land for conservation in Karnataka, which included 33.23 lakh hectares notified forest area as per forest records and 9.94 lakh hectares 'deemed forests'.

5 EIA Notification 2020

Context: Environmental activist censored for encouraging public participation in consultation process of Drafting of Environment Impact Assessment Notification 2020.

What is Environment Impact Assessment (EIA)?

- Environmental Impact Assessment or EIA is the process or study which predicts the effect of a proposed industrial/infrastructural project on the environment.
- It prevents the proposed activity/project from being approved without proper oversight or taking adverse consequences into account.
- A signatory to the Stockholm Declaration (1972) on Environment, India enacted laws to control water (1974) and air (1981) pollution soon after.
- Under the Environment (Protection) Act, 1986, India notified its first EIA norms in 1994, setting in place a legal framework for regulating activities that access, utilise, and affect (pollute) natural resources.
- The 1994 EIA notification was replaced with a modified draft in 2006. Earlier this year, the government redrafted it again to incorporate the amendments and relevant court orders issued since 2006, and to make the EIA "process more transparent and expedient."

Issues in the current system

- A facade of legal paperwork for a range of de facto concessions enjoyed by industries.
- Lack of administrative capacity to ensure compliance often renders long lists of clearance conditions meaningless.
- Periodic amendments exempting one category of industries or the other from scrutiny.

Key-highlights of the new draft

- The new draft exempts a long list of projects from public consultation.
- All inland waterways projects and expansion/widening of national highways will be exempt from prior clearance. These include roads that cut through forests and dredging of major river.
- The 2020 draft also exempts most building construction projects of built-up area up to 1,50,000 sq m. This is a reiteration of the Environment Ministry's December 2016 notification that was set aside by the National Green Tribunal in December 2017. The government subsequently moved the Supreme Court but did not get any relief.

  The two most significant changes in the new draft are the provisions for post-facto project clearance and abandoning the public trust doctrine. Projects operating in violation of the Environment Act will now be able to apply for clearance. It is a reiteration of a March 2017 notification for projects operating without clearance.

6 Sukhna Lake becomes a 'living entity'

Context: The Punjab and Haryana high court has declared Sukhna Lake a "living entity" or "legal person" with rights, duties and liabilities of a living person. It also declared all citizens of Chandigarh as loco parentis (in the place of a parent) to save the lake from extinction.

About:

- Sukhna Lake is situated at the foothill of Shivalik Hills in the city of Chandigarh.
  - The Lake was created in 1958, by damming a seasonal stream SukhnaChoe, which cascade from the Shivalik Hills.
  - Sukhna Reservoir was also designed by Le Corbusier (Chief Architect of Chandigarh city) and the Chief Engineer P L Verma in the year 1974.
- Several migratory birds like cranes, Siberian ducks, storks etc., can be seen during the season.

The decision:

- The court observed that Sukhna Lake is required to be declared as a legal entity for its survival, preservation and conservation.

Similar examples:

- In 2008, Ecuador became the first country to enshrine the legal rights of nature in its constitution.
- Bolivia passed a similar law in 2011.
- Meanwhile, New Zealand in 2017 became the first country to grant the Whanganui river legal rights, followed by the Indian state of Uttarakhand, when it declared the Yamuna and Ganges rivers "living entities" (a verdict that was later stayed by the Supreme Court).
- El Salvador recognized its forests as living entities and stated that each person must commit to caring for, preserving, and respecting forests.
- In 2019, the city of Toledo, Ohio, passed what is known as the Lake Erie Bill of Rights to protect its shores, making it one of several U.S. communities to have passed legislation recognizing the rights of nature.
- In July 2019, Bangladesh became the first country to grant all of its rivers the same legal status as humans.

What does being "living entity" means?

- Rights are the obligations that society and state have for establishing sustainable relationships.
- With this ruling, Sukhna Lake is no more voiceless water body, but "person" with legal rights.
- As "juristic person", the lake, have a right to be legally protected from any kind of harm or destruction.
- Polluting it, henceforth, could entitle to human rights violation for which it can take legal recourse.
- From now, the lake can be a party to disputes and rights violation, represented by court-appointed individuals who can file and contest cases on its behalf.

7 First-ever World Solar Technology Summit (WSTS)

Context: The International Solar Alliance (ISA) organized the first-ever World Solar Technology Summit (WSTS).

About:

- The main objective of the summit was to showcase next-generation solar technologies to member countries.
- Partnership agreements on the implementation of 47 projects was also signed and exchanged between ISA and NTPC. A partnership agreement on the 'One Sun One World One Grid' was signed and exchanged between the Ministry of New and Renewable Energy (MNRE), the World Bank, and the ISA.

The International Solar Alliance (ISA)

- The International Solar Alliance (ISA) is an alliance of 121 countries initiated by India, most of them being sunshine countries, which lie either completely or partly between the Tropic of Cancer and the Tropic of Capricorn.
- The primary objective of the alliance is to work for efficient exploitation of solar energy to reduce dependence on fossil fuels.
- This initiative was first proposed by Indian Prime Minister NarendraModi in a speech in November 2015 at Wembley Stadium, in which he referred to sunshine countries as Suryaputra ("Sons of the Sun").

- The alliance is a treaty-based inter-governmental organization. Countries that do not fall within the Tropics can join the alliance and enjoy all benefits as other members, with the exception of voting rights. After the United Nations, it is the largest grouping of states world-wide.

Geographical importance

- The area of Earth located in between the **Tropic of Cancer and Tropic of Capricorn** is called the **tropical (torrid) zone.**
- This is the part of the world in which the sun can appear directly overhead, and that more-direct exposure means that the sun's actual effect is greater here; anywhere north or south of this zone, sunlight always reaches the earth's surface at an angle and is correspondingly less intense.

8 Identification of Elephant Corridors

Context: Despite ready list, Jharkhand to identify elephant corridors as the corridors had changed since their identification, they would need to be identified again.

What are Elephant Corridors?

- Elephant corridors are narrow strips of land that connect two large habitats.
  - The National Tiger Conservation Authority (NTCA), constituted under the Wildlife (Protection) Act, 1972 (amendment 2006), defines wildlife corridors as "inherent geographical linkages (through forests, river courses or other habitat attributes) which facilitate movement of tigers and other wild animals from one source area to another."
  - They are linear, narrow, natural habitat passages that allow elephants to move between secure habitats without being disturbed by humans
- In many cases, these corridors are already under the control of a government agency and could include unutilized spaces in large commercial estates, and fallow or agricultural lands.
- The report (Wildlife Trust of India's 2017 report, Right of Passage) has the officially accepted list of 108 identified elephant corridors in the country. "
  - Of the 108 corridors, 14 are in Jharkhand and none of them have been notified so far.
- Right to Passage was, however, approved by the forest department of Jharkhand, along with those of Arunachal Pradesh, Assam, Karnataka, Kerala, Meghalaya, Odisha, Tamil Nadu, Uttarakhand and West Bengal.

What is the need of elephant corridor?

- Land degradation
- Elephant needs vast areas to roam
- Human Elephant Conflict

9 Marine spatial planning

Context: India and Norway have agreed to jointly work in the area of marine spatial planning in the oceanic space for the next five years.

What is Marine Spatial Planning?

- **Marine spatial planning**(**MSP**) is a process that brings together multiple users of the ocean such as:
  - energy, industry, government, conservation and recreation

- It aims to make informed and coordinated decisions about how to use **marine**resources sustainably.

Key-highlights of the plan

- **Pilot Sites:** Lakshadweep and Puducherry
- **Implementing Agency:** Ministry of Earth Sciences (MoES) through **National Centre for Coastal Research (NCCR)** for India in collaboration with the **Norwegian Environment Agency** through the Ministry of Foreign Affairs, Norway.
- **Extension program:** This is a part of the **Indo-Norway Integrated Ocean Initiative**under the Memorandum of Understanding signed between the two countries in 2019.
- **Objective:** To extend support for sustainable ocean resource utilization to advance economic and social development in coastal areas.
- **Activities under the plan:** A plan **to ensure that human activities** at sea take place in an efficient, safe, and sustainable manner in areas such as energy, transportation, fisheries, aquaculture, tourism, etc., across multiple sectors
- **Notably, the World Bank and the United Nations Environment Programme (UNEP) have expressed interest in supporting MoES in conducting MSP, a societal-beneficial initiative for India's coastal regions.**

National Centre for Coastal Research (NCCR)

Background:

- The Department of Ocean Development (DOD) established a Project Directorate i.e., **Integrated Coastal and Marine Area Management (ICMAM-PD), at Chennai in January 1998** to implement the World Bank-funded **Environment Management Capacity Building (EMCB) programme.**
- After completion of the World Bank assignment, the project Directorate was designated as the "National Centre for Coastal Research (NCCR)", an attached office of MoES.

Activities:

- **NCCR is envisaged to develop and improve** the country's capabilities in addressing the challenging problems prevailing in the coastal zone, which have societal, economical and environmental implications.

10 WWF identifies 100 cities, including 30 in India, facing 'severe water risk' by 2050

Context: A hundred cities worldwide, including 30 in India, face the risk of 'severe water scarcity' by 2050, according to a recent report by World Wide Fund for Nature (WWF).

Key-highlights of the Report

- The cities would face a 'grave water risk' by 2050 due to a dramatic increase in their population percentage to 51 per cent by 2050, from 17 per cent in 2020, according to a press statement by WWF-India.
- The cities include global hubs such as Beijing, Jakarta, Johannesburg, Istanbul, Hong Kong, Mecca and Rio de Janeiro.
- Thirty Indian cities are also included in the list.
- More than half of the identified cities are from China and India.

30 Indian cities that will face a 'grave water risk' by 2050 according to WWF		
1. Jaipur	11.Kolkata	21.Jalandhar
2.Indore	12.Ahmedabad	22.Pune
3.Thane	13.Jabalpur	23.Dhanbad
4.Vadodara	14.Mumbai	24.Bhopal
5.Srinagar	15.Lucknow	25.Gwalior
6.Rajkot	16.Hubli-Dharwad	26.Surat
7.Kota	17.Nagpur	27.Delhi
8.Nashik	18.Chandigarh	28.Aligarh
9.Visakhapatnam	19.Amritsar	29.Kozhikode
10.Bengaluru	20.Ludhiana	30.Kannur

11 Petersberg Climate Dialogue (PCD)

Context: The 11th Petersberg Climate Dialogue (PCD) took place in a virtual format and brought together ministers from 30 countries to discuss climate action.

About:

- The Petersberg Climate Dialogue series was launched in 2010, after the Copenhagen Climate Change Conference, and has been held annually.
- The event is hosted annually by Germany. The Dialogue facilitates open discussions in small groups on key issues in international climate policy.
- The Dialogue is intended to "create a space for close and constructive exchanges among ministers" on climate action.

A decisive meeting for climate diplomacy:

- The Dialogue is of particular importance this year as COP26, originally scheduled for November, has been postponed to an unknown date in 2021 due to the coronavirus.
- At the summit, the EU was set to announce its intention to raise its current climate target for 2030.
- Under the Paris Accord, governments promised to do so every five years, taking into account the latest scientific findings.

Paris Accord:

- The Paris Agreement is a landmark environmental accord that was adopted by nearly every nation in 2015 to address climate change and its negative impacts.
- The deal aims to substantially reduce global greenhouse gas emissions in an effort to limit the global temperature increase in this century to 2 degrees Celsius above preindustrial levels, while pursuing means to limit the increase to 1.5 degrees.

- However, current commitments are not enough to keep global warming below 2°C.
- The European Commission has decided to increase the EU's climate target from the current 40% reduction in emissions to 50 or 55%.
- However, the German government has not yet agreed on which of the two figures it would support.
- The Commission is currently conducting a public consultation, looking to propose a new target in September.

12 The New Green Revolution: A Just Transition to Climate-Smart Crops

Context: The agriculture sector's massive greenhouse gas emissions pose a threat to India's green transition. There is an urgent need for a transition to climate-smart crops.

What are Climate Smart Crops?

- These crops include quality seeds and planting materials of well-adapted varieties.
- They are resistance to drought, salinity and flooding.
- They are the most common climate-related traits for which crop varieties are bred.
  - Tubers, pulses and millets are some of the 'climate smart crops'.
- These crops are important for the livelihoods and nutrition of poor farmers, especially in tropical and sub-tropical countries.
- These crops avoid the imprudent deployment of farming inputs, residue management, soil disturbance and misguided irrigation strategies employed to improve harvests.
- Staple food crops such as rice and wheat are source of GHG and are prone to climate change. However, Climate Smart Crops are resistant to such phenomenon.

Contribution of Agriculture Sector to GHG

- Contribution to GHG: Agriculture contributes 16 percent of the total greenhouse gas emissions in the country, second only to the energy sector.
- In September 2020, the United Nations Environment Programme (UNEP) released a report that says that the food production line of the world accounts for about a quarter (21 to 37 percent) of GHG emitted every year due to human activities.

How does the agriculture sector contribute to GHG?

- Most farm-related emissions come in the form of methane (CH4) and nitrous oxide (N2O).
- Cattle belching (CH4) and the addition of natural or synthetic fertilizers and wastes to soils (N2O) represent the largest sources, making up 65 percent of agricultural emissions globally.
- Smaller sources include manure management, rice cultivation, field burning of crop residues, and fuel use on farms.

13 India's forests and coal mining

Context: Giving a boost to the mining sector, the government in its announcements intended to revive the economy following the pandemic. But a boost to mining brings with it associated troubles such as land conflicts, run-ins with communities and an impact on the environment.

About

- **What is 'GO and No-Go' zones?**

- The concept of declaring certain forest areas within coal blocks as "inviolate" began in 2004.
- The environment ministry classified certain forests as either 'go' or 'no-go' areas and banned mining from taking place in the latter.
- In 2009, the environment ministry had placed the country's forested areas under two categories - Go and No-Go - and imposed a ban on mining in the 'No-Go' zones on environmental grounds.

Initial classification and current status of 'no-go' and 'go' zones

	Total		**No-Go Zones**			**Go-Zones**		
Initial classification in 2010	Total land	Total Blocks	Total land	No. of Blocks	% of Land	Total land	No. of Blocks	% of Land
	6,52,572 hectare	605	3,20,684 hectare	222	49%	3,31,888 hectare	383	51%
Revised classification	6,02,850 hectare	582	1,40,311 hectare	105	23.27 %	4,62,539 hectare	477	76.72%

Status of coal mining:

- In 2015, the Supreme Court said that **coal is a precious national asset** and it should be used for specific purposes. Since 2015, 49 coal mining projects have been cleared.
- The **coal industry in India is state-owned**, but this auction of 40 new coal blocks will see the creation of a privatised, commercial coal sector in India.
- In 2020, 21 of the 41 blocks put up for auction, 21 feature in the original No-Go list.
- Currently India was not utilising its existing capacity fully and only 67% of the mines auctioned since 2015 are were not operational yet.

Coal mining in India

India produces over 85 minerals including coal, lignite, bauxite, chromite, copper ore and concentrates, iron ore, lead and zinc concentrates, manganese ore, silver, diamond, limestone, phosphorite etc.

India is the second-largest producer and importer of coal in the world.

There are over 3,500 mining leases that are in force in the country across 23 states covering an area of 316,290.55 hectares.

Of those, nearly 70% are in five states alone –

- Madhya Pradesh has 702 mining leases
- Tamil Nadu has 464
- Andhra Pradesh has 453
- Gujarat has 432
- Karnataka has 376

Ease of coal mining

- The federal government has been easing rules for coal mining, which was made a state monopoly in 1973.

- In 1993, the government allowed private companies to mine coal for their own use.
- It has further eased government control over the industry since 2014.
- State-owned Coal India Limited, established in 1975, still accounts for 80% of domestic production, of which 80% is sold to thermal power plants.

14 MiyawakiTechniqu

Context: Japan-inspired Miyawaki forests have emerged as a popular solution to restoring degraded habitats in the country, in recent times.

About Technique

- Invented by and named after **Japanese botanist Akira Miyawaki**, the 'Miyawaki Method' is a unique technique to grow forests.
- Under the approach, dozens of native species are planted in the same area, close to each other, which ensures that the plants receive sunlight only from the top, and grow upwards than sideways.

Steps in the process

- **This technique is a 6 step process:**

- **Indentify the native species**
- **Division-** For a multi-layered process, choose different species of plants like shrub layer (6 feet), sub-tree layer (6-12 feet), tree layer (20-40 feet) and canopy layer (above 40 feet). Do not place the same species next to each other.
- **Prepare the soil**
- **Plant-** Dig a one-metre-deep pit and plant 3-5 native saplings per square metre. Maintain a distance of 60 centimetres between the saplings and level the soil around the stem of the plant.
- **Insert sticks-T**o ensure that plants do not bend in the initial period, insert support sticks inside the soil.

15 Govt notifies BS-VI emission norms for quadri-cycles

Context: The government has notified BS-VI emission norms for quadricycles, paving the way for higher production of the new category of vehicle that was introduced less than two years ago.

What is quadricycle?

- A quadricycle is the size of a three-wheeler but with four tyres and is fully covered like a car.
  - It has an engine like that of a three-wheeler. This makes it a cheap and safe mode of transport for last-mile connectivity.
  - A quadricycle cannot be more than 3.6 metres long, should have an engine smaller than 800cc, and should not weigh more than 475 kilograms.
- In 2018, the government had introduced the quadricycle segment with necessary standards to produce the vehicle.
  - It had approved the vehicle for both commercial and private use.
- India's automobile industry has been urging the ministry to set BS-VI emission standards for quadricycles, after the norms were rolled out for other segments starting 1 April, 2020.

The new notification:

- This notification completes the process of BS VI for all L, M, and N category vehicles in India. The emission norms are in line with EU with World Motorcycle Test Cycle (WMTC).
  - WMTC is a system of driving cycles used to measure fuel consumption and emissions in motorcycles.
  - The methods are stipulated as part of the Global Technical Regulation established under the United Nations' World Forum for Harmonisation of Vehicle Regulations, also known as WP.

Bharat Stage Emission Standards

- Bharat stage (BS) emission standards are laid down by the government to regulate the output of air pollutants from internal combustion engine and spark-ignition engine equipment, including motor vehicles.
  - The central government has mandated that vehicle makers must manufacture, sell and register only BS-VI (BS6) vehicles from April 1, 2020.
- The first emission norms were introduced in India in 1991 for petrol and in 1992 for diesel vehicles.
- Followed these, the catalytic converter became mandatory for petrol vehicles and unleaded petrol as introduced in the market.

Difference between BS-IV and BS-VI:

- Both BS-IV and BS-VI are unit emission norms that set the maximum permissible levels for pollutants that an automotive or a two-wheeler exhaust can emit.
  - Compared to the BS4, BS6 emission standards are stricter.
  - Whereas makers use this variation to update their vehicles with new options and safety standards, the biggest modification comes in the permissible emission norms.
- The following are the key differences between BS4 and BS6 emission norms:
  - **Diesel Particulate Filter (DPF) and Selective Catalytic Reduction (SCR)** are being introduced with the roll-out of Bharat Stage VI norms, which were not a part of Bharat Stage IV.
  - **Real Driving Emission (RDE)** will be introduced in India for the first time with the implementation of Bharat Stage VI emission norms.
    - RDE will measure a vehicle's emission in real-time conditions against laboratory conditions.
  - **Onboard Diagnostics (OD)** has been made mandatory for all vehicles with BS6.
  - **Sulphur and Nitrogen Oxide** The most crucial difference between BS6-grade fuel and BS4-grade fuel will be in terms of Sulphur and Nitrogen Oxide content.
    - The sulphur traces in BS6 fuel is five times lower (10 ppm) as compared to sulphur traces in BS4 fuel (50 ppm).
    - Further, nitrogen oxide level for BS6-grade diesel engines and petrol engines will be brought down by 70% and 25%, respectively.

16 Israel accuses Iran of 'environmental terrorism'

Context: Israel accuses Iran of the recent oil spill on its shore near the coasts of **south Lebanon** and the **Gaza Strip,** calling this an act of environmental terrorism.

Concerns regarding oil spill

- **Oil toxicity**: Oil consists of many different toxic compounds, which can cause severe health problems like heart damage, stunted growth, immune system effects, and even death.
- **Oiling**: Oiling occurs when oil physically harms a plant or animal. Oil can coat a bird's wings and leave it unable to fly or strip away the insulating properties of a sea otter's fur, putting it at risk of
- **Blocks Sunlight**: Oil is generally translucent, shields the phytoplanktons from sunlight hence restricting them to perform autotrophism, this seriously disrupts the marine food chain and is a threat to biodiversity.
- **Beach toxicity**: Oil can form a mixture with sand which will threaten the organisms residing there and it also pollutes beaches, and the degradation of beaches will hurt tourism.
- **Bioaccumulation**: Predators that consume contaminated prey can be exposed to oil through ingestion and accumulate toxins in the food chain. Because oil contamination gives fish and other animals unpleasant tastes and smells, predators will sometimes refuse to eat their prey and will begin to starve.
- **Coral Bleaching**: The toxic hydrocarbons released from spilled oil will bleach the coral reefs and they will eventually die.

Response arrangements by India

- The Indian Coast Guard, part of the **Ministry of Defence**, is the designated national authority for oil spill response in Indian waters under the National Oil Spill-Disaster Contingency Plan (NOS-DCP) promulgated in 1996 and last updated in 2014.

Technological advancement to deal with oil spill

Three different types of equipment—booms, skimmers, and sorbents—are commonly used to recover oil from the surface

- **Booms:** Booms are temporary floating barriers used to contain marine spills, protect the environment, and assist in recovery.
- **Skimmers:** A skimmer is a device for recovering spilled oil from the water's surface. Skimmers may be self-propelled, used from shore, or operated from vessels.
- **Sorbents:** Sorbents are materials that soak up liquids. They can be used to recover oil through the mechanisms of absorption, adsorption, or both.

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2 ECOLOGY & BIODIVERSITY

1 Mandarin duck – the 'rare duck' has created a flutter in Upper Assam

Context: The spectacular and rare Mandarin duck was spotted floating in the Maguri-Motapungbeel (or wetland) in Assam's Tinsukia district.

What is the Mandarin duck?

- The **Mandarin duck (*Aix galericulata*)** was first identified by Swedish botanist, physician, and zoologist Carl Linnaeus in 1758. It is considered the most beautiful duck in the world.
- **Migratory route:**The migratory duck breeds in Russia, Korea, Japan, and northeastern parts of China.
- **Habitat**: It is a "small-exotic looking bird" native to East Asia. It has established populations in Western Europe and America too.
- **Presence in India:**The duck rarely visits India as it does not fall in its usual migratory route.It is also common for them to stray from the path.

What is the Maguribeel?

- The MaguriMotapungbeel is a wetland and lake located near to Dibru-Saikhowa National Park, Assam.
- It is an Important Bird Area as declared by **the Bombay Natural History Society.**

Dibru-Saikhowa National Park

- **Dibru-Saikhowa National Park** is a national park in Assa m andis located in Dibrugarh and Tinsukia districts.
  - The park is bounded by the **Brahmaputra and Lohit Rivers** in the north and the **Dibruriver** in the south.
  - It mainly consists of **moist mixed semi-evergreen forests, moist mixed deciduous forests, canebrakes, and grasslands.**
  - It is the largest salix swamp forest in north-eastern India.
- **Species include** Bengal tiger, Indian leopard, clouded leopard, dhole, small Indian civet, Malayan giant squirrel, Chinese pangolin, Gangetic dolphin, slow loris, pig tailed macaque, rhesus macaque, Asian elephant, wild boar,hog deer, etc.

2 Tirthan sanctuary, Great Himalayan National Park best performers among protected areas

Context: According to the Management Effectiveness Evaluation (MEE), Tirthan Wildlife Sanctuary and Great Himalayan National Park in Himachal Pradesh have performed the best among the surveyed protected areas.

Key-findings of the survey

- Management Effectiveness Evaluation (MEE) was done for the 146 national parks and wildlife sanctuaries in the country.
- The Turtle Wildlife Sanctuary in Uttar Pradesh was the worst performer in the survey.

What is Management Effectiveness Evaluation?

- Management Effectiveness Evaluationof Protected Areas is used to understand strengths and weaknesses of the protected area management systems.

Protected Areas in India

- India has systematically designated its Protected Areas in four legal categories — National Parks, Wildlife Sanctuaries, Conservation Reserves and Community Reserves under the Wildlife (Protection) Act, 1972.
- Under this Act, India has 903 formally designated Protected Areas which is 5% of the total area.

The Great Himalayan National Park

- The Great Himalayan National Park (GHNP), is one of India's national parks, is located in Kullu region in the state of Himachal Pradesh.
- In June 2014, the Great Himalayan National Park was added to the UNESCO list of World Heritage Sites.
- The park's valleys brings one into the high altitude habitat (3,500 m and above) of animals such as blue sheep, snow leopard, Himalayan brown bear, Himalayan tahr, and musk deer.
- The Great Himalayan National Park adjoins the Tirthan wildlife sanctuary on the southern side.

Tirthan Wildlife Sanctuary

- It is located in the Kullu district, Himachal Pradesh.
- Tirthan wildlife sanctuary is one of the most magnificent sanctuaries in Himachal Pradesh. It lies is Seraj forest division near Kullu town. The wildlife sanctuary was notified in 1976.
- Khirganga, Hans Kund and MantalaiRaktiSar are the names of hot springs present in the region.
- A part of the Tirthan Wildlife sanctuary also is a World Heritage Site. This national park is home to the snow leopard & rare pheasants like the Western Tragopan.

3 India's sandalwood trees facing threat from Sandalwood Spike Disease

Context: India's sandalwood trees, the country's pride — particularly of Karnataka — are facing a serious threat with the return of the destructive Sandalwood Spike Disease (SSD).

What is Sandalwood Spike Disease?

- Sandalwood Spike Disease is an infectious disease caused by phytoplasma.
  - Phytoplasmas are bacterial parasites of plant tissues.
  - They are transmitted by insect vectors and involved in plant-to-plant transmission.
- SSD has been one of the major causes for the decline in sandalwood production in the country for over a century.
- The disease was first reported in Kodagu in 1899.
  - More than a million sandalwood trees were removed in the Kodagu and Mysuru region between 1903 and 1916.
  - Later 98,734 trees were extracted during 1917-1925 in Salem also due to SSD.
- The devastating impact in natural habitats resulted in sandalwood being classified as **"vulnerable"** by the **International Union for Conservation of Nature** in 1998.

Is there any cure?

- There is no cure as of now for the infection.
- The infected tree will have to be cut down to prevent the spread of the disease.

Sandalwood distribution in India

In India, sandalwood is grown in around 9,000 sqkm, of which 8,200 sqkm is in Karnataka and Tamil Nadu

- As early as 1792, **Tippu Sultan** had declared it a '**Royal Tree' of Mysuru.**

4 Largest mass calving recorded by Saiga

Context: The smallest and most threatened population of saiga in Kazakhstan has experienced its largest mass calving in recent years.

About

- The Saiga antelope (Saigatatarica and S. borealis mongolica) is a large migratory herbivore of Central Asia found in Kazakhstan, Mongolia, the Russian Federation, Turkmenistan, and Uzbekistan. It is mostly found in Kazakhstan.
- There are currently five subpopulations of saiga.
  - The largest population inhabits central Kazakhstan (BetpakDala)
  - the second largest group is found in the Urals in Kazakhstan and Russian Federation
  - others belong to Kalmykia in the Russian Federation and the Ustyurt Plateau region in southern Kazakhstan and north-western Uzbekistan.
- Saiga is the critically endangered antelope of Asia's steppes.
- The saiga generally inhabits open dry steppe grasslands and semi-arid deserts.
- It often changes the location of their calving, sometimes traveling hundreds of kilometers every year.
- These unusual antelopes have a distinctive large, bulbous nose and live in what used to be vast nomadic herds, but sadly their numbers are plummeting

Conservation status:

- The IUCN Red Book assesses the saiga as critically endangered and CITES includes this species in its Appendix II.

- The species is listed under the CMS Appendix II.

The increased population

- 530 calves have been born to the Ustyurt Plateau population of saiga. They represent the largest number of calves recorded in recent years.

5 Snow Leapord

Context: In the latest sighting of rare species, a pair of snow leopards has been sighted in Nanda Devi National Park in Uttarakhand.

About:

- Snow leopards (Pantherauncia) are considered medium-sized cats, standing about 24 inches at the shoulder and weighing around 30-55kg.
- Status: The snow leopard is listed as Vulnerable on the IUCN-World Conservation Union's Red List of the Threatened Species.
  - In addition, the snow leopard, like all big cats, is listed on Appendix I of the Convention on International Trade of Endangered Species (CITES), which makes trading of animal body parts (i.e., fur, bones and meat) illegal in signatory countries.
  - It is also protected by several national laws in its range countries.
- Habitat: Snow leopards can be found throughout high mountain ranges, including the Himalayas and the southern Siberian mountains in Russia. They can also be found in the Tibetan Plateau and across a range that stretches from China to the mountains of Central Asia.
  - In India, their geographical range encompasses a large part of the western Himalayas including the states of Jammu and Kashmir, Himachal Pradesh, Uttarakhand and Sikkim and Arunachal Pradesh in the eastern Himalayas.

Conservation of snow leopards in India:

- The Government of India has identified the snow leopard as a flagship species for the high altitude Himalayas.
- It has developed a centrally-supported programme called Project Snow Leopard for the conservation of the species and its habitats.
- Currently, India has 516 snow leopards, out of which 86 are in Uttarakhand. The rest are living in regions of Himachal Pradesh, Jammu and Kashmir, Sikkim, and Arunachal Pradesh.
- These instances clearly show nature is rejuvenating during the nationwide lockdown in the wake of the ongoing pandemic.

6 Conservation of the world's seagrasses

Context: Given the significant threat to Seagrasses, there is an urgent need to take earnest measures to conserve seagrasses and their habitats.

What are Seagrasses?

- Seagrasses are flowering plants that grow submerged in shallow marine waters like bays and lagoons.
- Evolution: Terrestrial plants evolved about 850 million years ago from a group of green algae. Seagrasses evolved from terrestrial plants that recolonised the ocean 70-100 million years ago. There are 60 species belonging to four families in the order Alismatales.

- Seagrasses occur all along the coastal areas of India. They are abundant in the Palk Strait and Gulf of Mannar in Tamil Nadu.
- There are 21 islands in the Gulf of Mannar. Seagrasses abound in the waters around the islands of Kurusadi, Pumarichan, Pullivasal and Thalaiyari. All six genera and 11 species of seagrasses are found here.
- Some of the important seagrasses are
  - Sea Cow Grass (Cymodoceaserrulata)
  - ThreadySeagrass (Cymodocearotundata)
  - Needle Seagrass (Syringodiumisoetifolium)
  - Flat-tipped Seagrass (Haloduleuninervis)
  - Spoon Seagrass (Halophilaovalis)
  - Ribbon Grass (Enhalusacoroides)
- These were once abundant in the Gulf of Mannar region but are now threatened.

Do they require photosynthesis?

- Like terrestrial plants, seagrass also photosynthesise and manufacture their own food and release oxygen.
- With tiny flowers and strap-like or oval leaves, they require sunlight for photosynthesis.

Why are they considered as 'ecosystem engineers'?

Seagrasses are known for providing many ecosystem services. They are considered to be 'Ecosystem Engineers'.

- Maintain water quality
- Filter nutrients
- Stabilises the sea bottom
- Provide food and habitat
- Protect small beings
- Releases nutrients after decomposition
- Absorbs CO2

Harmful Seaweeds

- However, some rare species of seaweed clash coral reefs and damage them severely.
- The exotic, invasive Kappaphycus alvarezii seaweed is posing a serious threat to the coral reefs.
  - PepsiCo (an American multinational food, snack and beverage corporation) have started smothering the coral reefs and slowly killing them.
- In 2005, a government order was issued restricting the cultivation of the exotic species only to the seawaters north of the Palk Bay and south of Thoothukudi coast.

7 Zoological Survey of India lists 62 species of skinks

Context: A recent publication by the Zoological Survey of India (ZSI) reveals that India is home to 62 species of skinks and says about 57% of all the skinks found in India (33 species) are endemic.

What are Skinks?

- With long bodies, relatively small or no legs, no pronounced neck and glossy scales, skinks are common reptiles around homes, garages, and open spaces such as sparks and school playgrounds, and around lakes.
- Although they are common reptiles and have a prominent role in maintaining ecosystems, not much is known about their breeding habits, and ecology because identification of the species can be confusing.
- Certain skinks have green blood. Unique color of the blood is result of accumulation of the green, bile pigment called biliverdin.

Distribution of Skinks

With 1,602 species of skinks across the world, making it the largest family of lizards, their occurrence in India is less than 4 % of the global diversity.

- **Western Ghats:** The Western Ghats are home to 24 species of which 18 are endemic to the region.
- **Deccan Peninsular region:** The Deccan Peninsular region is home to 19 species of which 13 are endemic.
- **Northeast:** There are records of 14 skink species from the northeast of which two species are endemic.

Endemic Species

- Of the 16 genera of skinks found in India, four genera are endemic.
  - Sepsophis (with one species)andBarkudia (with two species) are limbless skinks found in the hills and coastal plains of the eastern coast.
  - Barkudiainsularisis believed to be found only in the Barkud Island in Chilkalake in Odisha.
  - Barkudiamelanosticta is endemic to Visakhapatnam.
  - Sepsophispunctatus is endemic to the northern part of Eastern Ghats.
- Five species of Kaestlea (blue-tailed ground skinks) are endemic to the Western Ghats and four species of Ristella (Cat skinks) also endemic to the southern part of Western Ghats.

8 Death of sloth bears in Nandankanan Zoological Park

Context: Death of two sloth bears in two days in Bhubaneswar's Nandankanan Zoological Park, among the 14 big zoos of the country, has left the officials worried over the possible spread of some sort of bacterial or viral infection.

About Sloth Bear

- The sloth bear is a myrmecophagous bear species.
- It is listed as Vulnerable on the IUCN Red List, mainly because of habitat loss and degradation.
- The shaggy-coated sloth bear is native to India, Sri Lanka and Nepal. Sloth bears primarily eat termites and ants, and unlike other bear species, they routinely carry their cubs on their backs.
- Sloth bears are the only bears that carry their young on their back.
  - **Class:** Mammalia
  - **Order:** Carnivora

- **Family:** Ursidae
- **Genus and Species:** Melursusursinus

Nandankanan Zoological Park

- Nandankanan Zoological Park is a premier large zoo of India. Unlike other zoos in the country, Nandankanan is built right inside the forest and set in a completely natural environment.
- Nandankanan is 15 kms from Odisha's capital, Bhubaneswar.
- Nandankanan is the first zoo in the World to breed White tiger and Melanistic tiger.
- It is the only conservation breeding centre of **Indian Pangolins** in the world.
- Also, it is the only zoological park in India to become an institutional member of **World Association of Zoos and Aquarium (WAZA).**
  - Founded in 1935, the WAZA is the global alliance of regional associations, national federations, zoos and aquariums, dedicated to the care and conservation of animals and their habitats around the world.
- Nandankanan is the first zoo in India where endangered Ratel was born in captivity.
- Nandankanan is the only zoo in India to have an Open-top Leopard Enclosure.
- Nandankanan is the **second largest heronry** for Open Billied Storks in Odisha.

9 New study helps monitor trends in phytoplankton biomass in Bay of Bengal

Context: Researchers have discovered way to measure the quantity of chlorophyll-a in the Bay of Bengal, a dominant pigment found in phytoplankton cell and present in a few areas of the ocean, in real-time.

What are Phytoplanktons?

- Phytoplanktons are tiny microscopic plants found in the ocean. They are important ecological indicators that regulate life in ocean.
- They have chlorophyll to capture sunlight, and use photosynthesis to turn it into chemical energy. They consume carbon dioxide and release oxygen.
- All phytoplankton photosynthesise, but some get additional energy by consuming other organisms.
- Like terrestrial plants, the eco-friendly phytoplankton is largely dependent on light, temperature and nutrients.

Chlorophyll

- Chlorophyll is a pigment or a chemical compound that absorbs and reflects specific wavelengths of light.
- Chlorophyll is found within cells in the thylakoid membrane of an organelle called the chloroplast.
- The primary pigment of photosynthesis is chlorophyll A.
  - Chlorophyll A absorbs light from the orange-red and violet-blue areas of the electromagnetic spectrum.

- Chlorophyll A transfers energy to the reaction center and donates two excited electrons to the electron transport chain.

- Chlorophyll B is an accessory pigment because it is not necessary for photosynthesis to occur.
- All organisms that perform photosynthesis have chlorophyll A, but not all organisms contain chlorophyll B.

- **Major controlling factors for the abundance and distribution of phytoplankton**

- Salinity and nutrients
- Physical forces

How Phytoplanktons are 'beneficial' for the environment?

- Phytoplanktons contribute to more than half of the oxygen that we breathe.
- That apart, they influence our climate by absorbing human-induced carbon dioxide, a heat-trapping greenhouse gas.
- They also serve as the foundation of the aquatic food web.

10 Olive Ridley sea turtles

Context: Around 250,000 Olive Ridley sea turtles have come ashore for mass nesting at the six-kilometre-long Rushikulya beach of Odisha's Ganjam district.

About the Olive Ridley Trutle

- The Olive ridley turtle (Lepidochelysolivacea) is the smallest and most abundant of all sea turtles, growing up to 70 cm and weighing 45 kg, on average.
  - The Olive ridley turtles are globally distributed in the tropical regions of the South Atlantic, Pacific, and Indian Oceans.
- Many females nest every year, some twice a season, laying clutches of approximately 100-110 eggs, which take from 45 to 65 days to hatch.
- Olive ridley turtles use three different strategies to nest:
  - Arribadas
  - solitary nests
  - mixed strategy
- An arribada is a mass-nesting event when thousands of turtles come ashore at the same time to lay eggs on the same

The mass testing in Odisha

- Orissa State, in the north east of India, hosts one of the world's major annual mass-nesting events of marine turtles.
- The mass nesting, known by the Spanish term arribada, started at Rushikulya on March 20, 2020. The turtles came ashore in groups of 5,000-10,000 each.
- Around 300,000 turtles laid eggs in another rookery at Gahiramatha marine sanctuary in Kendrapara district recently.

Major Sites of Olive Ridley Turtle in India

- **These are the five major sites where they are found;**
  - Gahirmatha Beach, Odisha
  - Rushikulya River Mouth, Odisha
  - Devi River Mouth, Odisha
  - Marina Beach, Chennai
  - Velas Beach, Ratnagiri

Gahirmatha marine sanctuary

- **Gahirmatha Marine Sanctuary** is a marine wildlife sanctuary located in Odisha.
- It is the world's largest nesting beach for Olive Ridley Turtles.
- It extends from Dhamra River mouth in the north to Brahmani river mouth in the south.
- It is very famous for its nesting beach for olive ridley sea turtles.

11 Preservation of Eastern and Western Ghats

Context: A public interest litigation petition has been filed in the Madras High Court seeking a direction to the Centre and the State government to constitute a permanent body for taking serious and practical steps to safeguard the flora, fauna and other natural resources in the Eastern and Western Ghats in Tamil Nadu.

Background:

- The Union Ministry of Environment and Forests had constituted the Western Ghats Ecology Expert Panel under the chairmanship of acclaimed ecologist MadhavDhananjayaGadgil, who submitted a report in 2011 followed by another report by the Kasturirangan committee.
- However, their recommendations were not implemented in letter and spirit.
- The present case has been filed based on the recommendations made by the MadhavGadgil and KasturiRangan committees.

Gadgil and KasturiRangan Committees Reports:

- Prof.Gadgil Committee and Dr Kasturirangan Committee recommended measures for long-term preservation of this ecologically fragile landscape.
  - Gadgil committee report recommended declaring the entire Western Ghats landscape as Ecologically Sensitive Area (ESA), divided under three sub-zones, with a ban on mining, thermal power plants, polluting industries and large dams, and the inclusion of local communities in biodiversity conservation and promoting eco-friendly activities.
  - Since this report rubbed many the wrong ways, the Kasturirangan committee was set up to review the Gadgil committee report.
  - The Kasturirangan committee recommended incentivising green growth that promotes sustainable and equitable development bringing a large part of the Ghats area under the ESA.
  - As compared to the Gadgil Committee report, the area of 56,000 sq km recommended by the KasturiRangan Committee report was significantly reduced and included around 68-odd existing Protected Areas covering around 17,000 sq km area.

12 Gaur back in Valmiki Reserve after an increase in grassland cover

Context: Gaur (BosGaurus), the largest extant bovine in the world, has not only returned to Bihar's Valmiki Tiger Reserve (VTR) but is also breeding there due to an increase in grassland cover.

About Gaur (Indian Bison):

- The Gaur (BosGaurus) also called the Indian bison is the largest extant bovine.
  - It is native to South Asia and Southeast Asia.Gaurs are grassland specialists and their main food is grass.
  - The Indian Bison is very much prevalent in the Western Ghats.They prefer evergreen forests and moist deciduous forests.
  - They are not found in the Himalayas with an altitude greater than 6,000 ft. They generally stick to the foothills only.

Conservation Status

- The species is listed as 'vulnerable' on the International Union for Conservation of Nature's Red List of Threatened Species since 1986.
- The Indian Bison is deemed as vulnerable according to the IUCN list.
- It is listed in the Schedule I of the Wild Life Protection Act, 1972.
  - It is the State animal of Goa.

About Valmiki Tiger Reserve:

- Valmiki Tiger Reserve forms the easternmost limits of the Himalayan Terai forests in India and is the only tiger reserve of Bihar.
  - Situated in the Gangetic Plains bio-geographic zone of the country, the forest has a combination of bhabar and terai tracts.
  - Fauna:Wild mammals found in the forests of Valmiki Tiger Reserve are Tiger, Sloth bear, Leopard, Wild dog, Bison, Wild boar etc. Several species of deer and antelopes viz barking deer, spotted deer, hog deer, sambar and blue bull are also found here.

13 Eco-sensitive zones (ESZ) declaration around the Wayanad Wildlife Sanctuary

Context: The State government of Kerala has requested Prime Minister NarendraModi's intervention on the draft notification issued by the Ministry of Environment Forest and Climate Change (MoEFCC) notifying 118.59 sqkms around Wayanad wildlife sanctuary as an eco-sensitive zone (ESZ).

What is Eco-Sensitive Zone

- The Eco Sensitive Zones are envisaged as a cushion or shock absorbers for protected areas. They are supposed to act as the transition zones from areas of high protection to less protection.
- They are notified by the Ministry of Environment, Forests and Climate Change, Government of India around Protected Areas, National Parks and Wildlife Sanctuaries.
- They are like an ecotone- the transition between two biological communities or ecosystems, and it is crucial for the protection of protected areas like wildlife sanctuaries and forests.

- Its aim is to reduce the impact of human intervention in the core protected area.

What is in the notification?

- The ESZ, as per the draft notification, will cover an area of 118.59 km, which includes 8.89 km of the **Tirunelly reserve forest** of north Wayanad and 17.67 km of **Chedelaythu range** in south Wayanad.
- It also included 18.21 sq. km of human settlements, inside the forest.
- **State government**: The State government had submitted a revised draft notification by reducing the ESZ to 88.21 sq. km after excluding the human settlements on 30 sq. Km. State government wants to remove the heavy populated area out of the proposed area of the zone.

Wayanad wildlife sanctuary

- The Wayanad Wildlife Sanctuary is an animal sanctuary in Wayanad, Kerala, India.
- The sanctuaryis an integral part of the Nilgiri Biosphere in the Western Ghats.
- It is contiguous to the tiger reserves of Nagerhole and Bandipur of Karnataka and Mudumalai of Tamil Nadu.

14 Elephant Corridor through Sigur plateau

Context: The Supreme Court appointed conservationist NanditaHazarika as Member of a Technical Committee constituted.

AboutThe Committee

- The Technical Committee was constituted by SC in October 2020.
- On October 14, the top court upheld the Tamil Nadu government's authority to notify an 'elephant corridor' and protect the migratory path of the animals through the Nilgiri biosphere reserve.
  - The reserve is the largest protected forest area in India, spanning across Tamil Nadu, Karnataka and Kerala.
- It was constituted to hear complaints by land owners against the action taken by the Nilgris Collector, which included sealing of their buildings and allegations about the "arbitrary variance in acreage of the elephant corridor."

Sigur plateau

- The corridor is situated in the ecologically fragile Sigur plateau, which connects the Western and the Eastern Ghats and sustains elephant populations and their genetic diversity.
- It has the Nilgiri Hills on its southwestern side and the Moyar River Valley on its north-eastern side.
- The plateau is a low rainfall marginal land with poor soils and till recent times, also had a low population density.
- There are five major streams in the Sigur plateau, namely, the Moyar River, Sigur River, Avarahalla River, Kedarhalla River and Gundattihalla River. All these rivers originate in the Nilgiris plateau.

15 2 More Wetlands in India added to list of 'Recognised Sites' under Ramsar Convention

Context: India has 41 wetlands, the highest in South Asia, with two more (the Lonar lake in Maharashtra and Sur Sarovar, also known as Keethamlake, in Agra) added to the list of recognised sites of international importance under the treaty of Ramsar Convention.

What is Ramsar Convention?

- The Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat is a treaty for conservation and sustainable use of such sites.
- It is named after Ramsar, the Iranian city where the treaty was signed in 1971, and places chosen for conservation under it are given the tag 'Ramsar site'.

Lonar Lake

- Located in Buldhana district, 500 km away from Mumbai, the lake was formed after a meteorite hit the Earth around 50,000 years ago.
- The world's only high velocity impact lake formed in basaltic rock is said to be identified by a British officer CJE Alexander in 1823.

Sur Sarovar

- Sur Sarovar, also known as Keetham Lake, is a human-made reservoir; originally created to supply water to the city of Agra in summer, the wetland soon became an important and rich ecosystem.
- The poet Surdas is said to have been inspired to write one of India's most famous devotional poems, the Bhakti Kavya, by this place.

List of recognised sites in India

- The Asan Conservation Reserve in Dehradun, the first wetland from Uttarakhand to be recognised by Ramsar convention, was added to the list in October this year.
- The other 38 Ramsar sites in India include Chilika Lake in Odisha, Keoladeo National Park in Rajasthan, Harike Lake in Punjab, Loktak Lake in Manipur and Wular Lake in Jammu and Kashmir.
- In January this year, 10 wetlands in India were recognised by the Ramsar Convention as sites of international importance.
- These are NandurMadhameshwar in Maharashtra, Keshopur-Miani, Beas Conservation Reserve and Nangal in Punjab, and Nawabganj, Parvati Agra, Saman, Samaspur, Sandi and SarsaiNawar in Uttar Pradesh.
- The other Ramsar sites are in Rajasthan, Kerala, Odisha, Madhya Pradesh, Himachal Pradesh, Assam, West Bengal, Jammu and Kashmir, Andhra Pradesh, Manipur, Gujarat, Tamil Nadu, Tripura and Uttar Pradesh.

16 China removes Pangolin scales from the list of 'approved ingredients'

Context: China has officially removed pangolin scales from the list of 'approved ingredients' from traditional medicine, a move aimed at protecting the most trafficked species in the world.

About Pangolin

- Pangolins are a group of Asian and African mammals that are covered in hard scales, curl up into a ball to defend themselves, and are sadly the most heavily trafficked animal in the world.
- **Species:** There are eight pangolin species, four Asian and four African-
  - Chinese pangolin, Manispentadactyla
  - Indian pangolin (also known as thick-tailed pangolin), M. crassicaudata
  - Sunda pangolin (all known as Malayan pangolin), M.
  - Philippine pangolin, M. culionensis
  - Tree pangolin (also known as white-bellied pangolin), Phataginustricuspis
  - Long-tailed pangolin (also known as black-bellied pangolin), P. tetradactyla
  - Giant pangolin (also known as giant ground pangolin), Smutsiagigantica
  - Cape pangolin (also known as ground pangolin, Temminck's ground pangolin, South African pangolin or steppe pangolin), S. temminckii

Status: All eight species are threatened with extinction, and are listed on the IUCN Red List as either Vulnerable, Endangered or Critically Endangered.

Species	Status
Chinese pangolin	Critically Endangered
Indian pangolin	Endangered
Sunda pangolin	Critically Endangered
Philippine pangolin	Critically Endangered
Tree pangolin	Endangered
Long-tailed pangolin	Vulnerable
Giant pangolin	Endangered
Cape pangolin	Vulnerable

17 Puntiussanctus: A new species of small Freshwater fish

Context: Velankanni in Tamil Nadu has thrown up a new species of small freshwater fish of the family Cyprinidae.

About:

- The silver-hued fish has been christened Puntiussanctus — 'sanctus' is Latin for holy — after the popular pilgrim town.
  - The Puntius species are known locally as 'Paral' in Kerala and 'Kende' in Tamil Nadu.
  - They are purely freshwater fishes.
  - While the genus shows great species richness in Kerala and Tamil Nadu, the specimen from Velankanni bears "distinct differences" from its Puntius cousins.

- Its physical characteristics included a protractible mouth, a pair of maxillary barbels (a sensory organ near the snout), 24-25 lateral line scales and 10 pre-dorsal scales.

Cyprinidae family:

- Cyprinidae family, also commonly called the carp family or the minnow family, is a large family of freshwater fish containing many of the carp-like fishes and minnow types.
- They can be found throughout Asia, most of Africa, Europe, and North America.
- The only place they are not to be found is South America and Australia.
- They come in all sizes from giant game fish to numerous small species less than 2 inches (5 cm).
- **Examples** Included in the Cyprinidae family are well-known aquarium favorites such as barbs, danios, rasboras, and various freshwater sharks.
  - One of the best fish in this group for algae control is the Chinese Algae Eater.
  - This family also includes minnows, bitterlings, daces, asps, roachs, flying fox, and chubs.

Registration:

- The new fish is now deposited in Government of India museum (Zoological Survey of India) at Pune.
- It has also been registered with ZooBank of the International Commission of Zoological Nomenclature, the official authority for naming animals.

ZooBank:

- ZooBank is the official registry of Zoological Nomenclature, according to the International Commission on Zoological Nomenclature (ICZN).
- Currently, ZooBank accommodates the registration of four different kinds of data objects:
  - Nomenclatural Acts: Published usages of scientific names for animals, which represent nomenclatural acts as governed by the ICZN Code of Nomenclature. Most of these acts are 'original descriptions' of new scientific names for animals, but other acts may include emendations, lectotypifications, and other acts as governed by the ICZN Code.
  - Publications: Publications that contain Nomenclatural Acts, as defined above.
  - Authors: Anyone who is an author of one or more Publications (as defined above), or who is a contributor to ZooBank content.
  - Type Specimens: Type specimens for scientific names of animals. The registration of Type Specimens is considered provisional and is not yet fully implemented in ZooBank.

18 Tristan da Cunha, declared the largest fully protected marine reserve

Context: The isolated UK Overseas Territory of Tristan da Cunha, which is home to the world's most remote human settlement, declared the largest fully protected marine reserves in the Atlantic Ocean at 687,000 square kilometres.

About

- Tristan da Cunha, a British territory, is 2,300 miles east of South America and 1,600 miles west of South Africa.

- Tristan da Cunha, which is inhabited by less than 300 humans is a small chain of islands and the water around the islands are considered to be the richest in the world.
- The island group is also home to the World Heritage Site of Gough and Inaccessible Islands, which is one of the most important seabird islands in the world.

Marine Protected Areas (MPAs)

- Marine Protected Areas (MPAs) involve the protective management of natural areas according to pre-defined management objectives.
- MPAs can be conserved for a number of reasons including economic resources, biodiversity conservation, and species protection.

Around 8 percent of the world's oceans are designated as MPAs, but only 2.6 percent are totally off limits to fishing.

19 Kerala: Forked Fanwort blooms in Kozhikode

Context: Recently, a river in Kerala's Kozhikode district has turned pink because of millions of forked fanwort flowers that have blossomed in its waters.

About

- The aquatic plant behind the 'pink phenomenon' is forked fanwort.
- **Local name:** It is known locally as 'mullanpayal'.
- **Family:** It comes from the family of Red Cabomba (CabombaFurcata).
  - Cabomba is a submerged perennial aquatic plant that grows in stagnant to slow-flowing freshwater. It dominantly belongs to Central and South America.
- **Native species:** It is not a native species found in the waters of Kerala. It is native to South America and is mostly used as an aquarium plant.
- **Invasive Species:** An invasive species can be any kind of living organism—an amphibian (like the cane toad), plant, insect, fish, fungus, bacteria, or even an organism's seeds or eggs—that is not native to an ecosystem and causes harm.

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3 CLIMATE CHANGE

1 Komodo dragons could become extinct soon due to climate change

Context: The Komodo dragon, the world's largest lizard, could become extinct in the next few decades due to climate change.

About

- Komodo dragons, or Komodo monitors, are the largest, heaviest lizards in the world — and one of the few with a venomous bite.
- Komodo dragons are large lizards with long tails, strong and agile necks, and sturdy limbs.
- Komodo dragons are limited to a few Indonesian islands of the Lesser Sunda group, including Rintja, Padar and Flores, and of course the island of Komodo, the largest at 22 miles (35 kilometers) long. They have not been seen on the island of Padar since the 1970s.
- They live in tropical savanna forests but range widely over the islands, from beach to ridge top.
- Its current population consists of only 4,000 individuals.
  - **Class:** Reptilia
  - **Order:** SquamataS
  - **Family:** Varanidae
  - **Genus and Species:** Varanuskomodoensis

How climate change can take a toll on their population?

- Climate change is likely to cause a sharp decline in the availability of habitat for Komodo dragons, severely reducing their abundance in a matter of decades
- Warming and increasing sea levels will reduce the range of komodo dragon habitats and potential lead to the disappearance of this species.

2 Aldabra's coral reefs recovered faster from bleaching

Context: Coral reefs inthe lagoon of the Seychelles' Aldabra atoll have recovered faster after the 2015-2016 bleaching event due to tolerance to heat stress, as per new research published in Nature.

About

- Aldabra, one of the world's largest atolls, is a UNESCO (United Nations Educational, Scientific and Cultural Organization) World Heritage Site in Seychelles.

- It is located in the **Indian Ocean.**
- It comprises four main islands of coral limestone separated by narrow sea passages and encloses a large shallow lagoon.
- It is home to a population of endemic giant Aldabra tortoises, which fluctuate to around 100,000 more than the 95,000 population of Seychelles.

Coral Reef and Climate Change

- Climate change is the greatest threat to coral reef ecosystems.
- Ocean warming and associated coral bleaching are one of the foremost causes of coral loss across the world.
- The average global temperature is already 1C hotter than in preindustrial times.
- In addition, climate change is intensifying periodic weather phenomena, such as El Niño warming events, increasing the temperatures reefs experience and reducing the recovery interval between bleaching events.
- Climate models predict that global heating will continue over the coming century because our carbon emissions are expected to continue rising.

What is Bleaching?

- Bleaching is a process where corals lose their vivid colour and turn white.
- Coral exists in a mutually beneficial relationship with zooxanthellae algae, which live inside the coral's polyps.
- The algae use the coral's waste products and provide the nutrients to feed them both through photosynthesis.
- Higher sea temperatures force the coral to expel the colourful algae and, if this process is prolonged, the coral starves.
- During a coral bleaching event, reefs lose so much zooxanthellae that they become white and experience massive die-offs.
- Ocean acidification exacerbates the problem, eroding the reef, forcing corals to expend more energy building their calcium carbonate skeletons and slowing down their growth rate.
- If bleaching continues for an extended period of time, corals eventually die.

Can coral recover from bleaching?

- In some instances, corals can recover from bleaching.
- If conditions return to normal and stay that way corals can regain their algae, return to their bright colours and survive.

The World Heritage Committee is scheduled to review the status of the Great Barrier Reef at a meeting in June in China, with the potential to place the reef on its "in danger" list.

US Virgin Islands bans sunscreens harming coral reefs

The United States Virgin Islands (USVI) banned sunscreen products with chemicals known to be harmful to coral reefs and marine life, making USVI territory the first in the United States to implement it.

About:

- There are two types of sunscreen:
  - Chemical: Chemical sunscreen agents such as oxybenzone (benzophenone-3) or avobenzone work by absorbing ultraviolet (UV) light, thereby reducing skin exposure

Physical: Physical sunscreens such as titanium dioxide, iron oxide, or zinc oxide, work by reflecting and scattering UV rays in addition to absorbing some of them.

How Sunscreens can harm?

- Sunscreens containing the 3 Os — oxybenzone, octocrylene and octinoxate — harm the coral reefs that protect the Virgin Islands' shoreline.
- Sunscreens containing mineral alternatives such as zinc oxide and titanium dioxide have been exempted.
- These substances contain nanoparticles that can disrupt coral's reproduction and growth cycles, ultimately leading to bleaching.

3 Heat Waves

Context: The India Meteorological Department (IMD) has warned that the summer will be hotter by an average of above 1 degree celsius than the normal.

About:

- A Heat Wave is a period of abnormally high temperatures, more than the normal maximum temperature that occurs during the summer season in the North-Western parts of India.
  - Heat Waves typically occur between March and June, and in some rare cases even extend till July.

What causes heatwave?

- Heatwaves occur when a system of high atmospheric pressure moves into an area and air from upper levels of the atmosphere is pulled toward the ground, where it becomes compressed and increases in temperature.
  - This high concentration of pressure makes it difficult for other weather systems to move into the area. Due to this, a heat-wave can last for several days or weeks in an area.
  - The high-pressure system also prevents clouds from entering the region, sunlight can become punishing, heating the system even more.
- The combination of all of the above factors come together to create the exceptionally hot temperatures called 'heat-wave'.

Heat Wave Zone:

- The heatwave zone refers to areas prone to heatwaves. According to the Indian Meteorological Department (IMD), heatwave is recorded when:
  - the departure of maximum temperature from normal is + 4 degrees C to + 5 degrees C or more for the regions where the normal maximum temperature is more than 40 degrees C
  - the departure of maximum temperature from normal is + 5 degrees C to + 6 degrees C for regions where the normal maximum temperature is 40 degrees C or less
  - Heat Wave is declared only when the maximum temperature of a station reaches:
    - at least 40 degrees C for plains
    - at least 30 degrees C for hilly regions
  - Heatwave is also declared when the actual maximum temperature remains 45 degrees C or more irrespective of normal maximum temperature.

4 Largest Arctic Ozone hole closes itself up

Context: Scientists have revealed that the largest hole ever observed in the ozone layer above the Arctic last month has healed itself.

About:

- The ozone layer protects Earth from Sun's harmful ultraviolet rays. It is found in Earth's stratosphere, a layer of the atmosphere around 10–50 kilometres above sea level.
- Stratospheric ozone is constantly produced by the action of the sun's ultraviolet radiation on oxygen molecules (known as photochemical reactions).
- Ozone is found in two different parts of our atmosphere.
  - **Ground level or "bad" ozone:** It is a human health irritant and component of smog. It is found in the lower atmosphere (troposphere) and has nothing to do with the "ozone hole."
  - **High level or "good" ozone**: It occurs in the stratosphere and accounts for the vast majority of atmospheric ozone.
- Although ozone is created primarily at tropical latitudes, large-scale air circulation patterns in the lower stratosphere move ozone toward the poles, where its concentration builds up.

Ozone:

- Ozone is a special form of oxygen, made up of three oxygen atoms rather than the usual two oxygen atoms.
- It usually forms when some type of radiation or electrical discharge separates the two atoms in an oxygen molecule (O2), which can then individually recombine with other oxygen molecules to form ozone (O3).

How ozone works?

- The sun emits electromagnetic radiation at different wavelengths, meaning energy at different intensities.
- The atmosphere acts like a multi-layer shield that protects Earth from dangerous solar radiation.
- The stratospheric ozone layer absorbs ultraviolet (UV) radiation, preventing dangerous UV rays from hitting Earth's surface and harming living organisms.
- There are two major types of UV light: UVB and UVA.
  - **UVB** is the cause of skin conditions like sunburns, and cancers like basal cell carcinoma and squamous cell carcinoma.
  - **UVA** light is even more harmful than UVB, penetrating more deeply and causing a deadly skin cancer, melanoma, and premature aging.

Formation of hole in the ozone layer:

- The hole formed earlier this year and reached its maximum size in March some 11 miles above the surface of the Earth.
- It was the largest ozone hole ever documented over the Arctic, beating the previous record holder, which was observed during the 2011 winter.

zinc oxide, Scientists had attributed the forming of the hole in the ozone layer above the North Pole to unusually low temperatures in the atmosphere above the region.

Reason behind Ozone depletion:

- Ozone depletion occurs when chlorofluorocarbons (CFCs) and halons—gases formerly found in aerosol spray cans and refrigerants—are released into the atmosphere (see details below).

Reasons behind recovery:

- According to the scientists the recovery of the hole is not due to the reduced pollution levels due to COVID-19 lock down. The closing was because of a phenomenon called the polar vortex.
- **High-altitude currents** called **polar vortex** are responsible for bringing cold air to **north pole** and the subsequent healing of the ozone layer.

5 Atmospheric methane concentration at record levels

Context: Global atmospheric concentration of methane 2019 levels are the highest since record-keeping began in 1983, according to a new preliminary estimate released by the United States National Oceanographic and Atmospheric Administration (NOAA).

About:

- Methane (CH4) is a colorless, odorless, and highly flammable gas composed of one carbon atom and four hydrogen atoms.
- It can be produced naturally and synthetically, and when burned in the presence of oxygen, it produces carbon dioxide and water vapor.

Sources of methane:

- There are both natural and human sources of methane emissions.
  - The main natural sources include wetlands, termites and the oceans. Natural sources create 36% of methane emissions.
  - Human sources include landfills and livestock farming
- Cows and other grazing animals host microbes in their stomachs, gut-filling hitchhikers that help them break down and absorb the nutrients from tough grasses. Those microbes produce methane as their waste.
- The manure that cattle and other grazers produce is also a site for microbes to do their business, producing even more methane.
- Rice paddies are a lot like wetlands: When they're flooded, they're filled with calm waters low in oxygen, which are a natural home for methane-producing bacteria.

Why methane is a concern?

- **Most potent GHG:** Of all the greenhouse gases, methane is one of the most potent because of its ability to efficiently absorb heat in Earth's atmosphere.
- **Long-lasting:** Methane lasts for maybe a decade in Earth's atmosphere before it begins to react with a free radical called hydroxyl and turns into carbon dioxide, where it can stay there for centuries.

  Sea level rise: Greenhouse gases like methane heat up the atmosphere, and as much as 90 percent of that excess heat is absorbed by the oceans. This heat causes seawater to expand in volume. This effect, along with glacial melting, causes sea levels to rise.

6 Third Mass Bleaching

Context: Australia's Great Barrier Reef has suffered its most widespread coral bleaching on record. It is a big threat posed by climate change to the world's largest living organism.

What are coral reefs?

- Coral reefs are some of the most vibrant marine ecosystems on the planet -- between a quarter and one-third of all marine species rely on them at some point in their life cycle.
- Often called the 'rainforest of the seas'—they host an abundant variety of sea life—crucial habitat for about 25% of all ocean species.

Great Barrier Reef:

- Covering nearly 133,000 square miles, it is the world's largest coral reef and is home to more than 1,500 species of fish, 411 species of hard corals and dozens of other species.
- It's also a vital resource to Australia's economy, contributing more than $5.6 billion annually and supporting tens of thousands of jobs.

Is coral reef a plant, animal or mineral?

- They look like a plant, but coral reefs are considered animals—they are invertebrates belonging to a group of animals called Cnidaria.
  - Other animals in this group include jellyfish and sea anemones.
  - Coral reefs are made up of tiny organisms called polyps. The polyps are soft-bodied but secrete limestone skeletons for support.
- Large, iconic reefs are formed when many, many polyps come together and build on one another. The result is a colony of polyps that actually act as one organism.

7 Plastic pollution in Atlantic at least 10 times worse than thought

Context: There are 12-21 million tonnes of tiny plastic fragments floating in the Atlantic Ocean, scientists have found.

What is marine microplastic?

- Marine microplastics (10–1000 µm) belong to the continuum of the discarded plastic debris that enters the ocean from land-based and marine sources.
- Microplastics are very small pieces of plastic that pollute the environment.
- Microplastics are not a specific kind of plastic, but rather any type of plastic fragment that is less than 5 mm in length.

Classification of microplastics

- **Two classifications of microplastics currently exist.**

- Primary microplastics: They are any plastic fragments or particles that are already 5.0 mm in size or less before entering the environment. These include microfibers from clothing, microbeads, and plastic pellets.
- Secondary microplastics: They are microplastics that are created from the degradation of larger plastic products once they enter the environment through natural weathering processes. Such sources of secondary microplastics include water and soda bottles, fishing nets, and plastic bags.

8 Did Death Valley just hit the highest temperature recorded ever

Context: California's Death Valley registered a temperature of 54.4 degrees Celsius or 129.9 degrees Fahrenheit on August 16, 2020, which, once verified, could be the hottest temperature ever recorded on Earth.

About

- Death Valley is a desert valley in Eastern California, in the northern Mojave Desert, bordering the Great Basin Desert.
- The valley is bounded on the west by the Panamint Range and on the east by the Black, Funeral, and Grapevine mountains of the Amargosa Range.
- It is one of the hottest places on Earth, along with deserts in the Middle East and the Sahara.
- As the hottest, driest and lowest national park, Death Valley is a land of extremes.

What is 'Heat Dome'?

- The high temperature recorded on August 16 is said to be a result of a so-called 'heat dome' that is smotheing the west coast of the United States.
- The National Oceanic and Atmospheric Administration or NOAA describes it thus:
- High pressure circulation traps hot ocean air like a lid or a cap trapping heat at the surface and favouring the formation of a heat wave.
- To summarize, a heat dome is a pocket of hot air that is trapped in the upper atmosphere and refuses to move.
- While it stagnates there, it heats everything around it, forcing hot air down to the ground, where the air lingers.

9 Harnessing the Power of India's Forests for Climate Change Mitigation

Context: Forests help mitigate the impacts of climate change, provide economic benefits for the country, and meet specific facets of India's sustainable development goals. It is essential, therefore, to revisit India's forest governance and evaluate the country's efforts at forest restoration and conservation.

Background

- India's first comprehensive climate analysis report, 'Assessment of Climate Change over the Indian region', highlights the role of forests as effective mechanisms to mitigate climate change impacts, provide economic benefits for the country, and meet several of India's sustainable development goals.
  - Over the past two decades, India has witnessed an ever-increasing rate of deforestation and unsustainable exploitation of forest resources, leading to overall degradation at an alarming rate.

What is the state of India's Forests?

- India is now ranked 3rd in the world for annual net gain in terms of forest area.
- The biennial India State of Forest Report-2019 released by the Union Ministry for Environment, Forest and Climate Change reports that India has achieved an increase of 24.56 percent in its total forest and tree cover.
- The government has claimed that India's green cover has increased by 15,000 km2 in the last four years.

Definitions

- Forest and tree cover: The total area of tree patches in areas both less than and more than 1 ha is then known as "forest and tree cover".
- Tree cover: "Tree cover" is also separately defined as "all tree patches less than 1 ha outside the recorded forest area".
- Trees outside forests: Further, "trees outside forests" refers to trees outside recorded forest area, regardless of the area of the tree-patch.
- Growing stock: The other term, "growing stock", is the volume of trees in an area of forest above a certain thickness at breast height and measured in cubic meters. The 'growing stock' is the basis for calculating the amount of biomass and carbon stock in forests.

- Classification Scheme
  - The forest cover is broadly classified in 4 classes, namely very dense forest, moderately dense forest, open forest and mangrove. These classes are defined is below.
- Very dense Forest
  - All Lands with tree cover (Including mangrove cover) of canopy density of 70% and above
- Mod Dense forest
  - All lands with tree cover (Including mangrove cover) of canopy density between 40% and 70% above
- Open Forest
  - All lands with tree cover (Including mangrove cover) of canopy density between 10% and 40%
- Scurb
  - All forest lands with poor tree growth mainly of small or stunted trees having canopy density less than 10 percent
- Non Forest
  - Any area not included in the above classes

What initiatives are taken by India?

- The Indian government is pursuing afforestation and reforestation through policies and programmes such as
  - the National Mission on Green India
  - the National Afforestation Programme
  - compensatory afforestation
  - plantation drives across States

National Forest Policy

- The first National Forest Policy in independent India came into effect in 1952.
- Thereafter, in 1988, a new version of the NFP came into being. The latest version has been in the offing for nearly four years now but a final version is yet to be made public.
- Nearly three and a half years ago, in June 2016, the Environment Ministry had unveiled a draft NFP but when it came under fire for not being enough to protect the then-existing forest regulations, the ministry had backtracked on it, calling it just a "study".

- Subsequently, in 2018, the central government officially unveiled the draft of the NFP.
- The draft was then revised in 2019 as well but since then there has been no news about the final version of the NFP.

International treaties to protect forests

- United Nations Forum on Forests (UNFF): UNFF was established in 2000. In May 2006 it adopted four objectives:
  - Reverse the loss of forest cover worldwide through sustainable forest management;
  - Enhance forest-based economic, social and environmental benefits;
  - Increase significantly the area of sustainably managed forests; and
  - Reverse the decline in official development assistance for sustainable forest management and mobilise significantly increased new and additional financial resources from all sources for the implementation of sustainable forest management.
- Convention on Biological Diversity: Since deforestation is one of the main causes of species loss, in 1998 the Conference of the Parties to the Convention on Biological Diversity endorsed a work programme for forest biological diversity. 2002 saw the adoption of an expanded programme of work on forest biological diversity.
- UNCCD: The United Nations Convention to Combat Desertification (UNCCD), entered into force in 1996. It has helped bring about a situation in which most countries have now established clear rules for combating desertification.
- REDD+: REDD (Reducing Emissions from Deforestation and Forest Degradation) is based on the idea of financially rewarding a country's government and its population when they can demonstrate that they have avoided deforestation.
- Bonn Challenge: The "Bonn Challenge" aims to restore 150 million hectares of degraded and deforested land by 2020, and 350 million hectares by 2030.
- 2030 Agenda for Sustainable Development: In 2015, the international community adopted the 2030 Agenda for Sustainable Development.
  - Goal 15 includes forest protection. Specifically, it aims to halt deforestation worldwide by 2020 and ensure that all forests are managed sustainably.
  - Goal 6 also underlines the importance of forests for water supply.
  - Goal 13: Although forests are not mentioned explicitly in this context they also play a major role in Goal 13, which deals with climate change.

10 America re-joins Paris Agreement

Context: Joe Biden has pledged to combat the climate crisis on his first day as US president by immediately rejoining the Paris climate agreement.

Background

- President Trump announced his move to exit the agreement in June 2017, but his decision took effect in November 2020.

What is the Paris Agreement?

- The Paris Agreement is a landmark international accord that was adopted by nearly every nation in 2015 to address climate change and its negative impacts.

Aim:

- Limit global temperature rise by reducing greenhouse gas emissions.
  - To substantially reduce global greenhouse gas emissions in an effort to limit the global temperature increase in this century to 2 degrees Celsius above preindustrial levels, while pursuing means to limit the increase to 1.5 degrees.
- Provide a framework for transparency, accountability, and the achievement of more ambitious targets.
- Mobilize support for climate change mitigation and adaptation in developing nations.

Important International Agreements on Climate Change

- Montreal Protocol, 1987
- UN Framework Convention on Climate Change (UNFCCC), 1992
- Kyoto Protocol, 2005

Why did US leave the agreement?

- Having previously falsely claimed climate change is a hoax, leaving the agreement was one of the key promises that Trump made on the 2016 campaign trail.
- In 2017, Trump argued:
  - **Negative impact on economy:** The agreement would negatively affect the U.S. economy and jobs market.
  - **Not beneficial for climate change:** It would not mitigate climate change
  - **Unfair favours for others:** It unfairly favoured other countries such as China and India.
- In 2019, Trump described it as “terrible, one-sided” and “a total disaster for our country.”
  - In response, over 200 city mayors promised to continue working towards the aims of the agreement, by signing up to the American Climate Alliance.

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4 POLICIES, SCHEMES & INITIATIVES

1 National Hydrogen Mission

Context: In the Budget 2021-22, Ministry of Finance proposed to launch a 'National Hydrogen Mission' for generating hydrogen from green power sources

About the Mission

- The National Hydrogen Mission aims is to develop India into a global hub for **manufacturing** of hydrogen and fuel cells technologies across the value chain, via suitable incentives and facilitation aligned with 'Make in India' and 'Atmanirbhar Bharat'.

Hydrogen is one of the chemical **elements** that exist in nature. Hydrogen exists naturally as a **molecule**, consisting of two hydrogen atoms. The chemical formula of hydrogen is **H2.**

Why the focus is shifting towards hydrogen?

- Most cars burn petrol or diesel in their engines. These chemical reactions make **carbon dioxide and water.**
  - Carbon dioxide is a greenhouse gas, which means too much of it can promote global warming. Global warming causes climate change, resulting in droughts, floods and extreme weather.
  - Hydrogen cars help to reduce greenhouse gas emissions.
- They either burn hydrogen in an engine or they react both hydrogen and oxygen together in a fuel cell.
  - Both processes produce electricity which powers an electric motor. Hydrogen cars produce one harmless exhaust gas – water vapour.

Other nascent technologies in energy sector

- Marine solar
- Molten salt reactor
- Dynamic Submarine Cable
- UltraBattery

2 Kamdhenu Deepawali Abhiyan

Context: Encouraged by the response to GaumayaGanesha Campaign which encouraged usage of eco-friendly material in manufacture of idols for the Ganesha Festival, Rashtriya Kamdhenu Aayog (RKA) has started a nation- wide campaign to celebrate "Kamdhenu Deepawali Abhiyan" in 2020 on the occasion of Deepawali festival.

About

- RashtriyaKamdhenuAayog (RKA) has been constituted by Prime Minister ShriNarendraModi for the conservation, protection and development of cows and their progeny and for giving direction to the cattle development programmes.
- RKA is high powered permanent body to formulate policy and to provide direction to the implementation of schemes related to cattle so as to give more emphasis on livelihood generation.

India's livestock sector

- Livestock economy sustains nearly 73 million households in rural areas.
- Even though, the country is largest producer of milk, the average milk yield in India is only 50% of the world average.
- The low productivity is largely due to deterioration in genetic stock, poor nutrition and unscientific management.

3 Bundling scheme for Renewable energy

Context: Ministry of new and renewable energy (MNRE) has proposed 'bundling' scheme to boost to renewable energy.

About the Bundling Scheme

- MNRE 'bundling scheme': In order to boost the renewable energy sector, MNRE has come out with the draft framework for a scheme to supply round-the-clock (RTC) power from wind and solar plants.
  - The scheme proposes to sell renewable energy and thermal power together in a 'bundle' so that buyers can get the assurance of receiving firm uninterrupted electricity supply.
- Objective: The scheme aims to address issues of intermittency, limited hours of supply and low capacity utilisation at renewable power plants, and make them more attractive for state-owned power distribution companies (discoms).

Details of bundling scheme

- Renewable energy supply: The generator is required to supply at least51% of electricity sold under this scheme from renewable sources.
- Renewable power may include a combination of solar, wind, small hydro with or without any energy storage system.
- The renewable energy component bought under this scheme shall be eligible for complying with renewable purchase obligation (RPO) norms.
- Composite tariff: The composite tariff would consist of 51% renewable energy tariff, 30% thermal fuel cost and the remaining would account for the fixed thermal tariff.
- The proportion of thermal tariff shall be adjusted to cover the possible changes in coal or gas prices, as per the index to be notified by the regulatory commission.

- Responsibility with power generator: Power generator will be responsible for supplying the composite power, hence, discoms will no more have to integrate renewable power into the grid.

Need for bundling scheme

- Erratic supply of renewable sources
- Reduce additional burden for discoms
- Reduce the burden on thermal assets

India's renewable energy commitments and ambitions

- According to 2027 blueprint, India aims to have 275 GW from renewable energy, 72 GW of hydroelectricity, 15 GW of nuclear energy and nearly 100 GW from "other zero emission" sources.
- In 2019 at UN climate summit, India announced that it will be more than doubling its renewable energy target from 175GW by 2022 to 450GW of renewable energy by the same year.
- Three of the top Five largest solar parks worldwide are in India:
  - The world's largest solar power plant, Bhadla Solar Park is in Rajasthan with a capacity of 2255 MW.
  - The second-largest solar park in the world at Kurnool, Andhra Pradesh, with a capacity of 1000 MW.
- In the Paris Agreement India has committed to an Intended Nationally Determined Contributions target of achieving 40% of its total electricity generation from non-fossil fuel sources by 2030.

4 SAFAR

Context: With a nationwide lockdown in place, over 90 cities, including Delhi, recorded minimal air pollution in the last few days, according to SAFAR.

About:

- The system of Air Quality Forecasting And Research (SAFAR) envisages a research-based management system where strategies of air pollution mitigation go hand in hand with the nation's economic development to target a win-win scenario.
- It provides real-time air quality index 24×7, followed with the advance forecast of 72 hours.
- It measures the sun's UV-Index (UVI), Mercury and Black carbon in real time along with PM1 levels and weather parameters like PM10, PM2.5 and Sulfur Dioxide.
- It also monitors the existence of harmful pollutants like Toluene, Benzene and Xylene.
- The SAFAR system is developed by Indian Institute of Tropical Meteorology, Pune, along with ESSO partner institutions namely India Meteorological Department (IMD) and National Centre for Medium Range Weather Forecasting (NCMRWF).

Particulate Matter (PM):

- Particulate Matter (PM) is mainly a mixture of both organic and inorganic particles, such as smoke, dust, soot and others. These particles differ in size and composition.
- PM 2.5: PM2.5 is 2.5 micrometres in diameter or much more smaller. These particles are lighter and go much deeper into the human body than PM 10, which can cause greater damage to health.

- PM 10: PM10 are less than 10 micrometres in diameter. It irritates human airways, especially among asthmatics and the elderly. They make your eyes burn and throat dry.

Air quality index (AQI):

- AQI is a numerical scale used for reporting air quality with regard to human health and the environment on daily basis.
- The index is used to convey to the public an estimate of air pollution levels.
- An AQI is considered good between 0-50, considered 'satisfactory' between 51-100, 100-200 'moderate', 201-300 'poor', 301-400 'very poor' and 401-500 'severe'.

5 Bio Fuel

Context: Researchers at the Indian Institute of Technology Hyderabad are using computational methods to understand the factors and impediments in incorporating biofuels into the fuel sector in India.

About

Bioenergy is energy derived from biofuels. Biofuels are fuels produced directly or indirectly from organic material – biomass – including plant materials and animal waste.

- Making of biofuels: Biofuels is derived from
  - agricultural crops, including conventional food plants or from special energy crops
  - forestry, agricultural or fishery products or municipal wastes
  - agro-industry, food industry and food service by-products and wastes

The current target

- India's Ethanol Blended Petrol program, launched in 2013, has been growing over the years.
- It is now mandatory in India to blend fuel grade bioethanol with petrol (gasoline) to reduce the burden of crude oil import.
- The current target is to blend bioethanol to levels close to 20 per cent with gasoline. In a move towards green energy, the government also hopes to replace 20 per cent of fossil-fuel derived diesel by biodiesel.

Bio fuels

- Jatropha: Jatropha curcas is multipurpose non edible oil yielding perennial shrub. This is a hardy and drought tolerant crop can be raised in marginal lands with lesser input.
- Sugarbeet: Sugar beet is a biennial sugar producing tuber crop, grown in temperate countries. Now tropical sugar beet varieties are gaining momentum in tropical and sub tropical countries, as a promising alternative energy crop for the production of ethanol.
- Sorghum: Sorghum is the most important millet crop occupying largest area among the cereals next to rice. It is mainly grown for its grain and fodder. Alternative uses of sorghum include commercial utilization of grain in food industry and utilization of stalk for the production of value-added products like ethanol, syrup and jaggery and bio enriched bagasse as a fodder and as a base material for cogeneration.

- Pongamia: There is several non edible oil yielding trees that can be grown to produce bio fuel. Karanja is one of the most suitable trees. It is widely grown in various parts of the country.

Categories of bio fuels

- First generation bio fuels - First-generation bio fuels are made from sugar, starch, vegetable oil, or animal fats using conventional technology. Common first-generation bio fuels include Bio alcohols, Biodiesel, Vegetable oil, Bio ethers, Biogas.
- Second generation bio fuels - These are produced from non-food crops, such as cellulosic bio fuels and waste biomass (stalks of wheat and corn, and wood). Examples include advanced bio fuels like bio hydrogen, bio methanol.
- Third generation bio fuels - These are produced from micro-organisms like algae.
- Fourth Generation Bio fuels - Four Generation Bio-fuels are aimed at not only producing sustainable energy but also a way of capturing and storing co2.

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5 RESOURCE CONSERVATION & MANAGEMENT

1 Hydrogen can cut global greenhouse gas emissions

Context: Widespread adoption of clean hydrogen can cut global greenhouse gas emissions by up to 34 percent in fossil fuel-dependent sectors by 2050 — and at a manageable cost — according to a new study by research firm BloombergNEF (BNEF).

About:

- Hydrogen is an element; it exists naturally as a molecule. Each hydrogen molecule is made up of two hydrogen atoms.
- The findings were published in a report titled 'Hydrogen Economy Outlook'.

Significance of Hydrogen

- Hydrogen fuel is a zero-carbon fuel burned with oxygen.
- It can be used in fuel cells or internal combustion engines.
- It has begun to be used in commercial fuel cell vehicles, such as passenger cars, and has been used in fuel cell buses for many years.
- It is also used as a fuel for spacecraft propulsion.

How Hydrogen can actually clean the environment?

- Hydrogen is a clean-burning molecule that can be used as a substitute for coal, oil and gas in a large variety of applications.
- But for its use to have net environmental benefits, it must be produced from clean sources, rather than from unabated fossil fuel processes – the usual method at present.
- Hydrogen could absolutely become the clean-burning, zero-carbon molecule to replace fossil fuels in hard-to-abate sectors of the economy.
- It has the potential to erase one-third of today's global emissions from fossil fuels and industry if it is deployed for steelmaking, while also providing dispatchable energy, producing ammonia, and powering trucks.

Indian Government Initiatives

- Union Budget 2021-22 announced that India was to launch Hydrogen Energy Mission
- Government has also launched the National Hydrogen Mission

2 Conserving the Western Ghats

Context: Six states, which form the Western Ghats, asked the government to expedite the process to notify the ecologically sensitive areas (ESAs) in the global biodiversity hotspot for clarity.

Background:

- The MadhavGadgil Commission, formed in 2010, recommended in its report submitted to the government in August 2011 that 64 per cent of the Western Ghats be declared ecologically sensitive.
  - However, to conserve and protect the bio diversity of Western Ghats while allowing for sustainable and inclusive development of the region, the government in 2012 had constituted a High Level Working Group under the Chairmanship of Dr.Kasturirangan to examine the Gadgil Commission report and recommended 37 per cent of the Ghats be declared ESAs.
- The Committee had identified geographical areas falling in the six States of Kerala, Karnataka, Goa, Maharashtra, Gujarat and Tamil Nadu as Ecologically Sensitive Areas.
- A draft notification was issued in October 2018 mentioning the areas to be notified in the ESA.

Western Ghats:

- The Western Ghats is one of the eight hotspots of biological diversity in the world and is spread across six states—Gujarat, Maharashtra, Goa, Karnataka, Tamil Nadu and Kerala.
- The hill ranges of the Western Ghats, a global biodiversity hotspot, extend along the west coast of India from the river Tapti in the north to the southern tip of India.
- Their positioning makes the Western Ghats biologically rich and biogeographically unique - a veritable treasure house of biodiversity.
- Though covering an area of 180,000km2, or just under 6 per cent of the land area of India, the Western Ghats contain more than 30 per cent of all plant, fish, herpeto-fauna, bird, and mammal species found in India.
- Many species are endemic, such as the Nilgiritahr (Hemitragushylocrius) and the lion-tailed macaque (Macacasilenus). In fact, 50 per cent of India's amphibians and 67 per cent of fish species are endemic to this region.

Eastern Ghats

- On the eastern side also there is another region called the Eastern Ghats. They run from the northern Odisha through Andhra Pradesh to Tamil Nadu in the south passing some parts of Karnataka.
- The main differences between the Western Ghats and Eastern Ghats are-

	Western Ghats	**Eastern Ghats**
Hill type	Almost Continuous hills	Discontinuous hills (because of River deltas)
Average Height	1500 to 2000 m	500-700 m
Highest peak	AnaiMudi (Kerala)	Jindhagada peak (Andhra Pradesh)
Delta	No delta formation by rivers	Delta formation
Forest type	The forest is Tropical and Semi Evergreen	Moist Deciduous or Monsoon forest
Rainfall	200 cm	70-200 cm

What States are demanding?

- The six states – Kerala, Karnataka, Goa, Maharashtra, Gujarat and Tamil Nadu are pushing for the quick declaration of the region as an Ecologically Sensitive Area.
  - The states were of unanimous view that there is a need to ensure protection of the western Ghats.
  - However, the states expressed their views as regards activities and extent of area mentioned in the 2018 notification.

Eco Sensitive Areas

- ESAs are defined as those areas 'that are ecologically and economically important, but vulnerable even to mild disturbances, and hence demand careful management'.
  - Therefore 'ecologically and economically important' areas are those areas that are biologically and ecologically 'rich', 'valuable' and or 'unique', and are largely irreplaceable if destroyed.
  - They are located within 10 kms around Protected Areas, National Parks and Wildlife Sanctuaries.
- Similarly, their 'uniqueness' may be recognized either by the rarity of the living systems they harbour, that are difficult to replace if lost, or by the uniqueness of the services they offer to human society.
- Their 'vulnerability' could be determined by physiographic features that are prone to erosion or degradation under human and other influences such as erratic climate, and on the basis of historical experience.

3 Black carbon deposits on Himalayan Glaciers

Context: According to new research by scientists from NASA and Chinese Academy of Sciences, soot deposited on Tibetan glaciers has contributed significantly to retreat of the world's largest non-polar ice masses – the Himalayan glaciers.

About the findings

- According to research, black carbon deposits on Himalayan ice threaten earth's "third pole". Tibet's glaciers are retreating at an alarming rate.
- Black carbon concentrations near the Gangotri glacier rose 400 times in summer due to forest fires and stubble burning from agricultural waste and triggered glacial melting.

Black soot/Black carbon

- Black soot is generated from industrial pollution, traffic, outdoor fires, and household burning of coal and biomass fuels.
  - Soot absorbs incoming solar radiation and can speed glacial melting when deposited on snow in sufficient quantities.
  - Soot includes black carbon, as well as organic carbon.
- Many industrial processes produce both black carbon and organic carbon, but often in different proportions.
- Burning diesel fuel produces mainly black carbon.
- Burning wood produces mainly organic carbon.
- Since black carbon is darker and absorbs more radiation, it's thought to have a stronger warming effect than organic carbon.

- The fine particles absorb light and about a million times more energy than carbon dioxide.
- Black carbon results from incomplete combustion of fossil fuels and biomass.
- It is said to be the second-largest contributor to climate change after CO2.
- Black carbon is short-lived and remains in the atmosphere only for days to weeks before it descends as rain or snow.

India is the second-largest emitter of black carbon in the world, with emissions expected to increase dramatically in the coming decades. Indo Gangetic plains are said to be the largest contributor.

Brown Carbon

- Brown carbon is brown smoke released by the combustion of organic matter.
- It coexists with black carbon when released in the atmosphere.
- Black carbon is primarily released by high-temperature combustion and brown carbon is emitted mainly by biomass combustion.
- These two are the two most important light absorbing substances in the atmosphere.

4 Rare earth metals used in clean energy technologies

Context: Naturally abundant wind, geothermal, solar, tidal and electric energy are being hastened as the future of the planet's energy needs. And rare earth elements are used in a bevy of technologies to generate this cleaner, renewable energy.

What are rare earth elements?

- Rare earth elements include wind turbine magnets, solar cells, smart phone components, cells used in electric vehicles, among others.
- The 17 Rare Earths are cerium (Ce), dysprosium (Dy), erbium (Er), europium (Eu), gadolinium (Gd), holmium (Ho), lanthanum (La), lutetium (Lu), neodymium (Nd), praseodymium (Pr), promethium (Pm), samarium (Sm), scandium (Sc), terbium (Tb), thulium (Tm), ytterbium (Yb), and yttrium (Y).

Primary producers

- Until 1948, India and Brazil were the world's primary producers of rare earth metals.
- The countries with the most rare earth metals currently are China (the largest reserves in the world), the United States, Brazil, India, Vietnam, Australia, Russia, Myanmar, Indonesia.

Usage

- Electronic technologies: These elements are important in technologies of consumer electronics, computers and networks, communications, clean energy, advanced transportation, healthcare, environmental mitigation, and national defence, among others.

Scandium is used in televisions and fluorescent lamps, and yttrium is used in drugs to treat rheumatoid arthritis and cancer.

- Defence equipments: While Rare Earth elements are used in building consumer electronics, in healthcare and transportation, they are especially important for governments because of their use in manufacturing defence equipment.
- Space: Rare Earth elements are used in space shuttle components, jet engine turbines, and drones.
  - Cerium, the most abundant Rare Earth element, is essential to NASA's Space Shuttle Programme.

6 ENVIRONMENTAL POLLUTION

1 Indoor pollution is as deadly as its outdoor counterpart

Context: Indoor air pollution is just as lethal as the outdoor variety. Indoor, or household, air pollution caused 64 per cent fewer deaths in the last two decades (2000-2019) in India, according to a report by interdisciplinary journal Lancet Planetary Health.

What is indoor air pollution?

- It refers to the physical, chemical, and biological characteristics of air in the indoor environment within a home, building, or an institution or commercial facility.
- A number of air pollutants have been recognised to exist indoors, including NOx, SO2, ozone (O3), CO, volatile and semi-volatile organic compounds (VOCs), PM, radon and microorganisms.

What factors affect indoor air quality?

- **Indoor air quality is affected by many factors, including:**
- Type and running conditions of indoor pollution sources
- Ventilation conditions: Air pollutants may accumulate in the indoor environment if the indoor air is not well ventilated, which seriously affects the health of the inhabitants.
- Indoor activities (cooking with dirty fuel):According to the World Health Organization (WHO), around three billion people, mostly women in the villages of India and in other parts of the world still cook and heat their homes using dirty solid fuels.
  - These include waste wood, charcoal, coal, dung and abundantly available crop wastes. These are burnt on open fireplaces, cooking stoves etc.
  - This generates a large amount of air pollutants such as
    - sulphur dioxide (SO2
    - nitrous oxides (NOx)
    - carbon monoxide (CO)
    - particulate matter (PM)

Remedial steps taken by government

- Central Pollution Control Board (CPCB): statutory organisation was constituted under the Water (Prevention and Control of Pollution) Act, 1974. Further, CPCB was entrusted with the powers and functions under the Air (Prevention and Control of Pollution) Act, 1981

- NGT: established under the National Green Tribunal Act 2010 for effective and expeditious disposal of cases relating to environmental protection
- THE AIR (PREVENTION AND CONTROL OF POLLUTION) ACT, 1981: enacted after India's participation in United Nations Conference on the Human Environment held in Stockholm in June, 1972
- National Clean Air Programme (NCAP): long-term, time-bound, nationallevel strategy to tackle the air pollution with targets to achieve 20% to 30% reduction in Particulate Matter concentrations by 2024 keeping 2017 as the base year.
- National Air Quality Index: The measurement of air quality is based on eight pollutants, namely,
  - Particulate Matter (size less than 10 µm) or (PM10),
  - Particulate Matter (size less than 2.5 µm) or (PM5),
  - Nitrogen Dioxide (NO2),
  - Sulphur Dioxide (SO2),
  - Carbon Monoxide (CO),
  - Ozone (O3),
  - Ammonia (NH3), and
  - Lead (Pb)
- Comprehensive Environmental Pollution Index (CEPI) developed by CPCB. CPCB has done a nationwide environmental assessment of Industrial Clusters based on CEPI

2 Presence of mercury in birds near thermal power plants paves way for modern analysis

Context: A new study found mercury (Hg) in birds concentrated around two thermal power plants (TPP) in Maharashtra's Nagpur could lead to bioaccumulation and biomagnification.

What is Bioaccumulation and Biomagnification?

- Bioaccumulation: The term bioaccumulation refers to the net accumulation over time of metals within an organism from both biotic (other organisms) and abiotic (soil, air, and water) sources.
- Biomagnification: The term biomagnification refers to the progressive build up of some heavy metals (and some other persistent substances) by successive trophic levels – meaning that it relates to the concentration ratio in a tissue of a predator organism as compared to that in its prey.

Toxic Effects of Mercury

The toxic effects of mercury depend on its chemical form and the route of exposure.

- Methylmercury:Methylmercury [CH3Hg] is the most toxic form.
  - It affects the immune system, alters genetic and enzyme systems, and damages the nervous system, including coordination and the senses of touch, taste, and sight.
  - Methylmercury is particularly damaging to developing embryos, which are five to ten times more sensitive than adults.
  - Exposure to methylmercury is usually by ingestion, and it is absorbed more readily and excreted more slowly than other forms of mercury.
- Elemental mercury: Elemental mercury, Hg(0), the form released from broken thermometers, causes tremors, gingivitis, and excitability when vapors are inhaled over a long period of time.

- Although it is less toxic than methylmercury, elemental mercury may be found in higher concentrations in environments such as gold mine sites, where it has been used to extract gold.
- If elemental mercury is ingested, it is absorbed relatively slowly and may pass through the digestive system without causing damage.

3 Scented products add to air pollution

Context: Use of hair sprays, hand sanitisers, etc., emit the same amount of chemical vapours as petroleum from vehicles, even though 15 times more petroleum is burned as fuel.

What are volatile organic compounds?

- Volatile organic compounds (VOCs) are emitted as gases from certain solids or liquids.
- VOCs are eTmitted by a wide array of products numbering in the thousands.
  - These chemical vapours, known as volatile organic compounds, react with sunlight to form ozone pollution, and, react with other chemicals in the atmosphere to form fine particulates in the air.
- Organic chemicals: Organic chemicals are widely used as ingredients in household products. Paints, varnishes and wax all contain organic solvents, as do many cleaning, disinfecting, cosmetic, degreasing and hobby products.

Fuels are made up of organic chemicals. All these products can release organic compounds while you are using them, and to some degree, when they are stored.

Concerns

- The use of scented goods (including things such as perfumes, hair sprays, air fresheners, and paints) emit the same amount of chemical vapours as petroleum from vehicles, even though 15 times more petroleum is burned as fuel.
- Each spritz of perfume contains volatile organic compounds (VOCs).

4 The usual Stubble Burning Problem

Context: Delhi's overall air quality, which currently lies in the 'moderate' category, is all set to deteriorate in the coming days due to a spike in stubbing burning activity across northwest India and other meteorological conditions.

What is Stubble Burning?

- Stubble burning is, quite simply, the act of removing paddy crop residue from the field to sow wheat.

Is it a Crime?

- Burning crop residue is a crime under Section 188 of the IPC and under the Air and Pollution Control Act of 1981.
- However, government's implementation lacks strength.

Could new technology trigger a second revolution?

- India urgently needs to undergo a second, "evergreen" revolution, driven by technology such as the-

- **happy seeder**, a machine which allows wheat to be sown on top of rice stubble
- **the super sms (straw management system)**, a machine which attaches to the rear of a combine harvester to cut and spread loose residue across the field.

Important Artificial Machines

- Happy Seeder(used for sowing of crop in standing stubble)
- Rotavator (used for land preparation and incorporation of crop stubble in the soil)
- Zero till seed drill (used for land preparations directly sowing of seeds in the previous crop stubble)
- Baler (used for collection of straw and making bales of the paddy stubble)
- Paddy Straw Chopper (cutting of paddy stubble for easily mixing with the soil)
- Reaper Binder (used for harvesting paddy stubble and making into bundles)

What else can be done?

- Agriculture conservation should be promoted with "low lignocellulosic" crop residues such as rice, wheat and maize.
- Crop residue-based briquettes ought to be encouraged and thermal power plants in the vicinity ought to be encouraged to undertake co-firing of crop residues with coal.

5 Mud packs and other remedies to save the Taj from pollution, age and insects

Context: The graves of Emperor Shah Jahan and his queen Mumtaz Mahal had received special "Multanimitti' (Fuller's clay) mud pack treatment", for the visit of United States President.

About Mud packs

- Mud packs have been one of the ASI's favoured ways to remove the yellow stains that have appeared over the years on the TajMahal's white marble facade.
- The treatment traditionally employed to clean marble surfaces help restore the natural shine and colour of the monument.
- Mud packs were applied on the surface of the monument first in 1994, and then again in 2001, 2008, and, most recently, beginning 2014.
- The Taj was declared a UNESCO World Heritage site in 1983.

Analyzing the pollution sources for Taj

- **Acid rain:** The most dangerous thing is acid rain. The inadvertent emission of sulfuric oxide, due to road traffic, causes acid rain, due to which TajMahal'scolour changes to yellow, tarnishing it, and worse, it erodes it, attacking what is most fragile at first, the sculptures and incrustation of stone.
- **Green dropping:** Algae proliferate along with some harmful insects, especially a local variety of mosquitoes (chironomids) make green dropping, the colour of algae they feed on. The mausoleum is regularly browned by these droppings but fortunately, marble resists these droppings which, obviously are not enough corrosive.
- **Water pollution:** The river Yamuna passes next to the monument, also goes to Delhi, which is heavily equipped in terms of polluting industry, this pollution is inevitably found in the river and reaches Agra very quickly, which has an astonishing consequence.

- **Discoloration:** There are various factors that have led to the discoloration of the TajMahal.
  - the polluting industries and the vehicular emissions in the Taj Trapezium Zone (TTZ) area
  - the Yamuna River, which flows behind the Taj, has become highly polluted.

Taj Trapezium Zone:

- The Taj Trapezium Zone (TTZ) spreads over 10,400 sq km across the districts of Agra, Firozabad, Mathura, Hathras and Etah in Uttar Pradesh and Bharatpur district of Rajasthan.
- Since 1994, no new factory can be established in this protected area around the TajMahal.

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7 DISASTER MANAGEMENT

1 Ecological disaster at Baghjan

Context: Assam's pollution watchdog has told Oil India Ltd (OIL) to shut down production and drilling at all installations in Upper Assam's Baghjan oilfield following some irregularities.

About OIL

- Oil India Limited is the second largest hydrocarbon exploration and production Indian public sector company with its operational headquarters in Duliajan, Assam, India.

The ecological disaster

- It affected the flora, fauna and wetlands which is close to the Maguri-Motapung wetland and the ecologically fragile Dibru-Saikhowa National Park.

Dibru-Saikhowa National Park

- Dibru-Saikhowa National Park is located in the Tinsukia district of the state of Assam.
- This was declared a wildlife Sanctuary in 1986 by the government of Assam by uniting two Reserve forest, viz., Dibru and Saikhowa including some other areas.
- Dibru-Saikhowa wildlife Sanctuary was declared as a National park in 1999.
- Dibru-Saikhowa National Park is one of the 19 biodiversity hotspots in the world. It is also a biosphere reserve.
- The park is bounded by the Brahmaputra River and Arunachal hills in the north and Dibru and Patkai hills on the south.
- It mainly consists of semi wet evergreen forests, tropical moist deciduous forest, bamboo, cane brakes and grasslands. Situated in the flood plains of Brahmaputra, at an altitude of about 118 m above sea level.

Maguri-Motapung wetland

- Located less than 10 km south of Dibru-Saikhowa National Park is MaguriMotapungbeel.
- Spread over 9.6 sq. km, MaguriMotapungbeel was declared an important bird and biodiversity area in 1996.

- It is host to over 110 bird species, including eight listed as threatened on the IUCN Redlist, such as the swamp grass babbler, the ferruginous duck, the white-winged wood duck and the falcated duck.

Other rare and migratory birds that visit this wetland include the lesser adjutant, the swamp francolin, the lesser teal and the bar-headed goose.

It is also home to 84 species of fish, including the golden mahseer.

Legal backing for closure

- As per the closure notice from PCBA, OIL has been operating the Baghjan oil field installation "without obtaining prior consent to establish/consent to operate from Pollution Control Board Assam, which is a serious violation of the provisions of the Water Act, 1974, Air Act, 1981 as well as Environment Protection Act, 1986".
- It is mandatory to obtain prior permission / clearance from MoEF&CC as well as State PCB for production, drilling, pumping of crude oil and laying pipeline activities as per EIA notification, 2006 and various provisions under the Section 25/26 of the Water (Prevention of Control of Pollution) Act, 1974 and Section 21 of the Air (Prevention of Control of Pollution) Act, 1981 and Authorization under the Hazardous & other waste (Management &Transboundary Movement) Rules, 2016 as amended upto date.

Important Acts

- **Disaster Management Act, 2005**

- It was enacted to effectively prevent, mitigate (reducing the severity) and prepare for disasters.
- It came into being on the heels of three major disasters.
  - 1999 - Super cyclone in Odisha
  - 2001 - Bhuj earthquake
  - 2004 - Indian Ocean tsunami
- The Act mandated the creation of the National Disaster Management Authority, State Disaster Management Authorities and District Disaster Management Authorities.
- It laid down the framework, roles and responsibilities of these bodies to formulate and implement disaster management plans at their levels.

National Disaster Management Authority (NDMA)

- The National Disaster Management Authority (NDMA) under the DM Act is the nodal central body for coordinating disaster management, with the Prime Minister as its Chairperson.
- The NDMA lays down policies, plans, and guidelines for the management of the disaster.
- Similarly, State, District, and Local level Disaster Management Authorities were established, manned by high functionaries. All these agencies are envisaged to work in coordination.

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8 MISCELLANEOUS

1 New height of Mount Everest 8,848.86 metres: Nepal, China joint survey

Context: After more than a decade of dispute and controversy, China and Nepal have finally agreed on how tall Mount Everest is.

About Mount Everest

- Mount Everest—known in Nepali as Sagarmatha and Tibetan as Chomolungma—straddles the border between Nepal and Tibet at the crest of the Himalayan mountain chain.

Why did Mount Everest's height change?

- The mountain's height changes. The movement of tectonic plates can lift it up ever so gradually, while earthquakes can bring it down.

The new height

- Nepal and China jointly announced that the revised height of the world's highest peak Mount Everest was 8,848.86 metres, about 86 centimetres more than the previous measurement done by India in 1954.
- This is less than a meter higher than the previously recognized height.
- The new height was calculated using a combination of geodetic data received from three mechanisms: levelling instrument, gravity meter and GPS. The team placed a signal receiver at every station, and measured how much time it took for signals to travel between the receiver and satellites — then converted that measurement into height.

2 World Turtle Day

Context: The National Mission for Clean Ganga (NMCG), along with the Wildlife Institute of India (WII), its project partner in the 'Biodiversity Conservation Initiative Phase II', celebrated World Turtle Day.

What is World Turtle Day?

- World Turtle Day is an annual event that has been taking place since 2000. It was founded by American Tortoise Rescue.
- The purpose of World Turtle Day is to educate people about the things that they can do to protect the habitats of turtle and tortoises.

American Tortoise Rescue:

- American Tortoise Rescue (ATR) was founded in 1990 by husband and wife team Susan Tellem and Marshall Thompson.
- It is a non-profit organisation that rescues and rehabilitates all species of tortoise and turtle.

About Turtle:

- Turtles are reptiles with hard shells that protect them from predators.
- Most of the species of turtles and tortoises are vulnerable, endangered or critically endangered, according to the IUCN.
- Turtles breathe air and lay their eggs on land, which makes them amniotes.
- There are seven known species of sea turtles: loggerhead, green turtle, leatherback, hawksbill, Kemp's ridley, flatback, and olive ridley.
- The turtle order, Testudines (or Chelonia), splits into two suborders, Cryptodira and Pleurodira, and then further splits into 13 families, 75 genera and more than 300 species.

National Marine Turtle Action Plan

- Considering the need to have a conservation paradigm for marine mega fauna and marine turtles, the Ministry of Environment Forest and Climate Change (MoEF&CC) has released 'Marine Mega Fauna Stranding Guidelines' and the 'National Marine Turtle Action Plan'.

What is 'in' the plan?

- These two documents highlight actions to be taken for:
  - handling stranded animals on shore
  - stranded or entangled animals in the sea or on a boat
  - management actions for improved coordination
  - reducing threats to marine species and their habitats
  - rehabilitation of degraded habitats
  - enhancing people's participation
  - advance scientific research
  - exchange of information on marine mammals and marine turtles and their habitats

3 The Commission for Air Quality Management (CAQM)

Context: Dissolving the 22-year-old Environmental Pollution (Prevention and Control) Authority (EPCA), the Centre has constituted a "permanent" body — the Commission for Air Quality Management in National Capital Region and Adjoining Areas.

About

- The Commission for Air Quality Management (CAQM) will have the power-
  - to formulate rules, set emission standards
  - to impose fines up to ₹1 crore or send violators to prison for up to five years.
- The permanent body is to be headed by a former secretary to the Government of India or chief secretary to a state government.

- The ex-officio members comprise chief secretaries or secretaries dealing with the subject of environment in the states of Delhi, Haryana, Punjab, Rajasthan and Uttar Pradesh and non-governmental organisations.
- Of the total members, only three members representing NGOs have been included.

4 Worldwide legal wildlife trade increased by 2000%

Context: Worldwide legal wildlife trade has increased by 2,000% since 1980, as per a latest report.

The Report

- The report has been prepared by the by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES).
  - IPBES is an intergovernmental organisation established to improve the interface between science and policy on issues of biodiversity and ecosystem services.

Key-highlights of the Report

- According to the report, the international legal wildlife trade has increased 500 percent in value since 2005 and 2,000 percent since the 1980s.
- On the other hand, the estimated value of the global illegal trade in wildlife is worth around $7-23 billion per year, equivalent to nearly 25 percent of the value of the legal market.

The warning

- Even the legal trade will become unsustainable due to:
  - insufficient and inadequate regulation
  - globalisation of trade routes
  - lack of sufficient reporting
  - links between poverty and illegal hunting

The role of CITES

- Since 1975, international legal trade in wildlife had been regulated by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- CITES has 183 countries, including India, as its signatories.
- The report noted that CITES had been able to reduce wildlife trade, drive up value of sustainably traded species and products and promote captive-breeding, ranching or farming as alternatives to wild capture.
- However, it added that the international trade in a large number of wild species — principally fisheries and forestry resources — were not regulated under CITES, while the domestic use and trade of wildlife fell outside the purview of the Convention.

5 Jammu's Chipko moment: protest against a plan to chop trees in Raika

Context: In order to protest against plan to chop 38,000 trees in Raika forests, green activities started a movement similar to Chipko movement. The movement was led by Climate Front, a student-led environment awareness organization.

What is the matter?

- The protesters were rallying against the construction of a new High Court campus that would reportedly result in the cutting down of as many as 38,006 trees in the eco-sensitive Raika-Bahu area.
- The proposed construction site is situated within **Bahu Conservation Reserve** and a part of it also falls under the **Ramnagar Wildlife Sanctuary**
- Jammu comes under the **seismic zone of lV and V**. This step of chopping over 38,000 trees would invite massive calamities.

About RaikaBahu forest region

- Raika-Bahu is an **eco-sensitive area** under the **Bahu Conservation Reserve** in Jammu.
- It is home to species like rock pigeon, Asian koel, barn owl, red-vented bulbul, jackal, wild boar and rhesus monkey.
  - The reserve was established in 1981.
- It is located just 3.75 km from **Ramnagar Wildlife Sanctuary.**
- Raika-Bahu forest area is situated in the middle of the reserve along river Tawi.
- It also supports the Gujjar community which rears goats, cows and buffaloes.

Ramnagar Wildlife Sanctuary

- The sanctuary is present in Jammu.
- The sanctuary harbors 8 mammal species which include nilgai, and barking deer, wild boar, rhesus monkey etc.
- The sanctuary supports Indian Mynah, blue rock pigeon, peafowl, red jungle fowl, jungle crow, golden oriole, white-cheeked bulbul.

6 World Wildlife Day 2021

Context: March 3 is celebrated as World Wildlife Day across the globe.

About the Wildlife Day

- The United Nations General Assembly had proclaimed March 3 as UN World Wildlife Day in 2013 to celebrate and raise awareness about animals and plants.
- The day is celebrated in commemorating the day of the signing of the **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)** in 1973.

Wildlife Day 2021

- **Theme:** 'Forests and Livelihoods: Sustaining People and Planet'.
- The theme highlight the role of forests, forest species, and ecosystem services in sustaining the livelihood of millions of people at a global level and especially of the indigenous and local communities that have been associated with the forest for the longest of times.

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

- CITES is an international agreement between governments.

- It aims to ensure that international trade in specimens of wild animals and plants does not threaten their survival.
- It came into existence in **1973 and on 1 July 1975 CITES entered in force**.
- For many years CITES has been among the conservation agreements with the largest membership, with now **183 Parties.**

Appendices:

- The species covered by CITES are listed in three Appendices, according to the degree of protection they need.
  - **Appendix I**: It includes species **threatened with extinction**. Trade-in specimens of these species are permitted only in exceptional circumstances.
  - **Appendix II:** It includes species **not necessarily threatened with extinction, but in which trade must be controlled** to avoid utilization incompatible with their survival.
  - **Appendix III**: This Appendix **contains species that are protected in at least one country,** which has asked other CITES Parties for assistance in controlling the trade.

7 Illegal Trade of Red Panda

Context: Recently, a report by trade monitoring network TRAFFIC analyzed the illegal trade-related threats to Red Panda in India.

About the report

- The trade monitoring network TRAFFIC has released a report titled "Assessment of illegal trade-related threats to Red Panda in India and selected neighbouring range countries".
- The report has analysed poaching and illegal trade of the species for the ten years from July 2010 to June 2019.

Red Panda

- The red panda (only living member of the genus Ailurus) is a small reddish-brown arboreal mammal.
  - It is also the state animal of Sikkim.
- It is listed as Endangered in the IUCN red list of Threatened Species and under Schedule I of the Indian Wildlife (Protection) Act, 1972.
- Habitat:It is found in the forests of India, Nepal, Bhutan and the northern mountains of Myanmar and southern China.
  - It thrives best at 2,200-4,800m, in mixed deciduous and conifer forests with dense understories of bamboo.
  - In India, About 5,000-6,000 red pandas are estimated to be present in Sikkim, western Arunachal Pradesh, Darjeeling district of West Bengal and parts of Meghalaya.
  - This is the second-largest population after China (6,000-7,000).
  - Red pandas have been reported from 11 districts of Arunachal Pradesh, which is presumed to hold the largest red panda population in the country.

TRAFFIC – The Wildlife Trade Monitoring Network

- TRAFFIC is a leading non-governmental organisation working globally on trade in wild animals and plants in the context of both biodiversity conservation and sustainable development.

- It is a joint program of WWF and IUCN – the International Union for Conservation of Nature created in 1976.
- TRAFFIC focuses on leveraging resources, expertise and awareness of the latest globally urgent species trade issues such as tiger parts, elephant ivory and rhino horn.

8 Tale of China's illegal trade

Context: China recently started a process to classify a step to rein in animals and birds from illegal trading in wildlife. However, experts are raising concerns over China's measures to prevent illegal wildlife trade.

What is illegal wildlife trade?

- Poachers, traffickers and highly-organized criminal gangs decimate already endangered wildlife species, reaping a deadly harvest in the pursuit of profits.
- The main consumer markets are China and South East Asia, but wildlife—alive or as body parts—is also smuggled to the Gulf, Europe and Northern America. Beyond India, the main transit countries are Nepal, Bangladesh, Bhutan, Sri Lanka and Myanmar.

Legal and policy framework to regulate and restrict the wildlife trade:

- Current laws prohibit trade in over 1,800 species of wild animals, plants, and their derivatives under the Wildlife (Protection) Act, 1972.
- The Indian Penal Code (IPC) and The Prevention of Cruelty to Animals Act 1960 empower authorities to penalize and jail those who harm wildlife.

Regulation of wildlife trade:

- CITES: To address the problem, in 1973 the United Nations General Assembly signed the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), aimed at stemming the illegal trade in wild animals and rare commodities.
  - CITES is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival.
  - It was drafted as a result of a resolution adopted in 1963 at a meeting of members of IUCN (The World Conservation Union).
  - A State or regional economic integration organization for which the Convention has entered into force is called a Party to CITES. Currently there are 183 Parties.
    - India is a member to CITES.
- TRAFFIC: It is the wildlife trade monitoring network, is a joint program of WWF and IUCN – the International Union for Conservation of Nature.
  - Created in 1976, it works to ensure that trade in wild plants and animals is not a threat to the conservation of nature.

9 UNESCO-IOC Tsunami-Ready Recognition to Odisha Communities

Context: Odisha has achieved another milestone in disaster management. Venkatraipur in Ganjam and Noliasahi in Jagatsinghpur have been recognised by UNESCO-IOC as Tsunami-Ready Communities.

About

- The Indian Ocean Tsunami Ready Programme of IOC-UNESCO is a community performance-based programme.
- It facilitates tsunami preparedness as an active collaboration of the community, community leaders, and national and local emergency management agencies.
- The main objective of this programme is-
  - to improve coastal community preparedness for tsunami emergencies
  - to minimize the loss of life and property
  - to ensure structural and systematic approach in building community preparedness.
- The Tsunami Ready program is implemented by the Odisha State Disaster Management Authority (OSDMA).

Tsunami

- A tsunami is a series of great sea waves caused by an underwater earthquake, landslide, or volcanic eruption.
- More rarely, a tsunami can be generated by a giant meteor impact with the ocean.
- A tsunami is not a single wave but a series of waves, also known as a wave train. The first wave in a tsunami is not necessarily the most destructive. Tsunamis are not tidal waves.

- Odisha State Disaster Management Authority (OSDMA) won the IT Excellence Award, 2019, for its innovative conception by using information technology in the field of disaster management.
  - The OSDMA was established in 1999, much before the Disaster Management Act was passed in 2005, and the National Disaster Management Authority (NDMA) was constituted in 2001.

10 World Tiger Day

Context: The government has released a detailed report of Tiger Census on the eve of Global Tiger Day.

About

St. Petersburg Declaration on Tiger Conservation

- The Heads of the Governments of Tiger Range countries at St. Petersburg, Russia, had resolved to double tiger numbers across their global range by 2022 by signing the St. Petersburg declaration on tiger conservation.
- It was also decided to celebrate July 29 as Global Tiger Day across the world, which is since, being celebrated to spread and generate awareness on tiger conservation.

13 tiger range countries

- India, Bangladesh, Bhutan, Cambodia, China, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, Russia, Thailand and Vietnam.

- Global Tiger Day is an annual celebration to raise awareness for tiger conservation, held annually on 29 July. It was created in 2010 at the Saint Petersburg Tiger Summit.

- Name of the report: 'Status of Tigers, Co-predators and Prey in India Report'.

Highlights of report

- 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 population have been elaborated in a detailed manner.
  - Tiger abundance within pockets in tiger reserves has been demonstrated for the first time.
  - LIDAR based survey technology will be used for the first time. (Lidar is a method for measuring distances by illuminating the target with laser light and measuring the reflection with a sensor.)
- India's tiger population now stands at 2967 which is 70 percent of the global tiger population.

Tiger Conservation Authority in India

- The Wildlife Protection Act of 1972 was amended in 2006 to provide for constituting the National Tiger Conservation Authority responsible for implementation of the Project Tiger plan to protect endangered tigers.
- The National Tiger Conservation Authority is set up under the Chairmanship of the Minister for Environment and Forests.
- The National Tiger Conservation Authority (NTCA) was established in December 2005 following a recommendation of the Tiger Task Force.

11 Desertification and Drought Day

Context: Desertification and Drought Day is observed every year on June 17 to promote public awareness of international efforts to combat desertification.

What is World Day to Combat Desertification and Drought?

- United Nations General Assembly acknowledged June 17 as the World Day to Combat Desertification and Drought.
- The day was officially declared by the UN General Assembly in the year December 1994 as "World Day to Combat Desertification and Drought".
- On October 14, 1994, India signed the United Nations Convention on the Elimination of All Forms of Desertification (UNCCD). After which this day started to be celebrated from the year 1995 to combat desertification.
- The objectives of Desertification and Drought Day as per Un General Assembly comprises of following points-
  - To promote public awareness of the issue
  - To let people know that desertification and drought can be effectively tackled, that solutions are possible, and that key tools to this aim lay in strengthened community participation and cooperation at all levels.
  - To strengthen implementation of the United Nations Convention to Combat Desertification in those countries experiencing serious drought and/or desertification, particularly in Africa.
- World Day to Combat Desertification and Drought 2020 Theme is "Food. Feed. Fibre"; which speaks the links between consumption and land.

UNCCD

- In 1994, the UN established the United Nations Convention to Combat Desertification (UNCCD) as the "sole legally binding international agreement linking environment and development to sustainable land management".
- The Convention itself was a response to a call at the UN Earth Summit in Rio de Janeiro in 1992 to hold negotiations for an international legal agreement on desertification.
- India is signatory to the United Nations Convention on Combating Desertification (UNCCD). The country is committed to combat desertification and land degradation and intends to achieve land degradation neutral status by 2030.
- MoEF&CC is the nodal Ministry for the implementation of the UNCCD.

12 International Day of Clean Air for blue skies

Context: The very first International Day of Clean Air for blue skies was held on September 7th, 2020.

About

- The General Assembly of United Nations adopted a resolution in 2019 to observe the International Day of Clean Air for Blue Skies on 07th September every year starting from 2020.
- The theme for the Day is #CleanAirforAll.

What India is doing to make its skies clear?

- The Union ministry of environment, forest and climate change (MoEFCC) is also considering a request to defer the deadline for thermal power plants to meet air pollution norms by 2022, another two years.
  - Thermal power plants are one of the largest sources of sulphur dioxide (SO2) and particulate matter (PM) pollution in India.
- **BS-VI standards:** With the country now having migrated to BS-VI standards, quality petrol and diesel is provided in the country, which is an important intiative to fight against pollution.
- **National Clean Air Programme:** In January last year, the Environment Ministry launched National Clean Air Programme (NCAP).
  - It aims to tackle the problem of air pollution in a comprehensive manner with a target to achieve 20 to 30 percent reduction in PM 10 and PM 2.5 concentrations by 2024 keeping 2017 as base year.

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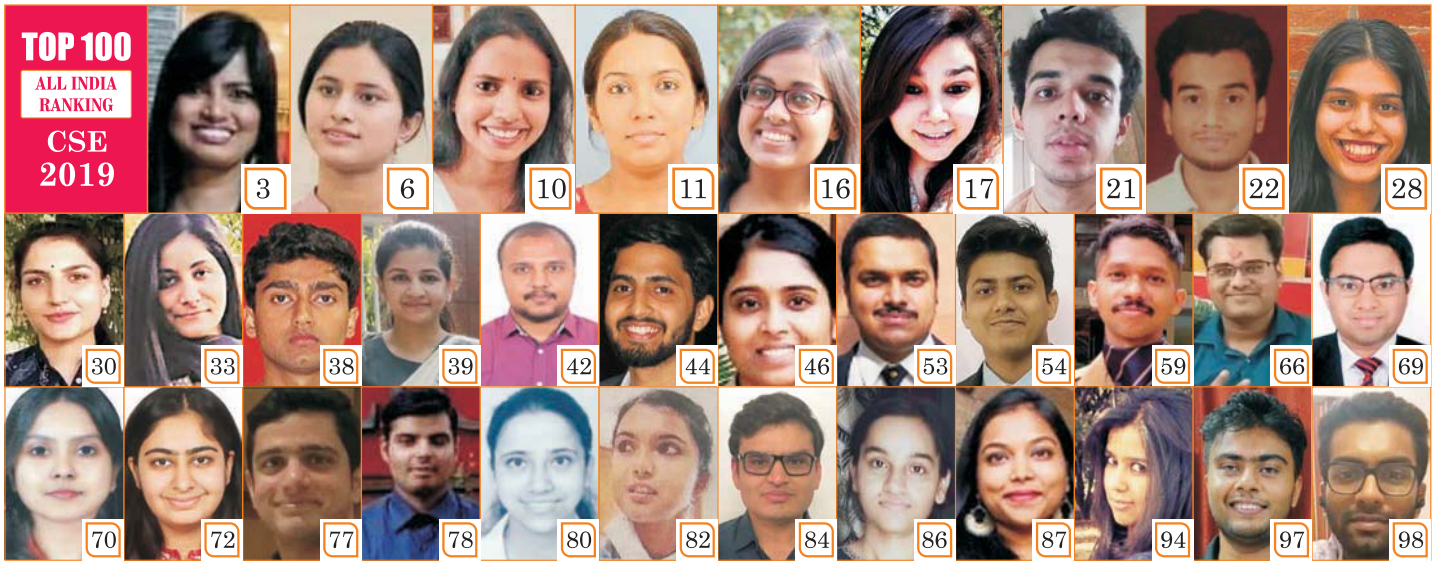

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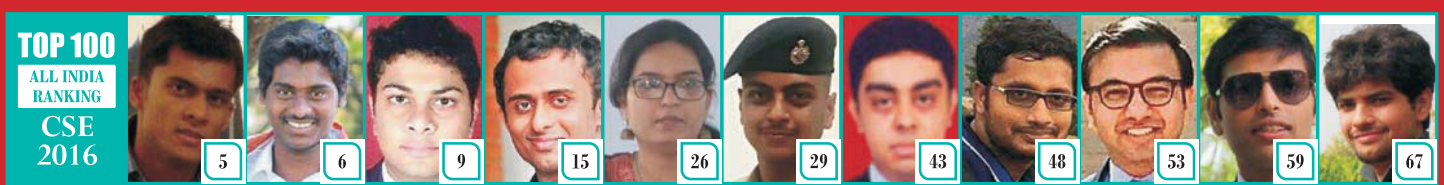

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