



# IAS PARLIAMENT

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A Shankar IAS Academy Initiative

## TARGET 2020

### ENVIRONMENT & GEOGRAPHY III

UPTO AUGUST 2020



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## TARGET 2020

### ENVIRONMENT & GEOGRAPHY - II

#### (UPTO AUGUST 2020)

### ENVIRONMENT

#### 1. POLLUTION

##### 1.1 Common Bio-Medical Waste Treatment Facilities

- Central Pollution Control Board (CPCB) has marked Common Bio-Medical Waste Treatment Facilities (CBWTFs) as a key factor in the race to contain the coronavirus outbreak.
- But the last available countrywide update on these facilities from 10 months ago presents a grim picture.
- Currently, in India, there are around 200 Common Bio-Medical Waste Treatment Facilities (CBMWTFs) in operation which is inadequate for health facilities in 750 districts of the country.
- There is a great need for rapid development of more CBMWTFs to fulfill the need of treatment and disposal of all BMW generated in India.
- CPCB's order mandates that Isolation wards, sample collection centers, and laboratories are all mandated to keep a separate 'COVID-19' waste collection bin in a temporary storage room.
- CBWTFs are to identify this separately-labeled waste for priority treatment and disposal.
- According to NGT even though 20 years had passed since the Supreme Court issued directions on dealing with solid waste management, no progress was made by states and that timelines set under the Municipal Solid Waste Rules, 2016, had expired.

##### 1.2 E-Waste

- E-Waste is short for Electronic-Waste and the term used to describe old, end-of-life or discarded electronic appliances.
- It is categorized into 21 types under two broad categories:
  1. Information technology and communication equipment.
  2. Consumer electrical and electronics.
  3. E-waste includes their components, consumables, parts and spares.
- It consists of toxic elements such as Lead, Mercury, Cadmium, Chromium, Polybrominated biphenyls and Polybrominated diphenyl.
- E-waste consisting of gold, silver, copper, platinum and other high-value, recoverable materials was mostly dumped or burned rather than being collected for treatment and reuse.
- It can cause some of the major health effects including serious illnesses such as lung cancer, respiratory problems, bronchitis, brain damages, etc. due to inhalation of toxic fumes, exposure to heavy metals and alike.
- It is an environmental hazard causing groundwater pollution, acidification of soil and contamination of groundwater and air pollution due to the burning of plastic and other remnants.
- **Recent Developments** - According to a recent United Nations University (UNU) e-waste monitor report, global e-waste will increase by 38% in the decade between 2020 and 2030.
- Asia generated the greatest volume (around 24.9 MT) followed by the Americas (13.1 MT) and Europe (12 MT). Africa and Oceania generated 2.9 MT and 0.7 MT respectively.
- UNU is a global think tank and postgraduate teaching organization headquartered in Japan.

- UNU's mission is to resolve the pressing global problems of human survival, development and welfare that are the concern of the United Nations, its peoples and the member states.

### 1.3 Star Rating of Garbage Free Cities

Recently, the Ministry of Housing & Urban Affairs (MOHUA) has announced the results of the Star Rating of Garbage Free Cities for the assessment year 2019-2020.

- The Star Rating Protocol was launched by the Ministry in 2018 to institutionalize a mechanism for cities to achieve Garbage Free status, and to motivate cities to achieve higher degrees of sustainable cleanliness.
- It is one of the various initiatives which intends to make Swachh Bharat Mission-Urban (SBM-U) as a successful project.
- It is based on 12 parameters which follow a SMART framework – Single metric, Measurable, Achievable, Rigorous verification mechanism and Targeted towards outcomes.
- It is a comprehensive framework that assesses cities across 24 different components of Solid Waste Management (SWM) and is graded based on overall marks received.
- The Star Rating is supported by self-assessment and self-verification for achieving a certain star rating. It also ensures the involvement of citizen groups for a transparent system of self-declaration.
- Further, the self-declaration is further verified through an independent third party agency appointed by MoHUA.
- Under the new report a total of six cities have been certified as 5-Star, 65 cities as 3-Star and 70 cities as 1-Star.
- The 5-Star cities include Ambikapur (Chattisgarh), Surat and Rajkot (Gujarat), Indore (Madhya Pradesh) and Navi Mumbai (Maharashtra).
- The performance of cities under the Star Rating Protocol is crucial as it carries significant weightage for their final assessment in Swachh Survekshan.
- The rating protocol is an outcome-based tool that helps MoHUA and other stakeholders to evaluate cities on the basis of this single rating.

### 1.4 Decarbonizing Transport in India

NITI Aayog and International Transport Forum (ITF) will collaborate to launch a new online project called 'Decarbonizing Transport in India'.

- It is to chart out a path for a low-carbon transport system in the country.
- It will offer an opportunity to provide inputs for transport challenges and their relation to CO<sub>2</sub> reduction in the country.
- The project will include designing a transport emissions assessment framework for India, providing the government with a detailed understanding of transport activities and CO<sub>2</sub> emissions as a basis for decision-making.
- It is a part of the ITF's DTEE (Decarbonizing Transport in Emerging Economies) series of projects.
- DTEEs aimed at lowering carbon emissions across different regions in the world.
- The current participants in the initiative are India, Argentina, Azerbaijan, and Morocco.

#### International Transport Forum

- It is an inter-governmental organization within the OECD (Organization for Economic Co-operation and Development) system.
- It is the only global body with a mandate for all modes of transport.
- It acts as a think tank for transport policy issues and organizes the annual global summit of transport ministers.
- India has been a member of ITF since 2008.
- DTEE is a collaboration between the ITF and the Wuppertal Institute, which is supported by the International Climate Initiative (IKI) of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.

### 1.5 Nationally Determined Contributions – TIA

- NITI Aayog has launched Indian Component of the Nationally Determined Contributions (NDC) – Transport Initiative for Asia (TIA).
- It aims to promote a comprehensive approach to decarbonize transport in India, Vietnam, and China.
- It is a joint programme with a duration of 4 years, supported by the
  - a) International Climate Initiative (IKI) of the German Ministry for the Environment,
  - b) Nature Conservation
  - c) Nuclear Safety (BMU).
- The NDC–TIA India Component will focus on
  - a) Strengthening GHG and transport modelling capacities,
  - b) Providing technical support on GHG emission reduction measures,
  - c) Financing climate actions in transport,
  - d) Offering policy recommendations on electric vehicle (EV) demand and supply policies etc.

### 1.6 RAISE Initiative

- Retrofit of Air-conditioning to improve Indoor Air Quality for Safety and Efficiency (RAISE) is a national programme to improve indoor air quality.
- It is launched by Energy Efficiency Services Limited (EESL), under the administration of Ministry of Power.
- It is developed for healthy and energy efficient buildings, in partnership with US Agency for International Development's (USAID) MAITREE programme.
- The pilot focuses on improving indoor air quality (IAQ), thermal comfort, and energy efficiency (EE) in EESL office's air conditioning system.
- It can potentially alleviate the issue of bad air quality in workspaces across the nation.

### 1.7 Chemical Hazards in India

*According to the National Disaster Management Authority (NDMA), in the recent past, over 130 significant chemical accidents have been reported in the country.*

- This has resulted in 259 deaths and caused major injuries to more than 560 people.
- There are over 1861 Major Accident Hazard (MAH) units spread across 301 districts and 25 states and three Union Territories in all zones of the country.
- Gas leak related disasters in India are as follows
  1. 2014 GAIL Pipeline Blast - Massive fire broke out following a blast in the underground gas pipeline maintained by the Gas Authority of India Limited (GAIL) at, East Godavari district of Andhra Pradesh.
  2. 2014 Bhilai Steel Plant Gas Leak - six people were killed and over 40 injured in an incident of leakage in a methane gas pipeline at a water pump house.
  3. 2017 Delhi Gas leak - Around 470 schoolchildren were hospitalized after inhaling poisonous fumes that spread due to a chemical leak at a container depot near two schools in the customs area of Tughlaqabad depot.
  4. 2018 Bhilai Steel Plant Blast - Nine people were killed and 14 others injured in a blast at the Bhilai Steel Plant of state-owned SAIL.
  5. 2020 Vizag Gas Leak – Styrene gas leak from LG Polymers factory situated in Visakhapatnam, Andhra Pradesh killed at least 11 people.

### 1.8 Section 5 of Environment Protection Act

- Section 5 of the Environment Protection Act allows the Centre to shut down industrial units that grossly violate the law.



- **Violation Committee Rules of MoEFCC** - These rules allow industrial projects in violation of environmental laws to apply to a special panel of experts called the 'Violations Committee' of the MoEFCC, provided they meet certain criteria and make appropriate modifications become compliant operations.
- The Union Ministry of Environment, Forests and Climate Change ordered closure of the LG Polymers plant in Vishakapatnam, Andhra Pradesh.
- The ministry has also sought updated information on whether the company had abided by the MSIHC rules by MoEFCC.
- Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989 prescribe how hazardous and industrial chemicals ought to be stored.
- From LG Polymers plant styrene gas leaked on May 17, 2020.
- The chemical factory had been working since 1997 without appropriate clearances and had applied for clearance, in 2018, under rules made by the MoEFCC itself.
- LG Polymers had applied to violation committee and its case was under consideration.

### 1.9 NGT Order on Ground Water Extraction

*National Green Tribunal (NGT) has called for commercial entities to follow new rules for getting permission to extract groundwater.*

- Environmental Impact Assessments (EIA) will now form the basis of granting such permissions.
- The Union Ministry of Jal Shakti and the Central Ground Water Board (CGWB) were ordered by the NGT to ensure no general permission was given for withdrawing groundwater, particularly to any commercial entity.
- Under the order, plants involved in commercial extraction of ground water will undergo individual assessment through an expert committee.
- All overexploited, critical and semi-critical (OCS) assessment units must undergo water mapping.
- Water management plans need to be prepared for all OCS assessment units in the country based on the mapping data, starting with overexploited blocks.
- NGT had also mentioned permission to extract groundwater must be for specified times and quantity of water, not for perpetuity.
- It must be necessarily subject to digital flow meters, which cannot be accessed by proponents, with mandatory annual calibration by the authorized agency at proponents.

### 1.10 Strict Liability Vs Absolute Liability

- The National Green Tribunal's order on Visakhapatnam gas tragedy, found LG Polymers prima facie liable under the law principle of "strict liability", which was made redundant in India by the Supreme Court in 1986.
- Under the "strict liability principle", a party is not liable and need not pay compensation if a hazardous substance escapes his premises by accident or by an "act of God" among other circumstances.
- The Supreme Court, while deciding the Oleum gas leak case of Delhi, 1986, found strict liability woefully inadequate to protect citizens' rights in an industrialized economy like India and replaced it with the 'absolute liability principle'.
- The principle of absolute liability is part of Article 21 (right to life).
- The country was then reeling under the shock of the 1984 Bhopal gas tragedy.
- The court under then Chief Justice P.N. Bhagwati wanted corporations to be made fully liable for future "undeserved suffering of thousands of innocent citizens".
- So, under the absolute liability principle, the apex court held that a company in a hazardous industry cannot claim any exemption.
- It has to mandatorily pay compensation, whether or not the disaster was caused by its negligence.
- The court said a hazardous enterprise has an "absolute non-delegable duty to the community".

- If any harm results on account of such activity, the enterprise must be absolutely liable to compensate for such harm irrespective of the fact that the enterprise had taken all reasonable care and that the harm occurred without any negligence on its part.
- The court found that strict liability, evolved in an 1868 English case called Rylands versus Fletcher, provided companies with several exemptions from assuming liability.
- Absolute liability, on the other hand, provided them with no defence or exemptions.
- The National Green Tribunal Act of 2010 has wholeheartedly adopted 'absolute liability'. Section 17 mandates that the Tribunal should apply the 'no fault principle' even if the disaster caused is an accident.
- The NGT statute recognizes only absolute or non-fault liability.
- That is, a hazardous enterprise is liable even if the disaster is an accident and not caused by the negligence of the company.

### 1.11 Aerosol Optical Depth

- Recently, a study by the Aryabhata Research Institute of Observational Sciences has found that radiative forcing of aerosols i.e. effect of anthropogenic aerosols is much higher over the high altitudes of western trans-Himalayas.
- The study analyzed the variability of aerosol optical, physical and radiative properties from January 2008 to December 2018 and the role of fine and coarse particles in Aerosol Radiative Forcing (ARF) assessment.
- ARF is the effect of anthropogenic aerosols on the radiative fluxes at the top of the atmosphere and at the surface and on the absorption of radiation within the atmosphere.
- The ARF values at top of the atmosphere were mostly low over Hanle and Merak.
- Hanle and Merak, situated in Ladakh are the part of Indian Astronomical Observatory (IAO).
- Highlights of the study are as follows
  1. Change in Temperature - The study shows that monthly-mean atmospheric radiative forcing of aerosols leads to heating rates of 0.04 to 0.13 degree Celsius per day.
  2. Aerosol Optical Depth (AOD) - The observations show that the AOD exhibited a distinct seasonal variation with higher values (0.07) in May and lower (0.03) in winter months.
  3. Composition of Air - Pure and polluted dust exhibited fractions between 16% and 23%, with a low frequency of less than 13% of absorbing aerosols, denoting weak influence of anthropogenic aerosols and Black Carbon over the trans-Himalayan sites.

#### Aerosols

- They are defined as a combination of liquid or solid particles suspended in a gaseous or liquid environment.
- In the atmosphere, these particles are mainly situated in the low layers of the atmosphere (< 1.5 km) since aerosol sources are located on the terrestrial surface.
- However, certain aerosols can still be found in the stratosphere, especially volcanic aerosols ejected into the high altitude layers.
- AOD is a measure of how light is absorbed or reflected by airborne particles as it travels through the atmosphere

### 1.12 Alliance to End Plastic Waste

- Alliance to End Plastic Waste was founded in 2019 as a nonprofit organization, in Singapore.
- It helps to solve the serious and complex issue of 8 million tons of plastic waste entering the ocean every year.
- Nearly 50 companies across the plastics value chain have joined the Alliance.
- They have committed to invest USD 1.5 billion towards solutions that will prevent the leakage as well as recover and create value from plastic waste.
- Recently, it has announced to invest between USD 70 million to 100 million in India over the next five years to reduce plastic waste.
- Currently, 'Alliance to End Plastic Waste' is working on the Project Aviral which aims to reduce plastic waste in the Ganga River.



### 1.13 Increase in Ozone Levels

- Recently, the Centre for Science and Environment (CSE) has observed an increase in ozone (a harmful pollutant) levels in the several cities of the country.
- The analysis is based on Central Pollution Control Board (CPCB) data from 22 cities in 15 States.
- The ozone is primarily a “sunny weather problem” in India as the presence of sunlight has a direct impact on formation of ground level ozone.
- Heat acts as a catalyst, facilitating photochemical reactions, hence higher concentrations of ozone are seen during the summer months.
- Additionally, the intense heat waves are one of the factors responsible for increased ozone levels in the country.
- Usually, the ozone levels tend to spike when winter conditions subside, and its presence is felt most during the day.
- At night, ozone levels tend to deplete, before spiking again during the afternoon, when sunlight is available.
- Thus, the characteristics of summer pollution include high winds, intermittent rains, thunderstorms, high temperature and heat waves.

#### Ozone Gas

- Ozone is not directly emitted by any source but is formed by photochemical reactions between oxides of nitrogen (NO<sub>x</sub>), other volatile organic compounds (VOCs) and gases in the air under the influence of sunlight and heat.
- The ‘good’ ozone present in the earth’s ozone layer protects human beings from harmful Ultraviolet (UV) radiation whereas the ground level ozone is highly reactive and can have adverse impacts on human health.
- Even short-term exposure of an hour is dangerous for those with respiratory conditions and asthma.
- Thus, an 8-hour average is considered for ozone instead of the 24-hour average for other pollutants.
- Ozone pollution is a clear indicator of vehicular pollution, which results in higher concentration of NO<sub>x</sub>.

### 1.14 Micro Plastics

- According to recent study Maldives beaches have the most Micro plastics in the world.
- These are small pieces of plastic, less than 5 mm in length, that occur in the environment as a consequence of plastic pollution.
- The debris can be of any size and shape, but those which are less than 5 mm in length (or about the size of a sesame seed) are called micro plastics.
- Micro plastics come from a variety of sources, including from larger plastic debris that degrades into smaller and smaller pieces.
- In addition, microbeads, a type of Micro plastic, are very tiny pieces of manufactured polyethylene plastic that are added as exfoliants to health and beauty products.
- These tiny particles easily pass through water filtration systems and end up in the ocean or other water bodies and cause serious environmental and food safety concerns.
- The problem with micro plastics is that, like plastic items of any size, they do not readily break down into harmless molecules.
- Plastics can take hundreds or thousands of years to decompose and in the meantime, wreak havoc on the environment.
- On beaches, micro plastics are visible as tiny multicolored plastic bits in sand.
- In the oceans, micro plastic pollution is often consumed by marine animals.

## 2. CLIMATE CHANGE

### 2.1 Climatic Investment Fund

- The Climate Investment Funds (CIFs) are implemented by the Multilateral Development Banks (MDBs) to bridge the financing and learning gap between international climate change agreements.

- They were designed by developed and developing countries.
- The World Bank is the Trustee of the CIFs.
- It include a “sunset clause” to ensure that the Fund’s activities do not prejudice the outcome on the UNFCCC negotiations.
- CIFs are two distinct funds
  1. Clean Technology Fund
  2. Strategic Climate Fund.
- The CTF promotes scaled-up financing for demonstration, deployment and transfer of low carbon technologies with a significant potential for long-term greenhouse gas emissions savings.

## 2.2 Assessment of Climate Change Report

*The first ‘Assessment of Climate Change over Indian Region’ was recently released by the Union Ministry of Earth Sciences.*

- Key projections of the report are as follows
  1. The coming decades are projected to witness a considerable rise in the mean, extreme and inter-annual variability of rainfall associated with monsoon.
  2. Flood risks are higher over the east coast, West Bengal, eastern Uttar Pradesh, Gujarat, Konkan and cities like Mumbai, Chennai and Kolkata.
  3. The Himalayan flood basins are projected to greater floods, due to the faster glacial and snow melting.
  4. Storms in the Arabian Sea are gaining more strength and the trend is projected to continue.
  5. In coming decades, the average duration of heatwaves during April-June is projected to double, and their frequency to rise by 3 to 4 times compared to 1976-2005.
  6. Eastern India could face two more droughts per decade compared to what was experienced during 1976-2005, while the Southern Peninsula is projected to experience one or two droughts fewer.

## 2.3 Forest Fires in India

- According to the report of the Forest Survey of India, between 2003–2017, a total of 5,20,861 active forest fire events were detected in India.
- About 54% of the forest cover in India is exposed to occasional fire.
- Most fire prone regions - Northeast India, Madhya Pradesh, Odisha, Chhattisgarh, Himachal Pradesh and Uttarakhand.
- Western Himalaya have shown a sharp increase of carbon monoxide, nitrogen oxides and ozone during high fire activity periods.
- The occurrence of high fire intensity at the low altitude Himalayan hilly regions may be due to the plant species (pine trees) in the area and proximity to villages.
- Villages make them more susceptible to anthropogenic activities like forest cover clearance, grazing and so on.
- The sharp increase in average and maximum air temperature, decline in precipitation, and change in land-use patterns have caused the increased episodes of forest fires in most of the Asian countries.

## 2.4 Burn Indices

- The Normalized Burn Ratio is an effective burn index commonly used to identify burnt regions in large fire zones.
- In normal conditions, healthy vegetation exhibits a very high reflectance in the near-infrared spectral region and considerably low reflectance in the shortwave infrared spectral region.
- These conditions get dismantled and reversed if a fire occurs.



- **Remote Sensing Burn Indices** - The spectral differences between healthy vegetation and burnt forest areas can easily be identified and highlighted by remote sensing burn indices.
- Remote sensing based models to measure primary productivity over an area and also looked at burn indices, which help to demarcate the forest fire burn scars using satellite imagery.
- It can be a promising tool for land resource managers and fire officials.

## 2.5 Co<sub>2</sub> from Geothermal Springs

- Carbon outflux from Earth's interior to the exosphere through volcanic eruptions, fault zones, and geothermal systems.
- They contribute to the global carbon cycle that effects short and long term climate of the Earth.
- Himalaya hosts about 600 geothermal springs having varied temperature and chemical conditions.
- The Himalayan geothermal springs covers about 10,000 square km in the Garhwal region of Himalaya.
- CO<sub>2</sub> in these thermal springs are sourced from metamorphic de-carbonation of carbonate rocks present deep in the Himalayan core along with magmatism and oxidation of graphite.
- Most of the geothermal water is dominated by evaporation followed by weathering of silicate rocks.
- Isotopic analyses further point towards a meteoric source for geothermal water.

## 2.6 UN Global Commission on Adaptation

- It was launched in Hague in 2018 by then UN Secretary General Ban Ki-moon.
- Its mandate is to encourage the development of measures to manage the effects of climate change through technology, planning and investment.
- Secretary General Ban Ki-moon leads the group with co-chair of the Bill & Melinda Gates Foundation, and World Bank CEO.
- It was launched with the support of 17 convening countries including China, Canada and the UK and low-lying countries vulnerable to climate change including Bangladesh and the Marshall Islands.
- The Netherlands initiated the Global Commission on Adaptation to share its knowledge on how it has managed to adopt innovative water management solutions as sea levels rise.
- UNGCA Publishes Global Call for Leadership on Climate Resilience.
- It will be released in Climate Adaptation Summit in the Netherlands in 2021.

## 2.7 Phasing out Coal

*Germany is the first country to phase out coal and nuclear energy.*

- The houses of parliament has passed a bill to shut down the last coal-fired power plant by 2038 and spending \$45 billion to help affected regions cope with the transition.
- Germany already has existing commitment to phase out nuclear power by the end of 2022.

## 2.8 Ocean Panel

- Ocean Panel, also known as the High Level Panel for Sustainable Ocean Economy was launched in 2018.
- It is a unique initiative of 14 serving world leaders building momentum toward a sustainable ocean economy.
- It is the only ocean policy body made up of serving world leaders with the authority needed to trigger, amplify and accelerate action worldwide for ocean priorities.
- It is co-chaired by Norway and Palau.
- It comprises members from Australia, Canada, Chile, Fiji, Ghana, Indonesia, Jamaica, Japan, Kenya, Mexico, Namibia, Norway, Palau and Portugal and is supported by the UN Secretary-General's Special Envoy for the Ocean.



- Its goal is to deliver a sustainable ocean economy, where effective protection, sustainable production and equitable prosperity go hand-in-hand.

## **2.9 South Asian Climate Outlook Forum (SASCOF)**

- It was established in 2010 and is coordinated by the India Meteorological Department (IMD).
- It covers Afghanistan, Bangladesh, Bhutan, India, Maldives, Myanmar, Nepal, Pakistan and Sri Lanka.
- SASCOFs are generally conducted during the 3rd week of the April month each year.
- The main activity during all the SASCOFs was the preparation and issuing of a consensus outlook for the southwest monsoon rainfall over South Asia.
- The first three (during 2010-2012) and fifth (during 2014) meetings of SASCOF was hosted by India Meteorological Department and held at Pune.
- The fourth session (in 2013) of the SASCOF was held at Kathmandu, Nepal and sixth session (in 2015) was held at Dhaka, Bangladesh.

## **3. GOVERNMENT INITIATIVES**

### **3.1 Community Forest resources Guidelines**

- Community forestry is an evolving branch of forestry whereby the local community plays a significant role in forest management and land use decision making by themselves in the facilitating support of government as well as change agents.
- It involves the participation and collaboration of various stakeholders including community, government and non-governmental organisations (NGOs).
- The level of involvement of each of these groups is dependent on the specific community forest project, the management system in use and the region.
- It gained prominence in the mid-1970s and examples of community forestry can now be seen in many countries including Nepal, Indonesia, Korea, Brazil, India and North America.
- A study was commissioned by the Ministry of Tribal Affairs (MoTA) in 2019 to create state level guidance for sustainable resource usage in Community Forest Resource (CFR) submitted its report.
- The report of the study highlighted Community forest resource (CFR) rights are given under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (FRA), the Energy and Resource Institute (TERI).
- According to the report
  1. MoTA must issue broad guidelines and principles for implementation of CFRs, mentioning specific role of the state forest department, state tribal/social welfare department, revenue department and gram sabhas
  2. State governments should prepare state-specific guidelines on the basis of MoTA's guidelines
  3. MoTa should focus on capacity-building of gram sabha members, assessment of the biomass stock and biodiversity conservation
  4. Focus on capacity building programmes to educate various stakeholder government departments about the acts/schemes/policies
  5. The micro-plans prepared by gram sabha for their respective CFR should be a part of the working plans of forest division concerned, so that forest staff could facilitate the implementation of sustainable forest management.

### **3.2 Forest Rights Act**

- The 73rd Amendment to the Constitution of India empowered the third tier of democratic government (gram panchayats/ gram sabhas) for local self-governance.

- FRA and the Provisions of Panchayats (Extension to Scheduled Areas) Act, 1996 further empowered gram sabhas.
- Now the gram sabhas are supreme instead of the forest department.
- But this doesn't mean that the provisions of the national forest policy or the various court orders regarding resource usage from forest will not apply to them.
- It means that now they'll have to manage these areas themselves.
- Under FRA, a village can get its traditionally held forest land, legally recognized as CFR.
- The FRA gives gram sabhas "right to protect, regenerate or conserve or manage any community forest resource which they have been traditionally protecting and conserving for sustainable use."

### 3.3 Minor Forest Produce

- It includes all non-timber forest produce of plant origin and includes bamboo, canes, fodder, leaves, gums, waxes, dyes, resins and many forms of food including nuts, wild fruits, honey, lac, tussar etc.
- It provides both subsistence and cash income for people who live in or near forests.
- They form a major portion of their food, fruits, medicines and other consumption items and also provide cash income through sales.
- Recently, Union government has revised the Minimum Support Price (MSP) for Minor Forest Produce (MFP).
- The MSP is the rate at which the government buys produce from farmers and tribal.
- The idea of MSP is to counter price volatility of commodities due to the factors like variation in their supply, lack of market integration and information asymmetry.
- The increased Minimum support price (MSP) ranges from 16% to 66%.
- MSP for MFPs is revised once every three years by the Pricing Cell constituted under the Ministry of Tribal Affairs.
- However, the authorities have revised the MSP much earlier than 3 years.
- This will offer much-needed support to tribal gatherers in view of the "exceptional and very difficult" circumstances prevailing in the country due to the Covid-19 pandemic.
- The Minimum Support Price would be determined by the Ministry with technical help of TRIFED.
- Earlier, the scheme was extended only to Scheduled Areas in eight states and fixed MSPs for 12 MFPs, now it has extended to all states and UTs with 73 products in total.

### 3.4 Van Dhan Vikas Kendra

- Van Dhan Vikas Kendras have been set up under the program 'Van Dhan Yojana' which was launched in 2018, in Chhattisgarh.
- The Van Dhan Vikas Kendra caters to ten Self Help Groups of thirty tribal gatherers each.
- The selection of the tribal beneficiaries and formation of the SHGs has been undertaken by the Tribal Cooperative Marketing Development Federation of India (TRIFED).
- The Van Dhan Vikas Kendras boost the economic development of tribals involved in the collection of Minor Forest Produce (MFP) and provide a sustainable MFP-based livelihood in MFP-rich districts.
- Union government has also created an online monitoring dashboard, called the Van Dhan Dashboard, for reporting the procurement activities undertaken at the state level.
- The dashboard is a part of the "TRIFED E- SamparkSetu" that aims to facilitate exchange of information to and from every Panchayat and Van Dhan Kendra, either through email or mobile phone.
- States have appointed the Van DhanKendras as their primary procurement agents for MFP procurements from local bazaars.

### 3.5 Environment Impact Assessment (EIA)

- EIA is a process of evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse.
- Environment Impact Assessment in India is statutorily backed by the Environment Protection Act, 1986 which contains various provisions on EIA methodology and process.
- To address unprecedented situation arising from global outbreak of Novel Corona Virus (COVID-19), and to ramp up availability or production of various drugs, MoEF&CC, has made an amendment to EIA Notification 2006.
- According to the amendment all projects or activities in respect of bulk drugs and intermediates, manufactured for addressing various ailments, have been re-categorized from the existing Category 'A' to 'B2' category.
- Projects falling under Category B2 are exempted from requirement of collection of Base line data, EIA Studies and public consultation.
- The re-categorization of such proposals has been done to facilitate decentralization of appraisal to State Level so as to fast track the process.
- This amendment is applicable to all proposals received up to 30th September 2020.
- The states have also been issued advisories to expeditiously process such proposals.
- Further, to ensure expeditious disposal of the proposals within given time-line, Ministry has also advised states to use information technology e.g. video conference, considering the fact that in view of the prevailing situation on ground, appraisal of proposals may not be possible through physical meetings.

#### ***Environment Impact Assessment (EIA) notification 2020***

- Union government has recently released Environment Impact Assessment notification 2020, it set to replace the EIA notification 2006.
- It is released by the Ministry of Environment, Forest and Climate Change (MoEFCC), it requires the public to respond within 60 days of being issued.
- It is being criticized for absurdly released during a nationwide lockdown, it has several dangerous loopholes such as
  1. Public hearings are no longer mandatory for several projects,
  2. Project expansion rules have been eased,
  3. Public consultation process is weaker,
  4. It legitimizes the wrongdoings by industries.
- For instance in March 2017, the MoEFCC issued a notification to appraise projects which have started work on-site without taking prior environmental clearance in terms of the provisions of the 2006 EIA notification.
- It was supposed to be an exception, but has since become a norm.
- Taking it a step further, the 2020 notification states that 'Such violations being recurring in nature may come to the notice in future during the process of appraisal or monitoring or inspection by Regulatory Authorities.
- Therefore, the Ministry deems it necessary to lay down the procedure to bring such violation projects under the regulations in the interest of the environment, rather than leaving them unregulated and unchecked, which will be more damaging to the environment'.

### 3.6 National Board for Wild Life

- NBWL is a statutory body as it has been constituted under Section 5 A the Wildlife Protection Act, 1972.
- It is the apex body to review all wildlife-related matters and approve projects in and around national parks and sanctuaries i.e. Protected Areas.
- In 2003, NBWL was constituted its term lapsed in 2013, in 2014 it was reconstituted (was notified on July 22, 2014).

- It is a 47-member board (including the chairman) which usually meets once a year - It is chaired by Prime minister.
- The environment ministry has delegated all powers of the NBWL to a compliant Standing Committee which regularly meets and clears projects in Protected Areas.
- The National Board may, at its discretion, constitute a Standing Committee under sub-section (1) of Section 5B to be chaired by Union Minister in charge of Forests and Wildlife.
- The National Board for Wildlife (NBWL) has approved a slew of wildlife clearances for 'developmental' projects across the country even as the country is in lockdown mode.
- Recently NBWL met virtually, it is to be noted NBWL has not met for the last six years.
- It has a Standing Committee that issues policy decisions and clearances, it has given clearance to following projects.
  1. Etalin hydropower project, Arunachal Pradesh.
  2. Highway construction in Goa, which passes through the Mollem Wildlife Sanctuary.
  3. Nagpur-Mumbai superhighway over 32,000 trees will be felled and the proposed design passes through 48 villages.
  4. Railway bridge in Madhya Pradesh and Telangana through the Kawal tiger corridor.

### 3.7 iCommit Initiative

*Recently, the iCommit initiative was launched on the occasion of the World Environment day (5th June).*

- The initiative is driven by Energy Efficiency Services Limited (EESL), under the administration of the Ministry of Power, Government of India.
- iCommit initiative is centred around the idea of building an energy resilient future.
- It is a clarion call to all stakeholders and individuals to continue moving towards energy efficiency, renewable energy, and sustainability to create a robust and resilient energy system in the future.
- The prerequisite for this goal is to create a flexible and agile power system.
- A healthy power sector can help the nation in meeting the objective of energy access and security for all.
- It seeks to bring together a diverse spectrum of government and private players to build a new energy future for India.

### 3.8 Healthy and Energy Efficient Buildings

- The Energy Efficiency Services Limited (EESL), in partnership with the U.S. Agency for International Development's (USAID) MAITREE program, launched the "Healthy and Energy Efficient Buildings" initiative that will pioneer ways to make workplaces healthier and greener.
- The initiative was launched on the occasion of the World Environment day (5th June).
- This initiative is to address the challenges of retrofitting existing buildings and air conditioning systems so that they are both healthy and energy efficient.
- The initiative, implemented by the EESL in its office, will pave the way for other buildings to take appropriate steps to be healthy and energy efficient.
- This will help in developing specifications for future use in other buildings throughout the country, as well as aid in evaluating the effectiveness and cost benefits of various technologies and their short and long-term impacts on air quality, comfort, and energy use.
- Energy Efficiency Services Limited (EESL) is under the administration of the Ministry of Power, Government of India.

### 3.9 Guidelines on Exotic Animals

- The Environment Ministry's wildlife division has introduced new rules to regulate the import and export of 'exotic wildlife species'.



- Currently, it is the Directorate-General of Foreign Trade, Ministry of Commerce that oversees such trade.
- Under the new rules, owners and possessors of such animals and birds must also register their stock with the Chief Wildlife Warden of their States.
- Officials of the Wildlife Department will also prepare an inventory of such species and have the right to inspect the facilities of such traders to check if these plants and animals are being housed in salubrious conditions.
- 'Exotic live species' will mean animals named under Appendices I, II and III of the Convention on International Trade in Endangered Species (CITES) of Wild Fauna and Flora.
- It will not include species from the Schedules of the Wild Life (Protection) Act, 1972.

### 3.10 Advisory on Import of Exotic Animals

- The term exotic does not have a set definition but it usually refers to a wild animal or one that is more unusual and rare than normal domesticated pets like cats or dogs.
- These are those species which are not usually native to an area and are introduced to an area by humans.
- Recently, the Ministry of Environment, Forest and Climate Change has issued an advisory to streamline and formalize the process of importing live exotic animals.
- Many exotic species of birds, reptiles and amphibians are imported into India for commercial purposes.
- The major reason for issuing the advisory is to regulate trade because the issue of zoonotic diseases is linked to wildlife.
- With this advisory, it will be known how many such exotic animals are there in the country.
- The advisory has defined them as those that are mentioned under the Appendices of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) but not under the Schedules of the Wild Life (Protection) Act, 1972.
- According to the advisory
  1. A person trying to import a live exotic animal will have to submit an application for grant of a license to the Director-General of Foreign Trade (DGFT), under the Ministry of Commerce and Industry.
  2. Earlier, these imports were happening through the DGFT but they were beyond the purview of the forest departments and the chief wildlife wardens were not aware of them.
  3. The importer will also have to attach a No Objection Certificate (NOC) of the chief wildlife warden of the state concerned along with the application.
  4. For those people who have already imported exotic animals, a declaration will have to be made within six months.
  5. However, if the declaration is made after six months, documents related to the provenance of the animal will have to be submitted.
- Being an advisory, it does not have the force of law and can potentially incentivize illegal trade by offering a long amnesty period.

### 3.11 Time Stamped Card System

- Recently, the Karnataka Forest Department has decided to put in place a traffic monitoring mechanism along the roads adjacent to Nagarhole National Park.
- The forest department will introduce a time-stamped card system for vehicles passing through the roads, adjacent to Nagarhole National Park, which have high traffic density 24x7.
- The time stamped card will have complete details on the speed limit to be maintained and the exit time at the next check post.
- Such a system is already in place on the road cutting through Nagarhole Tiger Reserve.
- It will help ensure that motorists don't stop midway and litter the area or cause disturbance to wildlife.
- It will also ensure better compliance of forest laws by motorists and will also minimize road kills.



### 3.12 National Transit Pass System

- Union Environment Ministry launched the National Transit Pass System (NTPS).
- It is an online system for issuing transit permits for timber, bamboo and other forest produce.
- Through mobile application e-pass will be issued for transit of forest produce.
- NTPS will bring ease of business and expedite issuance of transit permits for timber, bamboo and other minor forest produce without physically going to forest offices.
- The pilot project will be functional in Madhya Pradesh and Telangana for now.
- The system will be operational in all states by November 2020, to enhance seamless movement of forest produce.
- Transit of timber, bamboo and other forest produce is governed by various state specific acts and rules.

### 3.13 Conservation Assured | Tiger Standards [CA|TS]

- CA|TS is a conservation tool developed in 2013, in collaboration with field managers, tiger experts and government agencies engaged in tiger conservation.
- It sets best practice and standards to manage target species, and encourages assessments to benchmark progress.
- Tigers are the first species selected for the initiative.
- CA|TS is being adopted for use beyond tigers, including potentially jaguars, lions and freshwater dolphins.
- CA|TS is a partnership of tiger range governments, inter-governmental agencies, institutions, NGOs and conservation organizations.
- WWF is helping tiger range countries to implement CA|TS.
- National Tiger Conservation Authority (NTCA) announced the adoption of the across all of the country's 50 Tiger Reserves.
- These 50 Tiger Reserves are spread across 18 states containing over 70% of the world's tiger population.
- By this India becomes first among the 13 tiger range countries to nationally adopt CA|TS.
- This brings India's total number of registered sites to 94 (which includes sites outside the Tiger Reserves).
- This announcement further strengthens India's contribution to the global goal set in 2010 to double the number tigers in the wild, known as TX2

### 3.14 OSOWOG

- The Union Ministry of New and Renewable Energy (MNRE) had invited proposals for implementing 'One Sun One World One Grid' (OSOWOG) in May 2020.
- The concept of OSOWOG was introduced in the Global RE-Invest meeting of the Indian Ocean Rim Association and the first assembly of the International Solar Alliance (ISA).
- OSOWOG is India's initiative to build a global ecosystem of interconnected renewable energy resources.
- The blueprint will be developed under the World Bank's technical assistance programme that is implemented to accelerate the deployment of grid connected rooftop solar installations.
- OSOWOG is planned to be completed in three phases.
- Phase I - It will entail interconnectivity within the Asian continent.
- Phase II - It will add Africa.
- Phase III - It will globalize the whole project.
- This is seen as India's counter to China's Belt and Road initiative (BRI).



### 3.15 Winter Diesel

- It is a specialised fuel specifically for high altitude regions and low-temperature regions.
- It becomes necessary since the the flow characteristics of regular diesel change at such low temperatures and may become detrimental to vehicles.
- It was introduced by IOCL last year in Ladakh, where ordinary diesel can become unusable.
- It can be used in temperatures as low as  $-30^{\circ}\text{C}$  and has a low pour point.
- Characteristics of Winter Diesel –
- Contains Additives to maintain lower viscosity
- High cetane rating (Cetane denotes the combustion speed of diesel and compression needed for ignition)
- Lower Sulphur content – Ensures lower deposits in engines and better performance.

### 3.16 Nagar Van Scheme

*Union government has announced implementation of the Nagar Van Scheme*

- The Nagar Van (Urban Forests) aims to develop 200 Urban Forests across the country in the next five years.
- Warje Urban Forest in Pune (Maharashtra) will be considered as a role model for the Scheme.
- The Scheme enforces people's participation and collaboration between the Forest Department, Municipal bodies, NGOs, Corporates and local citizens.
- These urban forests will primarily be on the existing forest land in the City or any other vacant land offered by local urban local bodies.
- The finances for the scheme will be paid for by the CAMPA (Compensatory Afforestation Fund (CAF) Act, 2016) funds.

### 3.17 SATAT Scheme

- Sustainable Alternative towards Affordable Transportation (SATAT) scheme on Compressed Bio Gas was launched in 2018.
- It envisages targeting production of *15 MMT of CBG* from 5000 plants by 2023.
- Oil Marketing Companies have offered long term pricing on CBG to make projects bankable and have agreed to execute long term agreements on CBG.
- Under SATAT scheme, IOT Biogas Limited (Namakkal, Tamil Nadu) decided to divert part/full biogas production to Compressed Biogas (CBG) generation.
- The Compressed Biogas procured from IOT Biogas plant shall be sold through Retail Outlets (ROs) and Institutional Business (IB).
- This is the first time an alternative to natural gas is being sold by Oil Marketing Companies.

### 3.18 Compressed Bio-Gas

- Biogas and CNG are the same but for a few differences.
- Origin – CNG is found in nature as Natural Gas.
- Biogas, is produced in a sealed tank/ chamber, from an organic feed-stock.
- Composition - Biogas is mainly Methane & Carbon Di Oxide, while Natural Gas is mainly Methane.
- Compressed Biogas proposes to build large biogas plants that will continuously produce biogas from urban, domestic and industrial wastes.
- The biogas produced will be stored under pressure in gas cylinders for easy distribution to urban and semi-urban customers as alternative to charcoal and firewood.
- Union Government is in the process of including Compressed Bio-Gas under Priority Sector Lending.



### 3.19 Biochar

- Biochar is charcoal used as a soil amendment for both carbon sequestration and soil health benefits.
- Biochar technically defined as the solid material obtained from the thermochemical conversion of biomass in an oxygen-limited environment.
- Like most charcoal, biochar is made from biomass via pyrolysis (decomposition brought about by high temperatures).
- Biochar may increase the following
  1. Soil fertility of acidic soils (low pH soils),
  2. Agricultural productivity,
  3. Protection against some foliar and soil-borne diseases.
  4. Soil's water-holding capacity,
  5. Nutrient supply and retention.
- A recent research in Ghana, an African nation proved biochar application could help promote cowpea growth and crop yield in the country as well as fight climate change impact on soil.

### 3.20 Central Zoo Authority

- It is a statutory body under the Ministry of Environment, Forest and Climate Change.
- It was constituted in 1992 under the Wildlife (Protection) Act, 1972.
- It is chaired by the Environment Minister and has 10 members and a member-secretary.
- The main objectives of the authority are
- To complement and strengthen the national effort in conservation of rich biodiversity.
- The authority provides recognition to zoos and is also tasked with regulating the zoos across the country.
- It lays down guidelines and prescribes rules under which animals may be transferred among zoos nationally and internationally.
- It coordinates and implements programmes on capacity building of zoo personnel, planned breeding programmes and ex-situ research.
- Recently, the Ministry of Environment, Forest and Climate Change has reconstituted the Central Zoo Authority (CZA).
- Now CZA will include an expert from the School of Planning and Architecture, Delhi, and a molecular biologist.

### 3.21 Draft Policy for Supply of Round-the-Clock Power

- The Ministry of New and Renewable Energy has proposed a draft policy for the supply of round-the-clock (RTC) power to distributors through a *mix of renewable energy and electricity generated in coal-based plants.*
- It provides for reverse bundling, wherein high-cost thermal power is being allowed to be bundled with cheaper renewable energy.
- Thus, a power generating firm will have to supply electricity such that at least 51% of the annual energy supplied corresponds to renewable energy and the balance is drawn from thermal sources.
- It will also facilitate fulfilment of renewable purchase obligation (RPO) requirement of the obligated entities.
- The Renewable Energy may include solar, wind, small hydro, or a combination thereof, with or without any Energy Storage System (ESS).
- A composite tariff will be levied and a successful bidder will be selected through a transparent bidding process.
- The scheme is unique in the world as conventional and non-conventional resources will complement each other to provide a sustainable firm power to the grid.

- **India's Target** - Installing 175 GW of renewable energy (RE) sources by 2022 and 450 GW by 2030.
- For 2022, 100 GW of solar generation, 60 GW of wind, 10 GW of biomass and 5 GW of small hydro.
- 40% of the total installed power generation capacity is non-fossil fuel, reducing emission intensity of GDP by 33-35 per cent from 2005 level.

### 3.22 Green-Ag

- It is a project funded by Global Environment Facility.
- It aims to catalyze sustainable transformation of Indian agriculture without compromising the country's food security and farmers' income.
- It seeks to mainstream biodiversity, climate change, and sustainable land management objectives and practices into Indian agriculture.
- It is launched in 5 States - Madhya Pradesh, Odisha, Rajasthan, Mizoram and Uttarakhand.
- The Ministry of Agriculture and Farmers' Welfare (MoA&FW) is the national executing agency and FAO is the designated GEF Implementing Agency.
- The Ministry of Environment Forests and Climate Change (MoEF&CC) is the GEF Operational Focal Point and coordinates all GEF projects in the country.
- It was recently launched in the State of Mizoram.
- It will be implemented in Dampa Tiger Reserve in west Mizoram's Mamit district and Thorangtlang Wildlife Sanctuary in Lunglei district in southern part of the State covering more than 30 villages.

### 3.23 Herbal Roads Initiative

- Uttar Pradesh government will develop 800 km roads as Herbal roads in the state.
- It will have trees like likePeepal, Neem, Sehjan along with other herb varieties like brahmi, ashvagandha and jatrofa along with the land on the sides of roads.

### 3.24 UN Decade on Ecosystem Restoration

- It was declared by UN General Assembly and will be implemented by UNEP, FAO.
- It was led by El Salvador.
- This decade (2021 to 2030) declaration will accelerate existing goals like Bonn Challenge.
- Bonn Challenge aims to restore 350 million hectares of degraded ecosystems by 2030.

## 4. BIODIVERSITY

### 4.1 Tiger Census

- National Tiger Conservation Authority (NTCA) conducts a tiger census across India every 4 years.
- The first was conducted in 2006, followed by 2010 and in 2014.
- The Census (2014) had reported 2,226 tigers in the country, up from 1,706 in 2010.
- The fourth tiger census (All India Tiger Estimation 2018-19) was released in May 2019.
- 2018 tiger census used more technology including a mobile app named "MSTripes" for the very first time to store information of the counting.
- Tiger census 2018 covered the northeast India that was not included in the previous census.
- For the very first time three neighboring countries Bhutan, Nepal and Bangladesh helped in counting the number of tigers all across India, especially in the region with mutual borders in the 2018 tiger census.

## 4.2 All India Tiger Estimation

- All India Tiger Estimation 2018 has entered the Guinness World Record for being the world's largest camera trap wildlife survey.
- The fourth iteration of the survey, conducted in 2018-19 was the most comprehensive to date, in terms of both resource and data amassed.
- According to the report of 2018, India now has an estimated 2967 tigers out of which 2461 individual tigers have been photo captured, about 83 % of the tiger population.
- With this number, India is home to nearly 75% of the global tiger population.
- India has already fulfilled its resolve of doubling tiger numbers, made at St. Petersburg in 2010, much before the target year of 2022.
- The All India Tiger Estimation done every four year once, It is
  1. Steered by the National Tiger Conservation Authority
  2. Technically supported by Wildlife Institute of India
  3. Implemented by State Forest Departments and partners.

## 4.3 Status of Tigers in India Report

- Ministry of Environment, Forest and Climate Change has released a detailed 'Status of Tigers, Co-predators and Prey in India (2018) Report' on the eve of the Global Tiger Day (29th July).
- The report compares information obtained from the earlier three tiger surveys (2006, 2010, and 2014) with data obtained from the 2018-19 survey to estimate tiger population trends at country level.
- India's Project Tiger was launched in 1973 with 9 tiger reserves.
- India has 70% of the world's tiger population, it is tirelessly working with all 13 tiger range countries towards nurturing the tiger.

### Highlights

- The national tiger status assessment of 2018-19 estimated the overall tiger population in India at 2,967 - 33% increase from 2014 (2,226).
- Tigers were observed to be increasing at a rate of 6% per annum in India from 2006 to 2018.
- Uttarakhand's Corbett Tiger Reserve (CTR) has reported the highest tiger density among India's 50 reserves with 14 tigers per 100 sq km, followed by Kaziranga, Nagarhole and Orang tiger reserves.
- Madhya Pradesh has the highest number of tigers at 526, closely followed by Karnataka (524) and Uttarakhand (442).
- The Northeast has suffered losses in population.
- Further, the tiger status in Chhattisgarh, Jharkhand and Odisha has steadily declined, which is a matter of concern.
- With 2,967 tigers, India is four years in advance, has achieved the target set in the 2010 St Petersburg Declaration of doubling tiger population by 2022.

## 4.4 KAZI 106F

- 'Kazi 106F', described as the country's only Golden Tiger.
- It resides in world heritage Kaziranga National Park of Assam.
- It is also known as 'Tabby tiger' or 'Strawberry tiger'.
- The skin of tigers is orange-yellow with black stripes and whitish abdominal region.
- The yellowish background is controlled by a set of 'agouti genes' and their alleles and the black colour stripes are controlled by 'tabby genes' and their alleles.



- Suppression of any of these genes may lead to colour variation in tiger.
- Agouti genes interacts with the pigment cells to produce yellow to red or brown to black expression.
- This interaction is responsible for making distinct light and dark bands in the hairs of animals such as the agouti here same is happening in our tigress - Kazi 106 F.

#### 4.5 Source - Sink Dynamics & Tiger Population

- Source–sink dynamics is a theoretical model used by ecologists to describe how variation in habitat quality may affect the population growth or decline of organisms.
- In this model, organisms occupy two patches of habitat.
  1. Source, is a high-quality habitat that on average allows the population to increase.
  2. Sink, is very low-quality habitat that, on its own, would not be able to support a population.
- However, if the excess of individuals produced in the source frequently moves to the sink, the sink population can persist indefinitely.
- The tiger survey has highlighted that the tiger population in the source-sink is in the ratio of 60:40.
- 33% of the tiger population in India lives outside its source i.e, tiger reserves.
- 17/50 tiger reserves in India are going to achieve its maximum capacity to hold the tiger populations.
- Tiger survey suggested that there is a need to create buffer areas around the habitat zones of tigers where guided land-use and faster conservation interventions can help reduce human-tiger conflict.

#### 4.6 Rise in Population of Asiatic Lion

- Recently, the Gujarat Forest Department has announced an increase in the population of Asiatic lions in the Gir forest region.
- Total 674 lions were recorded compared to the 523 in the Lion Census of 2015.
- The count was estimated from a population observation exercise called Poonam Avlokan in place of the 15th Lion Census.
- Poonam Avlokan is a monthly in-house exercise carried out every full moon.
- It was a mechanism developed by the Forest Department in 2014 as part of preparations for the 2015 Lion Census.
- According to recent estimates the lion population has grown by almost 29% from the last count in 2015, the lion population in the state of Gujarat has doubled since 2001.
- The first Lion Census was conducted by the Nawab of Junagadh in 1936.
- Since 1965, the Forest Department has been regularly conducting the Lion Census every five years.
- The regular Lion Census is conducted once every five years. The last Census was conducted in 2015.

#### Asiatic Lion

- Asiatic lions are found in protected areas and agro-pastoral landscape of Saurashtra, covering nine districts in Gujarat.
- Its current estimated population is 674.
- India has recorded a 29% increase in its population in the past five years — from 523 in 2015 to 674 in 2020.
- Asiatic Lions are listed as 'Endangered' under the IUCN Red List.
- Asiatic Lions are protected under Schedule I of Wildlife Protection Act (1972).

#### 4.7 Project Dolphin and Project Lion

- Following the success of project tiger India will now have two more similar missions.



- The two new missions are namely Project Dolphin and Project Lion, to protect these species in their natural habitat in a holistic manner.
- Functions of the project are as follows
  1. **Project Dolphin** will cover both freshwater (river) and marine (oceanic) dolphins.
  2. **Project Lion** will have many additional components including creation of new required infrastructure, use of technology, involvement of experts for conservation, providing world standard care and health management.

#### 4.8 Gangetic River Dolphin

- Gangetic river dolphin, declared as a National Aquatic species in 2010, is a species of freshwater dolphins primarily found in the Ganges and Brahmaputra rivers and their tributaries in India, Bangladesh and Nepal.
- At present, there are about 3,700 Gangetic river dolphins in the Indian River systems.
- These dolphins are sighted along deep river reaches in Assam, Bihar, Jharkhand, Madhya Pradesh, Rajasthan, Uttar Pradesh and West Bengal.
- River Dolphin has two sub-species namely Indus River Dolphins and Gangetic River Dolphins, both subspecies are listed by the IUCN as endangered.
- Ganges river dolphins are protected under Schedule I of Wildlife Protection Act (1972).

#### 4.9 Reintroduction of African Cheetahs

- Recently three African hunting cheetahs from South Africa has been introduced in Mysore zoo.
- A year after zoo lost its last surviving African hunting Cheetah Mysore zoo has received three big cats from Ann Van Dyke Cheetah Centre, South Africa.
- Mysuru is the second zoo to house hunting cheetah in India, Hyderabad zoo has a pair of big cats.
- In January 2020 SC has lifted its seven-year stay on a proposal to introduce African cheetahs from Namibia into the Indian habitat on an experimental basis.
- The plan was to revive the Indian cheetah population.
- In May 2012, the top court had stalled the plan to initiate the foreign cheetahs into the PalpurKuno sanctuary in Madhya Pradesh fearing they may come into conflict with a parallel and a much-delayed project to reintroduce lions into the same sanctuary.
- **African Cheetahs** - These are bigger in size as compared to Asiatic Cheetah.
- Were as Asiatic cheetahs has more fur, a smaller head and a longer neck and they have a more cat-like appearance.
- IUCN Status is Vulnerable for the animal.
- It is protected under CITES Appendix-I of the List.
- This List comprises of migratory species that have been assessed as being in danger of extinction throughout all or a significant portion of their range.

#### 4.10 CrocBITE

- CrocBITE is an online database of crocodile attacks reported on humans.
- The non-profit online research tool helps to scientifically analyse crocodile behaviour via complex models.
- Users are encouraged to feed information in a crowdsourcing manner, the uploaded information needs to be verifiable.
- The database provides key insights into crocodile attack patterns and draws inferences to save human lives.

Crocodile species found in India includes

1. Muggor or Marsh Crocodile
2. Estuarine or Saltwater Crocodile
3. Gharial or River water Crocodile

Human-crocodile conflict Hotspots in India includes

1. Vadodara in Gujarat (Vishwamitri river)
2. Kota in Rajasthan,
3. Bhitarkanika in Odisha
4. Andaman and Nicobar Islands (Culling had been recommended a few years back in the Andaman and Nicobar islands by the forest department to the MoEFCC)



- The information is vital for Australia and Africa where such attacks are more likely than in other parts of the world.
- This is the only database of its kind with such comprehensive collection of information made available online.

#### 4.11 Indian Crocodile Conservation Project

- The Crocodile Conservation Project was launched in 1975 in different States.
- The Gharial and Saltwater crocodile conservation programme was first implemented in Odisha in early 1975 and subsequently the Mugger conservation programme was initiated.
- Gharial crocodile project started in Tikarpada (1975) aims to increase the sighting to five crocodiles per kilometre length of water.
- As a result of the programme, the estimated number of the saltwater crocodiles increased from 96 in 1976 to 1,640 in 2012 in India.

#### 4.12 Coccolithophores

- Coccolithophores are single-celled algae living in the upper layers of the world's oceans.
- It calcifies marine phytoplankton that produces up to 40 % of open ocean calcium carbonate and responsible for 20 % of the global net marine primary productivity.
- At equilibrium, it absorbs more carbon dioxide than they produce, which is beneficial for the ocean ecosystem.
- A study led by the National Centre for Polar and Ocean Research (NCPOR) has found that there is a decrease in the concentration of oceanic calcium carbonate (CaCO<sub>3</sub>) in the southern Indian ocean.
- This decrease in CaCO<sub>3</sub> is attributed to the increase in the concentration of another single-celled algae known as diatoms.
- This, in turn, will affect the growth and skeleton structure of coccolithophores, with potential significance for the world ocean ecosystem.

#### 4.13 Foraminifera

- By studying microscopic zooplankton called foraminifera, the team had published a paper in 2019 which first found evidence from the past of an Indian Ocean El Niño.
- Foraminifera build a calcium carbonate shell, and studying these can tell us about the properties of the water in which they lived.
- The team measured multiple individual shells of foraminifera from ocean sediment cores and was able to reconstruct the sea surface temperature conditions of the past.

#### 4.14 Sal Forest Tortoise

- The Sal Forest Tortoise, also known as the elongated tortoise (*Indotestudoelongata*) is widely distributed across **South and Southeast Asia**.
- It has been assessed as **critically endangered** under the IUCN Red List of Threatened Species.
- It is included in CITES Appendix II, allowing international commercial trade in the species provided such trade is not detrimental to the species, and subject to national trade legislation.
- It is also included in **Schedule IV of the Indian Wildlife (Protection) Act of 1972** (amended), which lists species that require a small game hunting license to allow collection and local trade; the species may warrant transfer to Schedule I, which would afford stricter protection.
- It is heavily hunted for food and collected both for local use, such as decorative masks, and international wildlife trade.
- The foremost threat to *Indotestudoelongata* has been the intensive collection almost throughout its entire range for trade to East Asia.



#### 4.15 Domestication of Chicken

- A recent study by scientists has revealed new details about the earliest domestication of chicken.
- The DNA sequencing of 863 genomes has showed the first domestication of chicken occurred in south-western China, northern Thailand and Myanmar.
- According to Charles Darwin, chickens were domesticated around 4,000 B.C. from a single ancestor, Red Jungle Fowl in the Indus Valley.
- The recent study involved sequencing of genomes from all four species of the genus Gallus, five sub-species of Red Jungle Fowl and various domestic chicken breeds collected worldwide.
- It revealed single domestication from Red Jungle Fowl sub-species Gallus gallusspadiceus.
- It contradicted the earlier claim that chickens were domesticated in northern China and the Indus Valley.

#### 4.16 Ecological Trap

- Ecological trap theory describes the reasons why organisms may actually prefer sink patches over source patches.
- The concept stems from the idea that organisms that are actively selecting habitat must rely on environmental cues to help them identify high-quality habitat.
- If either the habitat quality or the cue changes so that one does not reliably indicate the other, organisms may be lured into poor-quality habitat.
- It thought to occur when the attractiveness of a habitat increases disproportionately in relation to its value for survival and reproduction.
- The result is preference of falsely attractive habitat and a general avoidance of high-quality but less-attractive habitats.

## 5. PROTECTED AREAS

### 5.1 Mount Harriet National Park

- It is located in the south of the Andaman and Nicobar islands.
- Mount Harriet is the third-highest peak in the Andaman and Nicobar archipelago next to Saddle Peak in North Andaman and Mount Thuillier in Great Nicobar.
- The park is covered with evergreen forest pockets.
- It is rich in flora and faunal species like andaman wild pigs, saltwater crocodiles, butterflies and palm trees.

### 5.2 DehingPatkai Wildlife Sanctuary

- DehingPatkai wildlife sanctuary is located in the Dibrugarh and Tinsukia Districts of Assam.
- The DehingPatkai forms the largest stretch of tropical lowland rainforests in India.
- Ethnic groups living in the area include the indigenous Assamese communities, particularly Tai Phake, Khamyang, Khampti, Singpho, Nocte, Ahom, Kaibarta, Moran and Motok, Burmese, and non-indigenous Nepali people.
- Recently concerns have been expressed over the diversion of 98.59 hectares land of Saleki proposed reserve forest, which is a part of DehingPatkai elephant reserve, for a coal-mining project in Upper Assam.

### 5.3 Mollem Wild Life Sanctuary

- Bhagwan Mahaveer Sanctuary and Mollem National Park is a 240 square kilometres protected area located in the Western Ghats of South India, in Sanguem taluk, Goa State, along the eastern border with Karnataka.
- National Highway 4A divides it into two parts and the Mormugao - Londa railway line passes through the area.

- It contains several important temples dating to the Kadambas of Goa, and home to waterfalls, such as Dudhsagar Falls and Tambdi Falls.
- The parkland is also home to a community of nomadic buffalo herders known as the Dhangar.

#### 5.4 Kawal Tiger Corridor

- Kawal Tiger Reserve is located at Jannarammandal of Mancherial District (Old Adilabad district) in Telangana state of India.
- Govt of India declared Kawal wildlife sanctuary as Tiger Reserve in 2012.
- The reserve is the oldest sanctuary in the northern Telangana region of the state.
- This sanctuary is catchment for the rivers Godavari and Kadam, which flow towards the south of the sanctuary.

#### 5.5 Dibru-Saikhowa National Park

- It is a national park in Assam, India, located in Dibrugarh and Tinsukia districts.
- It was designated a Biosphere Reserve in July 1997.
- The park is bounded by the Brahmaputra and Lohit Rivers in the north and Dibru river in the south. It mainly consists of moist mixed semi-evergreen forests, moist mixed deciduous forests, canebrakes and grasslands.
- It is the largest salix swamp forest in north-eastern India, with a tropical monsoon climate with a hot and wet summer and cool and usually dry winter.
- Annual rainfall ranges from 2,300 to 3,800 mm (91 to 150 in).
- It is a haven for many endangered species and rich in fish diversity.

#### 5.6 Nagarhole National Park

- It is also known as 'Rajiv Gandhi National Park.
- It was established as a wildlife sanctuary in 1955 and was upgraded into a national park in 1988. It was declared as the 37th Tiger reserve under Project Tiger in 1999.
- The Park lies in the Western Ghats and is a part of the Nilgiri Biosphere Reserve.
- The Nagarhole River flows through the park, which joins the Kabini River which also is a boundary between Nagarhole and Bandipur National Park.
- The vegetation consists mainly of moist deciduous forests with predominating trees of teak and rosewood.

#### 5.7 Vikramshila Gangetic Dolphin Sanctuary

- Vikramshila Gangetic Dolphin Sanctuary is located in Bhagalpur District of Bihar, India.
- The sanctuary is a 60 km stretch of the Ganges River from Sultanganj to Kahalgaon in Bhagalpur District.
- Designated in 1991, it is protected area for the endangered Gangetic dolphins in Asia.
- According to the latest estimate, there were nearly 170 dolphins in the Vikramshila Gangetic Dolphin Sanctuary.
- The last survey of Bihar's dolphin population was conducted in 2018.
- It was found that there were 1,363 dolphins in the rivers in the state.
- Going by this number, Bihar is home to around half of the estimated 2,500-3,000 Gangetic dolphins in India.

#### 5.8 India's first Dolphin Observatory

- Bihar government is setting up India's first observatory for the mammals in Bhagalpur district at the Vikramshila Gangetic Dolphin Sanctuary (VGDS).



- The structural design of the observatory is such that it will promote eco-tourism.
- The observatory is being built on the Sultanganj-AguwaniGhat bridge over the Ganga, it will be in the middle of the river, where bridge's width will be nearly 100 feet.
- The four-storey observatory will be 40 feet high, with the bridge passing through its middle.
- The observatory building will be transparent, with glass from all sides to ensure people can watch the dolphins.
- It will give people an incentive to visit the place and see dolphins in the sanctuary without disturbing them.
- There would be no bad or adverse impact on the river's ecology as the observatory is being constructed on a bridge over the Ganga.
- There are also suggestions to build another dolphin observatory at the confluence of the Ganga and Punpun rivers near Fatuha in Patna, about 5-15 dolphins are visible at the site at all times of the year.

### 5.9 Haldwani Bio-Diversity Park

- Uttarakhand opened its biggest biodiversity park in Haldwani on the World Environment Day (5th June).
- Inside the Park, there are thematic gardens, a soil museum, species of plants, lichens, mosses and algae from the Jurassic era, a vermicomposting unit, an interpretation center, and a state-of-the-art weather station.
- The Park has 40 unique sections having 479 rare plant species of cactus, medicinal herbs, different types of tr etc.
- The various species of plants have been brought to the park from diverse terrains like Niti Mana Valley and even from some glaciers around Kedarnath.
- Niti Mana Valley is located near the India Tibetan Border in Chamoli district of Uttarakhand.
- The plant species in the biodiversity park is divided into spiritual & religious, scientific, human health, and aesthetic value sections.
- The spiritual section has trees that find mention in holy scriptures like Guru Granth Sahib, Quran, Bible, and others.
- It showcases the different kinds of soil found in various topographies of Uttarakhand – alpine, bhabhar, sub-mountainous, mountainous, tertiary, loam, terai.

### 5.10 Lichen Park

- India's first Lichen Park is developed by Uttarakhand forest department in Kumaon.
- It is established in Munsiyari area with over 80 species of lichens collected from across the Himalayan state.
- Uttarakhand has more than 600 species of lichens followed by Himachal Pradesh and Jammu and Kashmir with 503 and 386 species respectively.
- A lichen is a composite organism that arises from algae or cyanobacteria living among filaments of multiple fungi species in a mutualistic relationship.
- They are one of the oldest living things, grow in a wide range of habitat including some of the most extreme conditions like the arctic, tundra, hot dry desert rocky coasts etc
- Lichens are indicator of pollution levels in the Himalayas and are more sensitive towards habitat and climate changes.
- One of the lichen species called JhulaGhas is used as a flavouring agent in foods.

### 5.11 Maguri Motapung Beel

- MaguriBeel is a large wetland located near Dibru-Saikhowa National Park and Biosphere Reserve.



- A small channel connects MaguriBeel with the Dibru River to the North.
- It has been declared as an Important Birding Site (IBA) by Birdlife International.
- It is home to some of the rarest of the bird species and attracts varied species of birds from around the globe.
- Some of them includes - Ruddy Shelduck, Baikal Teal, Bar-Headed Goose, Falcated Duck, Ferruginous Duck, Northern Pintail etc.
- It is also very rich in aquatic life and this has led to development of many fishing camps near it.
- The nearby areas of the beel displays grassland environment, creating a safe haven for grassland birds.

**Dibru-Saikhowa National Park**

- It is in Dibrugarh and Tinsukia districts, Assam.
- It was designated a Biosphere Reserve in July 1997.
- It is bounded by the Brahmaputra and Lohit Rivers in the north and Dibru river in the south.
- Climate- Tropical monsoon climate with a hot and wet summer and cool and usually dry winter.
- Annual rainfall - 2,300 to 3,800 mm.
- Forests - Moist mixed semi-evergreen forests, moist mixed deciduous forests, canebrakes and grasslands.
- It is the largest salix swamp forest in north-eastern India.

**5.12 Kole Wetlands**

- It is spread over Thrissur and Malappuram districts of Kerala.
- It is a Ramsar site and IBA (Important Bird and Biodiversity Area)
- It accounts for more than 40% of the rice production in the State.
- It is situated in the Central Asian Flyway of migratory birds.
- It contains subterranean habitats that are important habitats for some fresh water fish species which are endemic to southern Western Ghats.
- The Society for Odonate Studies has been conducting Odonate surveys at the Kole wetlands since 2018.
- 37 species of dragonflies and damselflies have been reported from the wetlands so far.

**5.13 Bhagirathi Eco-Sensitive Zone**

- Bhagirathi is the source stream of Ganga, It emanates from Gangotri glacier at Gaumukh at an elevation of 3,892 m.
- Bhagirathi Eco Sensitive Zone extends from Gaumukh to Uttarakashi covering an area of 4179.59 sq. kilometer.
- The Bhagirathi Eco-Sensitive Zone notification was issued by the Ministry of Environment, Forest and Climate Change (MoEF&CC) in 2012.
- The notification was subsequently amended on 16th April, 2018 in consultation with the
  1. Ministry of Road, Transport and Highways.
  2. Government of Uttarakhand
  3. Indian Road Congress.
- The Bhagirathi Eco-Sensitive Zone notification mandated the State Government of Uttarakhand to prepare Zonal Master Plan (ZMP) to be implemented under the supervision of the Monitoring Committee.
- The ZMP is based on watershed approach and includes governance in the area of forest and wildlife, watershed management, irrigation, energy, tourism, public health and sanitation, road infrastructure, etc.
- It aims to safe guard local people without affecting their rights and privileges and also ensuring eco-friendly development for their livelihood security.
- Recently MoEF&CC has approved ZMP of Bhagirathi Eco-Sensitive Zone.



## 6. REPORTS

### 6.1 State of India's Environment 2020

- Recently, the 'State of India's Environment 2020 in Figures' report was published by the Centre for Science and Environment (CSE).
- The report outlines the status of sustainable development, livestock, forests, water, waste, air, land, wildlife and other natural resources, environmental crimes and global economic risk.
- It states that India had around 50 lakh internal displacements caused by disasters and extreme weather conditions like floods, cyclones and drought in 2019.
- According to it, the internal displacements in India were the highest in the world in 2019.
- Internal Displacement refers to the forced movement of people within the country they live in, due to conflict, violence, development projects, natural disasters and climate change.
- It refers to the number of movements, not people, as individuals can be displaced several times.
- Major Factors of Internal Migration in India are as follows
  1. Natural Disasters (such as cyclones, flood and droughts)
  2. Forced Migration
  3. Impact of Covid-19

### 6.2 Cooling Emissions and Policy Synthesis Report

- It is published by UN Environment Programme (UNEP) and International Energy Agency.
- It assessed the benefits of cooling efficiency and the Kigali Amendment to the Montreal Protocol.
- Action under the Kigali Amendment will phase-down the production and use of hydrofluorocarbons (HFCs) and could avoid up to 0.4°C of global warming by 2100.
- It highlights that by combining energy efficiency and avoidance of super-polluting refrigerants, the world could avoid cumulative greenhouse gas emissions equivalent to 4 years based on 2018 level.

### 6.3 Report on Construction and Demolition Waste

- Construction and demolition waste is generated whenever any construction/demolition activity takes place, such as, building roads, bridges, fly over, subway, remodeling etc.
- It consists mostly of inert and non-biodegradable material such as concrete, plaster, metal, wood, plastics etc.
- Centre for Science and Environment (CSE), a Delhi based think tank has released a report on construction and demolition (C&D) waste.
- The Highlights of the report are as follows
- India recycles just one per cent of its construction and demolition (C&D) waste, i.e. meagre 6,500 tons per day.
- The country generates an estimated 150 million tons of C&D waste every year, according to the Building Material Promotion Council.
- Unofficial estimates of the total waste generated in the country put the figure at three-five times more than the official estimate.
- About 53 cities were expected to set up recycling facilities to recover material from C&D waste by 2017, but only 13 cities have done that by 2020.
- Heaps of concrete, bricks and metal waste from construction were choking waterbodies, green areas and public spaces in Indian cities.
- Toxic dust particles from the debris were polluting air at a time when cities had to reduce their particulate pollution by 20-30 per cent by 2024, under the ongoing National Clean Air Programme.

#### 6.4 Global Forest Resources Assessment 2020

- Global Forest Resources Assessment is a report released by the United Nations Food and Agriculture Organization (FAO) **every five years** since 1990.
- This report assesses the state of forests, their conditions and management for all member countries.
- According to recent report estimates Africa had the largest annual rate of net forest loss in 2010–2020, at 3.9 mha, followed by South America, at 2.6 mha.
- On the other hand, Asia had the highest net gain of forest area in 2010–2020, followed by Oceania and Europe.
- The largest proportion of the world's forests were tropical (45 per cent), followed by boreal, temperate and subtropical.
- More than 54 per cent of the world's forests were in only five countries the Russian Federation, Brazil, Canada, the United States of America and China.
- The highest per cent of plantation forests were in South America while the lowest were in Europe.

#### 6.5 Environment Performance Index

- Environment Performance Index is a biennial index released by Yale University.
- The global index considered 32 indicators of environmental performance, giving a snapshot of the 10-year trends in environmental performance at the national and global levels.
- India secured 168 rank in the 12th edition of the biennial (EPI Index 2020) out of 180 countries, the country scored 27.6 out of 100 in the 2020 index.
- India's rank was 177 (with a score of 30.57 out of 100) in 2018.
- India needs to re-double national sustainability efforts on all fronts, according to the index.
- The country needs to focus on a wide spectrum of sustainability issues, with a high-priority to critical issues such as air and water quality, biodiversity and climate change.
- All South Asian countries, except Afghanistan, were ahead of India in the ranking.
- India's rank on Sustainable Development Goals (SDGs) among the South Asian countries was low, according to State of India's Environment 2020.
- India scored below the regional average score on all five key parameters on environmental health, including air quality, sanitation and drinking water, heavy metals and waste management.
- Among South Asian countries, India was at second position (rank 106) after Pakistan on 'climate change'.
- A ten-year comparison progress report in the index showed that India slipped on climate-related parameters.
- The performance on climate change was assessed based on eight indicators, adjusted emission growth rates; composed of growth rates of four greenhouse gases and one pollutant; growth rate in carbon dioxide emissions from land cover; greenhouse gas intensity growth rate; and greenhouse gas emissions per capita.
- The report indicated that black carbon, carbon dioxide emissions and greenhouse emissions per capita increased in 10 years.
- Its overall score under climate change has dipped 2.9 points.

#### 6.6 State of the World's Forests

- The State of the World's Forests (SOFO) examines the contributions of forests, and of the people who use and manage them, to the conservation and sustainable use of biodiversity.
- This flagship publication is part of "The State of the World series" of the **Food and Agriculture Organization** of the United Nations.
- The State of the World's Forests 2020 assesses progress to date in meeting global targets and goals related to forest biodiversity and examines the effectiveness of policies, actions and approaches, in terms of both conservation and sustainable development outcomes.

- A series of case studies provide examples of innovative practices that combine conservation and sustainable use of forest biodiversity to create balanced solutions for both people and the planet.

### **6.7 Impact of Energy Efficiency Measures Report**

- Impact of Energy Efficiency Measures Report was prepared by an Expert agency PWC Ltd, who was engaged by Bureau of Energy efficiency (BEE) for an independent verification to assess the resultant annual savings in energy as well as CO<sub>2</sub> emissions through various initiatives in India.
- Since 2017-18, every year Bureau of Energy Efficiency (BEE) appoints an third party expert agency to conduct study for comparing the actual energy consumption due to different energy efficiency schemes, with the estimated energy consumption.
- The objective of this study is to evaluate the performance and impact of all the key energy efficiency programmes in India, in terms of total energy saved and the related reduction in the CO<sub>2</sub> emissions.
- The findings of the report reflect that implementation of various energy efficiency schemes have led to total electricity savings to the tune of 113.16 Billion Units in 2018-19, which is 9.39% of the net electricity consumption.
- This year the study has identified following major programmes, viz. Perform, Achieve and Trade Scheme, Standards & Labelling Programme, UJALA Programme, Municipal Demand Side Management Programme, etc.

### **6.8 CRISIL Research Report on Renewable Energy**

- According to the report Gujarat and Rajasthan managed to add more capacities than others, while Karnataka retained its Number One position in total installed capacity.
- Gujarat's total renewable capacity crossed the 10,000 MW mark in FY20, making it the third State after Karnataka and Tamil Nadu to have more than 10 GW of installed capacity.
- It added the highest new capacity, of 1,934 MW, followed by Rajasthan, which added 1,911 MW.
- In terms of overall solar energy capacity addition in FY20, the top three States were Rajasthan, Tamil Nadu and Karnataka.
- In wind energy, the top three were Gujarat, Tamil Nadu and Maharashtra.
- However, Karnataka retained its leadership position in total installed capacity during the year.
- The State has the highest installed capacity for solar at 7,278 MW, up from 6,096 MW a year ago. Its wind energy capacity is at 4,791 MW.

### **6.9 Snakebite Mortality in India**

- Centre for Global Health Research (CGHR), Canada has recently released a study titled 'Snakebite Mortality in India: A Nationally Representative Mortality Survey'.
- The study found that India has recorded 1.2 million snakebite deaths in the 20-year period from 2000 to 2019 with an average of 58,000 deaths caused by snakebite annually.
- Around 70% of these deaths occurred in low altitude, rural areas of eight States namely Uttar Pradesh, Andhra Pradesh, Bihar, Jharkhand, Madhya Pradesh, Odisha, Telangana, Rajasthan and Gujarat.
- Half of all the snakebite deaths occurred during the monsoon period from June to September.
- The World Health Organization (WHO) recognizes snakebite as a top-priority neglected tropical disease.
- Indian anti-venoms neutralize venom from only the following snakes such as
  1. Spectacled Cobra (there are three other Indian cobra species),
  2. Common Krait (there are seven other krait species),
  3. Russell's Viper,
  4. Saw-scaled viper,
- Whereas there are 12 other snake species causing fatal bites in the country.



## 7. GEOGRAPHY

### 7.1 Artificial Neural Networks based Global Ionospheric Model (ANNIM)

- Researchers from Indian Institute of Geomagnetism (IIG) have developed a new Artificial Neural Networks based global Ionospheric Model (ANNIM) to predict the Ionospheric electron density and the peak parameters.
- ANNs replicate the processes in the human brain (or biological neurons) to solve problems such as pattern recognition, classification, clustering, generalization, linear and nonlinear data fitting, and time series prediction.
- The model has potential applications in calculating the Global Navigation Satellite System (GNSS) positioning errors.

### 7.2 Study on Regional Climatic Features

*Indian Institute of Geomagnetism (IIG) has tracked climate change by following the Paleomonsoonal pattern of the subcontinent by harnessing magnetic mineralogy.*

- The magnetic minerals are sensitive to the physical and chemical environment that they are embedded in.
- These external changes bring about modifications in the innate structure of these magnetic minerals, transitioning them from one magnetic phase to another.
- In this process, the magnetic mineralogy also changes. For example, from magnetite to hematite and vice versa.
- The mineral magnetic studies have unraveled 4 regional climatic features encompassing the entire Indian subcontinent and one localized climatic event.
  1. Higher monsoon precipitation in the western part of India was shown to be analogous with glacial melt in the Himalayas.
  2. The weakening of monsoon was inferred in the Himalayas and the hinterland of Arabian Sea, analogically cold and dry conditions were prevalent at Dhakuri (Uttarakhand), which led to the formation of loess deposits.
  3. The monsoon intensification in the western and eastern part of India with major implications in the hinterlands of the Arabian Sea and Bay of Bengal.
  4. Holocene aridity and weakened monsoon was inferred to be prevalent across the subcontinent.
  5. The localized feature of Younger Dryas cooling seems to be confined to just the upper reaches of the Himalaya, Younger Dryas is a period of rapid cooling in the late Pleistocene.

#### **Indian Institute of Geomagnetism (IIG)**

- It is an autonomous research institution established by Department of Science and Technology.
- It is engaged in basic and applied research in geomagnetism, as well as allied areas of geophysics, atmospheric physics and space physics, as well as plasma physics.
- It currently operates 12 magnetic observatories and actively participates in the **Indian Antarctic Program**.

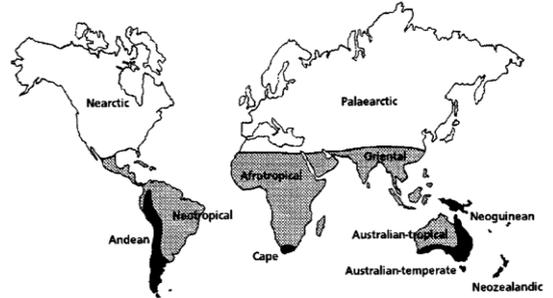
### 7.3 BoBBLE

*A team from IISC in Bengaluru and UK based University of East Anglia have created a blueprint for accurate prediction of monsoon, tropical cyclones and other weather related forecast.*

- The Bay of Bengal Boundary Layer Experiment or BoBBLE in short is a project funded by Union Ministry of Earth Sciences and the Natural Environment Research Council of UK.
- The team carried out studies of oceanographic properties on board RV Sindhu Sadhana in the southern Bay of Bengal.
- It plans to release underwater robots in Bay of Bengal to monitor how ocean conditions influence monsoon, which can help in better predictions of the rainfall.
- Once out in the ocean, they will release seven underwater gliders to measure ocean properties such as temperature, salinity and current.

## 7.4 Biogeographic Zones

- The Biogeographic Zones are the large distinctive units of similar ecology, biome representation, community and species, e.g., The Himalaya, The Western Ghats.
- Palearctic Zone includes arctic and temperate Eurasia, and all islands surrounding the continent in the Arctic, in the sea of Japan, and the eastern half of the North Atlantic.
- It thus also includes the Macaronesian islands, Mediterranean North Africa and Arabia.
- Regions and subregions of the world.
  1. **Holarctic region** = Nearctic + Palearctic subregions.
  2. **Holotropical region** = Neotropical + Afrotropical + Oriental + Australian tropical subregions.
  3. **Austral** = Andean + Cape + Australian temperate + Neozelandic + Neoguinean subregions.



## 7.5 Long Period Average

Recently IMD has officially redefined the definition of what constitutes 'normal' rainfall and reduced it by 1 cm to 88 cm from 89 cm.

- Long Period Average (LPA) is the averages of rainfall received over a 50-year period between 1951 and 2001, this average comes to 88 cm of rainfall (according to recent change).
- This is the average rainfall recorded during the months from June to September, calculated during the 50-year period, and is kept as a benchmark while forecasting the quantitative rainfall for the monsoon season every year.
- IMD maintains five rainfall distribution categories on an all-India scale which are
  1. **Normal or Near Normal:** When departure of actual rainfall is +/-10% of LPA, that is, between 96-104% of LPA
  2. **Below normal:** When departure of actual rainfall is less than 10% of LPA, that is 90-96% of LPA
  3. **Above normal:** When actual rainfall is 104-110% of LPA
  4. **Deficient:** When departure of actual rainfall is less than 90% of LPA
  5. **Excess:** When departure of actual rainfall is more than 110% of LPA

## 7.6 Decline in Arctic Sea Ice

Recently, National Centre of Polar and Ocean Research (NCPOR) has observed the largest decline in the Arctic Sea ice in the last 41 years.

- Sea ice arises as seawater freezes, because ice is less dense than water, it floats on the ocean's surface.
- Sea ice covers about 7% of the Earth's surface and about 12% of the world's oceans.
- According to recent observations in the last 40 years (1979-2018), the sea ice has been declining at 4.7% per decade, while the current declining rate was found to be 13% in July 2019.
- Thus, it has been noted that the volume of ice formation during winters is



Source: National Snow and Ice Data Centre  
Economist.com

unable to keep pace with the volume of ice loss during summers.

- Additionally, it has been predicted that if this trend continues, there would be no ice left in the Arctic Sea by 2050.
- The decrease of the Arctic Sea ice area and the increase in the duration of summer and autumn seasons affected the local weather and climate over the Arctic Ocean and its marginal seas.
- It may affect other components of the climate system such as reduction of heat, water vapor, and other material exchange between the atmosphere and the sea.
- It experienced record high-temperature rise, especially during the spring and summer months.
- The Arctic Ocean's surface temperature and salinity vary seasonally as the ice cover melts and freezes.
- Its salinity is the lowest on average of the five major oceans, due to low evaporation, heavy fresh water inflow from rivers and streams, and limited connection and outflow to surrounding oceanic waters with higher salinities.

### 7.7 Last Glacial Maximum

- About 19,000-21,000 years ago, ice-sheets covered North America and Eurasia, and sea-levels were much lower, with Adam's Bridge exposed so that the Indian subcontinent and Sri Lanka were contiguous.
- This period, the peak of ice age conditions, is called the Last Glacial Maximum.
- Global sea-level is rising and glacial ice is melting today, whereas the opposite was true for the Last Glacial Maximum.
- Researchers analyzed simulations of this past climate and predicted that the ongoing climate change could *reawaken an ancient climate pattern of the Indian Ocean*.
- They find that this could be similar to the El Nino phenomenon of the Pacific Ocean bringing more frequent and devastating floods and drought to several densely-populated countries around the Indian Ocean region.
- If current warming trends continue, this new Indian Ocean El Nino could emerge as early as 2050.
- It could bring more frequent droughts to East Africa and southern India and increased rainfall over Indonesia.

### 7.8 Ameri Ice Shelf (AIS)

*National Centre for Polar and Ocean Research (NCPOR) in Goa has predicted that there would be a 24% increase in the expansion of the AIS boundaries in Antarctica by 2021 and another 24 % by 2026 from its 2016 positions.*

- The floating sheets of ice called 'ice shelves' play a multi-faceted role in maintaining the stability of a glacier.
- Ice shelves connect a glacier to the landmass, the ice sheet mass balance, sea stratification, and bottom water formation are important parameters for the balancing of a glacier.
- The Ameri Ice Shelf is one of the largest glacier drainage basins in the world, located on the east coast of Antarctica, at about 70°S Latitude, 70°E Longitude.
- The AIS dynamics and mass balance help in understanding the changes in the global climate scenario.
- **Milne ice shelf** is in Ellesmere Island, Canada was also recently broken.

### 7.9 Fujiwhara Effect

- It is a phenomenon that occurs when two nearby cyclonic vortices move around each other and close the distance between the circulations of their corresponding low-pressure areas.
- When cyclones are in proximity of one another, their centers will circle each other cyclonically about a point between the two systems due to their cyclonic wind circulations.
- The two vortices will be attracted to each other, and eventually spiral into the center point and merge.
- It follows counter-clockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere.
- When the two vortices are of unequal size, the larger vortex will tend to dominate the interaction, and the smaller vortex will circle around it.



- Recently two tropical storms (Laura and Marco), formed in the western Atlantic Ocean at nearly the same time, are likely to impact the Gulf of Mexico, sparking concerns of the rare Fujiwhara effect.
- The last time two tropical storms formed at the same time and struck the region was in 1933.

#### 7.10 Role of Anti-cyclone in North-East Asia

*New research has revealed a link between an increase in extreme summer heat events in Northeast Asia and the role of anticyclones in the region.*

- Extreme heat events have increased across the world and are responsible for a large number of deaths and harming crops and livestock as well.
- Nearly half of the magnitude of the 2018 extreme heat event across China and Japan was caused by anomalous anticyclones in Northeast Asia.
- 2 main factors - Dynamic (anticyclone) and thermodynamic (mean temperature shifts to warmer states and increasing greenhouse gases) changes in the atmosphere.
- The more extreme the heat event, the larger the contribution of the thermodynamic change will be.

#### 7.11 Boreal Summer Intra-Seasonal Oscillation

- BSISO is a movement of convection (heat) from the Indian Ocean to the western Pacific Ocean roughly every 10-50 days during the monsoon (June-September).
- The BSISO of the Asian summer monsoon (ASM) is one of the most prominent sources of short-term climate variability in the global monsoon system.
- Researchers at the Indian National Centre for Ocean Information Services (INCOIS), Hyderabad have reportedly found a way to better forecast the Boreal Summer Intra-Seasonal Oscillation (BSISO).
- They found that waves induced by active phases of BSISO are nearly 0.5 meters higher than those which occur during other phases of BSISO.
- The active phase (between June and August) enhances monsoon winds and hence the surface waves. Some other phases induce high wave activity in the north Indian Ocean and the Arabian Sea
- Compared with the related Madden-Julian Oscillation (MJO) it is more complex in nature, with prominent northward propagation and variability extending much further from the equator.
- Wave forecast advisories based on the BSISO would be more useful for efficient coastal and marine management.

#### 7.12 Madden Julian Oscillation

- MJO is an oceanic-atmospheric phenomenon which affects weather activities across the globe. It brings major fluctuation in tropical weather on weekly to monthly timescales.
- It can be defined as an eastward moving 'pulse' of clouds, rainfall, winds and pressure near the equator that typically recurs every 30 to 60 days.
- It's a traversing phenomenon and is most prominent over the Indian and Pacific Oceans. The MJO consists of two parts or phases.
- **Enhanced rainfall (or convective) phase** - winds at the surface converge, and the air is pushed up throughout the atmosphere.
- Such rising air motion in the atmosphere tends to increase condensation and rainfall.
- **Suppressed rainfall phase** - winds converge at the top of the atmosphere, forcing air to sink and, later, to diverge at the surface.
- As air sinks from high altitudes, it warms and dries, which suppresses rainfall.
- The Indian Ocean Dipole (IOD), El Nino and MJO are all oceanic and atmospheric phenomena, which affect weather on a large scale.

- IOD only pertains to the Indian Ocean, but the other two affect weather on a global scale-up to the mid-latitudes.
- IOD and El Nino remain over their respective positions, while MJO is a traversing phenomenon.

### 7.13 Tuting-Tidding Suture Zone

*Recent study in the TTSZ in Arunachal Pradesh has revealed that the area is generating moderate earthquakes at two different depths.*

- In major part of the Eastern Himalaya, the Himalaya takes a sharp southward bend and connects with the Indo-Burma Range.
- Tuting-Tidding Suture Zone (TTSZ) of the Arunachal Himalaya has gained significant importance in recent times due to the growing need of constructing roads and hydropower projects, making the need for understanding the pattern of seismicity in this region critical.
- The study aims to explore the elastic properties of rocks and seismicity in this easternmost part of India.
- Low magnitude earthquakes are concentrated at 1-15 km depth, and slightly higher than 4.0 magnitude earthquakes are mostly generated from 25-35 km depth.
- The *intermediate-depth is devoid of seismicity* and coincides with the zone of fluid/partial melts.
- Exhumation and growth of Himalaya is a continuous process, which is because rocks on the lower surface of a fault plane move under relatively static rocks on the upper surface, a process called under thrusting of the Indian plate beneath its Eurasian counterpart.
- This process keeps modifying the drainage patterns and landforms and is the pivotal reason for causing an immense seismic hazard in the Himalayan mountain belt and adjoining regions.

### 7.14 Kutch Mainland Fault

*According to recent study Kutch Mainland Fault (KMF) has been accumulating stress within and could trigger an earthquake.*

- The Kutch Mainland Fault (KMF) is the major east-west trending fault.
- The fault line extends for over 150 km from Lakhpat to Bhachau. It has been *dormant for the last 1,000-odd years*.
- The fragile crust of Kutch holds **four major active faults** which frequently liberate energy in the form of earthquakes.
- The devastating January 26, 2001 earthquake had occurred from the South Wagad fault system.
- The study also gives evidence that there were four major earthquakes on KMF between 5600 and 1000 Before Present (i.e before radiocarbon dating technology in the 1950s).

### 7.15 Yanomami Tribes

*Recently, a Yanomami indigenous boy died in Brazil after contracting Covid-19, raising fears for the Amazon tribes.*

- Brazil is home to an estimated 8,00,000 indigenous people from more than 300 ethnic groups.
- Guarani, Kaingang, PataxóHãHãHãeTupinambá, Yanomami, Tikuna and Akuntsu are popular tribe of Amazon.
- Yanomami, also called South American Indians, live in the remote forest of the **Orinoco River basin** in southern Venezuela and the northernmost reaches of the Amazon River basin in northern Brazil.
- Yanomami live in small, scattered, semi-permanent villages and speak the Xirianá language. They practice hunting and slash-and-burn agriculture.
- Brazilian indigenous leader DaviKopenawa who secured the land rights of the Yanomami people was awarded the *Right Livelihood Award-2019*, also known as Sweden's alternative Nobel Prize.

### 7.16 Grand Ethiopian Renaissance Dam

- The dam is located on River Blue Nile (a tributary of River Nile) in Ethiopia. It started in 2011 and once completed it will be Africa's largest.
- It is the center of a dispute involving several East-African countries, dependent on the river's waters (ie) Egypt, Sudan and Ethiopia.
- Egypt and Sudan has objected to the construction of the dam and proposed a longer timeline for the project. Tri-party talks among them unable to reach agreements.
- Recently, the USA has stepped in to mediate and also Egypt has announced that it is willing to resume negotiations with Ethiopia and Sudan, concerning the (GERD).
- River Nile is the longest river in the world and is called the father of African rivers.
- It is formed by 3 principal streams – the Blue Nile, the Atbara, and the White Nile.
- It rises south of the Equator and flows northward to drain into the Mediterranean Sea by forming arcuate delta.
- Drainage countries - Parts of Tanzania, Burundi, Rwanda, the Democratic Republic of the Congo, Kenya, Uganda, South Sudan, Ethiopia, Sudan, and the cultivated part of Egypt.



### 7.17 Diamer Bhasha Dam

- The Diamer-Bhasha Dam is located on the Indus River in northern Pakistan between Kohistan district in Khyber Pakhtunkhwa and Diamer district in Gilgit Baltistan.
- It will have a gross storage capacity of 8.1 Million Acre Feet (MAF), power generation capacity of 4500 MW.
- With the height of 272 meters, it will be the Tallest Roller Compact Concrete (RCC) dam in the world, would be completed in 2028.
- Recently, Pakistan signed a contract with a joint venture of a China Power (Chinese state-run firm) and the Frontier Works Organization (FWO—a commercial arm of Pakistan's military) for the construction of the Diamer-Bhasha dam.
- The contract covers construction of a diversion system, main dam, Access Bridge and the 21MW Tangir hydropower project.
- India has opposed the move on the grounds that Gilgit-Baltistan region is part of the erstwhile state of Jammu and Kashmir that was illegally occupied by Pakistan.

### 7.18 Trans-Tasman Zone

- Trans-Tasman Travel Arrangement is an arrangement between Australia and New Zealand which allows for the free movement of citizens of one of these countries to the other.
- The arrangement came into effect in 1973 and allows citizens of each country to reside and work in the other country, with some restrictions.

### 7.19 Mekong River

China is building a dam in Lancang River, upper half of Mekong River.

- The Mekong, or Mekong River, is a trans-boundary river in Southeast Asia.
- It is the world's twelfth longest river and the seventh longest in Asia.
- Its estimated length is 4,350 km, and it drains an area of 795,000 km<sup>2</sup>.
- From the Tibetan Plateau the river runs through China, Myanmar, Laos, Thailand, Cambodia, and Vietnam.
- The extreme seasonal variations in flow and the presence of rapids and waterfalls in the Mekong make navigation difficult.
- The river is a major trade route between western China and Southeast Asia.



- The **Mekong River Commission (MRC)** is an inter-governmental organization that works directly with the governments of Cambodia, Laos, Thailand, and Vietnam to jointly manage the shared water resources and the sustainable development of the Mekong River.

### 7.20 Yarlung Tsangpo

- It is the longest river of Tibet Autonomous Region, China. It originates at Angsi Glacier in western Tibet, southeast of Mount Kailash and Lake Manasarovar.
- It is the upper stream of the Brahmaputra River. Downstream from Arunachal Pradesh the river becomes far wider and is called the Siang. After reaching Assam, the river is known as Brahmaputra.
- From Assam, the river enters Bangladesh, from there until about 200 years ago it used to flow eastward and joined the Meghna River, this old channel has been gradually dying.
- At present the main channel of the river is called Jamuna River, which flows southward to meet Ganges, which in Bangladesh is called the Padma.
- When leaving the Tibetan Plateau, the River forms the world's largest and deepest canyon, YarlungTsangpo Grand Canyon.
- India has long expressed concerns over dam-building on the Brahmaputra.
- In 2015, China operationalized its first hydropower project at Zangmu, while three other dams at Dagu, Jiexu and Jiacha are being developed.
- Indian officials have said the dams are not likely to impact the quantity of the Brahmaputra's flows because they are only storing water for power generation.
- Moreover, the Brahmaputra is not entirely dependent on upstream flows and an estimated 35% of its basin is in India.
- India does not have a water-sharing agreement with China, but both sides share hydrological data.



### 7.21 Indus Water Treaty

- Indus system comprises of main Indus River, Jhelum, Chenab, Ravi, Beas and Sutlej.
- The basin is mainly shared by India and Pakistan with a small share for China and Afghanistan.
- Under the treaty signed between India and Pakistan in 1960, all the waters of three rivers, namely Ravi, Sutlej and Beas (Eastern Rivers) were allocated to India for exclusive use.
- While, the waters of Western rivers - Indus, Jhelum, and Chenab were allocated to Pakistan except for specified domestic, non-consumptive and agricultural use permitted to India as provided in the Treaty.
- India has also been given the right to generate hydroelectricity through run of the river (RoR) projects on the Western Rivers which, subject to specific criteria for design and operation is unrestricted.
- Recently India has refused a request by Pakistan to hold a meeting on issues around IWT at the Attaricheckpost border.
- This is in concern with the governing the technical aspects of the construction of the Ratle run-of-the-river (RoR) project on the Chenab in the Kishtwar district of Jammu and Kashmir.

#### Indian Dams in Indus River System

- India has constructed following dams:
  1. Bhakra Dam on Satluj,
  2. Pong and Pandoh Dam on Beas
  3. Thein (Ranjit Sagar) on Ravi.
  4. Beas-Sutlej Link,
  5. Madhopur-Beas Link,
  6. Indira Gandhi Nahar Project etc,
- These dams have helped India utilize nearly entire share (95 %) of waters of Eastern Rivers.

- India has called for the appointment of a 'neutral' party while Pakistan favours a Court of Arbitration to agree upon a final resolution for the project.
- IWT meetings are led by Indus Water Commissioners from both countries and discuss a range of issues on construction of dams and hydropower projects concerning the Indus river system.

### 7.22 Depsang Plains

- Depsang Plains are located at the Line of Actual Control that separates the Indian and Chinese controlled regions. The Chinese Army occupied most of the plains in 1962.
- India controls the western portion of the plains as part of Ladakh, whereas the eastern portion is part of the Aksai Chin region, which is controlled by China and claimed by India.
- Depsang is also close to the Karakoram Pass, overlooking the very strategic Salto Ridge and Siachen glacier.
- Daulat Beg Oldie (DBO) is a historic campsite and current military base located in Ladakh, on an ancient trade route connecting Ladakh to the Tarim Basin.
- Recently military level strategic talks were held about the region between India and China at the Daulat Beg Oldie. This is the first Major General-level talks since the violent clash at Galwan.

### 7.23 Rohtang Pass

- Rohtang Pass (elevation 3,978 m) is located in the state of Himachal Pradesh. It is present on the PirPanjal Range of Himalayas.
- It connects the Kullu Valley with Lahaul and Spiti Valleys of Himachal Pradesh.
- The Ravi river rises west of the Rohtang pass in the Kullu hills of Himachal Pradesh.
- The world's longest tunnel (8.8km) above 10,000 feet -Rohtang Tunnel (Atal Tunnel) is under construction to connect villages in Lahaul-Spiti (Himachal Pradesh) to the rest of the country even during winters.
- The operation to clear snow is carried out every year as the pass remains snow-bound for almost six months, from mid-November to mid-May, isolating Lahaul and Spiti districts from the rest of the country.
- Recently Border Roads Organization (BRO) opened the Rohtang Pass, three weeks in advance, for transporting essential supplies and relief materials amid the lockdown.

### 7.24 Kasowal Bridge

- BRO has constructed and opened a 484- metre long permanent bridge on the **river Ravi** to connect the Kasowal enclave of Punjab along the Pakistan border to the rest of the country.
- Kasowal enclave is around 35 square km, It was connected through a pontoon bridge of limited load capacity.
- The enclave was formed because it has the Ravi behind it and the International Border ahead of it.
- There are similar enclaves of Pakistani territory too, which lie ahead of Ravi and face Indian Territory.
- These Pakistani enclaves Dera Baba Nanak enclave and Jassar enclave were occupied by the Indian Army in the 1965 and 1971 wars.

### 7.25 Etalin Hydropower Project

- The Project is based on the river Dibang, a tributary of the Brahmaputra River and flows through Arunachal Pradesh and Assam.
- It envisages construction of two dams over the tributaries of Dibang - Dir and Tangon. It is proposed to be completed in 7 years.
- The Project falls under the "richest bio-geographical province of the Himalayan zone" and would be located at the junction of the Palaearctic, Indo-Chinese and Indo-Malayan bio-geographic regions.
- The Project is in accordance with the Government's push to establish prior user rights on rivers that originate in China and an effort to fast-track projects in the north-east.

- It is expected to be one of the biggest hydropower projects in India in terms of installed capacity.
- In 2015, the FAC had ruled that the EIA commissioned by the power company had not properly accounted for the environmental impact of the project and also recommended consultation with NTCA.
- In 2019, the FAC reviewed the progress of the environment appraisal and said neither of its recommendations had been fully complied with, though a wildlife assessment was done by the Wildlife Institute of India, Dehradun ( an autonomous institute funded by the Environment Ministry).

### 7.26 Agatti Island

*Recently, the southern bench of the National Green Tribunal (NGT) has granted an interim stay on felling of coconut trees on Agatti Island in Lakshadweep.*

- It is in the UT of Lakshadweep. It is at a distance of 459 km from Kochi and is located to the west of Kavaratti Island.
- The lagoon area of this island is habitat of coral growth and multicolored coral fishes in the lagoons.
- Fishing is the most important industry which is perhaps the only island besides Minicoy getting surplus fish.
- Next to fishing, coir (coconut fibre) and copra (dried meat or kernel of the coconut) are the main industries.
- The tree-felling is also violating the Union Territory's (UT) Integrated Island Management Plan (IIMP).
- IIMP was formulated on the basis of a report submitted by the Supreme Court-appointed Expert Committee, headed by Justice R.V. Raveendran.
- It includes holistic island development plans prepared by the National Centre for Sustainable Coastal Management (NCSCM) for implementation by coastal States/ UTs.

### 7.27 Lonar Lake

*Recently, the lake turned red/pink due to lowered water levels and high salinity caused growth of Halo bacterium and increased Carotenoid levels.*

- Lonar Lake is a saline and alkaline lake located in Maharashtra.
- It was created by an asteroid collision with earth impact during the Pleistocene Epoch.
- It is one of the four known, hyper-velocity, impact craters in basaltic rock anywhere on Earth.
- The other three basaltic impact structures are in southern Brazil.
- It is a notified National Geo-heritage Monument, situated inside the Deccan Plateau.

#### Geo-Heritage Monument

- It refers to the geological features which are inherently or culturally significant offering insight to earth's evolution or history to earth science or that can be utilized for education.
- Geological Survey of India (GSI) is the parent body which is making efforts towards identification and protection of geo-heritage sites.

### 7.28 Puthimari River

*Recently it is in news for flooding after Amphan cyclone.*

- The Puthimari River rises in Assam, India.
- It is a tributary of the Brahmaputra River, the fourth largest in the world.
- The Puthimari is known for its floods and high sediment load.

### 7.29 Jia-Bhoreli River

- The Kameng River was previously named Bhoreli River, now called Kameng in Arunachal Pradesh and Jia Bhoreli in Assam.
- It originates from the glacial lake below snow-capped Gori Chen mountain in Tawang district on the India-Tibet border in South Tibet.
- It is one of the major tributaries of the Brahmaputra River, joining it at Tezpur, just east of the KoliaBhomoraSetu bridge.



- The Kameng forms the boundary between East Kameng District and West Kameng Districts and is also the boundary between the Sessa and Eaglenest sanctuaries to its west and the Pakke tiger reserve to the east.
- The Dafla Hills are east and the Aka Hills (home of Aka tribe) are west of the Kameng River.

### 7.30 Susta Area

- Susta area is one of the disputed territories between India (Uttar Pradesh) and Nepal.
- It is located on the bank of the Gandak river (called Narayani river in Nepal).
- The change of course by the Gandak River is the main reason for disputes in the Susta area.
- The area is very fertile for agriculture because of the alluvial soil brought by the river.

### 7.31 Kali River

- It is also known as Sharda river or Kali Ganga in Uttarakhand.
- It joins Ghagra river in Uttar Pradesh, which is a tributary of Ganga.
- River Projects: Tanakpur hydro-electric project, Chameliya hydro-electric project, Sharda Barrage.

### 3.25 Anakkampoyil-Kalladi-Meppadi Corridor

- Union government has given the nod for a ₹ 658-crore two-lane tunnel road in the Anakkampoyil-Kalladi-Meppadi corridor that links **Kozhikode to Wayanad** via Thamarassery pass
- On completion, the 6.5-km tunnel will be the third longest in the country.
- This alternative subterranean road would be 30-km shorter than the present ghat road. Approach roads and a 70-metre bridge over the Iranjipuzha river are part of the project.
- Kerala's longest is the 962-metre tunnel at Kuthiran, between Thrissur and Palakkad.
- The Konkan Railway Corporation, which prepared the detailed project report for this project.
- Cabinet has given the nod to make available the funds of the Kerala Infrastructure Investment Fund Board (KIIFB) for the tunnel road.
- **Perumon bridge** - The Cabinet has also given the nod for Perumon bridge across Ashtamudi Lake in Kollam district.
- The proposed bridge will link Perumon and Munrothuruthu.
- The **Naluchira bridge** across the Pampa river to link Thottappally and Naluchira in Alappuzha district has also got the approval.

### 7.32 Digha-Gopalpur Coastal Highway

- The Coastal Highway project will link Gopalpur in Odisha and Digha of West Bengal (NH-516A) .
- Digha-Gopalpur coastal highway would act as an economic corridor between the two major ports of Paradip and Dhamra.
- The coastal highway project was in 2015, spreads over 415 kilometers.
- The coastal highway would play a crucial role in the supply chain during natural calamities like cyclones and floods.

### 7.33 Container Ship to Agartala

Union Ministry of Shipping inaugurated the first trial movement of a container ship carrying steel and pulses from Kolkata port to Bangladesh's Chattogram port.

- It will transport cargo to Assam and Tripura. It will provide a shorter route to connect India's north-east region through Bangladesh.

- This is the first time after 1965 that Bangladesh is allowing its ports to be used as a transit for cargo movement from any part of India to northeastern states.
- It is done under the *Agreement on use of Chattogram and Mongla Ports* for movement of India's transit cargo through Bangladesh.
- India and Bangladesh have enhanced cooperation in shipping and inland water trade, under the Protocol on Inland Water Transit and Trade, in addition to the six existing Ports of Call.

### 7.34 Undersea Optical Fiber Cable

*India's first-ever undersea optical fiber cable has been introduced as part of a new project for Andaman and Nicobar Islands.*

- The 2,312-Kilometers long submarine optical fiber cable project connects Chennai - Andaman and Nicobar Islands (CANI).
- The cable system will help provide for faster internet speeds and get rid of the cobweb of wires needed for the same. It allowfor high-speed broadband connectivity, i.e. 400 Gbps for Port Blair and 200 Gbps for other islands.
- The project can be used by all the telecom operators for mobile and internet services.
- Apart from Port Blair, the cable will cover other islands namely Swaraj Dweep (Havlock), Long Island, Rangat, Little Andaman, Kamorta, Car Nicobar, and Greater Nicobar.

### 7.35 Marine Salvage Industry of Alang

- Alang is a census town in Bhavnagar district in the Indian state of Gujarat.
- In the past three decades, its beaches have become a major worldwide centre for ship breaking. It recycle approximately half of all ships salvaged around the world
- It is considered the world's largest graveyard of ships.
- The yards are located on the *Gulf of Khambat*, 50 km (31 mi) southeast of Bhavnagar.
- The employers cannot employ laborers directly, they must be trained by the institute run by Gujarat Maritime Board.
- The Indian Ship-breaking industry generates resources such as re-rolling scrap, melting scrap, cast Iron scrap, non-ferrous metals, machinery, and wooden articles.
- The industry is so hazardous that it is said that one worker dies in Alang every day.

### 7.36 Rewa Solar Project

*Recently, 750 MW (Mega Watt) solar project set up in Rewa, Madhya Pradesh has been inaugurated.*

- It is Asia's largest solar power project, with total area 1500 hectare.
- It was developed by the Madhya Pradesh Urja Vikas Nigam Limited (MPUVN), and Solar Energy Corporation of India (SECI), a Central Public Sector Undertaking.
- It is the first solar project in the country to break the grid parity barrier.
- Grid parity occurs when an alternative energy source can generate power at a cost of electricity that is less than or equal to the price of power from the electricity grid.
- It is the first renewable energy project to supply an institutional customer outside the state, i.e. Delhi Metro.
- It is also India's first solar project to get funding from Clean Technology Fund (CTF), which is available at a rate of 0.25% for a 40-year period from the World Bank.
- It has also received the World Bank Group President's Award for innovation and excellence.

### 7.37 Meghnaghat Combined-Cycle Power plant

- A combined-cycle power plant is a relatively more efficient way of producing electricity.



- It uses both a gas and a steam turbine together to produce up to 50 % more electricity from the same fuel than a traditional simple-cycle plant.
- It will reduce the share of environmentally harmful and expensive fuels like coal and oil.
- Recently, Asian Development Bank (ADB) has signed a \$ 200 million financing deal with the Reliance Bangladesh LNG and Power Limited (RBLPL).
- The deal aims to build and operate a 718-megawatt combined-cycle gas-fired power plant in Bangladesh.
- The plant is proposed to be located on land allotted by Bangladesh Power Development Board (BPDB), in Meghnaghat, Narayanganj District near Dhaka.

### 7.38 Finding on Fish Landings

- According to Central Marine Fisheries Research Institute (CMFRI) India's marine fish production has registered a marginal increase of 2.1% in 2019 compared to the previous year.
- Tamil Nadu took the first position in landings of fishes with 7.75 lakh tones.
- It was followed by Gujarat (7.49 lakh tones) and Kerala (5.44 lakh tones).

- While States such as West Bengal (55%), Andhra Pradesh (34%), Odisha (14.5%), Karnataka (11%) and Tamil Nadu (10.4%) recorded increase in landings, the fish catch decreased in Maharashtra, Goa and Kerala

### Indigenous Mango Heritage Area

- Kannapuram in Kannur district of Kerala is being declared an 'Indigenous Mango Heritage Area'.
- The Kerala State Biodiversity Board identified the area as heritage zone in coordination with the Kannapuramgrama panchayat.
- It is home to over 200 different varieties of mangoes.
- The families in the Kannapuram panchayat came together to protect and propagate the indigenous mango varieties 5 years ago.

### 7.39 Gairsain

- It is the second capital of Uttarakhand and declared as the summer capital.
- It is in the district of Chamoli, locating between between both Kumaon and Garhwal regions.
- It is expected that the declaration of a summer capital in the region will expedite development of the hilly areas

## 8. DISASTER MANAGEMENT

### 8.1 PM-CARES Fund

- PM-CARES was set up as a public charitable trust with the trust deed registered on March 27, 2020.
- It is meant for supporting relief or assistance of any kind relating to a public health emergency or any other kind of emergency, calamity or distress, either man-made or natural.
- It includes the creation or upgradation of healthcare or pharmaceutical facilities, funding relevant research or any other type of support.
- Composition of PM-CARES:
  1. Prime Minister as chairperson
  2. Defence Minister, Home Minister, Finance Minister
  3. Three trustees nominated by the Prime Minister "who shall be eminent persons in the field of research, health, science, social work, law, public administration and philanthropy".
- Donations to fund can avail 100% tax exemption.



- PM-CARES is different from the Prime Minister's National Relief Fund (PMNRF).

### **Foreign contribution to PM-CARES Fund**

- Recently, the Central Government has decided to accept contributions from abroad, irrespective of the nationalities, to the Prime Minister's Citizen Assistance and Relief in Emergency Situations (PM-CARES) Fund.
- Now the foreign governments, NGOs, and nationals can contribute to the Fund.
- The move is a major policy change as in the past 16 years India has not accepted any foreign aid.
- In 2018, the government refused to accept foreign aid to flood-ravaged Kerala since it was following the disaster aid policy set in December 2004.
- After a tsunami hit India in December 2004, the government felt that it could cope up on its own. Since then, India has followed the policy of not accepting aid from foreign governments.
- It has been said that the contribution to PM-CARES is not "aid" and the foreign contribution is "only" applicable to the PM-CARES fund and not any other fund like the Prime Minister's National Relief Fund.

### **8.2 Prime Minister's National Relief Fund**

- PMNRF was instituted in 1948 by then Prime Minister Jawaharlal Nehru, to assist displaced persons from Pakistan.
- The fund is currently used primarily to tackle natural calamities like floods, cyclones and earthquakes.
- The fund is also used to help with medical treatment like kidney transplantation, cancer treatment and acid attack.
- The fund consists entirely of public contributions and does not get any budgetary support.
- It accepts voluntary contributions from Individuals, Organizations, Trusts, Companies and Institutions etc.
- The corpus of the fund is also invested in various forms with scheduled commercial banks and other agencies.
- Disbursements are made with the approval of the Prime Minister.
- The fund is recognized as a Trust under the Income Tax Act and the same is managed by the Prime Minister or multiple delegates for national causes.
- Contributions towards PMNRF are notified for 100% deduction from taxable income under section 80(G) of the Income Tax Act, 1961.

### **8.3 Chief Minister Relief Fund**

- The Ministry of Commerce and Industry has clarified that the contributions to the Chief Minister's Relief Fund or the State relief fund will not qualify as Corporate Social Responsibility (CSR) expenditure, while any donation to the PM CARES Fund will.
- The Chief Minister's Relief Fund or State Relief Fund for Covid-19 is not included in Schedule VII of the Companies Act, 2013, and therefore any contribution to such funds shall not qualify as admissible CSR expenditure.
- Schedule VII of the Companies Act, 2013 provides the list of activities that can be included in CSR.
- Some political parties criticized this saying it is discriminatory and goes against the constitutional principle of federalism.
- However, donations to the State Disaster Management Authority to combat Covid-19 can be counted as admissible CSR expenditure.

### **8.4 State Disaster Response Fund**

- The Central Government contributes 75% of SDRF allocation for general category States/UTs and 90% for special category States/UTs.
- It is released as per the recommendation of Finance Commission.



- It shall be used only for meeting the expenditure for providing immediate relief to the victims.
- The Centre has relaxed SDRF utilisation norms for the next one year in view of Covid-19 pandemic, authorising “flexibility” and permitting expenditure.
- Out of the total allocation, 80% will be for SDRF and 20% for State Disaster Mitigation Fund (SDMF).

### 8.5 Disaster Management Fund

- Recently Ministry of Home Affairs has applied an unused provision in the Disaster Management Act, 2005.
- It aims to allow any person or institution to contribute to the National Disaster Response Fund (NDRF) for the purpose of disaster management.
- The Ministry of Home Affairs (MHA) had invoked the Disaster Management Act, 2005 for the first time in March this year in wake of COVID-19.
- The pandemic was notified as a “disaster,” paving the way for the States to utilize the State Disaster Response Fund (SDRF) for treatment of patients and other logistics such as quarantine centers, setting up laboratories among other things.
- The other notified disasters are cyclone, drought, earthquake, fire, flood, tsunami, hailstorm, landslide, avalanche, cloudburst, pest attack, frost and cold waves.
- As per Section 46 of the DM Act, the “NDRF supplements the State Disaster Response Fund (SDRF) in case of a disaster of severe nature, provided adequate funds are not available in the SDRF.
- The States have to submit utilization certificates, pending which no future allocation is made.
- The SDRF is the primary fund available with State governments to meet the expenses of relief operations of an immediate nature, for a range of specified disasters.
- The Centre contributes 75% of the SDRF allocation for general category States and Union Territories,
- 90% for special category States (northeast States, Sikkim, Uttarakhand, Himachal Pradesh, and Jammu & Kashmir).

### 8.6 Idukki Landslides

- Idukki district lies in the Western Ghats region of Kerala, it’s known as “Spice garden of Kerala”.
- Recently a landslide occurred in the hamlet of pettimudi in Munaar’sRajamala.
- The landslide was triggered from a Chola forest region in the eravikulan national park that lies in Rajamala.
- Factors that triggered land slide are
  1. **Heavy rain fall** recorded in Rajamala made the epicenter of the landslide vulnerable to slippage, because of the high sand content in the soil and 40 degree slope.
  2. **Human Interventions** – Buildings on the slopes without adequate protective measures
  3. **Blockage of river** channels and change of river course due to previous landslides.

### 8.7 IFLOWS

- It is a joint initiative between the Ministry of Earth Sciences (MoES) and Brihanmumbai Municipal Corporation (BMC).
- Mumbai is the 2<sup>nd</sup> city after Chennai to get this system.
- It is a Monitoring and flood warning system that will be able to relay alerts of possible flood-prone areas anywhere between six to 72 hours in advance.
- The primary source for the system is the amount of rainfall, but with Mumbai being a coastal city, the system also factors in tidal waves and storm tides for its flood assessment.
- Data incorporated from National Centre for Medium Range Weather Forecasting (NCMRWF), India Meteorological Department (IMD), Indian Institute of Tropical Meteorology (IITM) and BMC.