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For Prelims 2022

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An initiative
By Pradeep Kumar
(SOCIOLOGY EXPERT)

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The information in this magazine is intended to provide users with resources and information which they may find useful and of interest.

We take all reasonable steps to keep this information current and accurate, but errors can occur.

We express our gratitude to all our team members and thankful to all the advisors for making first step in publishing a small magazine.

Our Methodology for this Magazine

We have used authentic sources such as The Hindu, Indian express, PIB, Live Mint etc to collect articles which are important for Exam

The topics has been categorised subject wise so that is is easy for aspirants to read in flow and relate the topics

Background information has been provided so static related to current can be covered

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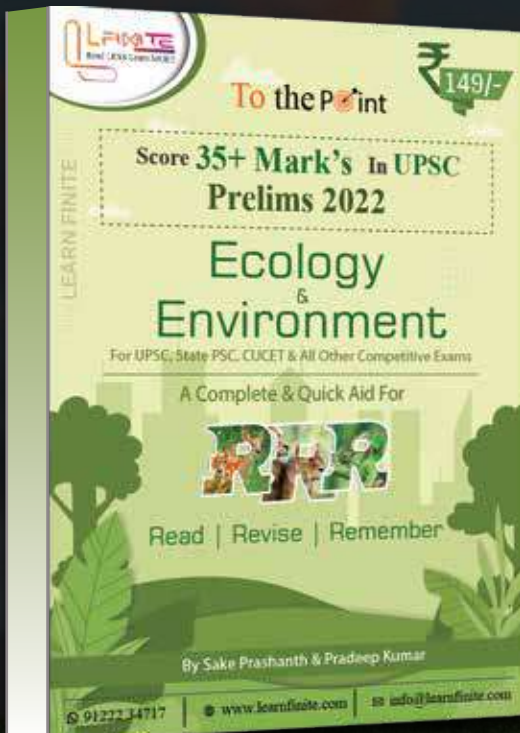
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Ice Age woolly rhino

In news

A well-preserved Ice Age woolly rhino with many of its internal organs still intact has been recovered from permafrost in Russia's extreme north.

Details

- The animal was discovered on the bank of the Tirekhtyakh river in the Abyisk district in Yakutia.
- Most of its intestines were intact. It had perfectly preserved soft tissue, hair and a lump of fat. Its horn was found near it.
- Recent years have seen major discoveries of mammoths, woolly rhinos, Ice Age foal, and cave lion cubs as the permafrost increasingly melts across vast areas of Siberia because of global warming.
- Scientists dated the carcass as anywhere from 20,000- to 50,000-years-old. More precise dating will be possible once it is delivered to a lab for radiocarbon studies.
- Researchers dated that specimen, which they called Sasha, at 34,000 years old.

Analytical Quality Control exercise

In news

Central Pollution Control Board organizes Analytical Quality Control exercise of 145 Environmental Laboratories for 9 trace metal parameters.

Objective

To continuously monitor the accuracy and reliability of the analytical data generated by these laboratories, to help to improve the infrastructure of laboratories and the quality of data.

Highlights

- The performance of each laboratory would be evaluated based on scores and the scorecards would be sent by the end of 31st of March 2021.
- The metals included in the 33rd AQC exercise are Total Arsenic (As), Cadmium (Cd), Total Chromium (Cr), Copper (Cu), Iron (Fe), Manganese (Mn), Nickel (Ni), Lead (Pb) and Zinc (Zn) for the assessment of pollution in air and water.

Significance

- The AQC exercise will help evaluate the performance of participating laboratories in terms of analytical activities, the robustness of instruments used for sample analysis and the expertise of manpower engaged in the laboratory.
- It will also help to ensure the reliability of the analyzed data, for an informed and conclusive decision for the prevention and control of pollution.

Antarctic ozone hole closes

In news

The annually occurring ozone hole over the Antarctic had rapidly grown from mid-August 2020 and peaked at around 24 mln sq km

How?

- A strong, stable and cold polar vortex and very cold temperatures in the stratosphere drove the expansion of the hole.
- The same meteorological factors also contributed to the record 2020 Arctic ozone hole, which has also closed.
- A polar vortex is a wide expanse of swirling cold air, a low pressure area, in polar regions. During winters, the polar vortex at the North Pole expands, sending cold air southward.
- An ozone hole is the thinning of the ozone layer boosted in size by colder temperatures.
- As the temperatures high up in the stratosphere starts to rise, ozone depletion slows, the polar vortex weakens and breaks down. By the end of December, ozone levels return to normal.

The Montreal Protocol on Substances that Deplete the Ozone Layer regulates production and consumption of nearly 100 chemicals referred (OSD). Since the ban on halocarbons, the ozone layer has slowly been recovering

(NCAVES) India Forum-2021

In news

Natural Capital Accounting and Valuation of the Ecosystem Services (NCAVES) India Forum-2021 is being organised by the Ministry of Statistics and Programme Implementation (MoSPI)

Implemented by

- MoSPI in close collaboration with the Ministry of Environment, Forest and Climate Change (MoEF&CC) and the National Remote Sensing Centre (NRSC).
- A web portal www.ncavesindiaforum.in has been designed for the purpose of registration, participation and to function as a repository for the environment related information.

Aim

- To build a stronger awareness about the different perspective to Environment and to show a way forward towards realizing the contribution of the natural capital to achieve a ***“better environment, better tomorrow”***.
- The Forum targets showcasing some of the important researches/work related to the environment through the online exhibition and the twitter poster session platform.

The Project

It will initiate pilot testing of SEEA Experimental Ecosystem Accounting (SEEA EEA) with a view to

- Improving the measurement of ecosystems and their services (both in physical and monetary terms) at the (sub)national level;
- Mainstreaming biodiversity and ecosystems at (sub)national level policy planning and implementation;
- Contribute to the development of internationally agreed methodology and its use in partner countries.

The project will have a duration until the end of 2021.

Mollusc species collapsing in eastern Mediterranean

In news

Mollusc species collapsing in eastern Mediterranean, finds study

Mollusc species

Mollusca is one of the most diverse groups of **animals** on the planet, with at least 50,000 living species (and more likely around 200,000). It includes such familiar organisms as snails, octopuses, squid, clams, scallops, oysters, and chitons.

The study

- The team gathered over 100 samples from the seafloor to gauge the characteristics of local mollusc populations — the species present, their numbers, etc.
- These were then compared to historical data on the same topic.
- Only around 12 per cent of the shallow-sediment molluscs noted in the historical records are still present today.
- On rocky reefs, that number is only five per cent.
- While the mollusc species originally native to the eastern Mediterranean are on the decline, tropical invaders have increased significantly, the research found.
- The species that migrate via the Suez Canal are well adapted to the warm water in the eastern Mediterranean and can, therefore, settle in large numbers.
- They now form large populations with fully reproductive individuals.
- The researchers estimated that 60 per cent of the remaining local mollusc populations were below their reproductive size.

Reasons

Global Warming, Pollution and the pressures from invasive species

Denotification of the Shivalik Elephant Reserve

In news

Uttarakhand court approved the proposal put before it: to denotify the Shivalik Elephant Reserve to make way for the expansion of Dehradun's Jolly Grant airport.

Background

- In 2002, the Centre notified the reserve under its Project Elephant, in order to protect the elephants in the area, their natural habitats and to reduce human-elephant conflict.
- Earlier this year, the Uttarakhand State Wildlife Board had already cleared the use of around 87 ha of forest-land for the same airport expansion project.

Issue

- The proposed bit of land falls in a sensitive zone of Shivalik Elephant Reserve, and is only some three kilometres from the crucial Kansaro-Barkot elephant corridor.
- Citing provisions of the Biological Diversity Act 2002 and the Wildlife Protection Act 1972, the petitioner argued that ***“it was not open to the State Wildlife Board to denotify the Shivalik Elephant Reserve in such a summery manner without assessing the ecological catastrophe that it can push the state and the entire region into”.***

Wildlife in Aravallis need better protection

In news

The study — a ***“systematic assessment”*** of mammals in the wildlife corridor formed by the Aravalli hills in Gurgaon and Faridabad with the Asola Wildlife Sanctuary in Delhi — has been carried out

Findings of the study

- The most interesting finding of the study was that in comparison to Asola, the Haryana portion of the Aravallis had more wildlife movement — despite the fact that Asola is a wildlife sanctuary and has more legal protection.
- It states that this can be attributed to “the attitude of tolerance to wildlife” amongst the local population, “general low density of people”, and “subsistence agricultural practices” prevalent in the two districts.
- The study indicated that the hotspot of wildlife in this corridor is actually between Damdama and Mangar Bani, and wildlife moves from there to Asola through the Aravalli in Faridabad.
- This indicates that Asola will survive as long as the Aravalli region of Gurgaon and Faridabad survives.
- If this finishes, Asola will automatically finish as well.
- It is, hence, critical to protect this region.

Threat

Highways, especially the Gurgaon-Faridabad Expressway, and increasing construction are a “major threat” to the wildlife corridor.

1st Generation (1G) ethanol

In news

The government has notified the modified scheme for extending financial assistance for producing “**1st generation**” (1G) ethanol from feed stocks such as cereals (rice, wheat, barley, corn and sorghum), sugarcane and sugar beet.

Highlights

- This was done to set up distilleries for producing 1st Generation (1G) ethanol from feed stocks such as cereals (rice, wheat, barley, corn & sorghum), sugarcane, sugar beet etc. or converting molasses based distilleries to dual feedstock vide notification dated 14th January, 2021.
- And to achieve 20% blending by 2025 as well as to meet out the requirement of ethanol production capacity in the country.
- Under the scheme, Government would bear interest subvention for five years including one year moratorium against the loan availed by project proponents from banks @ 6% per annum or 50% of the rate of interest charged by banks whichever is lower
- Under the scheme, the Centre will provide interest subvention to encourage the funding in this sector.
- Sugarcane and ethanol is produced mainly in three states viz Uttar Pradesh, Maharashtra and Karnataka.

Vision

To boost agricultural economy, to reduce dependence on imported fossil fuel, to save foreign exchange on account of crude oil import bill & to reduce the air pollution, the Government has fixed target of 10% blending of fuel grade ethanol with petrol by 2022 & 20% blending by 2030.

Significance

- This scheme would not only facilitate diversion of excess sugar to ethanol but would also encourage farmers to diversify their crops to cultivate particularly maize/corn which needs lesser water compared to sugarcane and rice.
- It would enhance production of ethanol from various feed stocks thereby, facilitate in achieving blending targets of ethanol with petrol and would reduce import dependency on crude oil, thereby, realizing the goal of Atmanirbhar Bharat.”
- It will also enhance income of farmers as setting up of new distilleries would not only increase demand of their crops but would assure farmers of getting better price for their crops.

First generation ethanol

It is produced from sugarcane in an autonomous distillery consists of sugarcane cleaning and preparation, extraction of sugars, juice treatment, concentration and fermentation, distillation, dehydration and cogeneration.

First bird fest

In news

First bird festival is being organised at the Mahananda wildlife sanctuary in West Bengal to provide an opportunity to enthusiasts to explore the forest and watch different birds

Highlights

- The Darjeeling Wildlife Division will be organising the 1st Mahananda Bird Festival from February 20 to 23
- The participants will be taken to the popular birding spots such as Rongdong and Latpanchor, besides other birding trails within the forests
- Visitors will be able to witness the diverse landscapes of rivers, plains, forests and hills during the festival
- The participation fee is Rs 5,000 and it includes entry fees, food and lodging

Mahananda Wildlife Sanctuary

- Mahananda Wildlife Sanctuary (Area 158 sqkm) is located at the Southern part of Darjeeling District, on the West bank River Tista.
- Due to diversity of elevation and vegetation, the faunal species found in the sanctuary is varied.
- Larger animals like Elephant, Gaur, Barking Deer, Spotted Deer, Wild boar, Leopard and other wild cats are found all over the sanctuary.
- The region is reputed to possess the richest variety of birds in the country.
- **Mahananda Wildlife Sanctuary is rich in fauna and has more than 300 species of birds.**

Severe drought in Turkey

In news

Most of Turkey has been under intense drought from the beginning of the year, after consecutive seasons of little or no rainfall, the Nasa Earth Observatory reported

Significance

This has put agriculture in the Mediterranean country under threat. Istanbul, its most populous city, can run out of water in months.

Background

- In 2018, the South African city Cape Town witnessed similarly severe droughts that threatened to cut off water supply for the entire town. Water reservoirs that supply to 3.7 million people had dipped to below 20 per cent.
- Last year was the driest year for Turkey in five years, with every province receiving below-average rainfall every month since July.
- From October to December, the country witnessed rainfall 48 per cent lower than the average for 1981-2010.
- This was followed by a difficult 2019 when it hardly rained in the summer and autumn months. This had already depleted the country's aquifers substantially.

- Now, several of Istanbul's water reserves have the lowest volumes recorded in the last 15 years. As of January 13, 2021, storage rates from at least seven reservoirs around Istanbul measured just below 25 per cent.

Issue

- It takes a lot of time for aquifers to recover from droughts as in the absence of rain, they rely of surface moisture to percolate though the soil and rocks.
- Dry spells can cause this layer of moisture, known as **root zone moisture**, to also vanish.

Root zone moisture

- Root zone moisture is also vital for agriculture as it is the most easily available source of water for plants.
- The water and moisture in the soil to a depth of 39 inches is called root zone moisture.
- It takes a lot of time for the aquifers to recover from droughts in the absence of rain.
- The aquifers rely on surface moisture to percolate through soil and rocks.
- When there are no rains and surface moisture, the root zone moisture might vanish completely.
- This eventually will make the soil unfit for trees and plants.

AI to help improve the air quality

In news

Air Quality Commission ropes in top technical institutions to set up a Decision Support System

Significance

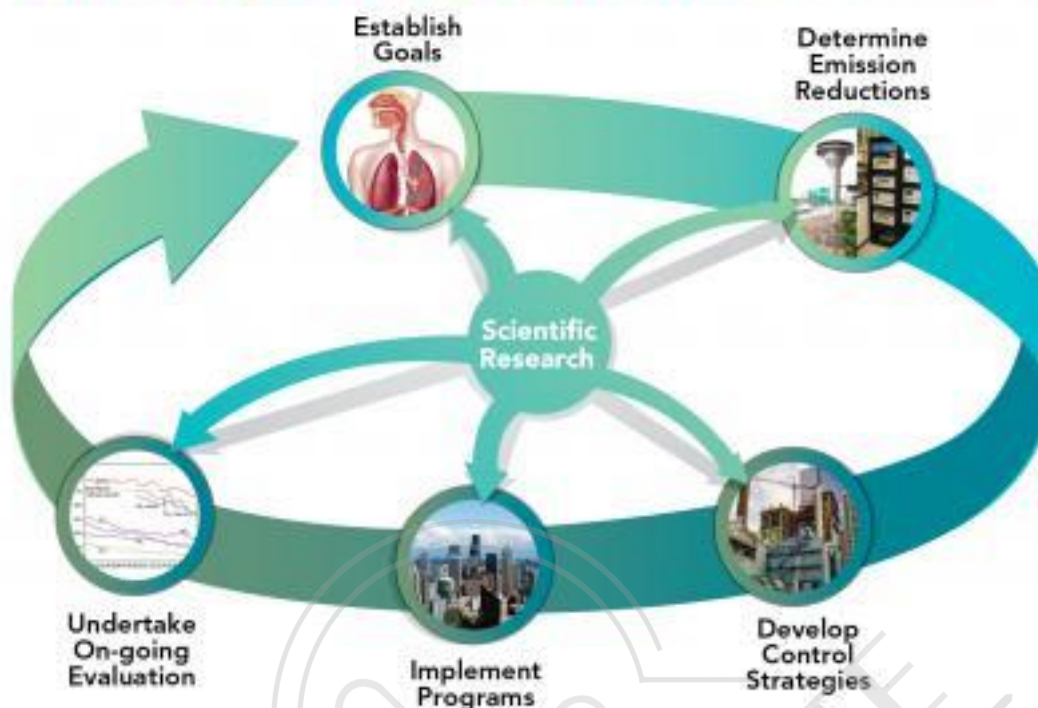
- The System will use Artificial Intelligence(AI) to help improve the air quality over targeted sectors of Delhi /NCR
- This tool will help immensely in capturing the static and dynamic features of the emissions from various sources.
- It will have an integrated framework to handle both primary and secondary pollutants using chemical transport model.
- The system will also be able to handle the source specific interventions with the framework to estimate benefits of interventions and will focus on presenting the best results in a comprehensive user friendly and simple format for different users.

Functioning

- The Air Quality Management **Decision Support Tool (DST)** integrates an emissions inventory development application and database; regional, local and source–receptor modelling; and Geographical Information System (GIS) based visualization tools in a software framework so as to build a robust system to formulate and implement source specific interventions to improve the air quality over targeted sectors of Delhi / NCR.
- Identification of source specific interventions by the DST is deliberated with the involvement of stake holders.
- The sources covered will include industries, transport, power plants, residential, DG sets, road dust, agricultural burning, refuse burning, construction dust, ammonia, volatile organic compounds, landfill etc.
- For instance, municipalities, industrial associations, industrial development authorities etc. would be the stake holders for identifying interventions related to waste burning, industrial source pollution, respectively.

Air quality management refers to all the activities a regulatory authority undertakes to help protect human health and the environment from the harmful effects of **air pollution**. The process of **managing air quality** can be illustrated as a cycle of inter-related elements.

AIR QUALITY MANAGEMENT CYCLE



New ant species discovered from Kerala

In news

Two new species of a rare ant genus have been discovered in India.

Details

- The species of the ant genus *Ooceraea* found in Kerala, and Tamil Nadu add to the diversity of this rare genus.
- They differ from others of the same genus on the basis of the number of antennal segments.
- New species are typically named after some distinguishing attribute or location but are often named after scientists as a means of honouring their research contributions to biology, especially in the fields of evolutionary and organismal biology, ecology or systematics.
- The two new species, the first ones spotted with ten-segmented antennae among this rare genus, were discovered by a team led by Prof. Himender Bharti of Punjabi University, Patiala. The discovery has been published in the journal *ZooKeys*.
- The genus is currently represented by 14 species of which eight possess nine-segmented antennae, while five possess eleven-segmented antennae and one species has recently been reported with eight-segmented antennae.
- In India, the genus was so far represented by two species with nine- and eleven-segmented antennae respectively.
- The newly discovered ant species with ten segmented antennae discovered, establish an old world lineage that contains a species emerging as the only model organism among the ant subfamily.

Aqua Rejuvenation Plant

In news

CSIR-CMERI unveils 'Aqua Rejuvenation Plant' which facilitates an Organic Farming Model through treated Waste Water.

Aqua Rejuvenation Plant (ARP)

- It is an Integrated Waste Water Rejuvenation Model which has Six-Stage purification profile for comprehensive treatment of Waste Water, based upon diverse purification parameters.
- The approx 24,000 litres of Water that can be rejuvenated using ARP will be sufficient for almost 4 acres of Agricultural Land (barring seasonal variations in water requirements).
- The used filtration media have been specially developed to handle Indian Sewage Water Parameters and based upon Geographical Variations they may be modified.
- The filter media is also locally source-able, so as to ensure that there would not be any stress in the Supply Chain for scaled-up Manufacturing of ARP.

Uses

- The treated water which is now being used for irrigation can be used even for drinking purpose also when little more time is given for settling.
- The system has dual benefit as while the treated water is being used for irrigation purpose, the filtered sludge generated is also utilized as manure / fertilizer.
- The bio char prepared from dry leaves falling in autumn season is also used for mixing in soil as it reduces the water requirement for irrigation thus saving precious water.

Sunderbans house to 428 species of birds

In news

Indian Sunderbans, which is a part of the most important mangrove forest on this planet, is house to 428 species of birds, a current publication of the Zoological Survey of India (ZSI) States

Publication:

"Birds of the Sundarban Biosphere Reserve"

Highlights

- India has over 1,300 species of birds and if 428 species of birds are from Sunderbans, it signifies that one in each three birds within the nation is discovered within the distinctive ecosystem.
- The guide with pictures of female and male of species is aimed to kindle curiosity and unfold data about birds amongst folks from all walks of life.

Sundarbans

- The Sundarbans is a mangrove area in the delta formed by the confluence of the Ganges, Brahmaputra and Meghna Rivers in the Bay of Bengal.
- It spans from the Hooghly River in India's state of West Bengal to the Baleswar River in Bangladesh.
- It comprises of closed and open mangrove forests, land used for agricultural purpose, mudflats and barren land, and is intersected by multiple tidal streams and channels.
- Four protected areas in the Sundarbans are enlisted as UNESCO World Heritage Sites, viz. Sundarbans National Park, Sundarbans West, Sundarbans South and Sundarbans East Wildlife Sanctuaries.

- Despite these protections, the Indian Sundarbans were considered endangered in a 2020 assessment under the IUCN Red List of Ecosystems framework.

Climate Adaptation Summit 2021

In news

The online international Climate Adaptation Summit (CAS) 2021 on 25 and 26 January, hosted by the Netherlands, convened global leaders and local stakeholders

India's action

- We are targeting 450 gigawatt of renewable energy capacity by 2030.
- We are promoting LED lights and saving 38 million tons of carbon-di-oxide emissions annually.
- We are going to restore 26 million hectares of degraded land by 2030.
- We are providing clean cooking fuel to 80 million rural households.
- We are connecting 64 million households to piped water supply.
- And, our initiatives have not been restricted to India alone.

Green tax

In news

The Union Minister for Road Transport and Highways Sh. Nitin Gadkari has approved a proposal to levy a “Green Tax” on old vehicles which are polluting the environment

The main principles to be followed while levying the Green Tax are

- Transport vehicles older than 8 years could be charged Green Tax at the time of renewal of fitness certificate, at the rate of 10 to 25 % of road tax;
- Personal vehicles to be charged Green Tax at the time of renewal of Registration Certification after 15 years;
- Public transport vehicles, such as city buses, to be charged lower Green tax;
- Higher Green tax (50% of Road Tax) for vehicles being registered in highly polluted cities
- Differential tax, depending on fuel (petrol/diesel) and type of vehicle;
- Vehicles like strong hybrids, electric vehicles and alternate fuels like CNG, ethanol,LPG etc to be exempted;
- Vehicles used in farming, such as tractor, harvester, tiller etc to be exempted;
- Revenue collected from the Green Tax to be kept in a separate account and used for tackling pollution, and for States to set up state-of-art facilities for emission monitoring

Why was it needed?

- **Discourages Pollution-Causing Activities:** By levying a duty, it is like a fine or punishment that either the seller or buyer or both have to bear for indulging into pollution-causing activities.
- **Encourages “Greener” Projects:** Since the duty will make these products more expensive, it encourages other industries, which follow “Green” production practices, to compete and get an edge.
- **Collect Funds for Environmental Initiatives:** Every country is spending billions of dollars on initiatives that can help in curbing the pollution in future. From forestation projects to river cleaning initiatives, all of these cost in millions and billions to the exchequer. The funds collected from this tax can be used to fund these initiatives making them financially viable.

Scrapping old vehicles

- India has been working on a scrappage policy for years that could, on the one hand, give a boost to the automobile industry and related businesses by stimulating demand, and lead to recovery of steel, aluminium, plastic and so on for recycling, on the other.
- Newer vehicles conforming to stricter emissions and fuel efficiency standards are more environment-friendly, and have modern safety features.
- In 2016, India notified the Corporate Average Fuel Economy (CAFE) Standard for passenger vehicles to boost efficiency.

National Baseline Geoscience Data Generation Programmes

In news

To expedite exploration activities in the country, Geological Survey of India (GSI), has embarked upon an ambitious scheme to complete some major National level surveys by 2024: **National Geochemical Mapping (NGCM)**, **National Geophysical Mapping (NGPM)**, **National Aero Geophysical Mapping Program (NAGMP)**.

Aim

It aims at integrating the collected data by GSI and the similar organizations to build a repository on the digital medium entailing multiple user access.

Highlights

- GSI is also going to adopt sophisticated deep penetration geophysical techniques such as Magneto-Telluric Surveys and Deep Seismic Reflection Surveys (DSRS) in order to define the crustal architecture for deep seated mineral targeting.
- GSI has also initiated its flagship initiative of National Geoscience Data Repository (NGDR) for collation of all the geoscience data of the country involving GSI, other national organizations with geoscience as a focused activities, all the state directorate of mines and geology, the academia engaged in research and development in the domain, the CPSEs engaged in exploration and geoscientific pursuits, and private sector agencies working in the domain.

Significance

- The collation, assimilation and integration of the data generated from the above projects and further interpretation will lead to identification of more areas for mineral exploration in the country. .
- The increased investment in mineral exploration will build a robust pipeline of prospective mineral blocks for auction.
- This will ensure long-term viability and continuity of mining in the country taking India towards the cherished goal of '**Atmanirbhar Bharat**'.

National Marine Turtle Action Plan launched

In news

The Ministry of Environment Forest and Climate Change (MoEF&CC) has released 'Marine Mega Fauna Stranding Guidelines' and 'National Marine Turtle Action Plan' in New Delhi.

Why?

The need to have a conservation paradigm for marine mega fauna and marine turtles

Issue

- Despite the immense economic, ecological and cultural values of marine habitats in India, marine mega fauna species and marine turtles face a wide variety of challenges including stranding and entanglement
- Managing such challenging situations requires coordination, action and people's participation which would help in the long-term conservation of marine species and their habitats.

Highlights of the plan

- It consists the ways and means to not only promote inter-sectoral action for conservation but also guide improved coordination amongst the government, civil society and all relevant stakeholders on the response to cases of stranding, entanglement, injury or mortality of marine mammals and also conservation of marine turtles.
- The 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 and exchange of information on marine mammals and marine turtles and their habitats.

Year of Indo-French alliance towards a Greener Planet

In news

Minister for Environment, Forest and Climate Change, Shri Prakash Javadekar and Ms Barbara Pompili, the French Minister for Ecological Transition launched the Indo-French Year of the Environment

Objective

To strengthen Indo-French cooperation in sustainable development, increase the effectiveness of actions in favor of global environment protection and give them greater visibility.

Major themes

Environmental protection, climate change, biodiversity conservation, sustainable urban development, and the development of renewable energies and energy efficiency.

India's achievement

- India has made significant progress towards climate change action & has already achieved 26% of reduction of emission intensity.
- As of 2020 the renewable capacity in India stands at 90 GW which includes 36 GW of solar energy & 38 GW of wind energy.

Antarctic iceberg, once Earth's biggest, suffers major split

In news

A major crack appeared in the Antarctic ice giant, A68a, once the world's biggest iceberg, as captured in satellite images since January 25, 2021.

Background

The iceberg had detached from the Larcen C ice shelf in 2017 and was travelling up towards the island of South Georgia in the British Overseas Territory, when turbulent sea currents diverted it towards to the South Atlantic Ocean.

Findings

- The recent satellite footage captured a smaller slab, now called A68g, distinctly separated from the original iceberg but floating along it about 135 km off the south-eastern coast of South Georgia.
- A68a, when it first broke off Antarctica, measured 5,800 square kilometres, almost triple the size of Delhi.
- It splintered and shed much of its mass since because of higher temperatures and rough sea currents.
- It still posed a threat to the little island of about the same size and home to penguins, seals and endangered blue whales.
- A68g is not the first one to depart from the floating ice giant. In fact, as the suffix 'g' suggests, it is the sixth smaller chunk or 'childberg' to have calved from A68a since the last part of 2020.
- These city-sized ice masses that have drifted away from Antarctica, still threaten marine and coastal habitats, squishing small species under their weight or erasing the lands where their food grows.
- **The earth lost 28 trillion tonnes of ice between 1994 and 2017 of which 6.5 trillion tones were from Antarctic ice shelves**

Centre for Wetland Conservation and Management

In news

On the World Wetland Day the Minister of State for Environment, Forest and Climate Change, announced the establishment of a Centre for Wetland Conservation and Management (CWCM). It is a part of its commitment towards conservation, restoration and management of India's wetlands.

Why was it required?

- India has nearly 4.6% of its land as wetlands, covering an area of 15.26 million hectares and has 42 sites designated as Wetlands of International Importance (Ramsar Sites), with a surface area of 1.08 million hectares.
- The year 2021 also commemorates the 50th anniversary of the signing of the Ramsar Convention on Wetlands on 2 February 1971 in Ramsar, Iran, celebrated annually as World Wetlands Day.

Benefits

- The dedicated Centre would address specific research needs and knowledge gaps and will aid in the application of integrated approaches for conservation, management and wise use of the wetlands.
- WCM would serve as a knowledge hub and enable exchange between State/ UT Wetland Authorities, wetland users, managers, researchers, policy-makers and practitioners.

Wetland

- A wetland is a distinct ecosystem that is flooded by water, either permanently or seasonally, where oxygen-free processes prevail.
- The primary factor that distinguishes wetlands from other land forms or water bodies is the characteristic vegetation of aquatic plants, adapted to the unique hydric soil.
- Wetlands play a number of functions, including water purification, water storage, processing of carbon and other nutrients, stabilization of shorelines, and support of plants and animals.

World Sustainable Development Summit 2021

In news

Prime Minister Shri Narendra Modi inaugurated World Sustainable Development Summit 2021 via video conferencing

Theme

‘Redefining our common future: Safe and secure environment for all’.

World Sustainable Development Summit

- The World Sustainable Development Summit (WSDS) is the annual flagship event of The Energy and Resources Institute (TERI).
- Instituted in 2001, the Summit series has marked 20 years in its journey of making ‘sustainable development’ a globally shared goal.
- The World Sustainable Development Summit will bring together a wide number of business leaders, governments, climate scientists, academicians, youth, and civil society in the fight against climate change.
- Adaptation and resilience, energy and industry transition, climate finance, nature-based solutions, clean oceans, circular economy, and air pollution are among the range of topics that will be discussed during the summit.
- The Ministry of New and Renewable Energy, the Ministry of Environment, Forests and Climate Change, and the Ministry of Earth Sciences is the key partners of the Sustainable Development Summit.

Objective

Post the signing of the Paris Agreement and the adoption of the Sustainable Development Goals, the summit aims at providing long-term solutions for the benefits of the global community by bringing together various stakeholders on a single platform and taking a step in a direction of achieving constructive action in combating issues that are significant to the future of humanity.

Leatherback Turtle

In news

Proposals for tourism and port development in the Andaman and Nicobar (A&N) Islands have conservationists worried over the fate of some of the most important nesting populations of the Giant Leatherback turtle in this part of the Indian Ocean.

Issue

- The Little Andaman plan, which proposes phased growth of tourism on this virtually untouched island, has sought the de-reservation of over 200 sq km of pristine rainforest and also of about 140 sq km of the Onge Tribal Reserve.
- Two sites where key components of the tourism plan are to be implemented are both Leatherback nesting sites — South Bay along the southern coast of the island and West Bay along its western coast.
- South Bay is proposed to be part of the “Leisure Zone” where a film city, a residential district and a tourism special economic zone are to come up.

Leatherback Turtle

- The leatherback is the largest turtle in the world. They are the only species of sea turtle that lack scales and a hard shell and are named for their tough rubbery skin and have existed in their current form since the age of the dinosaurs. Leatherbacks are highly migratory, some swimming over
- 10,000 miles a year between nesting and foraging grounds.
- They are also accomplished divers with the deepest recorded dive reaching nearly 4,000 feet—deeper than most marine mammals.
- The leatherback turtle has the widest distribution of any reptile with a global range with nesting mainly on tropical or subtropical beaches.

- Once prevalent in every ocean except the Arctic and Antarctic, the leatherback population is rapidly declining in many parts of the world. They face threats on both nesting beaches and in the marine environment.

All leatherback populations are listed as endangered under the Endangered Species Act. It is estimated that the global population has declined 40 percent over the past three generations.

Leopard population tracking gets new approach

Context

Wildlife specialists have for long faced challenges estimating the density of leopards in areas where some of the spotted cats are melanistic or black.

In news

Experts from three organisations, one of them Assam-based Aaranyak, have come up with a system that helps in properly estimating the leopard population in areas sustaining a mix of rosette and melanistic individuals.

Issue

- Melanistic leopards — commonly called black leopards or black panthers or ghongs (Assamese) — have been difficult to estimate as their rosettes are invisible.
- This problem is acute in the tropical and subtropical moist forests of South and Southeast Asia where the frequency of melanistic leopards is high and leopards also face the greatest threat.
- No precise estimates of leopard population could thus be done in protected areas and non-protected areas in India except on some occasions.

Solution

- The Spatial Mark-Resight (SMR) models applied by the scientists of Aaranyak, Panthera and World Wide Fund for Nature-India have provided a way of counting the melanistic leopards too.
- “In the SMR models, researchers borrow the capture history of the rosette leopards and apply the information on the melanistic leopards to estimate the entire population size of leopards.
- This is a significant analytical development that can help assess the population of leopards across a great part of the species range from where population estimates are scant.

Sub Mission on Plant Protection and Plant Quarantine

In news

The Department of Agriculture and Farmers Welfare performs regulatory, monitoring, surveillance and Human Resource Development functions through a scheme “**Sub Mission on Plant Protection and Plant Quarantine (SMPPQ)**”

Aim

Minimizing loss to quality and yield of agricultural crops from the ravages of insect pests, diseases, weeds, nematodes, rodents etc. and to shield our bio-security from the incursion and spread of alien species.

Locust attack

- During 2020-21, India became the first country in the world to control locusts by using drones after finalizing protocols and Standard Operating Procedures.

- The largest locust control operation in Indian history has been conducted by the Central Government in collaboration with the States. Locust attack was controlled in more than 5.70 lakh hectare area of 10 States.
- Control capabilities of Locust Circle Offices (LCOs) have been strengthened by deploying helicopters for aerial spraying of pesticides for locust control.
- Till now control operations against locusts were carried out in an area of 2,87,986 hectares by LCOs and 2,83,268 hectares by State Governments.

Locusts normally arrive during July-October, but have already caused chaos in Rajasthan. At a time India is battling coronavirus pandemic, locusts present a new worry with their potential for exponential growth and crop destruction. Standing crops and vegetables in Rajasthan, Punjab, Haryana and Madhya Pradesh face a major threat as swarms of locust have been reported a month in advance. There is an alert for Uttar Pradesh, Maharashtra and Delhi as well.

National Hydrogen Mission

In news

India has announced a National Hydrogen Mission that will draw up a roadmap for using hydrogen as an energy source. The initiative has the potential of transforming transportation

Hydrogen as fuel

- Hydrogen's potential as a clean fuel source has a history spanning nearly 150 years.
- In 1874, science fiction writer Jules Verne set out a prescient vision in *The Mysterious Island* — of a world where “water will one day be employed as fuel, that hydrogen and oxygen which constitute it, used singly or together, will furnish an inexhaustible source of heat and light, of an intensity of which coal is not capable”.

Green Hydrogen

- Green hydrogen has specific advantages. One, it is a clean burning molecule, which can decarbonise a range of sectors including iron and steel, chemicals, and transportation.
- Two, renewable energy that cannot be stored or used by the grid can be channelled to produce hydrogen.
- This is what the government's Hydrogen Energy Mission, to be launched in 2021-22, aims for.

How hydrogen fuel cells work

- Hydrogen is an energy carrier, not a source of energy. Hydrogen fuel must be transformed into electricity by a device called a fuel cell stack before it can be used to power a car or truck.
- A fuel cell converts chemical energy into electrical energy using oxidising agents through an oxidation-reduction reaction.
- Fuel cell-based vehicles most commonly combine hydrogen and oxygen to produce electricity to power the electric motor on board.
- Since fuel cell vehicles use electricity to run, they are considered electric vehicles.

FCEVs and other EVs

Electric vehicles (EVs) are typically bracketed into four broad categories

- Conventional hybrid electric vehicles or HEVs such as Toyota Camry combine a conventional internal combustion engine system with an electric propulsion system, resulting in a hybrid vehicle drivetrain that substantially lowers fuel usage. The onboard battery in a conventional hybrid is charged when the IC engine is powering the drivetrain.
- Plug-in hybrid vehicles or PHEVs such as the Chevrolet Volt too have a hybrid drivetrain that uses an IC engine and electric power for motive power, backed by rechargeable batteries which can be plugged into a power source.

- Battery powered electric vehicles or BEVs such as Nissan Leaf or Tesla Model S have no IC engine or fuel tank, and run on a fully electric drivetrain powered by rechargeable batteries.
- Fuel cell electric vehicles or FCEVs such as Toyota's Mirai, Honda's Clarity and Hyundai's Nexo use hydrogen gas to power an on-board electric motor. FCEVs combine hydrogen and oxygen to produce electricity, which runs the motor.

Tree City of the World

In news

The Arbor Day Foundation and the UN's Food and Agriculture Organisation have recognised Hyderabad as 2020 Tree City of the World.

Highlights

- The southern city is the only from India to get the recognition for its commitment to growing and maintaining the urban forest.
- Through this recognition, Hyderabad will join a network of like-minded cities who recognise the importance of trees in building healthy, resilient and happy cities.
- Hyderabad earned recognition in the Foundation's second year of the programme along with 51 other cities across the world during 2020 and cumulatively 120 cities from 63 countries.
- Most of the cities were from countries like the US, the UK, Canada, Australia etc.
- Trees and forests are a vital component of healthy livable, and sustainable cities and towns around the globe.
- Hyderabad's commitment to effective urban forest management is helping to ensure better future for its residents.

U.S. Officially Rejoins Paris Climate Agreement

In news

The United States officially rejoined the Paris Agreement on climate change designed to limit global warming and avoid its potentially catastrophic impacts.

Highlights

- Nearly 200 nations have signed on to the landmark accord and committed to limit their greenhouse gas emissions in an attempt to keep global warming below 2 degrees Celsius - preferably below 1.5 degrees Celsius - compared to pre-industrial temperatures.
- "The Paris Agreement is an unprecedented framework for global action.
- The Biden administration will make climate change a key component of its foreign policy, weaving it into its most important bilateral and multilateral conversations.

Background

- The U.S. left the Paris Agreement in November after a yearlong waiting period had ended.
- Former President Donald Trump originally announced his intention to withdraw from the treaty in 2017 and formally notified the United Nations in 2019.

Paris Agreement

- The Paris Agreement is a **legally binding international treaty on climate change**. It was adopted by 196 Parties at COP 21 in Paris, on 12 December 2015 and entered into force on 4 November 2016.

- Its goal is to **limit global warming** to well below 2, **preferably to 1.5 degrees Celsius**, compared to pre-industrial levels.
- To achieve this long-term temperature goal, countries aim to **reach global peaking of greenhouse gas emissions as soon as possible** to achieve a climate neutral world by mid-century.
- The Paris Agreement is a **landmark** in the multilateral climate change process because, for the first time, a binding agreement brings all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects.

Outdoor Air Purifier

In news

CSIR-Central Mechanical Engineering Research Institute, Durgapur unveiled the CSIR-CMERI developed Outdoor Air Purifier at its residential campus in Durgapur (West Bengal)

Reason

- Air Pollution due to industries and automobile is the major cause of concern these days. Particularly during the pandemic COVID period, it was especially noticeable on account of more getting an environment free from pollution as well as microorganisms, bacteria and viruses etc.
- Indoor Air Cleaner and purifiers are available in the market but it is an outdoor one which has the radial range of 5 meters.

Significance

- With its help air pollution can be reduced by 50% depending on the environment and pollution level.
- A customized adjustable timer can be set for the most pollution period say 8 AM to 6 PM.
- The machine is very cost effective and has a low maintenance cost. We can clean it with the vacuum cleaner

About the purifier

- These air purifiers have been installed on the street light poles focusing the narrow lanes of the campus and the machine also runs on solar power.
- Considering the comprehensive features, used components and the materials, the existing cost of a unit comes to 25 thousand rupees which may go up to 30 thousand rupees inclusive of taxes.
- This cost can be well reduced when steel sheet body is replaced by plastic and UV lamp is removed or customized as per requirement.

International Commission on Large Dams (ICOLD)

In news

The International Commission on Large Dams (ICOLD) Symposium on Sustainable Development of Dams & River Basins was inaugurated

Details

- INCOLD in collaboration with Central Water Commission (CWC), Dam Rehabilitation Improvement Project (DRIP) and National Hydrology Project (NHP) is organising Symposium on “Sustainable Development of Dams and River Basins”
- More than 300 delegates from across the country and abroad will participate in the Symposium.
- Dam Safety Bill which has been approved by Lok Sabha, in order to put regulatory mechanism in place, to provide for proper surveillance, inspection, operation and maintenance of all dams in India, which has been enacted will be publicised.

- There will also be a Special Sessions on “Innovative Financing in Dam Projects, Use of Geo-synthetics in Dam Engineering

Significance

- The symposium is being organised to provide an excellent opportunity to Indian Dam Engineering Professionals and Agencies to share their experiences, ideas and latest developments in new materials and construction technologies, advancement in investigation techniques, best engineering practices, dam safety issues etc.
- Besides this offers opportunity to networking with the world renowned dam experts from different countries and global organizations involved in Dam Construction, management and operation and maintenance for mutual benefits.

Madras hedgehog

In news

The Madras hedgehog, also known as the bare-bellied hedgehog, was discovered in 1851 in what was then known as the Madras Presidency has now been found and these are declining drastically.

Details

- These insectivorous spiny mammals “have been on this land since before human evolution.
- We have 423 animals in India, 50% are rats and bats. Besides these, we have shrews, pangolins, hedgehogs and other small mammals, each less than two kilograms that are not always looked at.
- There is no preserved specimen of this hedgehog, other than one skeleton in the Madras Museum
- Hedgehogs in the UK, Africa and Central Asia hibernate in winter, but the ones in South India estivate in summer instead.
- It is not protected under any wildlife act.
- Scientifically known as paraechinus nudiventris, the animal is insectivorous and nocturnal. Its elusive nature mean there has been limited studies about the species, its habitat and ecology.

CSE's State of Environment Report

In news

The report, released at an online event on February 25, highlighted the degradation of systems that have led to the creation of the COVID-19 pandemic across the globe

Highlights

- The COVID-19 outbreak has put 265 million people at risk of starvation. Almost 76 per cent of the world's informal work-force has been severely affected.
- Children including from new borns to 14-year-olds will suffer long-lasting impacts.
- These children will be vulnerable to being underweight, stunting and increased child mortality.
- Their education and work productivity will also be impacted.
- As per the report, pandemic has forced over 500 million children out of school globally. Out of the total children, India accounted for more than half.
- The report further highlighted that; 115 million additional people might get pushed into extreme poverty due to pandemic. Most of the poorer people live in South Asia.

India's states

- India ranks **117 among 192** nations in terms of sustainable development – it is now behind all South Asian nations except Pakistan
- With respect to meeting the Sustainable Development Goals, the **five best** performing states in India are Kerala, Himachal Pradesh, Andhra Pradesh, Tamil Nadu and Telangana
- Going by the same parameter, the **five worst** performing states have been Bihar, Jharkhand, Arunachal Pradesh, Meghalaya and Uttar Pradesh.

On air pollution

- **67 million** Indians died due to air pollution in 2019. The economic cost was over US \$36,000 million, equivalent to 1.36 per cent of India's GDP
- India desperately needs a vehicle scrappage policy. By 2025, we will have over **20 million** vehicles nearing the end of their lives. These will add to the pollution and environmental damage.

On water

- Drinking water to all households of rural India – this is one objective that has eluded India forever: 11 past deadlines have been missed. The Jal Jeevan Mission's target to provide drinking water to all rural households by 2024 will need focus on making the water source sustainable; recharge of groundwater and rainwater harvesting will be critical.
- In all the gloom, there is one good news: since 2014-15, an average **34 per cent** of MGNREGA funds have been spent on water-related works, leading to creation of almost **11 million** assets in half a million villages.
- Contrary to popular belief, India's rivers did not see any significant improvement in their water quality during the lockdown. Of India's 19 major rivers, five – including Ganga – ran dirtier in the Covid-19 period.

On biodiversity, forests and wildlife

What is well known is that India's flora and fauna is under threat. What is relatively unknown is the scale – **438** plant species (of which 95 per cent are flowering plants, including food crops) and **889** vertebrates and invertebrates are threatened.

Water scarcity likely in the Himalayan catchment

In news

Glaciers of the Himalayas that make for a picturesque panorama are important sources of water for about a billion people who live in the basins of the Indus, Ganges and Brahmaputra rivers

Himalayan

- Himalayan rivers are affected by the different components – rainfall-runoff, snow-melt and glacier-melt – and notes that if drier and warmer scenarios continue in the near future (2031–2050), we are more likely to face water stress in these catchment areas.
- The team studied five basins in the central Himalaya – Sutlej, Thulo Bheri, Kali Gandaki, Dudh Kosi and Arun.
- They analysed the daily precipitation, maximum and minimum daily temperatures, wind speeds, land cover, elevation and soil properties.

The study

- The results show that the glacier-melt increases about 15% to 70% in a warmer environment with its present volume, but then decreases to 3%–38% substantially when the glacier volumes shrink.
- Snowpacks and glaciers are two important water storage units in the Himalaya.

- Glacier melt will increase initially, they will shrink in size quickly and the amount of glacier melt will also decline in the latter end of the century.

Avalanche in Uttarakhand

In news

A glacier broke off at Joshimath in Uttarakhand's Chamoli district on Sunday, leading to a massive flood in the Dhauli Ganga river and causing large-scale devastation in the upper reaches of the ecologically fragile Himalayas

Snow Avalanches

- Avalanches can be caused by a variety of factors, including terrain, slope steepness, weather, temperature, and snowpack conditions.
- An avalanche is a rapid flow of snow down a hill or mountainside. Although avalanches can occur on any slope given the right conditions, certain times of the year and certain locations are naturally more dangerous than others.
- Wintertime, particularly from December to April, is when most avalanches tend to happen.
- However, avalanche fatalities have been recorded for every month of the year.

National Monsoon Mission

In news

Under the Monsoon Mission, Ministry has developed the state-of-the-art weather and climate prediction models, which are now in operational use.

Targets of Monsoon Mission

- Development of a seamless prediction system using monsoon mission model, on different time scales, like Seasonal (for whole Monsoon season), Extended range (up-to 4 weeks), Short range prediction (up-to 5days).
- Initiate and coordinate working partnership between Indian and foreign institutes to develop a system for prediction of extremes and climate applications
- Develop and implement system for climate applications having social impacts (such as agriculture, flood forecast, extreme events forecast, wind energy, etc.)
- Advanced data assimilation system for preparing high quality data for model predictions.

National Monsoon Mission

- It was launched by the **Ministry of Earth Sciences in 2012.**
- Its aim is to improve the forecasting skills by setting up a state-of-the-art dynamic prediction system for monsoon rainfall different time scales.
- NMM builds a **working partnership between the academic and research and development (R&D) organisations, both national and international.**
- Its **augmentation with the HPC facilities** has helped the country in achieving a paradigm shift in weather and climate modelling for operational weather forecasts.

What caused south Indian deluge in early January

Context

As many as 16 districts received 10 times (or more) the normal rainfall. The most excess was seen in Tiruppur district with almost 20 times the usual rainfall.

In news

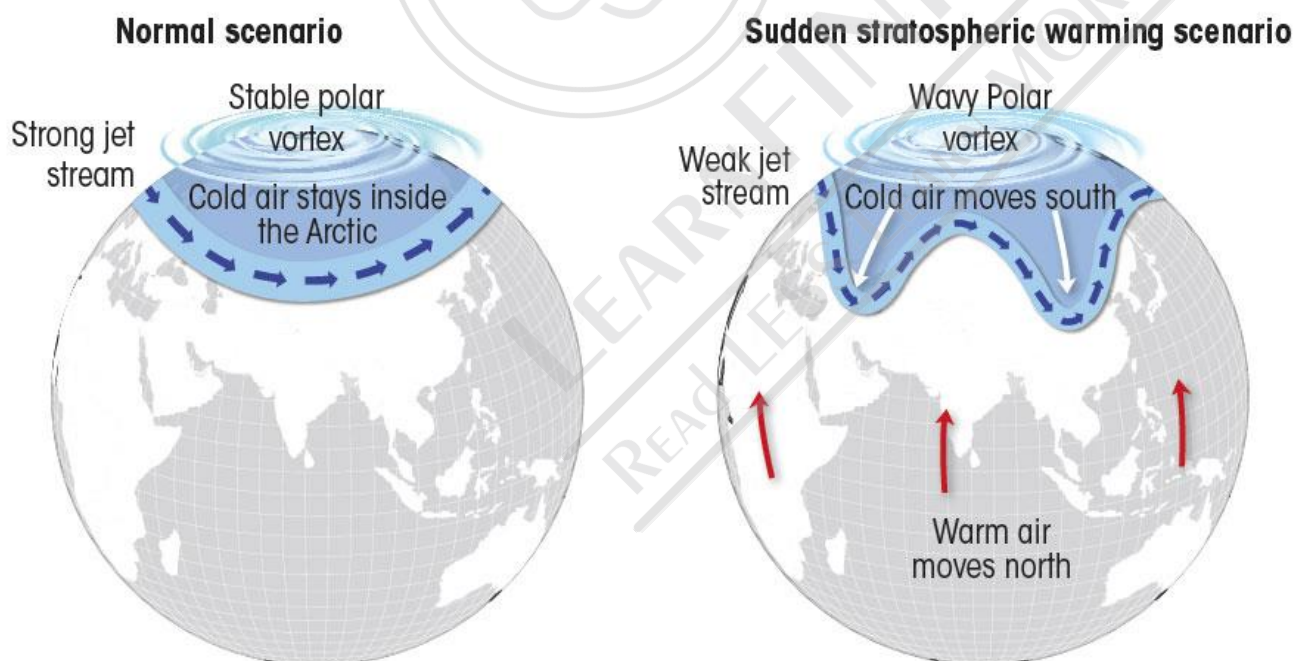
All districts in Kerala had large excess rainfall with the highest being in Kasargod and Malappuram, where the rainfall was 100 times the normal

Reason for the rainfall

- The polar sudden stratospheric warming or SSW is one of the reasons for the high rainfall in the tropics this year
- SSW events are regular but non-periodical. No SSW events were reported between 2013 and 2018 (see 'A decade of warming Arctic stratosphere').
- SSW occurs in two phases — easterly and westerly — based on the direction of the planet it impacts.

Oscillating Arctic

Air pressure and winds around Arctic switch between the two scenarios shown below; contribute to winter weather patterns



Source: US National Oceanic and Atmospheric Administration

Monitoring Committee to Identify Polluted Rivers

In news

Central Pollution Control Board (CPCB) in collaboration with the State Pollution Control Boards (SPCBs)/Pollution Control Committees (PCCs) is regularly monitoring the water quality of rivers & other water bodies in the country through a network of monitoring stations.

Data

- As per CPCB report of September, 2018, 351 polluted river stretches have been identified on 323 rivers based on monitoring results in terms of Bio-chemical Oxygen Demand(BOD) levels, an indicator of organic pollution.
- National River Conservation Plan (NRCP) has so far covered polluted stretches of 34 rivers in 77 towns spread over 16 States in the country with a sanctioned cost of Rs.5965.90 crore & sewage treatment capacity of 2522.03 million litres per day (mld) has been created.

Constitutional provision

- As per the Provisions of Environment (Protection) Act, 1986 and Water (Prevention & Control of Pollution), Act 1974, industrial units are required to install effluent treatment plants (ETPs) and treat their effluents to comply with stipulated environmental standards before discharging into rivers and water bodies.
- Accordingly, CPCB, SPCBs and PCCs monitor industries with respect to effluent discharge standards and take action for non-compliance under provisions of these Acts.

Steps taken by the Government

- Steps taken by the Government to stop discharge of industrial effluents into rivers inter alia, include issuance of notification of specific discharge standards, revision of the criteria for categorization of industries and issuing directions to all State Pollution Control Boards (SPCBs)/Pollution Control Committees (PCCs) to adopt the same, issuance of consent to establish/consent to operate by the SPCBs/PCCs,
- It would be based on Comprehensive Environment Pollution Index (CEPI) critically polluted areas are identified to take necessary measures through time-targeted Action Plans, regular inspections of Grossly Polluting Industries (GPIs) by CPCB for compliance verification, installation of Online Continuous Effluent Monitoring System (OCEMS) for assessment of effluent quality and compliance status.
- In addition, the industries are encouraged to reduce their waste water generation by technological advancement, reuse/recycle of wastewater and maintain Zero Liquid Discharge (ZLD) where ever possible.

Similipal forest fires put Odisha's Lodha tribe in trouble

In news

The rich flora and fauna are facing impending danger as the forest fire entered the core areas. The forest fire situation across Odisha (/topic/odisha) including Similipal National Park is totally contained and controlled," a government release state.

Impact

- Several tribal communities around the periphery areas of Similipal are worried as they rely on the forests to earn their living.
- The forest fires could affect the livelihood of several Scheduled Tribes of Mayurbhanj district such as the Kolha, Santal, Bhumija, Bhatudi, Gond and Ho

- The impact could be more drastic among three particularly vulnerable tribal groups (PVTGs) known as the Lodha, Khadia and Mankidia, as they live in Simlipal's forest fringe areas and largely depend on forest-based livelihood.
- The tribal population of Mayurbhanj is 58.7 per cent, the highest in the state.

Livelihood concerns

- As the fire continued to spread to newer areas while this reporter was in Simlipal, Budhia, Manguli, Sushil, Ashok and many of their community members were worried it might affect their harvesting of several minor forest produce that fuels their economy.
- From January to May, Lodha people collect *barda saag* (green leaves), mango, *siali* leaves, *khajuri* (date palm), *mahua* flowers, *sal* leaves, *jhuna*, tamarind and Tasar silk.
- Similarly, from June to July, they collect *kendu* (wild fruit), jackfruit, *barda saag*, *mahua* seeds, *chahar* (wild berries), *sal* seeds, *jamukoli* (wild berries), *mahudantkathi*, and *kussum* (wild berries).
- From August to December, they collect wild varieties of mushrooms, *kurkuti*, *pita kanda* (tuber), *karke kanda* (tuber), *jhuna*, gooseberries, *harada* and *bahada*.

Mass-nesting of turtles begins at Odisha's Gahirmatha

In news

Around 5,000 Olive Ridley sea turtles came ashore for mass-nesting at the Nasi-1 and Nasi-2 islands of Gahirmatha marine sanctuary

Highlights

- Last year, around 407,020 turtles laid eggs from 14-21 March at these islands.
- The nesting of sea turtles is one of nature's most amazing spectacles," said Debashis Bhoi, range officer of the marine sanctuary.
- Nasi-1 and Nasi-2 islands are two tiny islands stretching five kilometres.
- The small strip of land is the perfect nesting site for the turtles since there are no predators or human habitation.
- Many turtles are laying eggs on the same pits dug by other turtles and so, thousands of eggs are being destroyed.
- The beach is dotted with thousands of nesting turtles, leaving little space for other turtles to lay eggs.
- **The rookery at Gahirmatha was declared a marine sanctuary in 1997. It is spread over 1,435 square kilometers from Dhamra mouth to Hukitola island.**

Project RE-HAB to Prevent Elephant

In news

Khadi and Village Industries Commission (KVIC), launched a unique project of creating "bee-fences" to mitigate human – elephant conflicts in the country.

Objective

The objective of Project RE-HAB (Reducing Elephant – Human Attacks using Bees) is to thwart elephant attacks in human habitations using honey bees and thus reducing loss of lives of both, humans as well as elephants.

Details

- The pilot project was launched at four locations around village Chelur in Kodagu district of Karnataka on 15th March, 2021 by KVIC Chairman Shri Vinai Kumar Saxena.

- These spots are located on the periphery of Nagarhole National Park and Tiger Reserve and prone to human-elephant conflicts. The total cost of the RE-HAB project is just Rs. 15 lakh.
- Project RE-HAB is a sub-mission under KVIC's National Honey Mission.
- The Honey Mission is a programme to increase the bee population, honey production and beekeepers' income by setting up apiaries, Project RE-HAB uses bee boxes as a fence to prevent the attack of elephants.

Honey Mission

- KVIC has set up 15-20 interspersed bee boxes at each of the four locations in the passage ways of elephant-human conflict zones to block the entrance of elephants to human habitations.
- The boxes are connected with a string so that when elephants attempt to pass through, a tug or pull causes the bees to swarm the elephant herds and dissuade them from progressing further.
- Bee boxes have been placed on the ground as well as hung from the trees to block the passage of elephants.
- High resolution, night vision cameras have been installed at strategic points to record the impact of bees on elephants and their behavior in these zones.

6 tigers missing in Ranthambore

In news

Six tigers — four adults and two sub-adults — have been unaccounted for since March 2020 in the Ranthambore tiger sanctuary, Rajasthan"

- Independent wildlife groups such as Tiger Watch have alleged that the tigers have been missing for over a year and that poaching is the reason
- The National Tiger Conservation Authority, a wing of the Union Environment Ministry, has constituted a committee over the disappearance of the tigers.

Ranthambore National Park

- It is one of the biggest and most renowned national parks in Northern India.
- The park is located in the Sawai Madhopur district of south eastern Rajasthan, which is about 130 km from Jaipur.]
- Once considered as one of the famous and former hunting grounds of the Maharajas of Jaipur, today the Ranthambore National Park terrain is a major wildlife tourist attraction that has drawn the attention of many wildlife photographers and lovers.
- Ranthambore National Park harbours dry deciduous forests and open grassy meadow.
- The flora of the park includes 539 species of flowering plants.

Asiatic cheetahs in India

In news

The animal is believed to have disappeared from India when Maharaja Ramanuj Pratap Singh Deo of Koriya hunted and shot the last three recorded Asiatic cheetahs in India in 1947.

Highlights

- It was declared extinct by the government in 1952.
- Nearly 70 years after the cheetah was declared locally extinct or extirpated, India will receive its first batch of the large cats from Africa by the end of this year.
- This is the first time in the world that a large carnivore will be relocated from one continent to another.

- The current relocation attempt began in 2009, it is only last year that the Supreme Court gave the green signal to the Centre.

African cheetah and Asiatic cheetah

- Before Namibia, India had approached Iran for Asiatic cheetahs, but had been refused. The Asiatic cheetah is classified as a “critically endangered” species by the IUCN Red List, and is believed to survive only in Iran.
- From 400 in the 1990s, their numbers are estimated to have plummeted to 50-70 today, because of poaching, hunting of their main prey (gazelles) and encroachment on their habitat.

Asiatic cheetahs in India

- In 1947, Maharaja Ramanuj Pratap Singh Deo of Koriya (now in Chhattisgarh) reportedly killed the last known Asiatic cheetah in India.
- In that year, a few miles from Ramgarh village in the state, the Maharaja killed three of the animal.

Jal Shakti Abhiyan: Catch the Rain

In news

Prime Minister Shri Narendra Modi launched the ‘Jal Shakti Abhiyan: Catch the Rain’ campaign on World Water Day i.e. on 22nd March 2021

Details

- The Campaign will be undertaken across the country, in both rural and urban areas, with the theme “catch the rain, where it falls, when it falls”.
- It will be launched as a Jan Andolan to take water conservation at grass-root level through people’s participation.
- It is intended to nudge all stakeholders to create rainwater harvesting structures suitable to the climatic conditions and subsoil strata, to ensure proper storage of rainwater.

About MoA for Ken Betwa Link Project

- The agreement heralds the beginning of inter- state cooperation to implement the vision of Former Prime Minister Shri Atal Bihari Vajpayee to carry water from areas that have surplus water to drought prone and water deficit areas, through the interlinking of rivers.
- This project involves transfer of water from the Ken to the Betwa River through the construction of Daudhan Dam and a canal linking the two rivers, the Lower Orr Project, Kotha Barrage and Bina Complex Multipurpose Project.
- It will provide annual irrigation of 10.62 lakh ha, drinking water supply to about 62 lakh people and also generate 103 MW of hydropower.
- It will pave the way for more interlinking of river projects to ensure that scarcity of water does not become an inhibitor for development in the country.

International Day of Forests

In news

The United Nations observes March 21 as the International Day of Forests, commemorating the green cover around the world and reiterating its importance.

Theme

“Forest restoration: a path to recovery and well-being”.

Highlights

- The United Nations General Assembly proclaimed March 21 as the International Day of Forests (IDF) in 2012.
- The Day celebrates and raises awareness of the importance of all types of forests.
- On this day, countries are encouraged to undertake local, national and international efforts to organize activities involving forests and trees, such as tree-planting campaigns.

Forest cover in India

- Since Independence, a fifth of India's land has consistently been under forests, despite the population increasing more than three times.
- As per the biennial State of Forest Report, 2019, India's forest cover has increased by 3,976 sq km or 0.56% since 2017.
- For the second consecutive time since 2007, the report recorded a gain — an impressive 1,275 sq km — in dense forest (including very dense forest with a canopy density of over 70%, and moderately dense forest with a canopy density of 40-70%).

Contamination of Ground Water

In news

Central Ground Water Board (CGWB) generates ground water quality data on a regional scale through ground water quality monitoring throughout the country

Role of government

- Water being State subject, initiatives on water management including taking corrective action related to ground water quality in the country is primarily States' responsibility.
- However, **Central Pollution Control Board (CPCB)** in association with State Pollution Control Boards/Pollution Control Committees (SPCBs/PCCs) is implementing the provisions of The Water (Prevention & Control) Act, 1974 & The Environment (Protection) Act, 1986 to prevent and control pollution.
- Government of India in partnership with States, is implementing **Jal Jeevan Mission (JJM)** to provide potable tap water supply to every rural household in the country, by 2024.
- Under JJM, while planning water supply schemes to provide tap water supply to rural households, priority is given to quality-affected habitations which, inter alia, includes habitations affected with Arsenic and Fluoride contamination.
- Under **Atal Mission for Rejuvenation and Urban Transformation (AMRUT)** launched on 25th June, 2015 in selected 500 cities with focus on development of urban infrastructure
- CGWB has constructed several exploratory and observation wells in the Country tapping the Arsenic safe deeper aquifer zones delineated through exploration aided detailed aquifer mapping under National Aquifer Mapping programme.

Impacts of Groundwater Contamination with Fluoride and Arsenic

- In India, high Fluoride concentrations in groundwater (greater than 1 mg/l – milligrams per litre) are widespread in the arid to semi-arid western states of Rajasthan and Gujarat and in the southern states of Andhra Pradesh, Karnataka and Tamil Nadu.
- Arsenic in groundwater is emerging as a widespread problem in the floodplains of the Ganges Meghna-Brahmaputra (GMB).
- In India, many areas from West Bengal have been shown to be affected whereas Bihar is an emerging area with high Arsenic contamination.

- Fluorosis is a crippling disorder due to entry of Fluoride in the body, which affects every organ, tissue, cells in the body, and results in health complaints having overlapping manifestations with several other diseases like gout and osteoporosis.

Net-zero emission

In news

Recently 58 countries announced net-zero emission targets

Aim

In the next 30 years, they aim to reduce their emissions of climate change-causing carbon dioxide and other GHGs, and remove what they do emit through planting trees or advanced technologies.

Details

- Together these countries account for more than half the world's current GHG emissions.
- The International Energy Agency predicts that much of India's future emissions will come from things that have not yet been built — transport infrastructure, industry, and buildings — pointing to the opportunity to build cleaner.
- A strong set of climate actions across multiple sectors can generate 24 million jobs in just 15 years.
- For example, more ambitious policies to promote electric vehicles along with cleaner electricity and hydrogen electrolysis can create jobs in the auto manufacturing industry and in the electricity and construction sectors.
- Some jobs may decline in vehicle maintenance and repair, but far more jobs are likely to be induced by government and household spending.
- 25 per cent of the Centre's tax revenue comes from the energy sector, so weaning away from fossil fuels will also deplete the government's coffers.

New species of red algae

In news

Two new species of seaweed have been discovered by a group of marine biologists from Central University of Punjab, Bathinda.

Highlights

- Named *Hypnea indica* (after India) and *Hypnea bullata* (because of the blisterlike marks on its body – bullate), the seaweeds are part of the genus *Hypnea* or red seaweeds.
- The genus *Hypnea* consists of calcareous, erect, branched red seaweeds.
- "There are 61 species of which 10 were reported in India. With two new species, the total number of species now would be 63
- Species of *Hypnea* contain the biomolecule carrageenan, which is widely used in the food industry.
- As the two species have been found on the west and south east coasts of India, it suggests good prospects for their cultivation which can be put to good use economically.

Application

- *Hypnea indica* was discovered Kanyakumari in Tamil Nadu, and Somnath Pathan and Sivrajpur in Gujarat, *Hypnea bullata* was discovered from Kanyakumari and Diu island of Daman and Diu.
- The two species have been found on the west and south east coasts of India, it suggests good prospects for their cultivation which can be put to good use economically.

- The study also reports one other species of Hypnea for the first time in Indian coasts, Hypnea nidifica.
- Several recent studies have shown that algae with calcareous mineral deposits are prone for the damage from ocean acidification – an aftermath of climate change.
- As carbon dioxide in the atmosphere gets dissolved in ocean waters, the seawater becomes more acidic.
- Algae like Hypnea cannot survive in acidic seawater, hence, the only way to help these species is to reduce atmospheric carbon dioxide levels by adopting sustainable lifestyle choices.

New butterfly species

In news

A group of lepidopterists have added a species to the expanding list of butterflies in India

Highlights

- The discovery of the species *Nacaduba sinhala ramaswamii* Sadasivan, 2021 in the Agasthyamalais in the Western Ghats a decade ago has now found place in the Journal of Threatened Taxa.
- Line Blues are small butterflies belonging to the subfamily Lycaenidae and their distribution ranges from India and Sri Lanka to the whole of southeastern Asia, Australia and Samoa.
- It is the **first time that a butterfly species was discovered by an all-Indian research team from the Western Ghats.**

Western Ghats

- Older than the Himalaya mountains, the mountain chain of the Western Ghats represents geomorphic features of immense importance with unique biophysical and ecological processes.
- The site's high montane forest ecosystems influence the Indian monsoon weather pattern.
- Moderating the tropical climate of the region, the site presents one of the best examples of the monsoon system on the planet.
- It also has an exceptionally high level of biological diversity and endemism and is recognized as one of the world's eight 'hottest hotspots' of biological diversity.
- The forests of the site include some of the best representatives of non-equatorial tropical evergreen forests anywhere and are home to at least 325 globally threatened flora, fauna, bird, amphibian, reptile and fish species.

Mechanism for Prediction of Rainfall

In news

Rainfall prediction is given in different time scales, i.e. seasonal forecast

- Seasonal forecast (for the whole season),
- Extended range forecast (up to four weeks),
- Short-medium range forecast (up to 7 days)
- Nowcasts (up to 3 hrs).

Methods used in forecasting

Global Forecast System (GFS)

- Since December 2016, IMD is using the Global Forecast System (GFS) and Unified model run at National Centre for Medium Range Weather Forecast (NCMRWF) operationally every day to generate deterministic forecasts at 12 km horizontal resolution in the short to medium range (up to 7 days).
- The GFS assimilates global conventional atmospheric data as well as the data from satellites and weather radars.

- There also exists a high resolution meso-scale model with 3 km resolution to provide location specific forecast.

Global Ensemble Prediction System (GEPS)

- In addition, a high resolution (12 km grid scale) state of the art **Global Ensemble Prediction System (GEPS)** namely Global Ensemble Forecasting System (GEFS) and Unified model Ensemble Prediction System (UMEPS) was commissioned on 01 June 2018 for generating operational probabilistic weather forecasts for 10 days.
- The GEPS has enhanced the weather information being provided by the current models by quantifying the uncertainties in the weather forecasts.

Significance

All these initiatives have helped to improve the skill of monsoon rainfall forecasts over the country.

Indian monsoon 25 million years ago resembled present day Australia's

Context

- About 180 million years ago, India separated from the supercontinent Gondwana and took a long northward journey of about 9,000 km to join Eurasia.
- The subcontinent moved from the southern hemisphere, crossed the Equator to reach its current position.
- Due to these changing latitudes, it experienced different climatic conditions, and a new study has now tried to map these variations using leaf fossils.

In news

The team of researchers analysed the morphological characters of fossil leaves collected from Deccan Volcanic Province, East Garo Hills of Meghalaya, Gurha mine in Rajasthan and Makum Coalfield in Assam

The research

- The four fossil assemblages were found to be from different geological ages and helped to study the climate during 65, 57, 54, and 25 million years ago.
- "It has been observed from across the globe that plant leaf morphological characters such as apex, base and shape are ecologically tuned with the prevailing climatic conditions to adapt for all the seasons throughout the year.

Findings

- The results indicated that the fossil leaves from India were adapted to an Australian type of monsoon and not the current Indian monsoon system during its voyage.
- The reconstructed temperature data show that the climate was warm (tropical to subtropical) at all the studied fossil sites with temperatures varying from 16.3–21.3 degrees C.
- All the fossil sites experienced high rainfall, which varied from 191.6 cm to 232 cm.

Way forward

- Future plan is to better understand the evolutionary history of Indian monsoon and its role in the evolution of biodiversity hot spots in South and Southeast Asia.
- This will help in the conservation of modern biodiversity hot spots.
- Understanding the past dynamics of Indian monsoon will also help in climate modelling for future monsoon prediction.

Project Mausam

Context

‘Mausam’ is the initiative of Ministry of Culture to be implemented by the Archaeological Survey of India (ASI) as the nodal agency with research support of the Indira Gandhi National Centre for the Arts (IGNCA) and National Museum.

Aim

To explore the multi-faceted Indian Ocean ‘world’ – collating archaeological and historical research in order to document the diversity of cultural, commercial and religious interactions in the Indian Ocean.

Objective

To inscribe places and sites identified under Project Mausam as trans-national nomination for inscription on UNESCO’s World Heritage List.

Details

- Indian Missions in the 39 countries have approached local authorities and several countries including the following, have nominated their resource persons for the Project Mausam: -
- Bangladesh, Cambodia, Saudi Arabia, Thailand, Indonesia, Oman, Qatar, Singapore, Malaysia, The Islamic republic of Iran, UAE, Myanmar, Philippines and Jordan.
- It is proposed to hold an international conference with these experts on the next steps forward.
- It is proposed to prepare two transnational nominations namely; (a) Routes followed by the Cholas in the Southeast Asia region and; (b) Spread of Buddhism through land and sea routes in the South and Southeast Asian region (those countries that are a part of Project Mausam).

Bandhavgarh National Park Fire

In news

A wildfire that had spread across several zones in Bandhavgarh National Park has been brought under control, two days after it broke out.

Possible cause

- The cause of the fire is not natural and an inquiry has been constituted to ascertain the reasons.
- There have been instances when disgruntled local villagers, who have to bear the brunt of wild animals damaging their crops, start the fires.

About the national park

- Bandhavgarh National Park is a national park of India, located in the Umaria district of Madhya Pradesh.
- Bandhavgarh, with an area of 105 square kilometres (41 sq mi), was declared a national park in 1968 and then became Tiger Reserve in 1993.
- The current core area is spread over 716 square kilometres (276 sq mi).
- This park has a large biodiversity. The density of the tiger population at Bandhavgarh (8 tigers per km²) is one of the highest known in India.
- The park has a large breeding population of leopards, and various species of deer. Maharaja Martand Singh of Rewa captured the first white tiger in this region in 1951.
- This white tiger, Mohan, is now stuffed and on display in the palace of the Maharajas of Rewa. Historically villagers and their cattle have been at a threat from the tiger.
- The Park derived its name from the most prominent hill of the area which is said to have been given by Lord Rama to his brother Laxman to keep a watch on Lanka. (Bandhav = Brother, Garh = Fort).

New deadlines for thermal power plants to meet emission standards

In news

The Environment Ministry has amended rules allowing thermal power plants within 10 kilometres of the National Capital Region (NCR) and in cities with more than 10 lakh population to comply with new emission norms by the end of 2022.

Highlights

- A task force will be constituted by the Central Pollution Control Board (CPCB) to "categorise thermal power plants (TPPs) in three categories on the basis of their location
- TPP units in "non-attainment cities" and those within 10 kilometres of critically polluted areas are required to meet the emission norms by December 31, 2023.
- Non-attainment cities are those which have consistently failed to meet the National Ambient Air Quality Standards. The CPCB has identified 124 such cities.

New norms

- The Environment Ministry had revised emission norms for particulate matter (PM), sulphur dioxide and oxides of nitrogen for TPPs in December 2015, requiring them to install emission control systems by December 2017.
- The deadline was pushed to December 2022 for all power stations in the country in view of implementation issues and challenges.

Pollutants

- Major pollutants from coal-fired power plants are oxides of nitrogen (NOx), sulphur dioxide (SO₂) and particulate matter (PM).
- According to the Centre for Science and Environment (CSE), TPPs account for more than 60 per cent of total industrial emissions of particulate matter; 45 per cent of SO₂; 30 per cent of NOx; and more than 80 per cent of mercury, in the country.
- These are also responsible for 70 per cent of the total freshwater withdrawal by all industries, according to an analysis by the green think tank.

Forest fires in the spring

In news

Since the start of 2021, there has been a series of forest fires in Himachal Pradesh, Nagaland-Manipur border, Odisha, Madhya Pradesh, and Gujarat, including in wildlife sanctuaries

Details

- April-May is the season when forest fires take place in various parts of the country.
- But forest fires have been more frequent than usual in Uttarakhand and have also taken place during winter; dry soil caused by a weak monsoon is being seen as one of the causes.
- Recent fires include those in Bandhavgarh Forest Reserve in Madhya Pradesh, and in sanctuaries for the Asiatic lion and the great Indian bustard in Gujarat.

Vulnerability

- Uttarakhand and Himachal Pradesh are the two states that witness the most frequent forest fires annually.
- In Uttarkhand, 24,303 sq km (over 45 per cent of the geographical area) is under forest cover.

- The FSI has identified forests along the south, west and southwest regions of Uttarakhand — comprising Dehradun, Haridwar, Garhwal, Almora, Nainital, Udham Singh Nagar, Champawat districts — as being prone to varying intensities of forest fires.

Causes

- Forest fires can be caused by a number of natural causes, but officials say many major fires in India are triggered mainly by human activities.
- Emerging studies link climate change to rising instances of fires globally, especially the massive fires of the Amazon forests in Brazil and in Australia in the last two years.
- In India, forest fires are most commonly reported during March and April, when the ground has large quantities of dry wood, logs, dead leaves, stumps, dry grass and weeds that can make forests easily go up in flames if there is a trigger. Under natural circumstances, extreme heat and dryness, friction created by rubbing of branches with each other also have been known to initiate fire.

Kota farmer develops new mango variety

In news

Shrikishan Suman (55 years), a farmer from Kota, Rajasthan, has developed an innovative mango variety which is a regular and round-the-year dwarf variety of mango called Sadabahar

Highlights

- It is resistant to most major diseases and common mango disorders.
- The fruit is sweeter in taste, comparable to langra and being a dwarf variety, is suitable for kitchen gardening, high-density plantation, and can be grown in pots for some years too.
- The flesh of the fruits, which is bourn round the year, is deep orange with sweet taste, and the pulp has very less fiber content which differentiates it from other varieties.
- The bountiful of nutrients packed in mango are immensely good for health.
- The innovative attributes of the variety have been verified by the **National Innovation Foundation (NIF)**
- It is in the process of being registered under the Protection of Plant Variety and Farmers Right Act and ICAR-**National Bureau of Plant Genetic Resources (NBPGR)**, New Delhi.
- NIF has also facilitated the plantation of Sadabahar mango variety in the Mughal Garden at Rashtrapati Bhawan in New Delhi.

National Innovation Foundation

- The National Innovation Foundation (NIF) - India was set up in March 2000 with the assistance of Department of Science and Technology, Government of India.
- It is India's national initiative to strengthen the grassroots technological innovations and outstanding traditional knowledge.
- Its mission is to help India become a creative and knowledge-based society by expanding policy and institutional space for grassroots technological innovators.
- NIF has pooled a database of over 3,22,000 technological ideas, innovations and traditional knowledge practices (not all unique, not all distinct) from over 608 districts of the country.
- NIF has till date recognised 1093 grassroots innovators and school students at the national level in its various National Biennial Grassroots Innovation Award Functions and annual Dr A P J Abdul Kalam Ignite Children Award functions.

Indus and Ganges river dolphins

In news

The researchers studied ancient DNA that they got out of skulls and skeletons which were 20 to 30 to even 150 years old.

Highlights

- Detailed analysis of South Asian river dolphins has revealed that the Indus and Ganges River dolphins are not one, but two separate species.
- Currently, they are classified as two subspecies under *Platanista gangetica* and this needs a revision.
- The study estimates that Indus and Ganges river **dolphins may have diverged around 550,000 years ago.**
- The international team studied body growth, skull morphology, tooth counts, colouration and genetic makeup and published the findings last month in Marine Mammal Science.
- The Indus and Ganges River dolphins are both classified as 'Endangered' species by the **International Union for Conservation of Nature (IUCN).**

What needs to be done?

The Indian government has given legal protection to the dolphin, more ground action and close work with local communities are needed to help them survive

Dolphins in Odisha

- The population of dolphins in Chilika, India's largest brackish water lake, and along the Odisha coast has doubled this year compared with last year.
- The wildlife wing of the State Forest and Environment Department released the final data on the dolphin census conducted in January and February this year, indicating a spectacular growth in numbers.
- The highest growth has been noticed in the case of humpback dolphins. Only two humpbacks were sighted in the Rajnagar mangrove in 2020. **In 2021, however, this population grew astronomically to 281**
- These humpback dolphins were not part of any riverine systems, so they cannot be identified as residential mammals.
- They were spotted travelling along the Odisha coast and the number is likely to fluctuate in the next census.

The Hydrogen Economy

In news

Hydrogen Roundtable being Organised by The Energy Forum and FIPI under the aegis of Ministry of Petroleum and Natural Gas on 15th April 2021

Objective

To understand the progress of Hydrogen ecosystem across continents and contribute to creating synchrony among the thinktanks, Governments and the industry to join forces for developing innovative and sustainable technologies at attractive costs.

Organiser

The Energy Forum (TEF) and the Federation of Indian Petroleum Industry (FIPI), under the aegis of Ministry of Petroleum and Natural Gas, Government of India.

Highlights

- The Hydrogen Roundtable, the first of its kind, will comprise a High-level Ministerial Session, followed by five Panel Discussions by eminent policy makers, experts and industry leaders from different geographical regions of the world, with focus on policy road maps and mapping demand and supply of Hydrogen.
- A separate session is devoted to India's Hydrogen Mission, which will feature a keynote speech from Dr. Indu Shekhar Chaturvedi, Secretary, Ministry of New and Renewable Energy.
- The Hydrogen Roundtable will be having 25 panels from 15 countries, discussing the potential of Hydrogen from multiple sources and its relevance in national energy transitions.
The Roundtable is expected to have around 3000 participation around the globe.

Hydrogen economy

- The term "**hydrogen economy**" refers to the vision of using hydrogen as a low-carbon energy source – replacing, for example, gasoline as a transport fuel or natural gas as a heating fuel.
- Hydrogen is attractive because whether it is burned to produce heat or reacted with air in a fuel cell to produce electricity, the only by product is water.
- In 1970, the term '**hydrogen economy**' was coined by John Bockris.
- He mentioned that a **hydrogen economy can replace the current hydrocarbon-based economy, leading to a cleaner environment.**

Bat with sticky discs

In news

Meghalaya has yielded India's first bamboo-dwelling bat with sticky discs, taking the species count of the flying mammal in the country to 130

Highlights

- The disc-footed bat (*Eudiscopus denticulus*) was recorded in the north eastern State's Lailad area near the Nongkhyllam Wildlife Sanctuary, about 1,000 km west of its nearest known habitat in Myanmar.
- There are a couple of other bamboo-dwelling bats in India. But the extent of adaptation for bamboo habitat in this species is not seen in the others.
- The newly recorded bat was presumed to be a bamboo-dwelling species, but its flattened skull and adhesive pads helped in identifying it as the disc-footed known from specific localities in southern China, Vietnam, Thailand and Myanmar.
- The disc-footed bat has raised Meghalaya's bat count to 66, the most for any State in India.
- It has also helped add a genus and species to the bat fauna of India

Prevention of Marine Litter

In news

India and Germany sign agreement on 'Cities combating plastic entering the marine environment.

Aim

The project, aimed at enhancing practices to prevent plastic entering the marine environment, will be undertaken at the national level (at MoHUA), select states.

Issue related to marine litter

- Marine litter threatens ecosystems and adversely affects fishery and tourism industries around the globe.

- In addition to negative economic impact, it affects public health with increased concerns about micro-plastic and risk of particles entering the food chain.
- In recent times, the level of plastic waste that has accumulated in our oceans and marine ecosystems through the increasing production and use of durable synthetic materials has alarmed the public and policy makers alike.
- It is estimated that 15-20% of all plastics are entering oceans via riverine ecosystems of which 90% are contributed by 10 of the world's most polluting rivers.

Solution

- To this end, cities will be enabled to improve collection, segregation and marketing of plastic waste, to prevent plastic disposal to water bodies, and to improve handling of port and marine waste.
- This will be combined with data management and reporting systems, civil society involvement and increased cooperation with recyclers and the recycling industry through a digital platform.
- This is expected to foster improvements in segregation, collection, transportation, treatment and disposal of waste in municipalities, thereby establishing an efficient system, that ensures no waste finds its way into rivers or oceans.
- The new project is envisaged to be another successful collaborative effort under the Indo-German Bilateral Development Corporation working on sustainable urban transformation.

Exploring the Hydrogen Prospects and Innovative Technologies

In news

Experts from India and Japan discussed possibilities of collaboration for promotion of hydrogen-based technologies as well as related innovations, trends, concerns, and solutions at a webinar on ***De-carbonisation: Exploring the Hydrogen Prospects and Innovative Technologies***

Challenges for India-Japan hydrogen research

- Cost reduction and improved performance for fuel cells, hydrogen storage, challenges for viable green hydrogen process routes.
- Significant investments required for research infrastructure and support for commercialisation,

Hydrogen

- Hydrogen enables high efficiency and zero or near-zero-emissions operations.
- Green hydrogen will be good for industrial processes, production of chemicals, iron and steel, food and semiconductors and refineries and we should explore opportunities for co-innovation in accelerating green hydrogen to reduce dependency on petroleum import.
- Hydrogen gas is a fuel with plenty of potentials. But because it is highly combustible, managing it safely is key.
- Advantages of hydrogen Energy system is that hydrogen gas is generated using a renewable energy source, instead of fossil fuels, it is stored in a safe way, overcomes challenges such as the intermittency of sunshine, and a clean, alternative power source
- The experts agreed that hydrogen could be a good alternative because of its capability of producing lower emissions and less pollution and looked forward to collaborations between groups in India and Japan to that end.

National Hydrogen Energy Mission

In news

India will soon join 15 other countries in the hydrogen club as it prepares to launch the National Hydrogen Energy Mission (NHEM).

Highlights

- The global target is to produce 1.45 million tonnes of green hydrogen by 2023.
- Currently, India consumes around 5.5 million tonnes of hydrogen, primarily produced from imported fossil fuels.
- In 2030, according to an analysis by the Council on Energy, Environment and Water (CEEW), green hydrogen demand could be up to 1 million tonnes in India across application in sectors such as ammonia, steel, methanol, transport and energy storage.
- Hydrogen is said to be the alternative fuel and would replace fossil fuels
- India has set its goals to de-carbonize itself by 2050.

Major issues and solutions

- First, decentralised hydrogen production must be promoted through open access of renewable power to an electrolyser (which splits water to form H₂ and O₂ using electricity).
- Currently, most renewable energy resources that can produce low-cost electricity are situated far from potential demand centres.
- If hydrogen were to be shipped, **it would significantly erode the economics of it.**
- A more viable option would be wheeling electricity directly from the solar plant.
- Second, we need mechanisms to ensure access to round-the-clock renewable power for decentralised hydrogen production.
- To minimise intermittency associated with renewable energy, for a given level of hydrogen production capacity, a green hydrogen facility will typically oversize the electrolyser, and store hydrogen to ensure continuous hydrogen supply.
- Third, we must take steps to blend green hydrogen in existing processes, especially the industrial sector.
- Improving the reliability of hydrogen supply by augmenting green hydrogen with conventionally produced hydrogen will significantly improve the economics of the fuel. This will also help build a technical understanding of the processes involved in handling hydrogen on a large scale.
- Fourth, policymakers must facilitate investments in early-stage piloting and the research and development needed to advance the technology for use in India. The growing interest in hydrogen is triggered by the anticipated steep decline in electrolyser costs.

Climate partnership with U.S

In news

Prime Minister Narendra Modi announced that India and the U.S. were launching an energy and climate partnership during U.S. President Joe Biden's Leaders Summit on Climate

Highlights

- These can also help other developing countries, who need affordable access to green finance and clean technologies.
- Its goal would be to “mobilise finance and speed clean energy deployment; demonstrate and scale innovative clean technologies needed to decarbonise sectors, including industry, transportation, power, and buildings; and build capacity to measure, manage, and adapt to the risks of climate-related impacts.

- The partnership will proceed along **two main tracks**: the strategic clean energy partnership and the climate action and finance mobilisation dialogue, which will build on and subsume a range of existing processes

Below 2 degrees Celsius

- NDCs or Nationally Defined Contributions are targets defined by each country to help achieve the Paris Agreement's objective of keeping global warming to considerably below 2 degrees Celsius, preferably 1.5 degrees Celsius.
- India is targeting a 2030 GDP emissions intensity (i.e., volume of emissions per unit of GDP) that is 33%-35% below 2005 levels.
- It also seeks to have 40% of power generated from non-fossil fuel sources by 2030.

Effect of Asian desert dust on Indian summer monsoon

In news

A new study details how dust coming from the deserts in the West, Central and East Asia plays an important role in the Indian Summer Monsoon

How?

- The researchers explain how the Indian Summer Monsoon has a reverse effect and can increase the winds in West Asia to produce yet more dust.
- Dust swarms from the desert when lifted by strong winds can absorb solar radiation and become hot.
- This can cause heating of the atmosphere, change the air pressure, wind circulation patterns, influence moisture transport and increase precipitation and rainfall.
- A strong monsoon can also transport air to West Asia and again pick up a lot of dust.
- The hot air over the Iranian Plateau can heat the atmosphere over the plateau, strengthen the circulation over the deserts of the Arabian Peninsula and increase dust emission from the Middle East.

Aerosol

- The dust aerosols from deserts in West China such as the Taklamakan desert and the Gobi Desert can be transported eastward to eastern China and can influence the East Asia summer monsoon.
- In the southwest United States, there are some small deserts that influence the North African monsoon.
- "Some studies have found that the anthropogenic aerosols emitted from the Indian subcontinent can decrease summer monsoon precipitation, while others found that absorbing aerosols such as dust can strengthen the monsoon circulation.

Groundwater depletion

In news

With severe groundwater depletion, the cropping intensity or the amount of land planted in the winter season may decrease by up to 20% by 2025.

Research

- The international team studied India's three main irrigation types on winter cropped areas: dug wells, tube wells, canals, and also analysed the groundwater data from the Central Ground Water Board.
- They found that 13% of the villages in which farmers plant a winter crop are located in critically water-depleted regions.

- The team writes that these villages may lose 68% of their cropped area in future if access to all groundwater irrigation is lost.
- Alternative sources The team then looked at canals to understand if they can be promoted as an alternative irrigation source and as an adaptation strategy to falling groundwater tables.
- But the results showed that “switching to canal irrigation has limited adaptation potential at the national scale.
- We find that even if all regions that are currently using depleted groundwater for irrigation will switch to using canal irrigation, cropping intensity may decline by 7% nationally.

Indian Army inaugurates first solar energy harnessing plant

In News

Indian Army in its quest for harnessing renewable energy for its troops inaugurated the First Green Solar Energy harnessing plant of 56 KVA using Vanadium based battery technology in North Sikkim, at an altitude of 16000 ft.

Details

- Public Relation Officer (Defence) Guwahati, P Khongsai stated that the project was completed in collaboration with IIT Mumbai.
- The project will immensely benefit troops in the forward areas and will be environment friendly.

World's most trafficked mammal

In news

Pangolins, despite being listed in Schedule I of Wildlife (Protection) Act, 1972 continue to be the world's most trafficked mammal

Issue

- The primary demand for its scales in the making of traditional East Asian medicines has led to an estimated illegal trade worth \$2.5 billion every year.
- To enforce the appropriate national and international laws and to track the decline of the species, researchers of Zoological Survey of India (ZSI), Kolkata, have now developed tools to tell apart the scales of Indian pangolin (*Manis crassicaudata*) and Chinese pangolin (*Manis pentadactyla*).
- Studies have shown that between 2000 and 2019, an estimate of about 8,95,000 pangolins was trafficked globally, which mainly involved Asian and African pangolins.
- This has led to a drastic decline of the species.

Solutions

- According to the International Union for Conservation of Nature, Indian pangolins are endangered and the Chinese pangolins are critically endangered.
- Therefore, it is important to develop protocols that can readily identify species and the number of individuals poached in seizures.

Great Nicobar plan starts

In news

The committee has, removed the first hurdle faced by the project

Hurdle

The Environment Appraisal Committee (EAC) - Infrastructure of the Ministry of Environment, Forest and Climate Change (MoEFCC) has flagged serious concerns about NITI Aayog's ambitious project for Great Nicobar Island ('NITI Aayog vision for Great Nicobar ignores tribal, ecological concerns')

Recommendation

It has "recommended" it "for grant of terms of reference (TOR)" for **Environmental Impact Assessment (EIA)** studies, which in the first instance will include baseline studies over three months.

Concern

- The committee's concerns were both procedural and substantive.
- The missing information included the minutes of the meeting note, details of the township to be developed over 149 sq. km., a note on seismic and tsunami hazards, freshwater requirement details (6.5 lakh people are envisaged to finally inhabit the island when the present population is only 8,500; the current total population of the entire island chain is less than 4.5 lakh), and details of the impact on the Giant Leatherback turtle.
- The committee also noted that there were no details of the trees to be felled — a number that could run into millions since 130 sq. km. of the project area has some of the finest tropical forests in India.

Action

- The need for an independent assessment of terrestrial and marine biodiversity.
- A study on the impact of dredging, reclamation and port operations, including oil spills (to be carried out by nationally recognised institutions such as the Wildlife Institute of India).
- The need for studies of alternative sites for the port with a focus on environmental and ecological impact, especially on turtles, analysis of risk-handling capabilities.
- A seismic and tsunami hazard map
- A disaster management plan.

U.S. slider turtles

In news

American turtle popular as pet is threatening to invade the natural water bodies across the Northeast, which is home to 21 of the 29 vulnerable native Indian species of freshwater turtles and tortoises.

Highlights

- The alarm was raised after H.T. Lalremsanga and eight others from Mizoram University's Department of Zoology published another report.
- Their report said a red-eared slider was collected from an unnamed stream, connected to the Tlawng River, on a farm near Mizoram capital Aizawl.
- The red-eared slider (*Trachemys scripta elegans*) derives its name from red stripes around the part where its ears would be and from its ability to slide quickly off any surface into the water.

Issue

- Native to the U.S. and northern Mexico, this turtle is an extremely popular pet but on the flip side they grow fast and virtually leave nothing for the native species to eat.
- The red-eared slider has already affected States such as Karnataka and Gujarat, where it has been found in 33 natural water bodies.

New skink species

In news

New skink species has been found in Western Ghats.

Highlights

- Named *Subdoluseps nilgiriensis*, the reptile has a slender body of just about 7 cm and is sandy brown in colour.
- The new species is closely related to *Subdoluseps pruthi* found in parts of the Eastern Ghats.
- “The new species was found in a dry deciduous area, showing that even the dry zones of our country are home to unrealised skink diversity.
- There is an urgent need to change the notion that high biodiversity can be found only in the wet and evergreen forests.

Secretive habits

- Most skinks are diurnal and are usually secretive. Being elusive, not much is known about their natural and evolutionary history.
- “This species is only the third skink species discovered from mainland India in the last millennium.

About skink

- Skinks are non-venomous. They resemble snakes because of the often-inconspicuous limbs and the way they move on land.
- Such resemblance has led to confusion often resulting in humans killing this harmless creature.
- Skinks are known to feed on insects such as termites, crickets and small spiders, and we assume our new species has a similar diet.

Threat

- *Subdoluseps nilgiriensis* is currently considered a vulnerable species as there are potential threats from seasonal forest fires, housing constructions and brick kiln industries in the area.
- Rapid urbanisation, which has increased the road networks in the area, has also threatened its small geographical range.

Elephant seals

In news

One of the most distinctive of the 33 species that comprise the world’s seal family it is difficult for them to stay fat.

Highlights

- Scientists have conducted the most thorough study to date of the unique feeding behaviour of northern elephant seals, focusing on the females of the species during arduous two-month post breeding migrations in the north eastern Pacific Ocean.
- The seals were found to spend upwards of 20 hours every day – and sometimes a full 24 hours – in continuous deep-diving to feed on multitudes of small fish, rather than the larger prey favoured by other deep-diving marine mammals.
- To gain the body fat essential for successful reproduction and insulation in the frigid depths.
- They fed 1,000 to 2,000 times daily.

Research

- The researchers tracked 48 female elephant seals from Año Nuevo State Park in California, site of an important breeding colony.
- They based their findings on data obtained from 2011 and 2018 using three small removable devices: one attached under the jaw that counted the number of times they fed and measured their depth; a satellite tracker attached atop the head that provided location information; and a “smart” video camera with an infra-red LED light flash, motion tracker and another depth sensor, also atop the head.
- Male northern elephant seals may reach 4 metres length and weigh up to 2,000 kg.
- Females are substantially smaller getting up to about 3 metres in length and 590 kg.

Release of- High Resolution Emission Inventory (400 meters)

In news

Pune emission inventory report to understand the contribution of various sources of emissions in Pune Air quality has been released

Details

- The final product yielded mapping of pollution sources in each 400m x 400m grid of PMR for 8 major pollutants namely, PM_{2.5}, PM₁₀, NO_x, CO, SO₂, BC, HC.
- The emission inventory campaign has been led by **Indian Institute of Tropical Meteorology (IITM)** Pune under the Ministry of Earth Sciences along with SPPU
- Geographical Information System (GIS)-based statistical emission model developed by scientist of IITM is used to develop fine resolution of 400m gridded products.
- This exercise was earlier done in 2012-13 at the advent of SAFAR system with a resolution of 1km.

Highlights of Emission report

- A comparison of earlier (Yr-2012-13) emission inventory with the current (Yr-2019-20) inventory in PMR suggests a significant increase in Pune's overall emission load.
- The air quality of Pune is mainly regulated by particulate pollutants (PM_{2.5} and PM₁₀).
- A significant growth in the emissions of particulate pollutants has been observed during the past seven years.
- An increase of 70% and 61% is found in PM_{2.5} and PM₁₀ respectively from 2012-13 to 2019-20.
- There has been an enormous growth in the number of vehicles in PMR during the past decade. Transportation sector is found to be the major contributor in PM_{2.5} emissions as compared to rest of the sources.
- Though industrial production has increased over the years, emissions show a minimal rise as compared to other sectors.

Whiteflies

In news

Extensive studies were carried out from 2015 to 2020 across the country to understand the patterns of occurrence, the intensity of the infestation and their natural enemies.

Research

- The team visited at least 5 to 10 locations in each district and 5 to 12 districts in each state including the islands of Lakshadweep.

- They extracted genomic DNA from individual adult whiteflies and explained in detail about eight invasive species found in India.

Finding

- Most of these species are native to the Caribbean islands or Central America [or both].
- It is difficult to pinpoint how they entered our country. Most probably a nymph or baby insect may have come along with imported plants.
- The first reported invasive spiralling whitefly *Aleurodicus dispersus* is now distributed throughout India except Jammu & Kashmir.
- The host range of all of the invasive whiteflies was increasing due to their polyphagous nature (ability to feed on various kinds of food) and prolific breeding.
- Invasive whiteflies Other invasive whiteflies were also found to expand their host range on valuable plants species, especially coconut, banana, mango, sapota, guava, cashew, oil palm, and ornamental plants such as bottle palm, false bird of paradise, butterfly palm and important medicinal plants.

What is whitefly?

- It is a small (1-2 mm) white-coloured insect affecting cotton, and also occurring on vegetables and other crops in tropical and sub-tropical regions.
- The whitefly sucks sap from the phloem or living tissue carrying organic nutrients, causes yellowing and upward curling of the leaves.
- The insect also deposits sticky honey dew excretion, which promotes sooty mould fungi that interfere with photosynthesis.
- Sticky cotton makes ginning and milling difficult. In north India, whitefly is present throughout the year, due the wide range of crops grown, shifting from one crop to the other.
- But more damage is caused by the cotton leaf curl virus that is transmitted by the same insect.

Low-chilling apple variety

In news

A farmer from Himachal Pradesh has developed an innovative self-pollinating apple variety that does not require long chilling hours for flowering and fruit setting.

Highlight

- This has spread to plain, tropical, and subtropical areas in various parts of India, where the temperature is as high as 40-45 °C during summer.
- Commercial cultivation of this apple variety has been initiated in Manipur, Jammu, low lying areas of Himachal Pradesh, Karnataka Chhattisgarh, and Telangana, and fruit setting has been expanded to 23 states & UTs so far.
- This innovative apple variety – HRMN 99 has become a source of inspiration not only for thousands of farmers in the region but also for horticulturists of Bilaspur and other lower hill districts in the State areas which earlier could never dream of growing apples.
- Shri Hariman Sharma has also been conferred a National Award in 2017 during the 9th National Biennial Grassroots Innovation and Outstanding Traditional Knowledge awards by then Hon'ble President of India Shri Pranab Mukherjee at Rashtrapati Bhavan.

Declining forest bird species in Western Himalaya

In news

Invasion by non-native species, land-use changes led to decrease in abundance of important birds.

Highlights

- With extremely cold winters and pleasant summers, the State of Uttarakhand is home to the Western Himalayan temperate forests which harbour a large number of endemic bird species.
- A new study that analysed these natural oak-dominated forests and modified forests has noted that there was a drastic loss of bird species in all modified landscapes.
- The researchers studied an area of about 1,285 square kilometres between the altitudes of 1,700 and 2,400 metres.
- Six major land-use types which included natural oak forest, degraded oak forest (lightly used), lopped oak forest (intensively used), pine forest, agricultural cultivation area and sites with buildings were studied.
- The results showed that there was a low diversity of species in monoculture areas and urban sites.

Habitat guilds

- Habitat guilds are groups of bird species that have common habitat preferences.
- For instance, forest specialists include species which forage and breed only in dense protected oak forests at this altitude, while forest generalists can adapt to modified habitats such as orchards and degraded forests.”
- The researchers noticed that many of the species that dropped out of the modified land areas were recognised oak forest specialists such as rufous-bellied woodpecker, greater yellownape, rufous sibia, white-throated laughingthrush and black-faced warbler.
- Another paper published by the group looked at woodpeckers in the region to understand how they can be used as indicators of bird diversity and also to understand habitat degradation.

More firepower for Kaziranga guards

In news

The Assam government has approved a proposal to increase the firepower of the guards of Kaziranga National Park and Tiger Reserve and provide commando training to them.

Highlights

- The government has also sought the notification of all animal corridors, accelerated construction of elevated road corridors through the park, and exploration of helicopter services to and from the one horned rhino habitat.
- These decisions were taken at a meeting on flood preparedness, animal safety and anti-poaching headed by Chief Minister Himanta Biswa Sarma.
- Rifles would be increased for the 1,300 sq. km. Tiger Reserve’s guards and members of the Assam Forest Protect Force (AFPF).
- All AFPF personnel and frontline staff using modern weapons would be trained at the Assam Police Commando Training Centre near Guwahati on a regular basis.
- There shall be zero tolerance to poaching.

Kaziranga National Park and Tiger Reserve

- The forest region of Kaziranga Park is home to world’s largest population of Indian Rhinoceros.
- Other animals that can be seen in the elephant grass, marshland and dense tropical moist broadleaf forests of Kaziranga are Hoolock Gibbon, Tiger, Leopard, Indian Elephant, Sloth Bear, Wild water buffalo, swamp

deer, etc. With increase in tiger population every year, the government authorities declared Kaziranga as a Tiger Reserve in the year 2006.

- Also here one can find good number of migratory bird species from Central Asia.

Study about Venus

In News

A team from the University of California, Los Angeles used radar to determine the exact length of a day on Venus, the size of its nucleus, and its specific tilt angle, treating it like a "giant disco ball".

Details

- Data obtained by bouncing radio waves off Venus - treating it, as one scientist said, like a giant disco ball - is providing new insight into Earth's closest planetary neighbour, including a precise calculation of the duration of a Venusian day.
- The study also measured the tilt of the Venusian axis and the size of the planet's core, allowing for a deeper understanding of an enigmatic world sometimes called Earth's 'evil twin.'
- It was already known that Venus has the longest day - the time the planet takes for a single rotation on its axis - of any planet in our solar system, though there were discrepancies among previous estimates.
- The study found that a single Venusian rotation takes 243.0226 Earth days.
- That means a day lasts longer than a year on Venus, which makes a complete orbit around the sun in 225 Earth days.
- The researchers transmitted radio waves toward Venus 21 times from 2006 to 2020 from Nasa's Goldstone Antenna in the Mojave Desert of California and studied the radio-echo, which provided information on certain planetary traits, at Goldstone and at the Green Bank Observatory in West Virginia.
- Venus is an amazing laboratory for understanding planet formation and evolution, and it's a stone's throw away.
- There are likely billions of Venus-like planets in the galaxy.
- The new data showed that the Venusian planetary core has a diameter of about 4,360 miles (7,000 km), comparable to Earth's core.
- Its core is almost certainly composed of iron and nickel, though it is unclear whether it is solid or molten.

About Venus

- Venus spins on its axis almost upright - meaning it lacks discernable seasons - while Earth has more of a tilt.
- The study calculated the Venusian tilt at about 2.64 degrees. Earth's is about 23.5 degrees.
- Venus, the second planet from the sun, is similar in structure but slightly smaller than Earth, with a diameter of about 7,500 miles (12,000 km).
- Above its foreboding landscape is a thick and toxic atmosphere that consists primarily of carbon dioxide, with clouds of sulfuric acid droplets.
- With a runaway greenhouse effect, its surface temperatures reach 880 degrees Fahrenheit (471 degrees Celsius), hot enough to melt lead.
- Venus spins from east to west, in the opposite direction from all other planets in our solar system but Uranus.
- In another quirk, its day-night cycle - the time between sunrises as opposed to the length of a single axial spin - takes 117 Earth days because Venus rotates in the direction opposite of its orbital path around the sun.

Lunar Eclipse

In news

A total eclipse of the Moon will occur on May 26, 2021 (5Jyaistha, 1943 Saka Era).

Highlights

- From India, just after moonrise, ending of partial phase of the eclipse will be visible for a short span of time from north eastern parts of India(except Sikkim), some parts of West Bengal, some coastal parts of Odisha and Andaman & Nicobar Islands.
- The eclipse will be visible in the region covering South America, North America, Asia, Australia, Antarctica, the Pacific Ocean and the Indian Ocean.
- The next lunar eclipse will be visible from India on November 19,2021. It will be a partiallunar eclipse.
- The ending of the partial phase of which will be visible for a very short span of time just after moonrise from extreme north eastern parts of Arunachal Pradesh and Assam.

Lunar eclipse

- It occurs on a full moon day when the Earth comes in between the Sun and the Moon and when all the three objects are aligned.
- A total lunar eclipse will occur when the whole Moon comes under the umbral shadow of the Earth and the partial lunar eclipse occurs when only a part of the Moon comes under the umbral shadow of the Earth.

12th Chief Energy Ministerial

In news

India and UK launch new workstream to promote industrial energy efficiency at the ongoing 12th Chief Energy Ministerial

Aim & Objective

- Government aims to infuse green technologies and stimulate demand for low-carbon industrial material.
- The IDDI initiative has been supported by Germany and Canada, with more countries expected to join soon.
- The objective is to infuse green technologies and stimulate demand for low-carbon industrial material.

12th Clean Energy Ministerial (CEM12)

The theme of CEM12 was ***"Ambition into Action Turning a Year of Ambition into a Decade of Delivery"***

- The Twelfth Clean Energy Ministerial (CEM12), hosted by Chile, convened at a critical moment to determine the medium and long-term role of clean energy in supporting the economic recovery from the COVID-19 pandemic, building momentum towards the commitment to cut emissions ahead of COP26 taking place in November 2021, and continuing the shift towards cleaner economies, raising ambition and accelerating clean energy transitions.
- The CEM12 programme included over 40 high-level events and culminated with its Ministerial Plenary.
- CEM12 was 100% virtual and open to all, providing a platform for all to demonstrate clean energy leadership to a global audience.
- CEM12 hosted more ministers and clean energy leaders than ever before.

Largest Green Railways

In news

Indian Railways on way to become "Largest Green Railways" in the world with Zero Carbon Emission.

Highlights

- Railways looks at helping the environment with steps ranging from massive electrification, water & paper conservation, to saving animals from being injured on Railway tracks.
- 39 Workshops, 7 Production Units, 8 Loco Sheds and one Stores depot have been 'GreenCo' certified; These include 2 Platinum, 15 Gold and 18 Silver ratings.
- 19 Railway Stations have also achieved Green Certification including 3 Platinum, 6 Gold and 6 Silver ratings.
- Green certification mainly covers assessment of parameters having direct bearing on the environment, such as, energy conservation measures, use of renewable energy, Green House Gas emission reduction, water conservation, waste management, material conservation, recycling etc.
- 9 Railway Stations have also achieved Green Certification including 3 Platinum, 6 Gold and 6 Silver ratings.
- 27 more Railway Buildings, Offices, Campuses and other establishments are also Green certified including 15 Platinum, 9 Gold and 2 Silver ratings.

Economic Benefits

- Railway Electrification which is environment friendly and reduces pollution, has increased nearly ten times since 2014.
- Capturing the economic benefits of electric traction in an accelerated manner, Railways has planned to electrify balance Broad Gauge (BG) routes by December, 2023 to achieve 100% electrification of BG routes.
- Head-On-Generation systems, Bio-Toilets and LED lights recreate the train itself into a travel mode that's kinder to the environment while maintaining comparable passenger comfort.

COP26 Global Warming

In news

The world is facing two momentous challenges: COVID-19 and climate change, both need us to come together globally to find a way forward.

India's response

- India has a strong record on tackling climate change, including impressive domestic targets to have 450GW of renewable energy by 2030, and establishing the International Solar Alliance and the Coalition for Disaster Resilient Infrastructure (CDRI).
- India played a critical role in delivering the landmark Paris Agreement and we are working just as closely with India in the run-up to COP26.
- Emissions have to be cut In terms of limiting warming, every fraction of a degree makes a difference. An average global temperature rise of 2°C, compared to 1.5°C, would see hundreds of millions more people affected.
- The Climate Action Tracker estimates that countries' current emissions reduction targets have us on course for average temperature rises of 2.4°C. To limit warming to 1.5°C, we must halve global emissions by 2030. So this is the decisive decade.

26th UN Climate Change Conference of the Parties

- The 26th session of the Conference of the Parties (COP 26) to the UNFCCC was originally scheduled to take place from 9-19 November 2020, in Glasgow, UK.

- It was changed to be hosted by the United Kingdom in Glasgow from November 12 2021 Last month.

Saltwater crocodiles

In news

The carcass of a five-feet-long saltwater crocodile was found in the Patasala river near Silapokhari village within the Bhitarkanika National Park (BNP) in Odisha's Kendrapara district.

Highlights

- The reptile choked and drowned by being caught inside a fishing net or died due to infighting.
- Saltwater crocodiles were included in Schedule I of India's Wild Life (Protection) Act, 1972.
- The saltie's death has exposed lacunae in the crocodile conservation work done in the park.
- The rivers, creeks and other water bodies within BNP are the home of around 1,800 saltwater crocodiles.

Background

- In 1975, the then-Union Ministry of Forest and Environment, in a collaboration with the United Nations Development Programme had started a crocodile breeding and rearing project in Dangamala within BNP.
- Relentless efforts by the authorities have increased the number of crocodiles in Bhitarkanika to 1,768 in January 2021, from just 96 in 1974.
- The forest department had stopped the crocodile breeding and rearing programme in 2012 in the park as the crocodile population had reached a saturation point.

Awareness campaign on Single Use plastics

In news

GIZ, UN Environment Programme (UNEP) and Federation of Indian Chambers of Commerce and Industry (FICCI) along with Ministry of Environment, Forest and Climate Change, Government of India, are organizing the two-month long awareness campaign

Laws regarding plastic usage

- Government of India has already banned import of plastic waste in the country.
- The Ministry of Environment, Forest and Climate Change for the first time brought out Plastic Waste Management Rules, 2016, for handling plastic waste in an environmentally sound manner.
- "Under the rules plastic carry bags below 50 microns have been banned.
- Many states/UTs have also banned identified single use plastic items.
- In March 2021 for amending the Plastic Waste Management Rules, 2016, with respect to prohibiting identified 12 single use plastic items such as disposable plastic cutlery etc.

India Plastic Challenge – Hackathon 2021

- To spur innovation and entrepreneurship in area of tackling plastic waste pollution and elimination of single use plastic, Shri Javadekar announced the "India Plastic Challenge – Hackathon 2021".
- The "India Plastic Challenge – Hackathon 2021" is a unique competition calling upon start-ups /entrepreneurs and students of Higher Education Institutions (HEIs) to develop innovative solutions to mitigate plastic pollution and develop alternatives to single use plastics.

Perform Achieve and Trade (PAT) scheme

In news

The Ministry of Power is implementing measures to save energy with an objective to reduce CO₂ emission levels in the environment from industries, establishments and by using equipment/ appliances.

PAT

- In this regard, Perform Achieve and Trade (PAT) Scheme is a key programme for large industries and establishments.
- This scheme aims to enhance the cost-effectiveness of energy savings by upgrading technologies or by taking in-house actions to minimize energy consumption.
- The scheme provides mandatory targets for the identified Large Units and the excess energy saved by them is issued as Energy Saving Certificate, which are tradable instruments.
- The different industries and establishments are assigned separate energy efficiency targets based on their levels of energy consumption and the potential for energy savings.

Standards and Labeling (S&L) Program

- To enable market transformation of efficient products, Standards and Labeling (S&L) Program was introduced by the Bureau of Energy Efficiency (BEE).
- The objective of S&L is to provide the consumers, an informed choice about the energy savings potential and thereby the cost saving due to the products available in the market.
- The scheme includes display of energy performance labels on key energy consuming equipment & appliances, with stipulation for minimum energy performance standards.
- The scheme has now included 28 appliances till March 2021 and over 15000 models of energy efficient products have been awarded Star labels, a popular symbol among the consumers for endorsing energy savings.
- The impact of using a huge number of efficient products by the citizens have resulted into an estimated electricity savings of 56 Billion Units during 2020-21, worth over Rs. 30000 crore.
- This initiative has been effective in reducing the CO₂ emissions of approx.

Carbon dioxide and its impact

- Carbon Dioxide (CO₂) is the well-known greenhouse gas on our planet Earth.
- Rapid increase in its concentration in atmosphere is major cause of global temperature rise which in turn leads to many environmental and healthcare problems.
- The '**greenhouse effect**' works in case of CO₂ when solar radiation hits the surface of the earth, part of the heat escapes the atmosphere while balance heat gets trapped which in turn, raises the earth's temperature. This is a phenomenon popularly known as global warming.
- This primarily results in severe impact on climate change, which has a ripple effect over all natural ecosystems, and by extension, all industries and people around the globe.

Assam's 7th National Park

In news

The "last remaining stretches" of the Assam Valley tropical wet evergreen forests have become Assam's seventh National Park

Highlights

- The State government notified Dihing Patkai as a National Park, four days after creating the 422-sq. km Raimona National Park in western Assam's Kokrajhar district.
- The five older National Parks in the State are Kaziranga, Manas, Nameri, Orang and Dibru-Saikhowa. Kaziranga and Manas are UNESCO World Heritage Sites.
- They are also tiger reserves along with Nameri and Orang. The 234.26-sq. km Dihing Patkai straddling eastern Assam's Dibrugarh and Tinsukia districts is a major elephant habitat and 310 species of butterflies have been recorded there.
- The park has 47 species each of reptiles and mammals, including the tiger and clouded leopard.
- The newly notified National Park will be administered by the Soraipung Range of Digboi Forest Division and Jeypore Range of Dibrugarh Forest Division. Additional anti-poaching camps and manpower are being provided.

National park

- It is a park in use for conservation purposes, created and protected by national governments.
- Often it is a reserve of natural, semi-natural, or developed land that a sovereign state declares or owns.
- Although individual nations designate their own national parks differently, there is a common idea: the conservation of 'wild nature' for posterity and as a symbol of national pride.

Bharitalasuchus tapani

In news

Bharitalasuchus Tapani, a carnivorous reptile that lived 240 million years ago

Details

- This reptile belongs to a genus and species previously unknown to science.
- In the Telugu language, Bhari means huge, Tala means head, and Suchus is the name of the Egyptian crocodile-headed deity.
- The species is named after paleontologist Tapan Roy Chowdhury in honour of his contribution to Indian vertebrate paleontology and especially his extensive work on the Yerrapalli Formation tetrapod fauna.

About the reptile

- Bharitalasuchus Tapani was robust animals with big heads and large teeth, and these probably preyed on other smaller reptiles.
- They were approximately the size of an adult male lion and might have been the largest predators in their ecosystems.
- "The first Erythrosuchidae remains were discovered in South Africa in 1905 and more were found in China and Russia.
- The South African one is about 245 million years old, while the ones from China and Russia are around 240 million years old.
- So the Indian one is one of the youngest fossil records we have of an erythrosuchid.
- This is a nice example of evidence of biological interaction that occurred 240 million years ago."

Why was it neglected?

- It was neglected because the fossil specimen was not as complete as those of other erythrosuchids from other countries.
- Also, because the few paleontologists with expertise in the family had not examined the fossil or carried out the detailed comparative work needed.

Operation Olivia

In news

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

Details

- For optimal results, round-the-clock surveillance is conducted from November till May utilising Coast Guard assets such as fast patrol vessels, air cushion vessels, interceptor craft and Dornier aircraft to enforce laws near the rookeries," a Coast Guard officer said.
- From November 2020 to May 2021, the Coast Guard devoted 225 ship days and 388 aircraft hours to protect 3.49 lakh turtles that laid eggs along the Odisha coast.
- **The Olive Ridley (*Lepidochelys olivacea*) is listed as vulnerable under the International Union for Conservation of Nature's Red List.**
- All five species of sea turtles found in India are included in Schedule I of the Indian Wildlife Protection Act, 1972, and in Appendix I of the Convention of International Trade in Endangered Species of Wild Fauna and Flora which prohibits trade in turtle products by signatory countries.
- The Orissa Marine Fisheries Act empowers the Coast Guard as one of its enforcement agencies.

Main factors that damage Olive Ridley turtles and their eggs

- Heavy predation of eggs by dogs and wild animals,
- Indiscriminate fishing with trawlers and gill nets,
- Beach soil erosion.

Nesting habits

- The Olive Ridley has one of the most extraordinary nesting habits in the natural world, including mass nesting called arribadas.
- The 480-km-long Odisha coast has three arribada beaches at Gahirmatha, the mouth of the Devi river, and in Rushikulya, where about 1 lakh nests are found annually.
- "Sea turtles generally return to their natal beach, or where they were born, to lay eggs as adults," the Coast Guard officer explained.
- Mating occurs in the offshore waters of the breeding grounds and females then come ashore to nest, usually several times during a season.

High-Level Dialogue on Desertification

In news

PM delivers the keynote address at the UN 'High-Level Dialogue on Desertification, Land degradation and Drought.

Highlights

- In the last 10 years, around 3 million hectares of forest cover added in India, enhancing the combined forest cover to almost one-fourth of the country's total area.
- Restoration of 26 million hectares of degraded land aimed by 2030 to achieve an additional carbon sink of 2.5 to 3 billion tonnes of carbon dioxide equivalent.
- Centre of Excellence is being set up in India to promote a scientific approach towards land degradation issues.

- The Prime Minister gave example of the Banni region in Rann of Kutch in Gujarat to illustrate how restoration of land can start a virtuous cycle of good soil health, increased land productivity, food security and improved livelihoods.
- In Banni region, land restoration was done by developing grasslands, which helped in achieving land degradation neutrality.

Land degradation

- Land degradation is caused by multiple forces, including extreme weather conditions, particularly drought.
- It is also caused by human activities that pollute or degrade the quality of soils and land utility.
- It negatively affects food production, livelihoods, and the production and provision of other ecosystem goods and services.
- Desertification is a form of land degradation by which fertile land becomes desert.

Impacts of desertification

- Higher threats of malnutrition from reduced food and water supplies;
- More water- and food-borne diseases that result from poor hygiene and a lack of clean water;
- Respiratory diseases caused by atmospheric dust from wind erosion and other air pollutants;
- The spread of infectious diseases as populations migrate.

Deep Ocean Mission

In news

The Cabinet Committee on Economic Affairs has approved the proposal of Ministry of Earth Sciences (MoES) on **"Deep Ocean Mission"**, with a view to explore deep ocean for resources and develop deep sea technologies for sustainable use of ocean resources.

Highlights

- Deep Ocean Mission will be a mission mode project to support the Blue Economy Initiatives of the Government of India.
- Ministry of Earth Sciences (MoES) will be the nodal Ministry implementing this multi-institutional ambitious mission.
- The technologies required for deep sea mining have strategic implications and are not commercially available.
- Hence, attempts will be made to indigenise technologies by collaborating with leading institutes and private industries.
- This mission is also directed towards capacity development in Marine Biology, which will provide job opportunities in Indian industries. In addition, design, development and fabrication of specialised equipment, ships and setting up of required infrastructure are expected to spur the growth of the Indian industry, especially the MSME and Start-ups.

About Ocean

- Oceans, which cover 70 per cent of the globe, remain a key part of our life. About 95 percent of Deep Ocean remains unexplored.
- For India, with its three sides surrounded by the oceans and around 30 per cent of the country's population living in coastal areas, ocean is a major economic factor supporting fisheries and aquaculture, tourism, livelihoods and blue trade.
- Oceans are also storehouse of food, energy, minerals, medicines, modulator of weather and climate and underpin life on Earth.

- The Government of India's Vision of New India by 2030 enunciated in February 2019 highlighted the Blue Economy as one of the ten core dimensions of growth.

Desertification and Land Degradation Atlas of India

In news

Minister of State for Environment, Forest, and Climate Change called for generating awareness towards preventing and restoring land degradation for healthier and sustainable ecosystems and the latest version of "Desertification and Land Degradation Atlas of India has been released.

Aim

It aims to generate large-scale awareness towards understanding the key role of land in all environmental and economic concerns, that the world, as well as India, is facing now-a-days.

Highlights

- The Atlas provides state-wise area of degraded lands for the time frame 2018-19.
- It also provides the change analysis for the duration of 15 years, from 2003-05 to 2018-19.
- The salient findings of this Atlas are not only useful as a ready reference but, will also be helpful in strengthening the envisaged National Action Plan for achieving land restoration targets by providing important baseline and temporal data and technical inputs.

India's stand on desertification

- India hosted the 14th session of the Conference of Parties (COP 14) of the United Nations Convention to Combat Desertification (UNCCD) in September 2019.
- India is striving towards achieving the national commitments of Land Degradation Neutrality (LDN) and restoration of 26 Million ha of degraded land by 2030 which focus on sustainable and optimum utilization of land resources.
- India has been at the forefront of bringing the issue of land degradation to the core of relevant international alliances for the protection and conservation of the environment.
- The government of India has adopted a collective approach for making progress towards achieving the national commitments related to land restoration.

Setae of spiders

Context

- Spiders do not have sticky or adhesive pads like frogs and lizards, instead, they have toe pads covered in tiny, branched hairs.
- Called 'setae', these hairs are also found in geckos and certain beetles. Each hair is just one-hundredth of one millimetre thick.
- The feet of wandering spider *Cupiennius salei* is made up of about 2,400 'setae' and a study published last month (Frontiers in Mechanical Engineering) found that each hair showed unique adhesive properties.

In news

The research team from Germany studied how each hair sticks to rough and smooth surfaces, including sandpapers, glass, epoxy resin.

About the research

- They also looked at how the hairs stuck at different contact angles.

- The adhesion forces largely differed between the individual hairs, for example, one hair adhered best at a low angle with the substrate while the other one performed best close to a perpendicular alignment.
- The team writes that this variety helps spiders climb different surfaces.
- The team studied the hairs under hi-tech microscopes to understand their structure.
- They found that each hair was different and had previously unrecognised structural arrangements.

'Green family'

In news

Volunteers in 33 panchayats of Taranagar block plant 5,100 saplings as part of Harit Marubhumi drive.

Highlights

- The initiative was part of a unique Harit Marubhumi (green desert land) drive.
- The campaign highlighted the crucial interconnection between humanity and nature, making the tree an inseparable part of the "family consciousness", which in turn brings every issue related to plant, tree, leaves and the climate to the ecosystem for generating environmental sensitivity and empowerment.
- All the panchayats in Taranagar block joined the drive and identified the land where the plantation drive could be taken up.
- The women were also gifted with fruit-bearing saplings of lemon, guava, mulberry, jamun and pomegranate for planting them at home.

Summit on Green Hydrogen Initiatives

In news

India is all set to host a two day summit on Green Hydrogen initiatives on 22nd June 2021 involving the BRICS nations.

Details

- The prestigious event offers a platform to share their respective Green Hydrogen initiatives and views on how to take it to the next level in their own countries.
- The online event will be held via a video conference and will conclude on 23rd June.
- The event will be anchored by India's largest power producer and one of the global energy majors, NTPC Ltd, a Maharatna CPSU under Ministry of Power.
- The virtual summit will bring the best brains, policy makers and major stakeholders from the BRICS nations deliberating and discussing at length the future of Hydrogen in the energy mix.

Summit

- **On Day 1**, the representatives from each country would be sharing respective initiatives undertaken by their countries on utilization of hydrogen and their future plans.
- The speakers will also share the relevance of different technologies developed on hydrogen and its priorities for their country.
- **Day 2** will witness panel discussions on ideas integrating hydrogen in overall energy policy framework by different countries.
- The discussions to entail financing options for the emerging green hydrogen technologies and the institutional support needed to create the requisite ecosystem for the technology to flourish.

BRICS Green Hydrogen Summit

In news

India hosted a two-day summit on Green Hydrogen initiatives involving the BRICS nations. The event was anchored by NTPC Ltd.

Highlights

- As the world rapidly moves to decarbonise the entire energy system, hydrogen is poised to play a vital role and build on the rapid scale-up of renewable resources across the world.
- Hydrogen, when produced by electrolysis, using renewable energy, is known as 'green hydrogen'. It has no carbon footprint.
- This gives hydrogen the edge over other fuels to unlock various avenues of green usage.
- The summit aimed to address the challenges in terms of technology, efficiency, financial viability, and scaling up.
- Green hydrogen is of great topical interest to all the countries including BRICS as it has a great amount of potential to ensure sustainable energy supply, increase the level of energy availability and minimize the negative impact on the environment.
- Green hydrogen blending up to 10 per cent may be adopted in CGD networks to gain widespread acceptance. Further scaling up with greening of hard to abate sectors (like steel and cement) through hydrogen is to be explored.
- Many countries have brought out their strategies and defined targets and roadmaps based on their resources and strengths.

Solar Eclipse 2021

In news

This year's Solar Eclipse will be visible on June 10.

Highlight

- The annular solar eclipse appears when the Moon passes between Earth and the sun.
- The Moon does not block the entire view of the Sun, forming a 'Ring of Fire.'
- The map suggests that those who are based in Ladakh and Arunachal Pradesh will start witnessing the solar eclipse at 12:25.
- They will be able to see a partial solar eclipse and this celestial event will last until 12:51 for them.

Solar Eclipse

- A solar eclipse occurs when the moon gets between Earth and the sun, and the moon casts a shadow over Earth.
- A solar eclipse can only take place at the phase of new moon, when the moon passes directly between the sun and Earth and its shadows fall upon Earth's surface.
- But whether the alignment produces a total solar eclipse, a partial solar eclipse or an annular solar eclipse depends on several factors, all explained below.
- There are four types of solar eclipses: total, annular, partial and hybrid.

Association of cloud bursts with forest fires

In news

A recent study has found a connection between the formation of the tiny particles, the size of a cloud droplet on which water vapor condenses leading to the formation of clouds and forest fires.

About the study

- The quantity of such particles called the cloud condensation nuclei (CCNs) were found to have peaks associated with forest fire events.
- Scientists from Hemvati Nandan Bahuguna (HNB) Garhwal University and IIT Kanpur jointly measured the activation of cloud condensation nuclei and studied its impact on high altitude cloud formation and complexity of local weather phenomenon under the influence of different weather condition in the ecologically sensitive regions of Central Himalayas for the first time.
- Cloud condensation nuclei (CCN), which can activate and grow into fog or cloud droplets in the presence of supersaturation (SS) was measured by a droplet measurement technology's (DMT) CCN Counter in the pristine Himalayan region at Himalayan Clouds Observatory (HCO), Swami Ram Tirtha (SRT) Campus of Hemvati Nandan Bahuguna (HNB) Garhwal University, Badshahithaul, Tehri Garhwal, Uttarakhand, India.
- This observation was carried out under a Climate Change Programme Division, Department of Science & Technology (DST) funded project in collaboration with Hemvati Nandan Bahuguna (HNB) Garhwal University and IIT Kanpur, where the variation of CCN was reported on diurnal, seasonal, and monthly scale.

Significance

- This research will be helpful in source allocation of pollutants reaching the high-altitude regions of Garhwal Himalaya.
- Also, it will provide the better understanding for the cloud formation mechanism and weather extremities over this region.

Premature mortality

In news

Black Carbon has a significant adverse effect on human health and leads to premature mortality, says a new study.

Issue

- The Indo-Gangetic plain is exposed to black carbon (BC) with serious implications on regional climate and human health.
- However, most of the pollutions-based epidemiological studies essentially relate exposure to particulate mass concentration (PM 10 and/or PM 2.5) that invariably generalize all particulates with equal toxicity without distinguishing individuals by its source and composition, which genuinely have different health consequences.

Significance

- The study could help in the estimation of the future burden of mortality associated with air pollutants more accurately.
- The Indo-Gangetic plain is exposed to black carbon (BC) with serious implications on regional climate and human health.
- Importantly, the health effects in terms of mortality due to BC aerosol exposure have never been evaluated in India.

- A typical urban pollution hotspot in central Indo-Gangetic Plain (IGP), the town experiences very high aerosol loading and trace gas concentrations throughout the year due to the prevalence of a subsidence zone and observed decadal increasing trends both in Aerosol Optical Depth and Black Carbon aerosols.

Black Carbon

- Black carbon, or soot, is part of fine particulate air pollution (PM_{2.5}) and contributes to climate change.
- Black carbon is formed by the incomplete combustion of fossil fuels, wood and other fuels.
- Complete combustion would turn all carbon in the fuel into carbon dioxide (CO₂), but combustion is never complete and CO₂, carbon monoxide, volatile organic compounds, and organic carbon and black carbon particles are all formed in the process.
- The complex mixture of particulate matter resulting from incomplete combustion is often referred to as soot.

Study on social behaviour of Male Asian elephants

Context

- As human-elephant conflicts increase with time and expanding human range, understanding social behaviour becomes crucial to the conservation and management of the highly social and endangered Asian elephant.
- The Asian elephant is a charismatic species with a long history of co-existence with humans. Yet works on male societies of wild elephants based on long-term observations are rare.

In news

Researchers from Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), an autonomous Institute of the Department of Science and Technology, Government of India, studied associations of male Asian elephants by collecting and analysing data on behaviour of identified nonmusth wild Asian elephants of Nagarhole and Bandipur National Parks.

Finding of the research

- They found that the time spent by male Asian elephants in all-male and mixed-sex groups depended on the age of the male.
- Adult Asian male elephants preferred to spend their time alone than in mixed-sex or in all-male groups. Besides, old males were found mostly in the company of their age peers and less frequently with young males (15 to 30 years of age).
- Also, young males did not disproportionately initiate associations with old males.
- Adult male Asian elephants are less social than females. They enter musth -- a mate-searching strategy for old (above 30 years of age) males, annually.
- The researchers hypothesised that when the adult males enter musth, dominance relationships may affect the number of mating opportunities they procure.
- It might be more crucial for old males than for young males to test strength with each other and settle dominance relationships during their nonmusth time.

Himalayan yaks to be insured

In news

The high-altitude yak, feeling the climate change heat across the Himalayan belt, will now be insured.

Details

- The National Research Centre on Yak (NRCY) at Dirang in West Kameng district, Arunachal Pradesh, has tied up with the National Insurance Company Ltd. for insuring their livestock.
- “The countrywide population trend shows that yak population has been decreasing at an alarming rate.
- Further, climate change and inexplicable changes in the weather pattern have been reported from the yak rearing areas throughout the country.

Significance

The insurance policy would shield the yak owners against the risks posed by weather calamities, diseases, in-transit mishaps, surgical operations and strikes or riots.

Stats

The total yak population in India is about 58,000. The Union Territories of Ladakh and Jammu and Kashmir have some 26,000, followed by 24,000 in Arunachal Pradesh, 5,000 in Sikkim, 2,000 in Himachal Pradesh and about 1,000 in West Bengal and Uttarakhand.

The genome of a Salt-secreting Mangrove Species

In news

Scientists have reported for the first time a reference-grade whole genome sequence of a highly salt-tolerant and salt-secreting true-mangrove species, *Avicennia marina*.

Mangroves

- Mangroves are a unique group of species found in marshy intertidal estuarine regions and survive a high degree of salinity through several adaptive mechanisms.
- Mangroves are important resources for the coastal region and are of great ecological and economic value. They form a link between marine and terrestrial ecosystems, protect shorelines, provide habitat for a diverse array of terrestrial organisms.

About the species

- *Avicennia marina* is one of the most prominent mangroves species found in all mangrove formations in India.
- It is a salt-secreting and extraordinarily salt-tolerant mangrove species that grows optimally in 75% seawater and tolerates >250% seawater.

The study

- This study employed the latest genome sequencing and assembling technologies and identified 31,477 protein-coding genes and a “salinome” consisting of 3246 salinity-responsive genes and homologs of 614 experimentally validated salinity tolerance genes.
- The study reported identification of 614 genes, including 159 transcription factors, which are homologous to the genes that were functionally validated for salinity tolerance in transgenic systems.

Home to 27% of India’s flowering plants

In news

Sikkim, the smallest State with less than 1% of India’s landmass, is home to 27% of all flowering plants found in the country, reveals a recent publication by the Botanical Survey of India (BSI).

Details

- Flora of Sikkim – A Pictorial Guide, released earlier this week, lists 4,912 naturally occurring flowering plants in the tiny Himalayan State.
- “The total number of naturally occurring flowering plants in the country is about 18,004 species, and with 4,912 species, the diversity of flowering plants in Sikkim, spread over an area of 7,096 sq. km, is very unique.
- The publication provides details of 5,068 taxa (including 152 cultivated taxa) belonging to 1,491 genera and 209 angiosperm families which are naturally occurring flowering plants, along with geography, ecology, vegetation pattern and forest types of Sikkim.
- The State, which is a part of the Kanchenjunga biosphere landscape, has different altitudinal ecosystems, which provide opportunity for herbs and trees to grow and thrive.
- “From subalpine vegetation to the temperate to the tropical, the State has different kinds of vegetation, and that is the reason for such a diversity of flora.
- The elevation also varies between 300 metres and 8,598 metres above mean sea level, the apex being the top of Mt. Kanchenjunga (8,586 metres).

A proposed elephant reserve in Chhattisgarh

In news

The proposed Lemru Elephant Reserve in Chhattisgarh, in the pipeline for 20 years, has become the subject of yet another controversy.

The proposal

- In a letter on June 26, the state Forest and Environment Department asked the Principal Chief Conservator of Forests (Wildlife) to make a presentation for decreasing the area of the proposed reserve from 1,995 sq km to 450 sq km.
- The proposal for the reserve, in Korba district, was passed unanimously by the Assembly in 2005 and got central approval in 2007.

Lemru Elephant Reserve

- Lemru is one of two elephant reserves planned to prevent human-animal conflict in the region, with elephants moving into Chhattisgarh from Odisha and Jharkhand.
- Its area was then proposed to be 450 sq km.

Why area is being reduced?

- The area proposed under the reserve is part of the Hasdeo Aranya forests, a very diverse biozone that is also rich in coal deposits.
- Of 22 coal blocks in the area, seven have already been allotted with mines running in three, and in the process of being established in the other four.
- Under the **‘No-Go Area’** policy from the UPA area, the entire area was considered out of bound for mines, but in 2020, five coal blocks from the region were put on the auction list.

Green Sohra Afforestation Campaign

In news

Union Home Minister Shri Amit Shah launched the Green Sohra Afforestation Campaign at Sohra (Cherrapunji), he also inaugurated the Greater Sohra Water Supply Scheme

About the Campaign

- This afforestation campaign will be run by the Meghalaya Government with the help of Assam Rifles, this will greatly benefit eco-tourism and will also boost tourism in the state.
- Trees are cut for fuel and other uses, so 80% of the total land will be planted with traditional and long lifespan trees, the remaining 20% will be used for animal feed, ornamental plants and nursery which will meet all the requirements and help reduce the felling of long lifespan trees.
- With this technique, multi-level farming is done and the forest grows 30 times faster and after 3 years it becomes free of maintenance. Shri Shah said eco-tourism will be greatly benefited by this, besides tourism of Meghalaya will also get a boost.

Study on Water Scarcity

In news

Water being a State subject, steps for augmentation, conservation and efficient management of water resources are primarily undertaken by the respective State Governments.

Details of the study

- In order to supplement the efforts of the State Governments, Central Government provides technical and financial assistance to them through various schemes and programmes.
- The study "Reassessment of Water Availability in India using Space Inputs" has been carried out by Central Water Commission (CWC) in 2019.
- As per the study, the average annual water resources of the 20 basins of the country has been assessed as 1999.20 Billion Cubic Meters (BCM).
- The average annual water availability of any region or country is largely dependent upon hydro-meteorological and geological factors.
- Water Extraction is more than Annual Extractable Ground Water Resource.
- 270 units have been categorized as 'Critical', 1057 units as 'Semi-Critical', 4427 units as 'Safe' and 97 units as 'Saline'.

Ozone levels exceeding permitted levels

In news

A Centre for Science and Environment study has found that ozone levels are exceeding the permitted levels even during winter in Delhi-NCR.

Details

- Ozone is now a round-the-year problem requiring urgent [action] and the situation demands refinement of clean air action plan to add strategies for ozone mitigation, with stronger action on vehicles, industry and waste burning.
- Ozone, a highly reactive gas and dangerous for those suffering from respiratory conditions and asthma, is becoming more widespread in Delhi and NCR across all seasons.
- The CSE analysis found that the city-wide average largely remains within the standard with just occasional exceedance.

Ozone

- Ozone (O₃) is a highly reactive gas composed of three oxygen atoms. It is both a natural and a man-made product that occurs in the Earth's upper atmosphere (the stratosphere) and lower atmosphere (the

troposphere). Depending on where it is in the atmosphere, ozone affects life on Earth in either good or bad ways.

- Stratospheric ozone is formed naturally through the interaction of solar ultraviolet (UV) radiation with molecular oxygen (O₂).

Rare Arctic lightning storms strike north of Alaska

In news

Three successive thunderstorms swept across the icy Arctic from Siberia to north of Alaska, unleashing lightning bolts in an unusual phenomenon that scientists say will become less rare with global warming.

Details

- The air over the Arctic Ocean, especially when the water is covered with ice, lacks the convective heat needed to generate lightning storms.
- But as climate change warms the Arctic faster than the rest of the world, that's changing, scientists say.
- Episodes of summer lightning within the Arctic Circle have tripled since 2010, a trend directly tied to climate change and increasing loss of sea ice in the far north, scientists reported in a March study published in the journal Geophysical Research Letters.
- These electrical storms threaten boreal forests fringing the Arctic, as they spark fires in remote regions already baking under the round-the-clock summer sun.
- In Alaska alone, thunderstorm activity is on track to increase threefold by the end of the century if current climate trends continue, according to two studies by scientists at the National Center for Atmospheric Research in Boulder, Colorado, published over the last year in the journal Climate Dynamics.

Hydrogen Fuel Cell based Train

In news

On a mission mode towards Green Railways, Indian Railways Organisation of Alternative Fuels (IROAF) invite bids for Hydrogen Fuel Cell based Train on Indian Railways Network

Details

- The project shall kick off the concept of Hydrogen Mobility in the Country
- Initially, the bids are invited for 89km Sonapat-Jind section of Northern Railway
- Initially, 2 DEMU rakes will be converted and later, 2 Hybrid locos will be converted based on Hydrogen Fuel cell power movement
- “Advanced Chemistry Cell (ACC) Batteries” and “National Hydrogen Mission” are two flagship programs of Government of India so as to meet out the targets of reducing Green House Gas (GHG) emission under Paris Climate Agreement 2015 and “Mission Net Zero Carbon Emission Railway” by 2030.

Advanced Chemistry Cell (ACC)

- ACCs are the **new generation of advanced storage technologies that can store electric energy either as electrochemical or as chemical energy** and convert it back to electric energy as and when required.
- Such battery storages will **cater not only to electric vehicles but also to the consumer electronics** industry and electricity grids.

National Hydrogen Mission

- Being a zero-carbon fuel, hydrogen is considered to be one of the key sources of clean energy for the future.

- This fuel can be produced from various sources like natural gas, nuclear power, biomass, and renewable power like solar and wind.
- There are three types of hydrogen – grey, blue and green.
- The fuel produced from fossil fuels is called grey hydrogen, those produced from fossil fuels with carbon capture and storage options are called blue hydrogen, while those produced from renewable power sources are called green hydrogen.

Kaziranga becomes India's first national park to be equipped with satellite phones

In News

- Assam's Kaziranga National Park (KNP) became the first national park in India to be equipped with satellite phones.
- Assam Chief Secretary handed over 10 satellite phones to the forest personnel of the Kaziranga National Park.

Details

- The step to equip the forest personnel with satellite phones would boost anti-poaching measures in the park.
- The official further said the satellite phones will be used in the park's six ranges with no wireless or poor mobile connectivity.
- The Assam State Disaster Management Authority (ASDMA) procured the ten satellite phones for the National Park at an estimated cost of Rs 16 lakh.
- BSNL will be the service provider and the park authorities will bear the monthly expenses.
- BSNL trained the forest personnel to operate the satellite phones in shadow areas and grooves where mobile phones do not function.
- The satellite phones will be immensely useful for coordination.
- There shouldn't be barriers to communication and hence using satellite phones is a necessity in the Kaziranga National Park with a sprawling area.
- The satellite phones will give an edge to the forest personnel over the poachers and also during emergencies like flood

About Kaziranga National Park

- It is located in the State of Assam and covers 42,996 Hectare (ha).
- It is the single largest undisturbed and representative area in the Brahmaputra Valley floodplain.
- It was declared as a National Park in 1974.
It has been declared a tiger reserve since 2007. It has a total tiger reserve area of 1,030 sq km with a core area of 430 sq. km.
- It was declared a UNESCO World Heritage Site in 1985.
It is recognized as an Important Bird Area by BirdLife International.
- Kaziranga National Park which has been spread over a massive 430 sq km area and divided into six ranges in upper Assam, has certain areas with poor to no connectivity.

4 more sites in India added to Ramsar list

In News

India added another feather in its cap when four more sites - two each from Haryana and Gujarat - were recognised as wetlands of international importance under the Ramsar Convention.

Details

- Prime Minister Narendra Modi called the development a matter of pride.
- It is a matter of pride for us that four Indian sites get Ramsar recognition.
- This once again manifests India's centuries old ethos of preserving natural habitats, working towards flora and fauna protection, and building a greener planet.
- With this, the total number of Ramsar sites in India have reached 46, covering a surface area of 1,083,322 hectares.

These sites are:

- Thol, Gujarat
- Wadhvana, Gujarat
- Sultanpur, Haryana
- Bhindawas, Haryana

Ramsar Convention

- The Ramsar Convention on Wetlands is an intergovernmental treaty adopted on February 2, 1971 in the Iranian city of Ramsar, on the southern shore of the Caspian Sea.
- It came into force for India on February 1, 1982.
- Those wetlands which are of international importance are declared as Ramsar sites.
- **The aim** of the Ramsar list is to develop and maintain an international network of wetlands which are important for the conservation of global biological diversity and for sustaining human life through the maintenance of their ecosystem components, processes and benefits.

Wetlands

- Natural wetlands are permanently or seasonally saturated in water and create habitats for aquatic plants.
- They retain large volumes of water and their slow release makes them important for combating extreme weather conditions like floods and droughts.
- Termed '**kidneys of landscape**', wetlands contribute to water purification, water regulation, biodiversity, aesthetics and recreation, according to the United Nations.
- India has maximum wetlands in South Asia - 7.7 lakh - covering the country's 4.6 per cent geographical area, according to a report of NGO Wetland International.

Swachh Survekshan 2021

In News

- The Government announced Indore as the First Water Plus city under the Swachh Survekshan 2021.
- Madhya Pradesh's Indore is the state's commercial capital and the country's cleanest city.

About Swachh Survekshan

- Swachh Survekshan was launched as a part of Swachh Bharat Mission.
- Conducted by the Ministry of Housing and Urban Affairs since 2016, it is an annual survey of cleanliness, hygiene and sanitation in cities and towns in India.
- Swachh Survekshan is the world's largest urban sanitation and cleanliness survey which has been instrumental in fostering a spirit of healthy competition among towns and cities to improve their service delivery to citizens and towards creating cleaner cities.
- The primary objective of Swachh Surveksans is to encourage large scale citizen participation while creating awareness amongst all sections of society about the importance of collective efforts towards making towns and cities better places to reside in.

Water Plus City

- As per the protocols of the Union Ministry of Housing and Urban Affairs, a city can be declared as Water Plus provided, all wastewater released from households, commercial establishments etc. is treated to a satisfactory level before releasing the treated wastewater to the environment.
- In order to become a Water Plus City, it must be ensured that the dirty water from the city does not go into any river or drain.
- Secondly, all public toilets in the city must be connected to sewer lines and must be cleaned. And finally, 30 per cent of the city's sewer water has to be recycled and reused.
- Subsequently, a Water Plus city certificate is allocated to a city for maintaining cleanliness in rivers and drains under its administration.
- The Water PLUS protocol provided by the government aims to provide a guideline for cities and towns to ensure that no untreated wastewater is released into the environment thereby enabling sustainability of the sanitation value chain.

Four more sites of India added to Ramsar list

In news

Four more wetlands from India get recognition from the Ramsar Secretariat as Ramsar sites

New sites

- These sites are Thol and Wadhvana from Gujarat and Sultanpur and Bhindawas from Haryana.
- With this, the number of Ramsar sites in India are 46 and the surface area covered by these sites is now 1,083,322 hectares.
- While Haryana gets its first Ramsar sites, Gujarat gets three more after Nalsarovar which was declared in 2012.

Ramsar

- The aim of the Ramsar list is “to develop and maintain an international network of wetlands which are important for the conservation of global biological diversity and for sustaining human life through the maintenance of their ecosystem components, processes and benefits”
- Wetlands provide a wide range of important resources and ecosystem services such as food, water, fibre, groundwater recharge, water purification, flood moderation, erosion control and climate regulation.
- They are, in fact, are a major source of water and our main supply of freshwater comes from an array of wetlands which help soak rainfall and recharge groundwater.

Bhindawas Wildlife Sanctuary

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

Sultanpur National Park from Haryana

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

Thol Lake Wildlife Sanctuary from Gujarat

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

Wadhvana Wetland from Gujarat

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

Pilot project on Hydrogen Blending

In news

NTPC Limited, India's largest integrated power generating company under Ministry of Power has floated a global Expression of Interest (EoI) to set up a Pilot Project on Hydrogen Blending with Natural Gas in City Gas Distribution (CGD) Network in India.

Details

- The EoI follows the recent tenders floated by NTPC REL for green hydrogen fuelling station at Leh and NTPC VidyutVyapar Nigam Limited (NVVN) for procurement of Fuel Cell Buses.
- A dedicated 1.25 MW Solar plant is also being set up at Leh by NTPC REL to power the hydrogen fuelling station.
- This pilot on hydrogen blending with natural gas will be the first of its kind in India and would explore the viability of decarbonizing India's natural gas grid.
- NTPC is keen on playing a key role in India's transition to hydrogen economy would later take this up at a commercial scale across India.
- The successful execution of the pilot will also demonstrate the decarbonization objective along with import substitution aim under the government's 'AatmaNirbhar Bharat Abhiyaan'.
- NTPC Limited is also keenly exploring production of green ammonia to decarbonize the fertilizer industry and possibly fulfil government's upcoming mandate of using certain percentage of green hydrogen in fertilizer and refinery sector.

Vriksharopan Abhiyan – 2021

In news

Vriksharopan Abhiyan - 2021" of Coal Ministry to be Launched on 19th August, 2021 as part of Azadi Ka Amrit Mahotsav Celebrations

About the programme

- An Important Step Towards Enhancing Green Cover In and Around Coalfields and for Environmental Sustainability in Mining Operations.
- It is expected that more than 300 plantation sites in and around coalfields across the country will be connected during the *Abhiyan on 19th* through live Video Conferencing.

- **Vriksharopan Abhiyan 2021**, which is one of the key events of **Azadi Ka Amrit Mahotsav** celebrations in the coal sector, will surely bring environment sustainability in mining operations and help coal sector obtain social and environmental licence to operate, which will be very crucial in coming days when more mines will be opened up involving new players.
- Also, the Abhiyan is expected to sensitize and motivate the society and common people to take up more and more afforestation initiatives in their neighbouring areas.

Coal sector in India

- India, as a fast emerging economy, faces the twin challenges of fulfilling its commitments for decarbonizing the energy sector on the one hand and on the other, meeting the country's rising energy demand, which would primarily be reliant on coal due to its affordability and substantial indigenous availability.
- Thus, our coal sector has to play a very crucial role in the foreseeable future in fulfilling the country's energy demand for meeting various developmental needs, at the same time, be responsible towards the environment and the society.
- In this backdrop, India's coal sector has been taking several innovative initiatives to promote sustainable mining.

One of the key initiatives has been “**Go Greening**” drive in and around mining areas thereby not only ameliorating the local ecosystem but also creating additional carbon sink to mitigate the causes of climate change. Further, our coal companies are also aiming to achieve **carbon neutrality** through various environment friendly measures such as extensive plantation and adoption of clean coal technologies.

Ratification of Kigali Amendment to the Montreal Protocol

In news

Cabinet approves Ratification of Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer for phase down of Hydrofluorocarbons

Benefits

- HFC phasedown is expected to prevent the greenhouse gas emissions, helping prevent climate change and would benefit the people.
- The industry producing and consuming Hydrofluorocarbons will be phasing out Hydrofluorocarbons as per the agreed schedule under and transition to non-HFC and low global warming potential technologies.

Major Impact, including employment generation potential

- Hydrofluorocarbons. phasedown is expected to prevent the emission of up to 105 million tonne of carbon dioxide equivalent of greenhouse gases, helping to avoid up to 0.5 degree Celsius of global temperature rise by 2100, while continuing to protect the ozone layer.
- Implementation of HFC phase down under the Kigali Amendment through the adoption of low-global warming potential and energy-efficient technologies will achieve energy efficiency gains^ and carbon dioxide emissions reduction - a "climate co-benefit,"
- HFCs phase down implementation will involve synergies with on-going government programmes and schemes of the Government of India with the objective to maximize the economic and social co-benefits, besides environmental gains.
- There would be scope for domestic manufacturing of equipment as well as alternative non-HFC and low-global warming potential chemicals to enable the industry to transition to the low global warming potential alternatives as per the agreed HFC phase down schedule. In addition, there would be opportunities to promote domestic innovation for new generation alternative refrigerants and related technologies.

Details

- Under the Kigali Amendment; Parties to the Montreal Protocol will phase down production and consumption of Hydrofluorocarbons, commonly known as HFCs.
- Hydrofluorocarbons were introduced as non-ozone depleting alternative to Hydrofluorocarbons (HFCs). While HFCs do not deplete the stratospheric ozone layer, they have high global warming potential ranging from 12 to 14,000, which have adverse impact on climate.
- Recognizing the growth in use of HFCs, especially in Refrigeration and Air-conditioning sector the Parties to the Montreal Protocol, reached agreement at their 28th Meeting of the Parties (MOP) held in October 2016 in Kigali, Rwanda to add HFCs to the list of controlled substances and approved a timeline for their gradual reduction by 80-85 per cent by the late 2040s.
- India will complete its phase down of HFCs in 4 steps from 2032 onwards with cumulative reduction of 10% in 2032, 20% in 2037, 30% in 2042 and 80% in 2047.
- All amendments and adjustments of the Montreal Protocol, prior to the Kigali Amendment have Universal support.

Background

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

COP26 to be held in Glasgow in November

In news

India extends full support to the UK for a successful COP26 to be held in Glasgow in November.

Details

- The world needs higher concrete actions in terms of climate finance and technology transfer by the developed countries.
- India believes that Climate actions must be nationally determined and strongly advocates that the differentiation and operationalization of flexibility provided in the UNFCCC and the Paris Agreement for developing countries should be at the core of decision-making.
- The world needs higher concrete actions in terms of climate finance and technology transfer by the developed countries.

COP

- The COP is the supreme decision-making body of the Convention.
- All States that are Parties to the Convention are represented at the COP, at which they review the implementation of the Convention and any other legal instruments that the COP adopts and take decisions necessary to promote the effective implementation of the Convention, including institutional and administrative arrangements.

Vriksharopan Abhiyan -2021

In news

There cannot be any bigger service to nature and humanity than to plant as many saplings as possible.

Highlights

- Vriksharopan Abhiyan was launched which will spread awareness about tree plantation amongst employees, society stakeholders and motivate everyone to nurture plants in their vicinity and beautify our landscapes.
- During the programme, two eco-parks were inaugurated namely **Mudwani Dam Eco-park** of Northern Coal fields Limited in Singrauli, Madhya Pradesh and **Mine -II Eco-Park** of NLC India Ltd, Neyveli, Tamil Nadu and foundation stone was laid for two parks, namely **Jhanjra Eco-Park** of Eastern Coalfields Limited in Pachim Bardhaman, West Bengal & **Chandrashekhar Azad Orient UG No. 4 Eco-Park** of Mahanadi Coalfields Limited in Jharsuguda, Odisha.
- These eco-parks/tourism sites would provide avenues for recreation, adventure, water sport, bird watching etc. for the people residing in nearby areas and will be integrated to form part of local tourism circuit.

Solar Electric Vehicle (EV) Charging Station

In news

The Delhi-Chandigarh Highway has become the first e-vehicle friendly highway in the country, with a network of Solar-based Electric Vehicle Charging stations (SEVCs) set up by Bharat Heavy Electricals Limited (BHEL) under the FAME-1 [Faster Adoption and Manufacturing of (Hybrid) & Electric Vehicles in India] scheme of the Ministry of Heavy Industries.

Details

- India is a vibrant voice of environment security which comprises climate change, energy conservation, clean energy transition efforts, etc. and the nation's efforts in environment have started giving desired results.
- This is an important step in the direction of achieving the vision of the Hon'ble Prime Minister, he added.
- The EV charging station at Karnal lake resort, is strategically located at the midpoint of Delhi-Chandigarh highway, and is equipped to cater to all types of E- cars plying currently in the country.
- The establishment of similar EV chargers at regular intervals of 25-30 kms. on the highway will allay range-anxiety among Electric Vehicle users and bolster their confidence for inter-city travel.
- The SEVC stations are equipped with individual grid-connected rooftop solar plants that will supply green and clean energy to the charging stations.

Stockholm Water Week's

In news

The Safe Water Network, USAID and WRI India jointly convened the session on 'Making Cities Water Positive Through City Water Balance Plan' in Stockholm Water Week's first day.

Details

- Making Cities Water Positive through City Water Balance Plan e-Toolkit' was launched comprising 7 modules and 29 tools to assist the decision makers in developing and implementing solutions for making Cities Water Positive.
- The key feature of Water Resource Efficiency focused on solving the leadership crisis issue by involving app-based approach to create 14000 leaders at community level.

- They were trained on creating awareness and practicing self-monitoring system with focus on rainwater harvesting system, water availability and so on.

World Water Week in Stockholm

- World Water Week in Stockholm is a week-long global water conference held each year in late August or early September.
- Known as World Water Week, the event is organized and led by the Stockholm International Water Institute (SIWI).
- Events and conference sessions address a wide range of the world's water, development and sustainability issues and related concerns of international development.

History

- The World Water Week in Stockholm originally began as the Stockholm Water Symposium in 1991 and has been convened annually ever since.
- In 2001, the official name became World Water Week in Stockholm.
- SIWI identifies a conference theme to place a specific focus on one aspect of the world's escalating water crisis.
- Initially, one theme was promoted for 4–5 years.
- Since 2008, a different theme has been selected for each year.

Delhi's new smog tower

In news

Delhi got a 'smog tower', a technological aid to help combat air pollution

Details of tower

- The structure is 24 m high, about as much as an 8-storey building — an 18-metre concrete tower, topped by a 6-metre-high canopy. At its base are 40 fans, 10 on each side.
- Each fan can discharge 25 cubic metres per second of air, adding up to 1,000 cubic metres per second for the tower as a whole.
- Inside the tower in two layers are 5,000 filters.
- The filters and fans have been imported from the United States.

How it works?

- The tower uses a 'downdraft air cleaning system' developed by the University of Minnesota.
- IIT-Bombay has collaborated with the American university to replicate the technology, which has been implemented by the commercial arm of Tata Projects Limited.
- Polluted air is sucked in at a height of 24 m, and filtered air is released at the bottom of the tower, at a height of about 10 m from the ground.
- When the fans at the bottom of the tower operate, the negative pressure created sucks in air from the top.
- The 'macro' layer in the filter traps particles of 10 microns and larger, while the 'micro' layer filters smaller particles of around 0.3 microns.

Glaciers in Zaskar Valley

In news

The Pensilungpa Glacier (PG), located in Zaskar, Ladakh, is retreating, and a recent study has attributed the retreat to an increase in the temperature and decrease in precipitation during winters.

About the study

- Since 2015, the Wadia Institute of Himalayan Geology (WIHG), Dehradun, has been working on various aspects on glaciology, i.e., glacier health (mass balance) monitoring, dynamics; discharge, past climatic conditions, speculation for future climate change and its impact on glaciers in this region.
- A team of scientists from the institute ventured to study the less explored region of the Himalayas, i.e., Zaskar, Ladakh.
- The study suggests that due to continuous rise in the air temperature in line with the global trend, the melting would increase, and it is possible that the precipitation of summer periods at higher altitudes will change from snow to rain, and that may influence the summer and winter pattern.
- The study also points at the significant influence of debris cover on the mass balance and retreat of the glacier's endpoint, especially in summer. Furthermore, the mass balance data for the last 3 years (2016–2019) showed a negative trend with a small accumulation area ratio.

Leaded petrol now eradicated from the world

In news

There is now no country in the world that uses leaded petrol for cars and lorries, the UN Environment Programme has announced.

Details

- The toxic fuel has contaminated air, soil and water for almost a century.
- It can cause heart disease, cancer and stroke, and has been linked to problems with brain development in children.
- Most high-income countries had banned the fuel by the 1980s, but it was only in July that Algeria - the last country still to use leaded petrol - ran out.

Significance

Ending the use of leaded petrol will prevent more than one million premature deaths each year from heart disease, strokes and cancer, and it will protect children whose IQs are damaged by exposure to lead.

Background

- The alarm was raised as early as 1924, when five workers were declared dead and dozens more hospitalised after suffering convulsions at a refinery run by the US oil giant Standard Oil.
- But despite this, lead continued to be added to all petrol globally until the 1970s.
- Wealthier countries then started phasing out its use - but three decades later, in the early 2000s, there were still 86 nations using leaded petrol.
- North Korea, Myanmar and Afghanistan stopped selling leaded petrol by 2016, leaving only a handful of countries, including Iraq, Yemen and Algeria, still providing the toxic fuel in the latter half of the last decade.

Global award for turtle conservation

In news

Indian biologist Shailendra Singh has been awarded the Behler Turtle Conservation Award for bringing three critically endangered turtle conservation species back from the brink of extinction.

Details

- The award has been bestowed by several global bodies involved in turtle conservation such as Turtle Survival Alliance, IUCN/SSC Tortoise and Freshwater Turtle Specialist Group, Turtle Conservancy, and the Turtle Conservation Fund.
- In just 15 years, there are few individuals that have made such monumental contributions to turtle conservation as Shailendra Singh.
- He and his team's efforts now span much of India, impacting well over half of its turtle and tortoise species, many of which are among the most endangered turtles on the planet.

Turtle Conservation

- Turtle Survival Alliance (TSA) India is dedicated towards conserving non-marine chelonians, crocodilians and cetaceans, and functions as a field program of WCS-India through five field-based projects across the country in the Ganges and Brahmaputra River systems.
- The extirpation of turtle populations in many regions of Asia has been driven by increased market demand for turtles as food, traditional medicine, or pets, resulting in unprecedented trade and trafficking of wild turtle populations.
- The WCS-TSA-India team have been supporting the Forest Department to effectively address the challenges by employing a suite of conservation actions including ex-situ measures, and capacity building of enforcement agencies to minimize illegal turtle trade.

Manda buffalo gets 'unique breed' tag

In news

The National Bureau of Animal Genetic Resources (NBAGR) has recognised the Manda buffalo, found in the Eastern Ghats and plateau of Koraput region of Odisha, as the 19th unique breed of buffaloes found in India.

Details

- The Manda are resistant to parasitic infections, less prone to diseases and can thrive on modest resources.
- This buffalo germ-plasm was first identified through a survey conducted by the Animal Resource Development (ARD) department of Odisha in collaboration with the Orissa University of Agriculture and Technology (OUAT).
- The NBAGR, affiliated to Indian Council of Agriculture Research, made an assessment and recognised it as an indigenous and unique breed.
- Both male and female of this breed are used for ploughing and agricultural operations in Koraput, Malkangiri and Nabarangpur districts.
- Around 1,00,000 buffaloes of this breed are in the native tract mostly contributing to family nutrition of households and all the agricultural operations in the hilly terrain of the southern districts for generations.

Sukhet Model

In news

The Sukhet model is an initiative by the Dr. Rajendra Prasad Central Agricultural University (RPAU) at Pusa in Samastipur district and the brainchild of Vice-Chancellor Ramesh Chandra Srivastava, a vermicompost enthusiast.

Details

- Under the Sukhet model, two local workers visit households that have cattle to collect cow dung and farmyard waste and bring it to a vermicomposting yard.

- Any family which gives us 1,200 kgs of cow dung and wet garbage waste every two months gets their LPG gas cylinders refilled for free.
- Everyday, they have to meet the target of 20 kg of cow dung and garbage waste to avail the refill.
- The target is to take this model to 100 households of the village in first phase.

Issue

The only problem is that only those households who have cattle to give us cow dung are able to benefit from the Sukhet model.

Tamil Nadu to set up India's first Dugong Conservation Reserve

In news

The State government in Assembly declared 500 sq.km of the biodiversity-rich waters in the Palk Bay, on the southeast coast of Tamil Nadu, as India's first dugong conservation reserve.

Details

- The reserve will span the northern part of the Palk Bay from Adiramapattinam to Amapattinam.
- Marine biologists and conservationists have long demanded a reserve as the population of dugongs, as known as sea cows, in Indian waters has been dropping to dangerous levels.
- According to Wildlife Institute of India (WII) estimates, only 200-250 Dugongs are left in the wild, of which 150 are found in the Palk Bay and Gulf of Mannar in Tamil Nadu, among the last surviving natural habitats for dugongs in the world.

Dugongs

- They play a crucial role in maintaining healthy fish stock. "Dugong is the only herbivorous marine mammal on earth that feeds exclusively on seagrass.
- It consumes 40kg of seagrass daily and helps in the growth of fresh vegetation. In the absence of dugongs, seagrass will grow densely and fish will not come to lay eggs.
- In India, dugongs are found in Palk Bay, Gulf of Mannar in Tamil Nadu, Gulf of Kutch in Gujarat and Andaman and Nicobar islands.
- Dugongs generally inhabit shallow waters.

Major initiatives taken by the state

- Establishment of a Sea Cow sanctuary.
- Establishment of another Elephant sanctuary.
- Establishment of medical facilities for Emergency Critical care and rehabilitation of wildlife.
- Stricter enforcement to prevent wildlife crimes

Whale sharks, sea horses

Studies have revealed that the proposed conservation reserve supports several globally important species such as the highly-threatened whale shark, sea horses, green and hawksbill sea turtles, dolphins and sacred chanks.

First India-Japan High Level Policy Dialogue on Environment

In news

The First India-Japan High Level Policy Dialogue was held virtually on 7th September 2021 between Mr. Bhupender Yadav, Union Minister of Environment, Forest and Climate Change of India and Mr. KOIZUMI Shinjiro, Minister of the Environment of Japan

Details

- They discussed issues on Air Pollution, Sustainable Technologies and Transports, Climate Change, Marine Litter, Fluorocarbons, COP 26, etc.
- India and Japan may explore strengthening bilateral cooperation especially on circular economy and resource efficiency, low carbon technology, green hydrogen, etc.
- Environment Minister also requested Japan to consider joining the Leadership Group for Industry Transition, a global initiative spearheaded by India and Sweden.
- Both countries can strengthen bilateral cooperation through the Joint Credit Mechanism (JCM), Coalition for Disaster Resilience Infrastructure (CDRI) and could also explore collaboration in areas endorsed by the G20, especially on climate, environment and energy
- Both sides agreed to further strengthen the bilateral cooperation on environment, and also to take forward the discussion on JCM.

Mesoamerica faces floristic biodiversity loss

In news

Mesoamerica, where several important crops such as maize, beans, squash, chilli peppers and vanilla originated, is witnessing a decline in their wild relatives, according to a study published recently.

Details

- The potato is the third most important food crop in the world after rice and wheat in terms of human consumption. More than a billion people worldwide eat potato, and global total crop production exceeds 300 million metric tonnes.
- Some 224 plants closely related to maize, potato, beans, squash, chilli pepper, vanilla, avocado, husk tomato and cotton were analysed by the researchers who conducted the study.
- They found that 35 per cent of these wild species were threatened with extinction, according to a press statement by the International Union for the Conservation of Nature (IUCN).

Reason behind extinction

- The reasons for the decline included conversion of wild habitats into farms, the shift from traditional to mechanised agriculture and the use of pesticides and insecticides.
- Other threats include invasive species, contamination from genetically-modified crops, over-collection and logging.

Outcome of the study

- The wild plant groups at highest risk of extinction are Vanilla with all eight species in the region listed as 'endangered' or '**critically endangered**' on the IUCN Red List of Threatened Species.
- It is followed by cotton (*Gossypium*) — 92 per cent of its species are at risk and avocado (*Persea*) — 60 per cent of its species are threatened.
- Two groups related to maize, *Zea* and *Tripsacum*, are 44 per cent and 33 per cent threatened respectively.
- Thirty-one per cent of bean species, one out of four chilli pepper species, 23 per cent of potato species, 12 per cent of husk tomato species and nine per cent of squash species are further threatened with extinction.
- The study noted that at least 16 wild crops included in it, had been used to breed food crops that were more resilient to the changing climate, extreme weather and other threats.

Shapeshifters

Context

Climate change affects not only humans but also animals

In news

- In adapting to a warming planet, some warm-blooded animals are shapeshifting and getting larger beaks, legs and ears to better regulate their body temperatures (Trends in Ecology and Evolution).
- Strong shapeshifting has particularly been reported in birds.

Details

- Several species of Australian parrot have shown, on average, a 4%-10% increase in bill size since 1871.
- This is positively correlated with the summer temperature each year.
- North American dark-eyed juncos, a type of small songbird, had a link between increased bill size and short term temperature extremes in cold environments.
- There have also been reported changes in mammalian species.
- Researchers have reported tail length increases in wood mice and tail and leg size increases in masked shrews.

Shapeshifting

- It does not mean that animals are coping with climate change and that all is fine.
- It just means they are evolving to survive it — but we're not sure what the other ecological consequences of these changes are, or indeed that all species are capable of changing and surviving,

Way forward

- The researchers are next planning to investigate shapeshifting in Australian birds first-hand by 3D scanning museum bird specimens from the past 100 years.
- The increases in appendage size we see so far are quite small — less than 10% — so the changes are unlikely to be immediately noticeable.
- However, prominent appendages such as ears are predicted to increase.

Sheltered vultures now at home with nature

In news

In October 2020, eight critically endangered Oriental white-backed vultures were released into the wild for the first time in India from the Jatayu Conservation and Breeding Centre (JCBC) situated at the Bir Shikargah Wildlife Sanctuary in Shivalik ranges of the Himalayan foothills in Haryana's Pinjore.

Details

- A year later, they have blended well into the untamed habitat outside the aviary, offering hope to conservationists.
- But the grave threats to the survival of vultures are far from over.
- The Oriental white-backed vultures that were released in the wild are resident birds and not migratory, so they largely stay within a radius of 50-100 km of the breeding centre.
- All eight vultures were deployed with satellite tracking devices on their back, and orange-coloured wing tags on both wings, so we are able to monitor them.
- They have been bred in captivity so they will gradually adjust in the wild.

- As many as 378 vultures of three species are housed at the centre, of which 131 are Oriental white backed vultures, 195 are Long-billed vultures, and 52 are Slender-billed vultures.

Significance

- They have managed to join the wild flock with other vultures such as the Himalayan griffon, which is surely an encouraging sign.
- They are not taking sustained flights as other wild birds do, but they are gradually increasing their time of flying, which is again good.
- We need to wait for another one year.
- If they survive, then it will be an indication that the environment is safe, after which we will release other raptors as well.

97% decline

- The vulture population in India was estimated at 40 million once. Populations of three species of vultures have declined by over 97% since the 1990s, and that of the Oriental white-backed vultures by a drastic 99.9%.
- It has been established that the vulture population was decimated by the veterinary usage of Diclofenac in India.

Kolkata-based Botanical Survey of India

In news

In the 1840s, when British botanist William Griffith came across the rare holoparasitic flowering plant *Sapria himalayana* in Arunachal Pradesh, there were not enough ways to document it.

Details

- A botanical portrait of the root parasite plant with bright red flowers and sulphur yellow dots was made as early as in 1842 hundreds of miles away, near Kolkata.
- Botanical painting was crucial to the discovery of numerous other such plants, including the *Eulophia nuda*, an orchid painted by G.C.
- Dass in May 1862 at the same historic location, the Acharya Jagadish Chandra Bose Indian Botanic Garden.
- Thousands of such botanical paintings, unique and almost two centuries old, are rare and valuable not only because of the artistic talent of their Indian painters but also because they highlight the country's plant diversity.
- The Central National Herbarium of the Kolkata-based Botanical Survey of India (BSI) has the biggest collection of 3,280 large botanical painting.

Father of Indian botany

- Scottish botanist and physician, William Roxburgh (1751-1815), is also known as the father of the Indian botany for his contribution to plant taxonomy in India.
- Earlier this month, the Botanical Survey of India digitised the entire collection of Roxburgh drawings held by it.

Over 390 species of sharks in danger of extinction

In news

Overfishing, the biggest threat, is compounded by loss and degradation of habitat, pollution as well as climate change.

Stats

- Over 37 per cent of the world's sharks, rays and chimaeras are facing extinction due to overfishing, compounded by loss and degradation of habitat, climate change and pollution
- As many as 220 of the total 661 species of rays are threatened, followed by sharks (167 of 536) and chimeras (four of 52), according to the extensive survey done from 2013 to 2021.
- The chondrichthyan fishes that faced extinction more than doubled since the last global survey done in 2014 that showed 181 of a total of 1,041 species were threatened.

Details

- One ray species, the Java stingaree (*Urolophus javanicus*), may have already gone extinct according to the reclassification of threatened species by the International Union for Conservation of Nature (IUCN) earlier this year.
- The international organisation changed the status of the species to 'Possibly Extinct' from '**Critically Endangered**' in 2006 in its list of threatened species.
- This unique endemic species has not been seen since the end of the 19th century when it was discovered.

The world's coral reefs

In news

Status of Coral Reefs of the World:2020, prepared by the Australian government, said reducing local pressures on coral reefs to maintain their resilience was critical.

Study Details

- *Status of Coral Reefs of the World: 2020* was prepared by the Global Coral Reef Monitoring Network, along with the Australian government.
- There were many shocking aspects noted in the report as well. For instance, the 1998 coral bleaching event killed eight per cent of the world's coral.
- Subsequent events between 2009 and 2018 killed 14 per cent of the world's coral.
- Most declines in global coral cover were associated with either rapid increase in sea surface temperature (SST) anomaly or sustained high SST anomaly.
- There was 20 per cent more algae on the world's coral reefs in 2019 than in 2010. The increase in the amount of algae, was associated with declines in the amount of hard coral.
- The study noted that since 2010, almost all regions had exhibited a decline in average coral cover. According to estimates, coral reefs would experience further declines in the coming decades as sea temperatures arose.
- However, the increases in global coral cover between 2002 and 2009 and in 2019 offered hope.
- It showed that coral reefs globally remained resilient and could recover if conditions permitted.
- For instance, coral reefs in east Asia, which has 30 per cent of the world's coral reefs, had more coral on average in 2019 than they did in 1983. This, despite the area being affected by large-scale coral bleaching events during the last decade.

EV chargers to be mandated for new homes in England

In news

The British government is set to introduce legislation that will require all newly built homes in England to be installed with electric vehicle chargers, according to Electrek, making it the first country in the world to impose the requirement.

Details

- These are to be “smart” charging devices which can automatically charge electric vehicles during off-peak periods, it said, while adding that office complexes will be required to have one charging outlet for every five parking spaces.
- The mandate for EV chargers in homes and offices is expected to take effect in 2022
- This is part of England’s efforts towards rapidly increasing the number of available EV chargers across the country, ahead of the UK’s ban on the sale of new petrol and diesel vehicles set to take effect in 2030.
- Flexible charging at home and at the workplace during the day is going to be crucial to decarbonising not just transport, but [also] the UK’s entire energy system.

Significance

It will also boost confidence in helping those who transition from gas cars to overcome range anxiety, as so many homes in England don't have off-street parking or garages.

Biological Reclamation

In news

Coal India Ltd. (CIL), under the Ministry of Coal are not only reclaiming land to its original shape but also enhancing Green cover along with Coal Mining activity.

Details

- Emphasis is to have simultaneous back filling of land after opencast Coal Mining operation and dense plantation thereon to maintain environmental equilibrium.
- Out of many such greenfield projects, one of the largest project of CIL, Jayant Opencast Coal Project in Singrauli District of Madhya Pradesh is forging ahead with a mission of looking beyond coal mining with land restoration & enhancing green cover day by day.
- This has helped in lowering down the effect of pollution substantially & has also helped in increasing Carbon offset.

Green Cover Mission

- In line with the Green Cover Mission, massive plantation is being carried out every year in and around the project which includes reclaimed area & overburden (OB) dump areas with the help of Madhya Pradesh Rajya Van Vikas Nigam Limited (MPRVVN).
- Saplings include species such as Jamun, Jungle Jalebi, Seesam, Sirus, Mahua, Subabul, Bel, Amla, Kachnar, Karanj, Neem, Amaltas, Bamboo, Bougainvillea, Cassia, Gulmohar, Khmer, Peltophorum etc.
- All new coal projects have mandatory well laid mine closure plan which apart from other activities, becomes a guiding factor for restoration of land to its original condition after completion of mining activity.
- Action on such restoration begins right from the start of the project wherein backfilling of void by overburden becomes a major activity after mining & simultaneous plantation over the land becomes key activity for early biological restoration.

Flouride has poisoned agricultural soil, crops in Bengal

In news

A new study has pointed out how crops and vegetables that use fluoride-contaminated groundwater have been contributing to an increase in consumption of fluoride among locals.

About the study

- Groundwater in Purulia and Bankura is already known to be fluoride-contaminated, as it crosses the desirable limit of 1.5 milligram per litres of concentration as per the World Health Organization standards.
- The study investigated the magnitude of fluoride contamination in agricultural land soil and food crops in these two districts as well as its adverse impact on the health of locals.
- Farmers in Bankura and Purulia use groundwater extensively, particularly to cultivate crops during summers.
- Contaminated water, therefore, is being used to cultivate crops for years due to the lack of government intervention.
- The concentration of fluoride in groundwater above the permissible level is, therefore, a factor that contributes to the accumulation of fluoride in agricultural soil and crops, the study stated.

Stages of toxicity

- There are three stages to fluoride toxicity, according to Roychowdhury: “First, the groundwater used for agricultural purposes deposits a good amount of fluoride in the soil.
- Then this fluoride is absorbed by crops, and it enters the food chain system, causing harm to the human body.
- The study found that the accumulation of fluoride was higher in leafy and non-leafy vegetables than in pulses and cereals from both districts.
- The maximum accumulation was found in onion, while being minimum in rice.
- It also found that children were the most vulnerable to fluoride contamination due to their low body weight.

The menace of fluoride contamination

- Fluoride is an essential micronutrient and has both beneficial and detrimental effects on human health.
- However, exposure to high levels of fluoride causes dental fluorosis, skeletal fluorosis and non-skeletal fluorosis.
- Ligaments calcification, liver and kidney dysfunction, nerve weakness, developmental disorder, organ tissue damage, bending of legs, weakness, anemia, depression, gastrointestinal problems, loss of appetite, and brittle bone problems in children are some of the commonly seen health issues.
- Children mostly suffer from dental fluorosis, a condition that is largely irreversible.
- Severe skeletal and non-skeletal issues become more prominent only after several years of continuous consumption of fluoride-contaminated food.

Hybodont Shark

In news

In a rare discovery, teeth of new species of hybodontshark of Jurassic age have been reported for the first time from Jaisalmer.

Details

- Hybodont sharks have been reported for the first time from the Jurassic rocks (approximately, between 160 and 168 million-years-old) of the Jaisalmer region of Rajasthan.
- Hybodonts, an extinct group of sharks, was a dominant group of fishes in both marine and fluvial environments during the Triassic and early Jurassic time.
- However, hybodont sharks started to decline in marine environments from the Middle Jurassic onwards until they formed a relatively minor component of open-marine shark assemblages.
- Hybodonts finally became extinct at the end of the Cretaceous time 65 million years ago.
- Significantly, the newly discovered crushing teeth from Jaisalmer represent a new species named by the research team as *Strophodus jaisalmerensis*.

- The genus *Strophodus* has been identified for the first time from the Indian subcontinent and is only the third such record from Asia, the other two being from Japan and Thailand.
- The new species has recently been included in the Shark references.com, an international platform operating in association with International Union for Conservation of Nature (IUCN), Species Survival Commission (SSC), and Germany.

Significance

This discovery marks an important milestone in the study of Jurassic vertebrate fossils in the Jaisalmer region of Rajasthan, and it opens a new window for further research in the domain of vertebrate fossils.

INTERNATIONAL COASTAL CLEAN UP DAY

In news

The 36th International Coastal Cleanup Day was celebrated consecutively for the tenth year by Eastern Naval Command (ENC) on 18 Sep 21.

Details

- On the occasion, ENC undertook Coastal Cleanup Drive at Yarada Beach, Bheemili Beach and other sea fronts within premises of naval units at Visakhapatnam.
- Approximately 500 Naval personnel, Defence Civilians and their families carried out the cleanup drive following the prevailing COVID19 protocols.
- The cleanup drive was aimed at creating awareness among people to keep our beaches clean, safeguarding the environment and inculcating the habit of respecting coastlines which in turn nurtures the marine biodiversity.
- The International Coastal Cleanup began more than 30 years ago when communities rallied together with the common goal of collecting and documenting the trash littering their coastline.
- Every year, on the third Saturday in September, the International Coastal Cleanup Community encourages people around the world to remove trash and debris from beaches, waterways and other water bodies, to identify the sources of the litter, to change behaviours that cause pollution and to raise awareness on the extent of the marine debris problem.

Southern Naval Command (SNC) The Southern Naval Command observed International Coastal Clean-up Day on 18 Sep 21 with focus on mangrove plantation and clearance of plastic/non-biodegradable waste along waterfront areas in and around Kochi.

India's Clean Energy Economy

In news

A special event on '**Ambition to Impact: Opportunities for Global Collaboration in India's Clean Energy Economy**' at the United Nations High-Level Dialogue on Energy (HLDE) 2021 was co-organised by the Ministry of New and Renewable Energy, Government of India.

Details

- The webinar showcased India's efforts to achieve the 2030 Sustainable Development Agenda through a citizen-centric energy transition and focused on enhancing the speed of India's clean energy deployment through global collaboration.
- It discussed the multilateral efforts required for this transition through conducive international policies, co-development of technologies, pooled finances for demonstrations, and investments to create markets and scale up deployment.

- India is constantly engaging with international communities through global initiatives to achieve its targets.
- Apart from the Government of India, Energy Compacts have been submitted by a wide range of Indian stakeholders, including utilities, Smart Cities, and corporates from the bioenergy, renewable energy, power, e-mobility, telecom, consumer goods and FMCG, food, cement and hard-to-abate sectors.
- Corporate Energy Compacts include Adani Green Energy and Adani Transmission; Ather Energy; Bharti Airtel; Heidelberg Cement; ITC Ltd.; J K Cement; JSW Cement; Punjab Renewable Energy Systems Ltd.; ReNew Power and UltraTech Cement.

Three new heatwave hotspots in India

In news

North-Western, Central, and further to south-central region of India are the new hotspot of intense heatwave events over the past half-century.

About the study

- A study found an increase in deadly Indian heat waves in recent years.
- The study also highlights the need for developing effective heat action plans in the three heatwave hotspot regions with a focus on different vulnerabilities among the inhabitants.
- Heatwaves emerged as a deadly health hazard, claiming thousands of lives across the globe in recent decades, with episodes strengthening in frequency, intensity, and duration in the past half-century in India as well.
- This has caused severe impacts on health, agriculture, economy, and infrastructure.
- The study showed a shift in the Spatio-temporal trend of HW events from the eastern region of Gangetic West Bengal and Bihar to North-Western, Central and further to south-central region of India.
- The research also observed an alarming southward expansion and a spatial surge in SHW events in the last few decades that may put a greater population at additional risk of heat stress in a region already characterized by low Diurnal temperature range (DTR), or the difference between the maximum and minimum temperatures within one day and high humidity.
- Importantly, the HW/SHW events were found to be positively correlated with mortality in Odisha and Andhra Pradesh, highlighting that human health is highly susceptible to severe heatwave disasters.

Heat waves in India

In India Heat waves typically occur from March to June, and in some rare cases, even extend till July. On an average, five-six heat wave events occur every year over the northern parts of the country. Single events can last weeks, occur consecutively, and can impact large population. In 2016, severe heat wave conditions affected Bihar, Jharkhand, Gangetic West Bengal, Odisha, Punjab, Haryana, Chandigarh & Delhi, Rajasthan, Maharashtra, West Madhya Pradesh and Gujarat.

What is criterion for declaring heat wave in India?

Heat wave is considered if maximum temperature of a station reaches at least 40°C or more for Plains and at least 30°C or more for Hilly regions.

- Based on Departure from Normal Heat Wave: Departure from normal is 4.50°C to 6.40°C Severe Heat Wave: Departure from normal is >6.40degree C
- Based on Actual Maximum Temperature Heat Wave: When actual maximum temperature $\geq 45^{\circ}\text{C}$ Severe Heat Wave: When actual maximum temperature ≥ 47
- If above criteria met at least in 2 stations in a Meteorological sub-division for at least two consecutive days and it declared on the second day.

Monsoon shifts

In news

For the first time since 2010, India is poised to see three consecutive Septembers with excess rainfall.

Details

- Experts say that this is a sign of a change in monsoon patterns though it is too early yet to demonstrably prove that is a lasting consequence of global warming.
- As of September 24, monsoon rainfall for the month is nearly 19 cm.
- The normal for the entire month is 17 cm, and there is still a week's worth of rainfall to come.
- India Meteorological Department said that September rainfall would be stronger than usual but India would still end up with only around 96% of what's normal.
- The monsoon normally starts to withdraw by the 1st of September and completely exits by October.
- Last year, to reflect the increasingly delayed withdrawal of the monsoon, the IMD updated the beginning of the withdrawal date to September 17th.
- In both 2019 and 2020, the monsoon began its withdrawal in October and the same is expected this year too.

Global Warming

- Global warming is the long-term heating of Earth's climate system observed since the pre-industrial period (between 1850 and 1900) due to human activities, primarily fossil fuel burning, which increases heat-trapping greenhouse gas levels in Earth's atmosphere.
- The term is frequently used interchangeably with the term climate change, though the latter refers to both human- and naturally produced warming and the effects it has on our planet.
- It is most commonly measured as the average increase in Earth's global surface temperature.

Wetlands of India Portal

In news

On the occasion of Gandhi Jayanti a web portal – Wetlands of India Portal.

Details

- The portal is a single point access to all information relating to wetlands.
- The portal is a dynamic system for processing information and making it available to the stakeholders in an efficient and accessible manner.
- The portal also hosts capacity building material, data repository, videos and and information for students.
- Importantly, a dashboard for each State and UT has been developed to access the portal and populate it with information of wetlands in their administration.
- The portal would be populated by the different States and UTs and additional features may be added in the coming months.
- The portal also enables citizen engagement. Currently citizens can register themselves and upload wetland related pictures across different themes.

Wetland

- A wetland is a place where the land is covered by water, either salt, fresh or somewhere in between.
- Marshes and ponds, the edge of a lake or ocean, the delta at the mouth of a river, low-lying areas that frequently flood—all of these are wetlands.

Aerosol sources in central Himalayan region

In news

Mineral dust, biomass burning, secondary sulfate, secondary nitrate from northwest India and Pakistan, polluted cities like Delhi, the Thar Desert, and the Arabian Sea area, and long-range transported marine mixed aerosols are the main sources of aerosols in the central Himalayan region, shows a study

Details of the finding in study

- This dust transport and forest fires are the main sources of total suspended particles (TSP), particularly in pre-monsoon period (March-May) when TSP concentration peaks in the region.
- The study on source apportionment of atmospheric pollution, which elucidates the atmospheric chemistry, emission source origins, and transport pathways of aerosol over the central Himalayan region, will help assessment of contributions and temporal variability of sources that influence the area through regional transport as well as climate impacts assessment.
- With a unique role in the Asian climate, the Himalayan region is considered a vulnerable environment.
- The researchers also suggested a significant effect of biomass-burning aerosols, while the relatively high water-soluble organic carbon and significant contributions of biomass burning, secondary, or aged organic aerosols over Nainital.

China launches biodiversity fund

In news

Chinese President Xi Jinping announced the launch of a 1.5 billion yuan (\$232.47 million) fund to support biodiversity protection in developing countries, as talks continue on a new post-2020 global pact to tackle species loss.

Details

- Beijing — the world's biggest polluter — has sought to play a more prominent role internationally on biodiversity conservation in recent years.
- Global spending to protect and restore nature needs to triple this decade to about \$350 billion annually by 2030 and \$536 billion by 2050 to meet this target.
- He also announced a new national park scheme that would bring a land area of 230,000 square km (88,800 square miles) under stronger state protection.
- The parks - which cover China's panda, tiger and leopard habitats as well as key nature reserves near the headwaters of the Yangtze, Yellow and Mekong rivers in the northwest - are home to nearly 30 percent of the key terrestrial wildlife species found in the country.
- COP15 needs to see donor countries from the developed world contributing in this regard.

Geospatial Energy Map of India

In news

NITI Aayog in collaboration with Indian Space Research Organisation (ISRO) has developed a comprehensive Geographic Information System (GIS) Energy Map of India with the support of Energy Ministries of Government of India.

Aim

It is a unique effort aimed at integrating energy data scattered across multiple organizations and to present it in a consolidated, visually appealing graphical manner.

Details

- The GIS map provides a holistic picture of all energy resources of the country which enables visualisation of energy installations such as conventional power plants, oil and gas wells, petroleum refineries, coal fields and coal blocks, district-wise data on renewable energy power plants and renewable energy resource potential, etc through 27 thematic layers.
- The map attempts to identify and locate all primary and secondary sources of energy and their transportation/transmission networks to provide a comprehensive view of energy production and distribution in a country.
- It leverages latest advancements in web-GIS technology and open-source software to make it interactive and user friendly.
- The Geospatial Energy Map of India will be useful in planning and making investment decisions. It will also aid in disaster management using available energy assets.

Arctic melt

In news

A new study has now put a timeline to an impending disaster: If carbon emissions continue at current levels, summer ice will disappear by 2100 — and, along with it, creatures such as seals and polar bears.

The study

The researchers looked at two scenarios

- **Optimistic (if carbon emissions are brought in check):** By 2050, summer ice in this region will dramatically thin. Under the optimistic scenario, some summer ice could persist indefinitely.
- **Pessimistic (if emissions continue as they are) :** Under the low-emissions scenario, ice from even the central Arctic will wane by mid-century, and will no longer endure through the year. Locally formed summer ice will persist in what is known as the Last Ice Area, but will now be only a metre thick.

The implications

- The study forecasts that under the low-emissions scenario, at least some seals, bears and other creatures may survive.
- These species currently exist under similar summer conditions along western Alaska and parts of Hudson Bay.
- However, under the higher-emissions scenario, by 2100, even the locally formed ice will disappear in summer, the study has found. With no summer ice anywhere, there will be no ice-dependent ecosystems.

Ayush Van

In news

Union Minister of Ports, Shipping and Waterways and AYUSH inaugurated Ayush Van, a dedicated forest for Ayurvedic plants in a program held at the Deendayal Port Trust (DPT)– Rotary Forest in the city.

Details

- The Ayush Van was set up in 30 acres of land allotted by DPT in green-belt area where tree plantation is being done to improve greenery in urban area and increase density of tree cover in the Kutch region.
- Ayush Van is a dedicated forest for the Ayurvedic Plants.
- Medicinal plants of India are now becoming one of the major systems of well being that are being accepted globally.

Ministry of Ayush in India

- The Ministry of Ayush was formed on the 9th of November 2014 with a vision of reviving the profound knowledge of our ancient systems of medicine and ensuring the optimal development and propagation of the Ayush systems of healthcare.
- Earlier, the Department of Indian System of Medicine and Homoeopathy (ISM&H) formed in 1995, was responsible for the development of these systems.
- It was then renamed as the Department of Ayurveda, Yoga, and Naturopathy, Unani, Siddha and Homoeopathy (Ayush) in November 2003 with focused attention towards education and research in Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homoeopathy.

Bio-Economic Hub

In news

Union Minister Dr Jitendra Singh says, North East to be developed as India's Bio-Economic Hub.

Aim

This Mission that aims to promote the documentation, scientific validation and evaluation of traditional healthcare practices is an important step and assumes special significance in the context of the vast plant resources and diverse traditional healthcare practices of the North-East.

Details

- The Eastern Himalayan Region is one of the mega-biodiversity rich zones and is among the 34 biodiversity Hotspots of the world.
- There is a need to put these invaluable genetic resources to use for the economic growth of the region in particular and to the nation in general, through biotechnological interventions.
- India's Bio-Economy is on its way to achieve 150-billion-dollar target from the current 70 billion-dollar by 2025 and will contribute effectively to the Prime Minister's vision of a 5 trillion-dollar economy by 2024-25.

Zero Waste Cities Challenge

In news

Guwahati has 2 winners for work on waste models.

Details

- Five months ago, Guwahati was among the three cities chosen by WasteAid, a United Kingdom-based non-profit, to launch a Zero Waste Cities Challenge.
- The aim was to find entrepreneurs with innovative business ideas that can help reduce or recycle waste and create green employment opportunities.
- The non-profit has now chosen two winners — entrepreneurs from Shree Guru Plastic and Inside Out — for their work on promoting circular economy and reducing the usage of plastics.

Circular Economy

- Circular economy is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products for as long as possible.
- It aims to tackle global challenges such as waste, pollution, climate change and biodiversity loss.

India's Third Biennial Update Report at COP26

In news

The Government of India presented the third Biennial Update Report at the COP26 which was submitted early this year to the UNFCCC.

Key Highlights

- This presentation was made during the 11th Facilitative Sharing of Views (FSV).
- The achievement of 24 per cent reduction in emission intensity of its Gross Domestic Product (GDP) over the period of 2005-2014, and the significant increase of its solar programme.
- The scientific advisor, on behalf of the Government of India, stated certain facts that determined India's approach in tackling the serious issue of climate change.
- It was stated that India represents 17% of the total world population and it accounts for only 4% of cumulative emissions.
- India's present greenhouse gas emissions (GHG) are about 5%.
- Moreover, it was put forth that India has been proactive in mitigating the challenges imposed by climate change and such measures move across the socio-economic spheres. For instance, decoupling of economic growth from greenhouse gas emissions has been of major importance.
- India's 15 per cent of total carbon dioxide emission in 2016 was removed from the atmosphere by the LULUCF (Land Use, Land-Use Change and Forestry).
- The importance of people's participation in dealing with climate change was also talked about.

Green Energy Collaboration

In news

UK has emerged as India's second largest international research and innovation partner.

Objectives of the Collaboration

- To increase cooperation between India and the UK in the areas of clean and green energies
- Promote the use of advanced batteries
- Use of carbon capture method to reduce air pollution and infusing better technology in this area
- Production of hydrogen-related fuels
- Encourage the affordability of biomaterials, improvement of livestock research

Highlights

- India will join G20 troika in few days from 1st December this year and will hold the G20 presidency from December 1, next year and India plans to convene the G20 leaders' summit in 2023 for the first time.
- It was rightly pointed out that the Newton – Bhabha MoU, which was signed between India and UK, took scientific cooperation to the next level and opened up avenues for research in energy security, food and agriculture, water, health, climate change. The present collaboration acts as a further boost to these areas of cooperation.
- India is assured to establish a One Health approach and put forth a Global Equitability for Health Infrastructure Development to counter pandemic-like situations.

India's flagship initiatives

- National Mission on Interdisciplinary Cyber Physical Systems(ICPS)
- Quantum Computing and Communication
- National Mission on Supercomputing
- Deep Ocean Mission

- Electric Mobility
- Green hydrogen etc.

The USA Becomes the 101st Member of the International Solar Alliance

In news

- The US Special Presidential Envoy, in the COP26 Summit, made a landmark declaration confirming the membership of the USA to the International Solar Alliance.
- U.S becomes the 101st country to sign the framework agreement of the ISA to catalyze global energy transition through a solar-led approach.

Background

Earlier at COP26, the United States also joined the Steering Committee of the GGI-OSOWOG comprising of 5 members – USA, Australia, France, the United Kingdom, and India — and endorsed the One Sun Declaration along with 80 countries.

About The International Solar Alliance

- The ISA is an intergovernmental treaty-based organization with a global mandate to catalyze solar growth by helping to reduce the cost of financing and technology.
- ISA is the nodal agency for implementing **One Sun One World One Grid (OSOWOG)**, which seeks to transfer solar power generated in one region to feed the electricity demands of others.
- **OSOWOG** envisions building and scaling inter-regional energy grids to share solar energy across the globe, leveraging the differences of time zones, seasons, resources, and prices between countries and regions.
- It will also help decarbonize energy production, which is today the largest source of global greenhouse gas emissions.

India Launches E-Amrit Portal on Electric Vehicles at COP26

In news

The Government of India launched the E-Amrit web portal on electric vehicles at the COP26 Summit in Glasgow.

Aim

- The e-AMRIT portal aims at creating awareness about electric mobility in India.
The e-AMRIT portal aims to accelerate the initiatives of the government on raising awareness of electric vehicles and sensitizing consumers on the benefits of adopting electric vehicles.
- The e-AMRIT portal aims to be an accelerator of change and influence millions of users and stakeholders to adopt electric vehicles.
- The portal has been built to address the needs and priorities of future electric vehicle users, early electric vehicle adopters, academia, government, industry, research community, and businesses.

Objective

- The important purpose of the E-Amrit portal is to increase awareness about electrical vehicles and encourage people to switch to such vehicles.
- To ensure the decarbonization of transport with the introduction of electric mobility that would assist in reducing the carbon footprint.
- Initiatives like the launch of the E-Amrit portal will play a pivotal role in increasing the pace of zero emission vehicle transition and also address the challenges.

- NITI Aayog intends to add more features and introduce innovative tools to make the E-Amrit portal more interactive and user-friendly.

Details

- E-Amrit is a one-stop destination for all information on electric vehicles—busting myths around the adoption of EVs, their purchase, investment opportunities, policies, subsidies, etc.
- The portal has been developed and hosted by NITI Aayog under a collaborative knowledge exchange programme with the UK government and as part of the UK–India Joint Roadmap 2030, signed by the Prime Ministers of the two countries.
- E-Amrit intends to complement initiatives of the government on raising awareness on EVs and sensitizing consumers on the benefits of switching to electric vehicles.

2030 Vision: India and the UK are committed to a partnership that delivers for both countries.

Both nations recognize that the 2030 vision is for establishing revitalized and dynamic connections between its people. It aims at **strengthening collaboration on clean transport, including in the areas of e-vehicles, charging infrastructure and battery storage.**

Enhancing Steel Intensity towards Green Steel

In news

The Government of India decided to enhance Steel intensity in the Rural sector and move towards **“Green Steel” or “Low Carbon Steel”** manufacturing to make India a Manufacturing Hub.

Vision

The government is developing a long-term action plan and policies. Many targets have been set in the National Steel Policy 2017 vision to expand India’s steel production capacity to 300 million tonnes by 2030-31, per capita steel consumption to 160 kg, and reduce greenhouse gas emissions

Objectives of the govt. move

- To achieve the roadmap of carbon neutrality by 2050
- To develop a multi-track approach
- Establish carbon recycling blast furnace and CCU (Carbon capture and utilization) and direct hydrogen ironmaking
- To promote industry-leading electric arc furnace technology
- Better R&D facilities by introducing new technologies.

Why there is, need to switch?

The iron and steel industry in India is the greatest single energy consumer and CO₂ emitter in the industrial sector, it is imperative that the steel industry shift to **“Green Steel” or “Low Carbon Steel”** manufacturing to combat climate change.

Government Initiative

- To minimise the steel industry’s reliance on coal, the government is working on projects such as coal gasification and the National Hydrogen Mission. This will not only reduce the steel industry’s reliance on coal, but it will also aid in the reduction of greenhouse gas emissions.
- Steel is a key component of our contemporary society, used in various things ranging from cutlery to bridges and wind turbines. However, the method of manufacturing by using coal has exacerbated climate change.

Green Steel

- Green steel is steel with the lowest carbon footprint currently possible, which varies from producer to producer and will continue to evolve over time.
- Steel-making requires stripping oxygen from iron ore to produce pure iron metal.
- In traditional steel-making, it is done by using coal or natural gas in a process that releases CO₂.
- In green steel production, hydrogen made from renewable energy replaces fossil fuels.

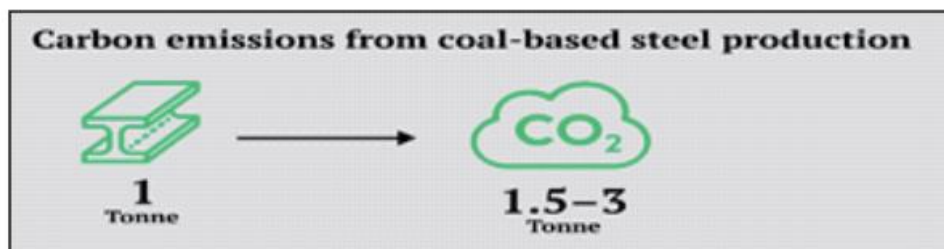


Fig: Steel production today accounts for 8% of total global CO₂ emissions

Change in Course of Himalayan Glacier

In news

Indian researchers studying an unnamed glacier in one of the less explored region in the upper Kali Ganga valley, Pithoragarh district, Uttarakhand, India, have reported that the glacier had abruptly changed its main course.

Observations

- It is for the first time that such change in course has been reported from a Himalayan glacier, and the researchers have attributed this to the accumulated influence of both climate and tectonics.
- A team of scientists from Wadia Institute of Himalayan Geology (WIHG), Dehradun, Uttarakhand, an autonomous institute under the Department of Science & Technology, Government of India, found that the unnamed NE moving glacier had been abruptly truncated and forced to move towards SE.
- The WIHG team observed that the 5 km long unnamed glacier, which covered around 4 km² area in Kuthi Yankti valley (Tributary of Kali River), has abruptly changed its main course. It moved, truncated, and ultimately merged with the adjacent glacier named Sumzurkchanki as a result of tectonic forcing during the time between Last Glacial Maxima (19-24 ka) and Holocene.
- It is one of the unique behaviors of the glacier, and no such observation has so far been reported on this type of glacier kinematics.
- Remote sensing and an old survey map confirmed the active fault on the glacier.

Significance

- The abnormal behaviour of this unnamed glacier clearly suggests that not only is climate a controlling factor, but tectonics also plays an important role in glacial catchments.
- The recent disaster in Rishiganga is a latest example which suggests that the rock mass on which the glacier was sitting gradually became fragile (due to weathering, percolation of meltwater in joints, crevasses, freezing and thawing, snowfall, overloading, and gradually operating tectonic forces forcing rocks to mechanical disintegration) with due course of time and detached from the source rock.
- It clearly suggests that the Himalaya is an active mountain range and highly fragile where tectonics and climate play a critical role.

E-Amrit Portal

In news

India today launched 'E-Amrit', a web portal on electric vehicles (EVs), at the ongoing COP26 Summit in Glasgow, UK.

Details

- E-Amrit is a one-stop destination for all information on electric vehicles—busting myths around the adoption of EVs, their purchase, investment opportunities, policies, subsidies, etc.
- The portal has been developed and hosted by NITI Aayog under a collaborative knowledge exchange programme with the UK government and as part of the UK–India Joint Roadmap 2030, signed by the Prime Ministers of the two countries.
- E-Amrit intends to complement initiatives of the government on raising awareness on EVs and sensitizing consumers on the benefits of switching to electric vehicles.
- In the recent past, India has taken many initiatives to accelerate the decarbonisation of transport and adoption of electric mobility in the country.
- Schemes such as FAME and PLI are especially important in creating an ecosystem for the early adoption of EVs.

Right to burn fossil fuels

In News

The crux of the theoretical argument is that since India has neither historically emitted nor currently emits carbon anywhere close to what the global North has, or does, in per capita terms, and thus it has no reason to commit to declining dependence on coal, at least in the near future.

The Argument against Coal

- Renewable alternative: Economic development requires energy but that does not translate into energy by burning coal. We have other cleaner forms of energy available. The Argument in favour of coal is on account of its cost, reliability and domestic availability alone. With the reduction in the prices of renewable energy, this argument has diminished.
- Lower Cost of electricity: from renewable energy sources has been declining sharply over the last decade and is already less than fossil fuel--based electricity generation.
- High degree of Reliability: variability of such sources to a large extent and, with technological progress.
- The abundance of renewable natural resources: in the tropical climate can give India a head start in this competitive world of technology. India has no dearth of solar energy.
- South--South collaborations: These can further help India avoid the usual patterns of trade between the North and the South, and may help address the issue of surplus labour provide decentralised access to clean energy to the poor and it simultaneously addresses the issues of employment, technology, energy poverty and self -reliance.

WAY FORWARD:

- Working class must demand greener path from the global elite: The need of the hour is a global progressive agenda that does not pit the working class of the North against the South but the working people of the world as a whole resisting the global ruling elite in its aggressive and dangerous model of competitive emissions.
- Chalking out an independent, greener path to development may create conditions for such negotiations and give the South the moral high ground to force the North to come to the table, like South Africa did at Glasgow.

Partial Eclipse of the Moon on 19 November

In news

A partial eclipse of the Moon will occur on 19 November, 2021 (28 Kartika, 1943 Saka Era).

Details

- From India, just after moonrise, ending of partial phase of the eclipse will be visible for a very short span of time from extreme north eastern parts of Arunachal Pradesh and Assam.
- According to IMD sources, the Eclipse will be visible in the region covering western Africa, western Europe, North America, South America, Asia, Australia, the Atlantic Ocean and the Pacific Ocean.
- The partial phase of the eclipse will begin at 12h 48m IST. The partial phase will end at 16h 17 m IST.
- The next lunar eclipse will be visible from India on 8 November, 2022. It will be a total lunar eclipse.

Lunar Eclipse

- Lunar eclipse occurs on a full moon day when the Earth comes in between the Sun and the Moon and when all the three objects are aligned.
- A total lunar eclipse will occur when the whole Moon comes under the umbral shadow of the Earth and the partial lunar eclipse occurs when only a part of the Moon comes under the umbral shadow of the Earth.

Looking beyond the Forest Rights Act

In News

The Forest Rights Act (FRA) has been in existence for 15 years but many forest dwellers across India are in vulnerable condition due to improper implementation of FRA.

Forest Rights Act

- The Act provides for democratic tenets in the implementation process.
- Gram Sabha: FRA requires the constitution of a Forest Rights Committee comprising members from within the village by conducting a Gram Sabha with two-thirds of the members present at the meeting.
- The FRA provides for equal rights in titles issued under the Act for women. They have the equitable role at every stage of decision-making.
- Satellite image, as an evidence of ownership of titles is allowed. Whereas there can be other types of evidences as well.

Concerns associated with the act

- The supporters of tribal rights allege that the Department is overlooking the genuine claims of the tribal people.
- The process was not followed in many places. These committees were mostly constituted by the Panchayat Secretaries upon the directives received from District Magistrates at short notice. The nominations for members for the taluk-level and district-level committees were also not transparent.
- On the ground, the women were hardly visible in the Panchayats and ownership of titles.
- It was disappointing that in the initial stages of implementation, there was insistence on satellite images as evidence while other admissible proofs were ignored, as happened in Gujarat.

- Welfare and developmental schemes of the Rural Department were not extended everywhere to the tribal people who received documents of land possession under the FRA despite the directives issued by the Ministry to treat them on a par with others.
- Poor awareness levels among the tribal people proved to be a handicap, especially in the scheduled areas which are remotely located. To effectively present claims, a fair understanding of the Act and its implementation process is necessary.
- Involvement of NGOs was missing in some interior areas in States like Chhattisgarh where insurgency was affecting the lives of the people.

Challenges

- Many tribal areas are witnessing a decline in the quality of forest produce in their vicinity, thus forcing them to look for other sources of livelihood.
- In Chhattisgarh, in many villages, earnings from activities such as collection of tendu leaves for rolling local cigars were affected when there was an influx of labourers from Bihar who were willing to work for low wages.
- Poor market and exploitation by local traders/middlemen were no less demoralising.
- Possessed forest lands (including the lands recognised under the FRA) that are small, of poor quality (particularly lands located on hill slopes) and are not very fertile.
- The lack of irrigation facilities forces them to depend only on rainfall.
- On the Human Development Index, the tribal-populated States always rank lower than the national average.

Way Forward

- NGO representatives working in the tribal areas believe that the livelihoods of the locals would improve if horticulture practices are promoted in addition to bamboo and aloe vera plantations with an assured market.
- A popular recommendation is medical and ecotourism along the lines of the Kerala model.
- Schemes and programmes already drafted for the tribal people must be implemented in letter and spirit across the country. With protective laws like the Panchayats (Extension to Scheduled Areas) Act, 1996, in place, it is only a matter of will.
- Induct people who are sensitive to the cause of tribal people in the decision-making process at every stage.
- To improve the condition of the tribal people, especially those living in remote areas, there needs to be a push on every possible aspect of their socioeconomic life.

Early Warning System for Landslides

In News

Geological Survey of India (GSI), Ministry of Mines in collaboration with the British Geological Survey (BGS) under the National Environmental Research Council (NERC), UK funded, multi-consortium LANDSLIP project has developed a prototype regional Landslide Early Warning System (LEWS) for India,

About LANDSLIP project

- The project is currently being evaluated and tested by GSI in two pilot areas in India (Darjeeling district, West Bengal, and the Nilgiris district, Tamil Nadu).
- GSI through the LANDSLIP project is engaged in developing an experimental regional Landslide Early Warning System (LEWS) based on rainfall thresholds since 2017.
- The LANDSLIP is currently in the process of transferring the above tools of regional LEWS to the national nodal agency (GSI) for carrying out a similar endeavour in multiple landslide-prone states in India.

Geological Survey of India (GSI)

- It was set up in 1851 primarily to find coal deposits for the Railways.
- Over the years, it has not only grown into a repository of geo-science information required in various fields in the country but has also attained the status of a geo-scientific organisation of international repute.
- The main functions of the GSI relate to creation and updation of national geo-scientific information and mineral resource assessment.
- It is headquartered in Kolkata and has six regional offices located at Lucknow, Jaipur, Nagpur, Hyderabad, Shillong and Kolkata. Every state has a state unit.
- Presently, GSI is an attached office to the Ministry of Mines.

Cyclone Jawad

In News

The Prime Minister chaired a meeting to review the preparedness plan to tackle the aftermath of Cyclone Jawad that is likely to approach the Andhra Pradesh-Odisha coast.

Cyclone Jawad

- The IMD has notified that there is a low pressure created in the south eastern part of the Bay of Bengal.
- This results in the concentration of depression and ultimately gets intensified to a cyclonic storm which is likely to strike the Andhra Pradesh – Odisha coast with an estimated wind speed of 100 km/hour.
- The cyclone is named Jawad by Saudi Arabia and it means generous or merciful.

Cyclones Naming

- India, Bangladesh, Myanmar, Pakistan, Maldives, Oman, Sri Lanka and Thailand decide the names of cyclones in the region.
- The countries submit a list of cyclone names from time to time to choose the names from the pool.
- While selecting names for cyclones, countries first analyse them to see if the word is easily understood by people in the region, hence the names are generally familiar words.

Air pollution

In News

Air pollution in parts of central-western India and north India increased during the pandemic in contrast to the general trend.

Major Findings

- Satellite observations show that parts of central-western India and north India showed an increase in pollution contrary to the general trend in that a reduction in economic activities had caused a decrease in air pollution in most parts of India.
- Scientists at the Aryabhata Research Institute of Observational Sciences (ARIES) utilized the EUMETSAT and NASA satellite observations for the years 2018, 2019, and 2020.
- The study has shown that **ozone**, **carbon monoxide**, and **NO₂** showed an increase of about 15% over the central-western part of India.

Swachh Bharat Mission (Urban) 2.0 and AMRUT 2.0 to make the cities garbage free and water secure during the mission period of five years (2021-2026).

In News

The major focus of Swachh Bharat Mission (Urban) 2.0 [SBM (U) 2.0] and AMRUT 2.0 launched on 1st October, 2021 is to make the cities garbage free and water secure during the mission period of five years (2021-2026).

The highlights of SBM (U) 2.0 are as under:

- All households and premises segregate their waste into “wet waste” (from kitchen and gardens) and “dry waste” (including paper, glass, plastic, and domestic hazardous waste and sanitary waste wrapped separately);
- 100% door to door collection of segregated waste from each household/ premise;
- 100% scientific management of all fractions of waste, including safe disposal in scientific landfills;
- all legacy dumpsites remediated;
- all used water including faecal sludge, is safely contained, transported, processed and disposed so that no untreated faecal sludge and used water pollutes the ground or water bodies, in cities with less than one lakh population;
- phased reduction in use of single use plastic.

The highlights of AMRUT 2.0 are as under:

- Universal coverage of water supply from 500 cities to about 4,800 statutory towns.
- Focus on making the cities ‘self-reliant’ and ‘water secure’.
- Universal coverage of sewerage and septage management in 500 AMRUT cities.
- Target to provide 2.68 crore drinking water tap connections and 2.64 crore sewer connections.
- Focus on financial sustainability of Urban Local Bodies (ULBs) through enhanced credit worthiness and market borrowing.
- ‘**Pey Jal Survekshan**’ will be undertaken in cities to promote healthy competition among them and function as monitoring tool and Mission accelerator.
- AMRUT 2.0, reforms on water conservation envisages recycle of treated wastewater to meet 20% of the total city water demand and 40% of industry water demand in aggregate at the state level.

Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)

In News

ICAO decided to implement a Global Market Based Measure (GMBM) scheme in the form of Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) to address CO2 emissions from international civil aviation.

About the scheme

- The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) is a global market-based measure designed to offset international aviation CO2 emissions in order to stabilize the levels of such emissions.
- The offsetting of CO2 emissions will be achieved through the acquisition and cancellation of emissions units from the global carbon market by airplane operators.
- CORSIA does not apply to domestic aviation. Under it, aircraft operators will begin monitoring their emissions from international flights and begin acquiring offsets for their emissions growth.

Climate Change makes children vulnerable to infectious diseases: Study

In News

Scientists have found that climate parameters accounted for 9-18% of the total infectious disease cases in a study to probe the association between climate parameters and infectious diseases in children under 16-years-of-age in Varanasi-city in central Indo-Gangetic Plane.

Findings of the study

- Globally, it is estimated that children are to bear most of the burden of disease due to climate change, with the poorest disproportionately affected. The higher risk associated with children is due to the combination of physiological vulnerability as well as the risk of exposure.
- A study was undertaken for the first time over the central Indo-Gangetic Plain region DST-Mahamana Center of Excellence in Climate Change Research, BHU, explored the association between climate parameters and infectious diseases in a three-year follow-up prospective cohort of 461 children under 16-years-of-age in Varanasi city.
- The researchers established that climate parameters like temperature, humidity, rainfall, solar radiation, and wind speed were significantly associated with the infectious diseases-- gastrointestinal diseases, respiratory diseases, vector-borne diseases, and skin diseases, in children in Varanasi.
- Maximum temperature and humidity (absolute/relative) are important climate drivers.
- This study further added that climate parameters accounted for 9-18% of the total infectious disease cases, while non-climate parameters account for the rest.
- Upper respiratory tract infection (mostly cold and flu) and gastrointestinal infections (mainly diarrhea) constitute 78% of the disease burden. Socio-economic conditions and child anthropometry modified the climate-disease association with high proportion of children found suffering from stunting, wasting, and underweight conditions.
- Findings from this study draw the attention of government and policymakers to prioritize effective measures for child health as the present association may increase disease burden in the future under climate-change scenarios in already malnourished pediatric population through multiple pathways.

India co-chairs Global Methane Initiative Steering Leadership Meeting

In News

A Steering Leadership meeting of Global Methane Initiative (GMI) has been held virtually.

About GMI

- **Global Methane Initiative(GMI)** is a voluntary Government and an informal international partnership having members from 45 countries including the United States and Canada. The forum has been created to achieve global reduction in anthropogenic methane emission through partnership among developed and developing countries having economies in transition.
- The forum was created in 2004 and India is one of the members since its inception and has taken up Vice-Chairmanship for the first time in the Steering Leadership along with USA. The Chairperson of the Steering Leadership is from Canada.
- Several decisions including holding of next round of meeting in near future were taken. Both Canada and the US appreciated the actions taken by India in reducing and harnessing methane gas.

Heavy Metal in Rivers

In News

Samples taken from two-thirds of the water quality stations spanning India's major rivers showed contamination by one or more heavy metals, exceeding safe limits set by the Bureau of Indian Standards.

Major Findings

- Central Pollution Control Board (CPCB) in association with State Pollution Control Boards/Committees in different States/Union Territories (UTs) have been monitoring water quality of rivers and other water bodies, across the country through a network of 4294 monitoring stations under the National Water Quality Monitoring Programme.
- The monitoring is conducted and samples analyzed for various physico-chemical, micro- biological and micro-pollutants (metals & pesticides) parameters as per Guidelines for Water Quality Monitoring, 2017 issued by Ministry of Environment, Forest & Climate Change (MoEF&CC).
- The concentration range of various heavy metals such as Arsenic (Ar), Cadmium (Cd), Copper (Cu), Lead (Pb), Chromium (Cr), Nickel (Ni), Zinc (Zn), Mercury (Hg), Iron (Fe) and Manganese (Mn) observed in major rivers of the country during the year 2020.
- As per the Provisions of Environment Act, 1986 and Water Act 1974, industrial units are required to install effluent treatment plants (ETPs) and treat their effluents to comply with stipulated environmental standards before discharging into river and water bodies.
- As per the orders of NGT, regular review on implementation of action plans is undertaken in the States/UTs and also at Central level.

6th India Water Impact Summit

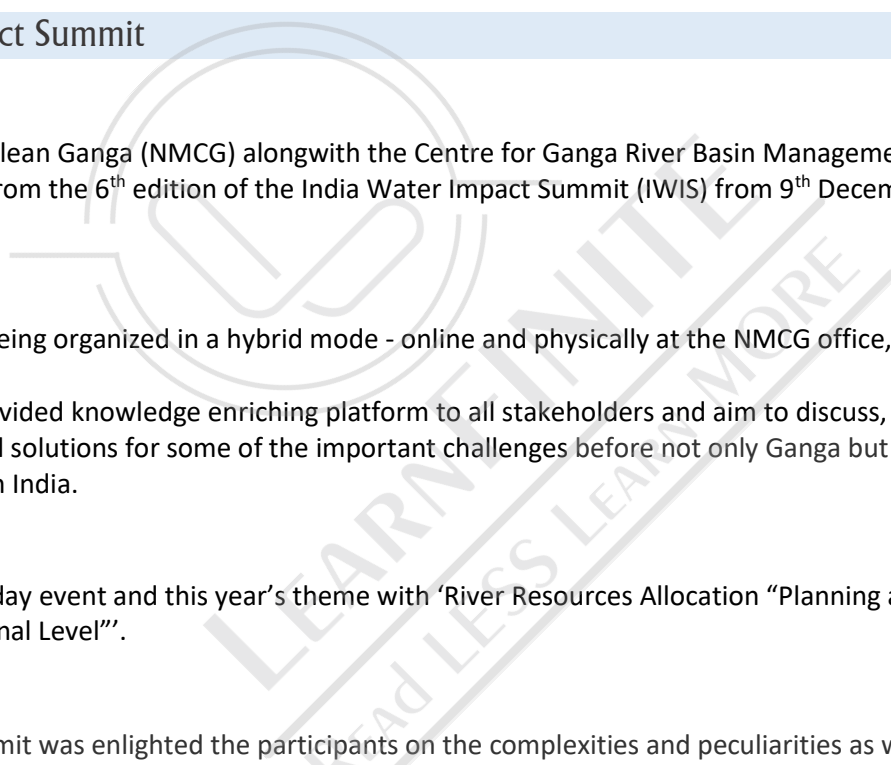
In News

The National Mission for Clean Ganga (NMCG) alongwith the Centre for Ganga River Basin Management and Studies (c-Ganga) was organized from the 6th edition of the India Water Impact Summit (IWIS) from 9th December to 14th December 2021.

Aim

- The summit was being organized in a hybrid mode - online and physically at the NMCG office, New Delhi and IIT, Kanpur.
- The IWIS 2021 provided knowledge enriching platform to all stakeholders and aim to discuss, debate and develop the model solutions for some of the important challenges before not only Ganga but all rivers and the water sector in India.

Theme

The IWIS 2021 was a five-day event and this year's theme with 'River Resources Allocation "Planning and Management at the Regional Level"'.


Focus

- This year the Summit was enlightened the participants on the complexities and peculiarities as well as the scales of managing the rivers across the basin.
- The systematic assessment, planning, and management of river resources for various human requirements was ensure healthy rivers and scope for optimal and sustainable development by providing municipal water supplies, hydro-energy, recreation and tourism, irrigation, commercial navigation, fisheries, waste management and flood management.

Impact of Global Warming on Atmosphere

In News

The analysis of past data of cyclones over North Indian Ocean (Bay of Bengal and Arabian Sea) during the period from 1891 to 2020 indicates that, frequency of Very Severe Cyclonic Storms has increased in recent few years over the Arabian Sea.

Impact of Cyclones

- The number of Cyclones and Number of stations reported very heavy and extremely heavy rainfall events have increased in recent years.
- The increase in frequency over the Arabian Sea has not posed a corresponding increase in the coastal vulnerability along the west coast since most of such Cyclones forming over the Arabian Sea are making landfall over the coasts of Oman, Yemen etc and hence the threat to Gujarat & Maharashtra coasts remains same.
- On an average, out of 5 Cyclones developing over the North Indian Ocean (NIO) comprising Bay of Bengal and Arabian Sea, about 3 to 4 of them make landfall causing loss of life and property. Low lying coastal belts of West Bengal, Odisha, Andhra Pradesh and Tamil Nadu & Puducherry are more prone to the impact of these systems.
- The number of deaths due to cyclones has decreased significantly.
- **The Heat Action Plan** is a comprehensive early warning system and preparedness plan for extreme heat events. The Plan presents immediate as well as longer-term actions to increase preparedness, information-sharing, and response coordination to reduce the health impacts of extreme heat on vulnerable populations.
- IMD has started **Forecast Demonstration Project** (FDP) on heat waves from April 2017 for the hot weather season under which a detailed daily report including realized data of heat waves, weather systems leading to the occurrence of heat waves, diagnosis on the basis of Numerical Model outputs and forecast and warnings for five days is prepared.

The Dam Safety Act 2021

In News

The Rajya Sabha passed the landmark Dam Safety Bill (2019), paving the way for enactment of the Dam Safety Act in the country.

Issue

- After China and USA, India is the 3rd largest dam-owning nation in the world.
- There are around 5,700 large dams in the country, of which about 80% are already over 25 years old.
- Nearly 227 dams that are over 100 years old are still functional.

The Act provides for

- Adequate surveillance, inspection, operation, and maintenance of all the large dams in the country so as to prevent dam failure related disasters.
- An institutional mechanism at both Central and State levels to address structural and non-structural measures required for ensuring the safe functioning of dams.

The provision of the Act

- A National Committee on Dam Safety (NCDS) will be constituted to help evolve uniform dam safety policies, protocols, and procedures.
- A National Dam Safety Authority (NDSA) as a regulatory body for ensuring the nationwide implementation of dam safety policies and standards will be established.
- At the State level, the Act prescribes for the constitution of State Committees on Dam Safety (SCDS) and the establishment of the State Dam Safety Organizations (SDSO).
- The Dam Safety Act also addresses in a comprehensive manner, critical concerns related to dam safety on account of emerging climate change related challenges.
- This Act provides for regular inspection and hazard classification of dams. It also provides for drawing up of emergency action plans and comprehensive dam safety reviews by an independent panel of experts.
- Through this Act the Dam owners are required to provide resources for timely repair and maintenance of the dam structure, along with related machinery.
- This Act looks at Dam Safety holistically and provides for not only structural aspects, but also operational and maintenance efficacy through prescription of strict O & M protocols.

- This Act has penal provisions, involving offences and penalties, for ensuring compliance of the provisions.

Concerted worldwide efforts needed to limit global temperature levels to save islands

In News

The Vice President of India urged all countries to put in consolidated efforts to limit global temperature levels so that smaller islands and the homes of the islanders do not get displaced.

Need for Limiting the Rise of Global Temperature to 1.5°C

- Limiting global warming to 1.5°C instead of 2°C could result in less exposure to extreme heat waves, floods, drought, and changes in the global mean surface temperature of the earth.
- The Risk of heavy precipitation and tropical cyclones will be limited if global warming is limited to 1.5°C.
- Limiting global warming to 1.5°C is expected to substantially reduce the probability of drought and risks associated with water availability i.e. water stress in the world.
- The rise in mean sea level will be around 0.1 m less by the end of the century in a 1.5°C world as compared to a 2°C warming.
- Risks of food shortages, heat-related mortality particularly in urban areas because of urban heat islands. Risks are projected to change for some vector-borne diseases such as malaria and dengue fever with positive or negative trends depending on the disease, region, and extent of change will be lower at 1.5°C than at 2°C.
- At 2°C of global warming, coastal tourism will be at the margin line at the same time salinity of coastal groundwater will also increase and the degradation of beach and coral reef assets.
- Global warming of 1.5°C has the potential to limit economic damages of many developed and developing countries and of the small island, low-lying coasts and deltas.

147th foundation day of India Meteorological Department (IMD)

In News

Salient contributions of IMD were acknowledged on the occasion of the 147th foundation day of the India Meteorological Department (IMD).

Important Highlights:

- IMD has played a crucial role in extending the weather and climate services to South Asian, South-East Asian and Middle East countries.
- Discussions included the usage of drone-based observation technology to strengthen localized forecasting.
- Four doppler weather radars were dedicated to the nation at Leh, Mumbai, Delhi and Chennai to improve the research of weather forecasting and climate studies along with a better understanding of operational analysis.
- A new platform for crowd searching for the collection of observation through the public was inaugurated which opens a new chapter in citizen science. This will ensure to bridge the gap between science and society.
- The web GIS services were launched by IMD to minimize the loss of lives and properties due to natural calamities by monitoring a wide range of weather conditions.

State Environment Impact Assessment Authorities

In News

A new system of Star Rating of SEIAAs has been introduced for encouraging the efficiency, transparency and accountability in the functioning of SEIAAs.

SEIAA

- SEIAAs are a very important arm of the Environment Ministry for implementation of EIA Notification at the State level.
- They have been delegated powers to consider and grant environmental clearance (EC) for all proposals under Category B.

Star Rating system

- The ranking system is based on the provisions of EIA Notification 2006 and various guidelines issued by the Ministry from time to time.
- It aims to encourage the SEIAAs to increase their efficiency in decision making without diluting any regulatory safeguards.

Forest Survey Report 2021

In News

The India State of Forest Report (ISFR) 2021 prepared by the Forest Survey of India has been released.

Major findings of the ISFR

- The total forest and tree cover of the country has been estimated as 80.9 million which is 24.62% of the total geographical area of the country. There has been an increase in forest cover (to 1540 sq km) and tree cover (to 721 sq km).
- Andhra Pradesh followed by Telangana and Odisha are the top three states showing an increase in forest cover.
- Based on the area, Madhya Pradesh has the largest forest cover followed by Arunachal Pradesh, Chhattisgarh, Odisha and Maharashtra.
- About 17 states/UTs have above 33% of the geographical area under forest cover.
- Total mangrove cover has been estimated as 4,992 sq km, which indicates an increase of 17 sq km in mangrove cover.
- Odisha followed by Maharashtra and Karnataka have shown an increase in mangrove cover.
- Total carbon stock in the country's forests is 7, 204 million tonnes, indicating an increase of 79.4 million tonnes in carbon stock. There is an annual increase in the carbon stock which is about 39.7 million tonnes.

Significance of ISFR

- The Forest Survey of India included a new chapter related to the assessment of forest cover in tiger reserves, corridors and lion conservation areas of India. It is based on a decadal assessment of change in forest cover in those areas between the period of 2011 and the current cycle of 2019-2020.
- Above Ground Biomass is a new chapter that is added. This study was carried out at a pan-India level using Synthetic Aperture Radar (SAR) data. The study is still continuing and a detailed report will be submitted after its completion.

FSI, in collaboration with Birla Institute of Technology and Science (BITS) Pilani, carried out a study on climate change hotspots in Indian forests.

National Water Awards

In News

The third edition of the National Water Awards (2020) was announced in order to provide impetus to better water management in the country.

About the Awards

- This award was launched by the Jal Shakti Ministry in 2018 to provide opportunities to start-ups as well as leading organizations to engage with policymakers on how to adopt the best water resources management practices in India.
- In the best state category, Uttar Pradesh has been awarded the first prize followed by Rajasthan and Tamil Nadu.
- India's current water requirement is estimated to be 1100 billion cubic meters per year which is going to rise up to 1447 billion cubic meters by 2050. Therefore, it becomes imperative to establish a meticulous water management system.
- The intentions behind organizing such awards are in alignment with the mission of 'Har Ghar Jal' to all rural households by 2024 under the Jal Jeevan Mission.

National Tiger Conservation Authority (NTCA)

In News

The 19th meeting of NTCA was conducted to formulate an action plan for the introduction of the Cheetah in India and strengthen tiger conservation.

About Action Plan

- The action plan that was discussed in the meeting emphasized the introduction of 50 Cheetahs in various parks in 5 years.
- The experts await the 5th cycle of All India Tiger Estimation which is at present underway and will guide policy decisions.
- There are 51 tiger reserves in the country and efforts are made to expand the network as 35 rivers originate from these areas, it becomes crucial in terms of water security.
- Poaching activities in the northeastern states, excessive visits to core areas of the reserves by the tourists are some major challenges that need to be addressed and regulated.
- 14 tiger reserves have been accredited under CA|TS (Conservation Assured | Tiger Standards) categories. The CA|TS is a set of criteria that examines the management of tiger sites to gauge the success rates of tiger conservation.
- A water atlas has been launched to map the water bodies in the tiger bearing areas of India.

About CATS

- This has been a tiger reserve accreditation tool developed by the global coalition of Tiger Range Countries (TRC) including the inputs of the tiger and protected area experts.
- There are 13 Tiger Range Countries such as India, Bangladesh, Bhutan, Nepal, Cambodia, China, Indonesia, Lao, Malaysia, Myanmar, Russia, Thailand and Vietnam.
- The Global Tiger Forum (an NGO working on tiger conservation) and the World Wide Fund are the two implementing partners of NTCA for CA|TS assessment in India.

Carbon sequestration

In News

India's pledge to set a net zero target by 2070, at the COP26 summit, Glasgow, has again highlighted the importance of forests as an undisputed mechanism to help mitigate the challenges of climate change.

Degradation of forests

- As per the State of Forests Report (1989), the country had 7.83% of its geographical area under the open forest category, having a density of 10% to less than 40%.
- In 30 years (2019) this has been increased to 9.26%.

- Having diverted nearly 1.5 million hectares of forests since 1980 for developmental activities and losing nearly 1.48 million hectares of forests to encroachers coupled with an intricate link between poverty and unemployment, India is witnessing enormous degradation of forests and deforestation.

Measures to increase forest cover

- Participation of people is an essential and effective route to achieve the desired target of carbon sequestration through the restoration of forests.
- The efforts to make this participatory approach operative resulted in the formation of nearly 1.18 lakh JFMCs managing over 25 million hectares of forest area.
- Most of these became active and operative while implementing various projects financed by external agencies such as the World Bank, the Overseas Economic Cooperation Fund (OECF) Japan, the Department for International Development (DFID) United Kingdom and the European Union (EU).
- The similar system of joint management in the case of national parks, sanctuaries and tiger reserves which existed in the name of eco-development committees initially proved effective.
- However, the completion of the project period and lack of subsequent funding affected their functionality and also the protection of forests due to a lack of support from participating local communities including associated non-governmental organisations.

Way Forward

- India will have to 'focus much more on climate change and devise strategies and programmes to achieve the net zero target'.
- Besides reducing the quantum of emissions in a phased manner — itself full of challenges — the approaches for carbon storage and offsetting through natural sinks such as forests need to be given equal priority.
- To achieve net zero targets there is a need to revisit our existing legal and policy mechanisms, incentivise the local communities appropriately and ensure fund flow for restoration interventions, duly providing for the adequate participation of local people in planning and implementation through local institutions.

National Natural Resource Management System

In News

The National Natural Resource Management System scheme has been discussed in the Parliament.

About the Scheme:

- It is a central sector scheme of the Ministry of Environment, Forest and Climate Change that acts as a national level interagency system for the integrated management of natural resources.
- In 1983, the Department of Space acknowledged the need to introduce remote sensing technology in the information system that was regularly used by the resource managers and planners.
- To infuse technology into the management of resources, the National Natural Resource Management System was launched under the aegis of the then Planning Commission with the National Resource Management Information System (NRIS) as the feeder information system of the government that involves socio-economic information and models.
- The major **objective** of the scheme is to promote the usage of remote sensing technology for inventions, assessments and monitoring of the country's natural resources.

'Lakshya Zero Dumpsite'

In News

The Ministry of Housing and Urban Affairs has approved the proposal of Dadu Majra dumpsite remediation in Chandigarh and agreed to offer financial assistance to make the city completely free of garbage.

Details

- The 'Heritage City' of Chandigarh was founded in 1953 and planned by the Swiss-French architect Le Corbusier and is renowned for its meticulously planned public spaces, greenery and maintenance of the strict eco-friendly norms.
- A large number of Community and Public Toilet seats have been provided in the city that transformed the lives of the people making it hygienic and dignified.
- The city of Chandigarh has been recognised as 1-star Garbage Free in the recently concluded Star Rating Assessment for Garbage Free Cities in 2021 under the aegis of Swachh Bharat Mission- Urban 2.0.
- The city was recognised for its commitment to transform 'manhole to machine hole' as the best performing union territory in the SafaiMitra Suraksha Challenge 2021.
- The progressive steps taken by the city to achieve its target of becoming a garbage free city, must be taken further and replicated across the country.

IPCC

In News

India welcomes the release of the Working Group II (WG2) contribution to the Sixth Assessment Report (AR6) of the Intergovernmental Panel on Climate Change (IPCC).

Major Findings

- The Report affirms that climate change due to historical emissions is leading to serious impacts which are already being felt globally.
- The Report emphasizes that action on adaptation is urgently needed – as urgently as action on mitigation.
- Further, the SPM clearly acknowledges the importance of Indigenous and Local Knowledge in adaptation to climate change.
- Vulnerable and marginalized communities, regions and populations face rising exposure to hazards.
- The Report is a clarion call for the world to abandon their unsustainable production and consumption and move urgently to climate resilient development.
- The Report notes that the impacts and the consequent limitations to adaptation would rise beyond 1.5 degree warming above pre-industrial levels.
- Provision of finance is critical for helping developing countries and vulnerable populations act quickly and effectively. Public finance is the key enabler for adaptation.
- Rapid progress on achieving the SDGs will help in enhancing adaptive capacity and resilience.
- The Report re-affirms that the balance between adaptation and mitigation in climate resilient development depends on national circumstances.
- Adaptation suffers from a tremendous lack of finance, with only a small proportion of climate finance devoted to it, while the overwhelming proportion goes to mitigation.
- The Report recognizes the key role of agriculture and the great importance of food security in adaptation.
- India faces multiple climate hazards and has high vulnerability to climate change.

Extended Producers Responsibility(EPR) Guidelines

In News

The Ministry of Environment, Forest and Climate Change has issued notification on Extended Producers Responsibility to regulate plastic packaging under Plastic Waste Management Rules 2016.

The guidelines:

- The guidelines give a proper framework to improve the management of plastic waste and make it mandatory to reuse rigid plastic packaging material.
- The recycling of plastic waste under EPR guidelines along with the use of recycled plastic content will reduce plastic consumption and promote the practice of recycling.
- The guidelines set up a market mechanism for plastic waste management through the allowance of sale and purchase of surplus extended producer responsibility certificates.
- It will be implemented through a customised online platform that acts as the digital backbone of the system. This will enable online tracking and monitoring of EPR obligations and will decrease the compliance burden on the companies with the aid of online registration and filing of annual returns.
- It will also impose environmental compensation based on the polluter pays principle if the guidelines are not obeyed by the producers, importers and brand owners. As a result the pollution levels will be kept under check.
- In order to prevent the mixing of plastic packaging waste with solid waste, the producers, importer and brand owners may avail the provisions like deposit refund system or buy back or any other model.

Decarbonisation of transport

In News

In order to promote the idea of 'Financing for Decarbonisation of Transport', a consultation workshop was organised virtually by the NITI Aayog in collaboration with World Resource Institute, India.

Importance of Workshop

- The initiative of financing the decarbonisation of transport will be a sustainable climate-centric approach that will not only benefit the environment but also be of advantage from a financial perspective.
- It is in alignment with India's active participation in mitigating climate change and the ambitious targets set at COP26.
- Decarbonisation is an emerging concept of green mobility that ensures to reduce the carbon footprint that results from vehicular emissions.
- The transport industry constitutes the third largest contributor of greenhouse gas emissions in India and accounts for 14% of the CO₂ emissions.
- Therefore, it is a matter of essence to decarbonise the transport sector with active involvement of the stakeholders and strategic investments boosting a speedy transition to 100% zero emission vehicles. The workshop exemplifies a welcoming start towards a low carbon and sustainable future.

One Ocean Summit

In News

France has organised the One Ocean Summit in collaboration with the United Nations and the World Bank.

About the Summit:

- The Summit involved discussions to take various initiatives for the conservation of marine ecosystems considering the following intentions:
 - Protecting the marine ecosystem
 - Sustainable fisheries

- Fight pollution
- Eliminating plastics from entering the marine environment
- Mitigate the impacts of climate change
- Improved governance of oceans
- **OceanOPS**, a joint centre of the World Meteorological Organisation and the IOC-UNESCO, will launch the Odyssey project that will be endorsed by the United Nations Decade of Ocean Science for Sustainable Development in support of the Global Ocean Observing System.
- The summit emphasised the current and future challenges of maritime cultural heritage.

Objective:

- The Summit intended to encourage the international community to take attentive steps towards protecting and conserving the ocean ecosystem along with the sustainable use of maritime resources.
- The major idea is to collaborate on marine issues and convert the shared responsibility into achievable commitments.

Green Hydrogen/Green Ammonia Policy

In News

The Ministry of Power notified the Green Hydrogen/Green Ammonia Policy to step closer to the major objective of shifting towards renewable energy sources.

The Policy: Essential Provisions

- Green Hydrogen and Ammonia manufacturers will be allowed to purchase renewable power from the power exchange or can set up a renewable energy capacity themselves or through any developer.
- Open access will be provided within 15 days of receipt of the application.
- The manufacturers can bank the unconsumed renewable power for 30 days with distribution companies and take it back at the time of requirement.
- Waiver of Inter-state transmission charges will be offered for 25 years for the manufacturers whose projects commenced before 30th June 2025.
- Connectivity to the grid will be given on the basis of priority to avoid delays of tedious procedures.
- Incentives will be granted to the manufacturers and distribution licensees under the Renewable Purchase Obligation (RPO) for the consumption of renewable power.

“New Frontiers” Program on Renewable Energy

In News

The Ministry of New and Renewable Energy will conduct a program on renewable energy titled “New Frontiers” that will involve students and think tanks.

About the program

- The Ministry of New and Renewable Energy focusing on the topic, “India’s Leadership in Energy Transition”, will hold a physical event.
- The discussions are likely to surround the matters related to:
 - Women in Renewable Energy – Call for Action
 - Role of International Solar Alliance in Energy Transition
 - Role of Clean Technology Start-ups and Climate Entrepreneurs
- The major objective is to adopt a roadmap to achieve net-zero emissions by 2070 by switching to renewable energy.
- It will also address the targets mentioned by India at the COP 26 and ways to achieve them heading towards sustainability.

World Sustainable Development Summit

In News

The Prime Minister of India will virtually address the inaugural ceremony of the World Sustainable Development Summit which is an annual flagship event of The Energy and Resources Institute (TERI).

About the Summit:

- The summit will continue for three days involving heads of various intergovernmental organizations, Ministers/Envoys representing more than a dozen countries and delegates from over 120 countries along with the Deputy Secretary-General, United Nations.
- It will attend to the areas of climate change, sustainable production, energy transitions, global commons and resource security.
- The summit will provide a single platform with interventions from various stakeholders to further strengthen the Sustainable Development Goals (SDGs).

World Wetlands Day

In News

World Wetlands Day celebrated at Sultanpur National Park.

About Bakhira Wildlife Sanctuary:

- It is a natural flood plain wetland situated in Sant Kabir Nagar District of UP.
- It was established in 1980.
- Expanding over an area of 29 sq. km, the Bakhira Wildlife Sanctuary provides wintering and staging grounds for a number of waterfowls and a breeding ground for resident birds.

About Khijadiya Wildlife Sanctuary:

- Khijadiya, which is part of the Central Asian Flyway, has become the fourth wetland of Gujarat to get the Ramsar tag.
- It is a freshwater wetland near the coast of the Gulf of Kutch, which was formed following the creation of a bund (dike) in 1920 by the then ruler of the erstwhile princely state of Nawanagar to protect farmlands from saltwater ingress.
- The sanctuary is now part of Marine National Park, **Jamnagar, the first marine national park in the country.**

Conserving Marine Resources

In News

The Government of India has put forth considerable efforts to conserve the coastal and marine resources through effective policy interventions and monitoring.

Government Interventions:

- The Wildlife Protection Act (WPA, 1972) consists of provisions that assure legal protection to many marine animals. India has 31 major marine protected areas that are notified under the Wildlife Protection Act.
- The National Committee on mangroves, wetlands and coral reefs functions as an advisory body to the government to formulate policies and programmes on marine species.
- The Coastal Regulation Zone (CRZ) notification keeps a strict check on the developmental activities and dumping of wastes in the sensitive coastal ecosystems.
- The Biological Diversity Act, 2002 along with the Biological Diversity Rules 2004 aim to provide protection to the marine ecosystem conserving biodiversity, sustainable use of resources and equitable sharing of its components.

- The flagship scheme of the Department of Fisheries, PM Matsya Sampada Yojana (PMMSY), focuses on the sustainable and responsible development of the fisheries sector in India.

Atal Tunnel

In News

Atal tunnel has been officially recognised as the longest highway tunnel above 10,000 feet by the World Book of Records.

Details

- The certification of the Atal tunnel as the longest highway tunnel has been conferred at a ceremony to award the Border Roads Organisation (BRO) for its remarkable achievement in constructing the tunnel.
- **The World Book of Records** that offered the recognition to the tunnel, is an organisation that catalogues and verifies records throughout the world in order to authenticate such certifications.
- The Atal tunnel is regarded as an engineering marvel which is anticipated to play a future role in the development of the Lahaul and Spiti region of Himachal Pradesh.
- The tunnel will also benefit the armed forces by providing an alternative link to access the Ladakh region improving connectivity.

Incentives for adoption of renewable energy

In News

The government has decided to promote the adoption of renewable energy for a sustainable future for the country.

The incentives offered by the government:

- Foreign Direct Investment (FDI) up to 100% under the automatic route has been permitted.
- The Inter State Transmission System (ISTS) charges have been waived for inter-state sale of solar and wind power for projects to be commissioned by 30th June 2025.
- The ultra mega renewable energy parks will be set up to provide land and transmission to the developers of renewable energy on a plug and play basis.
- The scope of the schemes like PM KUSUM, solar rooftop phase II scheme, Green energy corridor scheme will be extended for the evacuation of renewable power.
- The Project Development Cell will be set up for attracting and facilitating investments.
- Standard bidding guidelines will be framed for tariff-based competitive bidding processes facilitating procurement of power from grid-connected solar PV and wind projects.
- The Ministry of New and Renewable Energy will be supporting a scheme called the Renewable Energy Research and Technology Development Programme to promote research and development on renewable energy.
- The scheme will encourage research proposals of renewable energy to collaborate with industries with 100% funding from the government/non-profit research organisations along with 50-70% financial aid to industry, start-ups, private institutes, entrepreneurs and manufacturing units.

Swachhta Saarthi Fellowship 2022

In News

The Swachhta Saarthi Fellowship 2022 has been announced by the office of the Principal Scientific Adviser, the Government of India under the Waste to Wealth Mission.

About the Programme:

- The 'Waste to Wealth' mission is one of the nine national missions of the Prime Minister's Science, Technology and Innovation Advisory Council (PM-STIAC).
- This fellowship was launched in 2021 to recognise the engagement of students, community workers/self-help groups and municipal/sanitary workers in tackling the issue of waste management.
- To continue the noble initiative, the Swachhta fellowship applications are released for the participation of all the stakeholders and encourage them to keep up the good work.

Import of Cheetahs from Abroad

In News

The Government of India is in the process of holding consultation meetings with African countries for bringing cheetahs.

About the Cheetah:

- The cheetah was declared extinct in India in 1952.
- Currently, there are no cheetahs in any National Park or Wildlife Sanctuary in India.
- The cheetah is the only large carnivore to have become extinct in Independent India.
- The cheetah is one of the oldest of the big cat species, with ancestors that can be traced back more than five million years to the Miocene era.
- The cheetah is also the world's fastest land mammal that lives in Africa and Asia.