



IAS PARLIAMENT

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A Shankar IAS Academy Initiative

TARGET 2019

ENVIRONMENT II

Shankar IAS Academy

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TARGET 2019

Environment II (DECEMBER 2018 TO MARCH 2019)

1. POLLUTION

1.1 State of the Air

Following are the major policies framed, studies conducted, and steps taken in the last year over air and its quality.

1. WHO report - World's 14 most polluted cities are in India

- India is home to the world's 14 most polluted cities based on the amount of particulate matter under 2.5 micrograms found in every cubic metre of air.
- These are Kanpur, Faridabad, Varanasi, Gaya, Patna, Delhi, Lucknow, Agra, Muzaffarpur, Srinagar, Gurgaon, Jaipur, Patiala and Jodhpur.
- The fifteenth city on the list was Ali Subah Al-Salem (Kuwait).

2. Delhi tops transport-related emissions

- According to the report by Centre for Science and Environment (CSE), a Delhi-based non-profit, Urban commuting has become one of the most energy- and pollution-intensive activities in India.

3. India State level Disease Burden Initiative

- According to the initiative published in the The Lancet Planetary Health journal, 1 out of every 8 deaths in India is attributable to air pollution.
- It also says that, the average life expectancy in the country would have been 1.7 years higher if the air pollution level was less than the minimal level.

4. Pet coke trading banned

- Union Environment Ministry banned import of pet coke for purpose of trading in Delhi and its neighbouring states.
- It had also notified dos and don'ts for the sale and use in cement plant and other industries.

5. National Clean Air Programme (NCAP)

- The Centre formulated a NCAP to fight the menace through a long-term strategy.
- It set a target to reduce 35 per cent of the pollution in three years and 50 per cent in the next 5 years for the 100 identified cities.

6. Cleanest petrol, diesel flows in

- World's cleanest petrol and diesel started being supplied in Delhi after state-owned oil firms advanced rollout of Euro-VI grade fuel by two years in a bid to combat alarming levels of air pollution.

7. Vehicle scrap policy gets go ahead

- India's new vehicle scrap policy was given 'in-principle' approval to pave way to remove 20-year-old commercial vehicles from April 1, 2020.

8. Uttarakhand gets new manufacturing policy

- In a decision aimed to rid Uttarakhand of vehicular pollution, the Cabinet approved the electric vehicle manufacturing and battery charging infrastructure promotion policy for the state.

9. Kerala's electric vehicles

- Kerala's electric vehicle draft policy, which is part of NITI Aayog, that aims to reduce number of vehicles on the road with the introduction of modern shared transport system like air conditioned e-bus and e-autorickshaws was recently approved.

10. Combat plan

- Niti Aayog proposed 15-point action plan to combat air pollution in 10 most polluted cities in the country, including Delhi, Kanpur and Varanasi

11. Thermal emission beats all

- A study conducted by Louisiana State University in May said that emission from thermal power plants is the largest single-point source of pollution in India.

12. Draft Delhi Electric Vehicle Policy 2018

- In a major move to fight air pollution, the Delhi government released Draft Delhi Electric Vehicle Policy 2018, which aims to ensure adoption of 25 per cent e-vehicles among new registrations by 2023.

1.2 National Clean Air Programme

The Centre recently launched the National Clean Air Programme (NCAP).

- **Objective** - The overall objective of the programme includes comprehensive mitigation actions for prevention, control and abatement of air pollution.
- It also aims to augment the air quality monitoring network across the country and strengthen the awareness and capacity building activities.
- Also, city-specific action plans are being formulated for 102 non-attainment cities that are considered to have air quality worse than the National Ambient Air Quality Standards.
- The Smart Cities programme will be used to launch the NCAP in the 43 smart cities falling in the list of the 102 non-attainment cities.
- **Target** - It proposes a tentative national target of 20%-30% reduction in PM_{2.5} and PM₁₀ concentrations by 2024, with 2017 as the base year for comparison.
- However, the government has stressed that NCAP is a scheme, not a legally binding document with any specified penal action against erring cities.
- **Implementation** - NCAP talks of a collaborative, multi-scale and cross-sectoral coordination between central ministries, state governments and local bodies.
- The CPCB will execute the nation-wide programme for the prevention, control, and abatement of air pollution within the framework of the NCAP.
- NCAP will be “institutionalised” by respective ministries and will be organised through inter-sectoral groups that will also include the Ministry of Finance, Ministry of Health, NITI Aayog, and experts from various fields.
- Other features of NCAP include –
 1. Increasing the number of monitoring stations in the country including rural monitoring stations
 2. Technology support
 3. Emphasis on awareness and capacity building initiatives
 4. Setting up of certification agencies for monitoring equipment
 5. Source apportionment studies
 6. Emphasis on enforcement
 7. Specific sectoral interventions.

Proposed mitigation measures

- **Enforcement** - It calls for stringent enforcement through a web-based, three-tier mechanism that will review, monitor, assess and inspect to avoid any form of non-compliance.
- The experience indicates lack of regular monitoring and inspection as the major reason for non-compliance.
- Trained manpower and regular inspection drive will be ensured for stringent implementation purpose.
- It also calls for an “extensive plantation drive” at pollution hotspots and execution.
- However, it is not made clear how much air pollution this will seek to reduce.



- **Elaborating existing schemes** – While some of the strategies are not new to India, NCAP appears to be targeting effective implementation.
- For example, it talks of “congestion management” at traffic junctions by the traffic police, solid waste management by municipal corporations, and stringent industrial standards put in place by concerned ministries.
- For power sector emissions, it refers to emission standards set by the Ministry of Environment and Forests for Thermal Power Plants in December 2015 to be implemented within a two-year period.
- It notes that this has since been extended to December 2022.
- For agricultural stubble burning, it highlights the initiatives already in place by way of the central assistance of Rs 1,151 crore for in situ management of crop residue and provides for general action points to be explored.
- **Focus** - NCAP calls for a city action plan that needs to be guided by a comprehensive science-based approach involving source apportionment studies.
- It also advises that state capitals and cities with a million-plus population be taken up on priority

Concerns

- NCAP takes into account available international experiences and national studies.
- It notes that internationally, actions have been “city-specific” rather than country-oriented and cites examples such as Beijing and Seoul that saw 35%-40% PM_{2.5} reductions in five years.
- However effective this might have been abroad, reductions by similar levels might leave Indian cities still heavily polluted.
- Delhi’s very severe pollution levels are four times the permissible limits now, and a 30% reduction by 2024 would still leave it very dangerous for health.

1.3 National Air Quality Monitoring Programme

- Central Pollution Control Board (CPCB) is executing a nation-wide programme of ambient air quality monitoring known as National Air Quality Monitoring Programme (NAMP).
- The network consists of 731 operating stations covering 312 cities/towns in 29 states and 6 Union Territories of the country.
- Under NAMP, the following 4 air pollutants have been identified for regular monitoring at all the locations,
 1. Sulphur Dioxide (SO₂),
 2. Oxides of Nitrogen as NO₂,
 3. Respirable Suspended Particulate Matter (RSPM / PM₁₀) and
 4. Fine Particulate Matter (PM_{2.5})
- The monitoring of meteorological parameters such as wind speed and wind direction, relative humidity (RH) and temperature were also integrated with the monitoring of air quality.
- The monitoring is being carried out with the help of CPCB, State Pollution Control Boards, Pollution Control Committees, National Environmental Engineering Research Institute (NEERI), Nagpur.
- The objectives are to
 - i. determine status and trends of ambient air quality;
 - ii. ascertain whether the prescribed ambient air quality standards are violated;
 - iii. Identify Non-attainment Cities;
 - iv. obtain the knowledge and understanding necessary for developing preventive and corrective measures and
 - v. understand the natural cleansing process undergoing in the environment through pollution dilution, dispersion, wind based movement, dry deposition, precipitation and chemical transformation of pollutants generated



1.4 Breathe India

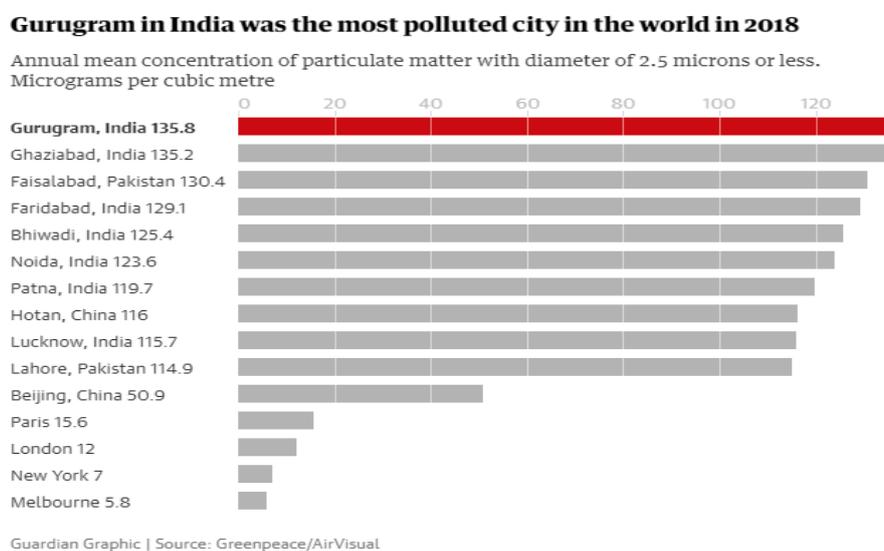
- Breathe India is a 15-point formula to combat air pollution proposed by Niti Aayog.
- It has cited a WHO report to state that Kanpur, Faridabad, Gaya, Varanasi and Patna are most polluted cities in the world.
- The plan seeks "concerted action from all levels of governance".
- The 15-point formula includes measures like replacing all petrol-diesel vehicles in use at government offices by electric and hybrid vehicles, streamlining power plants, encouraging solar panels on rooftops and feebate schemes.
- It says that government should increase focus on electric and hybrid vehicles. The procurement of electric vehicles (EVs) should be mandatory for vehicles for central government use and certain public facilities.
- It has favoured setting up smog-free towers in cities for providing quick relief from sudden spike in air pollution.
- It has recommended
 - i. strategic decommissioning of inefficient power plants, primarily running on coal.
 - ii. simplification of rules, regulations and leasing policy for operations and called for power distribution reforms
 - iii. the government to enforce use of ready-made concrete to reduce construction dust, which is a major contributor to pollutants in air in expanding cities
- It has called for implementing a large scale feebate programme beginning 2020.
- A feebate is a policy that entails levying a surcharge or fee on inefficient or polluting vehicles and giving a rebate on efficient ones.

1.5 World Air Quality Report 2018

'IQAir AirVisual 2018 World Air Quality Report' was recently published by NGO Greenpeace and IQ Air Visual.

- **Highlights** - The report was a compilation of air quality data from public and private monitoring sources.
- India dominates the top of the list. It asserted that 7 of the world's top 10 cities with the worst air quality in 2018 are in India.
- Gurugram, which borders Delhi, ranked the most polluted in the world with an average of more than 135 micrograms of PM_{2.5} per cubic metre ($\mu\text{g}/\text{m}^3$) throughout the year.
- It is however an improvement as compared to 145.6 $\mu\text{g}/\text{m}^3$ in 2017 in Gurugram.
- Gurugram was followed by Ghaziabad at the second position with an annual average concentration of 135.2 $\mu\text{g}/\text{m}^3$ in 2018.
- Delhi is ranked 11th but considered as the most polluted capital city. It is followed by Dhaka and Kabul.
- The Bosnian capital, Sarajevo, is the most polluted European city.
- The only other country to feature in the top 30 is China, which appears 5 times, including Hotan in the western Xinjiang province (8th) and the ancient Silk Road city of Kashgar (19th).
- **Permissible limits** - The National Ambient Air Quality Standards define the permissible limit for the concentration of PM 2.5 at 40 $\mu\text{g}/\text{m}^3$.
- On the other hand, the World Health Organisation (WHO) defines the same at 10 $\mu\text{g}/\text{m}^3$.
- **Pollution factors** - The Ministry of Heavy Industries and Public Enterprises commissioned a study recently on the factors of pollution in Delhi.
- In Delhi, dusty sources such as roads, construction sites and bare soil add about 42% of the coarse particulate matter (PM₁₀) in summer, and 31% in winter.
- Similarly, PM₁₀ from transport varied between 15% and 18% across seasons.
- Vehicles contribute 18-23% of PM_{2.5} which is an unhealthier particulate that penetrates the lungs.

- Biomass burning was estimated to make up 15-22% and dusty sources 34% of PM_{2.5} during summer.
- These insights provide a road map for action; the Delhi government has done well to decide on inducting 1,000 electric buses.



1.6 Clean Air India Initiative

- It is a collaborative project between Get In The Ring, a platform for start-ups, the **government of the Netherlands**, Start-up India, and INDUS Forum, an online matchmaking platform of Indian and Dutch businesses.
- It aims to curb air pollution in Indian cities by promoting partnerships between Indian start-ups and Dutch companies and build a network of entrepreneurs working on business solutions for cleaner air.
- An 'INDUS impact' projects aims to halt the hazardous burning of paddy stubble by promoting business partnerships that "upcycle" it.
- It entails using paddy straw as feedstock to make materials that would find use in construction and packaging, which the dutch companies are keen to market in India.

1.7 Global Conference on Air Pollution and Health

- The first-ever Global Conference on Air Pollution and Health was organized by the WHO with participation of UN Climate Change.
- The conference focussed on presenting evidence, identifying gaps and finding possible solutions such as affordable and clean urban transport, waste and household energy strategies.
- The participants were Ministers of Health and Environment and other national government representatives, representatives of intergovernmental agencies, health professionals, as well as research, academia and civil society representatives.
- In the event, cooperative initiatives were taken forward between the WHO and sister UN agencies - secretariat of UN Climate Change (UNFCCC), UN Environment, World Meteorological Organization (WMO), Climate and Clean Air Coalition (CCAC), the United Nations Economic Commission for Europe (UNECE) and the World Bank.
- The conference responds to a World Health Assembly mandate to combat one of the world's most significant causes of premature death, causing some 7 million deaths annually.

1.8 NGT Order on Noise Pollution

The National Green Tribunal (NGT) has directed the Central Pollution Control Board (CPCB) to prepare a noise pollution map and remedial action plan.

- **Noise pollution** is generally defined as regular exposure to elevated sound levels that may lead to adverse effects in humans or other living organisms.
- According to the World Health Organization, sound levels less than 70 dB are not damaging to living organisms, regardless of how long or consistent the exposure is.
- **Sources** - Like environmental pollution, noise pollution, too, is the outcome of human activities.
- Industrialisation, urbanisation and modern lifestyle, all contribute to noise pollution.
- Factories, airports, railway stations and busy roads usually have noise levels much above the safe standards.
- Indiscriminate honking with pressure horns, excessively loud music systems in cars, homes, dance bars and other public joints are also the causes.
- Use of loudspeakers at full volume at religious, social and political gatherings worsens this menace.
- **Existing Provisions** - Legal provisions to prosecute the noisemakers already exist.
- Section 2 (a) of the Air (Prevention and Control of Pollution) Act, 1981, includes noise in the definition of pollutants.
- Also, noise pollution control rules were framed in 2000 under the amended and updated Environment Protection Act, 1996.
- It specifies the ambient standards for different places in respect of permissible noise.
- But unfortunately, these have remained only on paper.
- Though noise monitoring mechanisms were established in a few cities, these were hardly ever put to any gainful use.
- **NGT's Direction** - The NGT has asked the CPCB to categorise cities based on their noise profile and identify the noisy hotspots.
- The CPCB has also been asked to propose remedial plans for the noise pollution, within 3 months.
- NGT has also called upon police departments in all states to procure sound monitoring devices.
- They are also directed to assist the pollution control authorities in their efforts to mitigate noise pollution.
- Manufacturers of public address systems and sound amplification equipment should provide inbuilt noise meters and data loggers in their products.
- This would help regulators to establish violation and fix responsibility.

1.9 Decline in Diesel Vehicles - Assessment of Challenges and Options

Across the world, the popularity of diesel as a powertrain for passenger vehicles is on the decline.

- **Recent developments** - Europe, diesel vehicles' biggest market (53% of all cars sold is powered by diesel), is fast giving up on diesel.
- France, where diesel cars account for 70% of its overall fleet, saw more petrol cars being sold in 2017.
- In Germany, the share of diesel cars fell from 48% in 2012 to 33% in 2018.
- **Diesel Use in India** – Diesel cars accounted for 47% of all passenger vehicles in 2012-13.
- This was driven more by cheaper diesel prices than other reasons, as it was lower than petrol by as much as Rs. 25 per litre.
- However, government de-controlled diesel prices in 2014.
- As the price differential between diesel and petrol narrowed, the preferences changed.
- Today, only 23% of the cars sold have diesel powertrains.
- **Emission Norms** - Globally, the initial stages of emission norms focussed on carbon-di-oxide emission. E.g. Euro-I to Euro-IV emission norms
- So, diesel engines performed well on this account as they emitted lower CO₂.
- Diesel cars were increasingly promoted in most European countries with incentives.

- As emission norms evolved, it became clear that particulate matter (PM) and Oxides of Nitrogen (NOx) were equally dangerous.
- Notably, diesel engines emit higher levels of PM and Nox than petrol engines.
- So, Euro-V norms were introduced in 2010 focussing on reducing PM, and Euro-VI norms came into force in 2015 targeting NOx.
- Indian government has decided to shift from Bharat Stage BS-IV to BS-VI emission norms from April 2020.
- This will directly impact diesel engines the hardest. The manufacturers have to tackle both PM and NOx in one go, with a complex exhaust system.
- **Feasibility of Petrol** - Shifting to petrol powertrains will have another challenge for the manufacturers, which is the CAFE norms.
- The CAFE (Corporate Average Fuel Efficiency) norms came into force from April 2017.
- It requires cars to be 10% or more fuel efficient between 2017 and 2021, and 30% or more fuel efficient from 2022, in terms of CO₂ emission.
- The move is targeted at reducing the carbon footprint of the automobile industry.
- Diesel cars had been helping manufacturers meet these norms.
- But the shift to petrol would increase the CO₂ emission and the manufacturers would have to produce more fuel-efficient petrol cars or electric/hybrid vehicles.
- Government should move forward with the Faster Adoption and Manufacturing of Electric Vehicles (FAME)-2 norms.
- This should incentivise the manufacturer rather than the buyer.
- For goods movement, the only option is to reduce the share of road transportation and to focus on coastal shipping and inland waterways.

1.10 Lake Urmia

- It is a saltwater lake.
- It is situated in the mountains of northwest Iran i.e the west of the southern portion of the Caspian Sea and is fed by 13 rivers.
- It is designated as a site of international importance under the **UN Convention on Wetlands**.
- The lake has been shrinking since 1995, due to a combination of prolonged drought, elevated summer temperatures that speed up evaporation, over-farming and dams.
- It became one of the worst ecological disasters of recent decades as the lake's surface which was 2,366 km² in 2011 shrank to just 700 km² in 2013.
- This has threatened the habitat of shrimp, flamingos, deers and wild sheep and caused salt storms that pollute nearby cities and farms.
- It has started stabilising in recent times after the implementation of a joint program between Iran and the UNDP.



1.11 Firecracker ban on Galapagos Islands

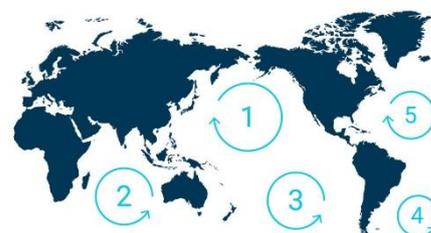
- Galapagos Islands are an archipelago of volcanic islands distributed on either side of the equator in the Pacific Ocean.
- It is a World Heritage Site that comes under the jurisdiction of Ecuador.
- The islands are known for their large number of endemic species and were studied by Charles Darwin
- Ecosystems are very sensitive in the islands and its fauna that is so unique that they are easily affected by even fireworks.

- Animals have suffered from elevated heart rates, nervous stress and anxiety, which have “notably” changed their behaviour and affected the survival of species
- So, the local government has recently banned fireworks on the Islands to protect its unique fauna
- Those fireworks that produce light but no noise have been excluded from the ban.
- It is also to avoid any potential deterioration in air quality or pollution of water sources.



1.12 Great Pacific Garbage Patch

- It is the largest accumulation of ocean plastic in the world and is located between Hawaii and California.
- It is the largest of the five offshore plastic accumulation zones in the world's oceans.
- It covers an estimated surface of 1.6 million square kilometres.
- A total of 1.8 trillion plastic pieces were estimated to be floating in the patch
- Microplastics, tiny fragments of plastic smaller than 50mm in size that make up the vast majority of items in the GPGP, is a major contributor to bioaccumulation in the food web.
- The other environmental impact comes from the larger debris, especially the fishing nets. The net fragments kill marine life by trapping fish and animals such as turtles in a process known as ‘ghost fishing’.



1.13 Paraben Levels in Water

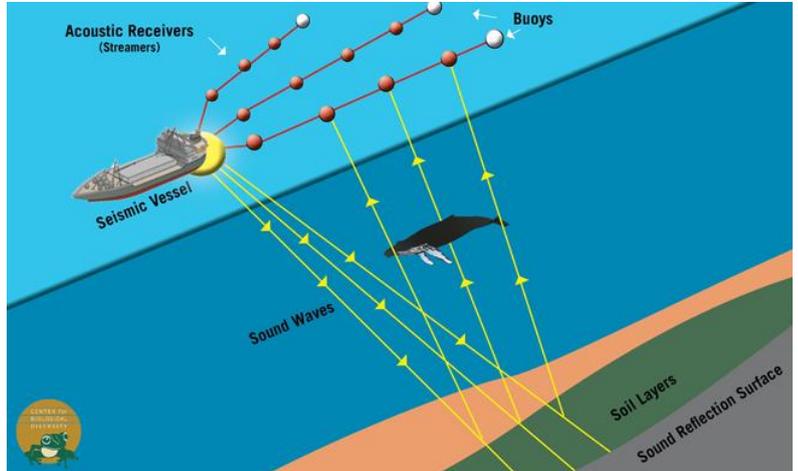
A project is initiated to identify parabens and triclosan in water bodies to help develop measures to correct their harmful effects.

- Parabens are a group of organic compounds used as preservatives in cosmetics and hygiene products.
- They are harmful for human health and when they end up in water bodies with urban and hospital waste, they become a threat to corals and may cause hormonal disruptions in dolphins and other marine animals as well.
- Use of cosmetics with parabens could pose a risk of breast cancer in women.
- Multiple studies have linked chlorinated parabens to endocrine disrupting functions, specifically mimicking the effects of Estrogen.

1.14 Seismic Airguns & Marine Wildlife

5 oil and gas companies have recently been given the green light to use seismic airgun blasts to search for oil and gas deposits in the sea floor from New Jersey to Florida.

- Seismic Air Gun consists of one or more pneumatic chambers that are pressurized with compressed air.
- When it is fired air into a fire chamber which in turn causes a piston to move, thereby allowing the air to escape the main chamber and producing a pulse of acoustic energy.
- This controlled seismic energy used to perform both reflection and refraction seismic surveys i.e they are used to find oil and gas deep underneath the ocean floor.
- Sound from these intense blasts can travel over 2,000 miles.
- The blasts could potentially harm commercial fishing by killing Zooplanktons.



- But conservationists are particularly concerned about critically endangered North Atlantic right whales, of which only about 450 remain.
- Large marine mammals like whales and dolphin use sound for communicating, feeding, and mating.
- So, the blasts could impact all three of those essential activities.

1.15 Bioplastics

- Plastics are usually made from petroleum, with the associated impacts in terms of fossil fuel depletion and climate change.
- It is estimated that by 2050, plastics could already be responsible for 15% of the global CO₂ emissions.
- Bioplastics, plant-based plastics is often considered as an alternative to petroleum-based plastics.
- They are in principle climate-neutral since they are based on renewable raw materials such as maize, wheat or sugar cane.
- Therefore, producing bioplastics consumes CO₂ and their net greenhouse gas balance is assumed to be zero.
- However, a recent study found that shifting to plant-based plastics could lead to generate increased greenhouse gas emission from cropland expansion on a global scale.

1.16 Green Crackers

Council of Scientific and Industrial Research (CSIR), and National Environmental Engineering Research Institute (NEERI) has finalized the chemical formulation of 'green' crackers after a direction from Supreme Court.

- The bulk production of such crackers will start after the clearance from Petroleum and Explosives Safety Organization (PESO).
- "Green crackers" do not contain harmful chemicals that would cause air pollution.
- Components in firecrackers are replaced with others that are less dangerous and less harmful to the atmosphere.
- The idea was initially proposed by Science & Technology Minister Harsh Vardhan.
- It was carried forward by a network of CSIR labs - Central Electro Chemical Research Institute (CECRI), Indian Institute of Chemical Technology, National Botanical Research Institute, National Chemical Laboratory.
- The team came up with 3-4 formulations and looked at 30-40% of active materials which reduce particulate matter.

- Barium nitrate and potassium nitrate will be used in the proposed formula, which will cut PM 2.5 emission by up to 30 per cent.
- CSIR-NEERI is testing the efficacy of bijli crackers by “eliminating the use of ash as desiccants”.
- Potential sound-emitting functional prototypes that do not emit sulphur dioxide were also developed.
- These crackers are named as Safe Water Releaser (SWAS), Safe Thermite Cracker (STAR) and Safe Minimal Aluminium (SAFAL).
- These have the unique property of releasing water vapour and/or air as dust suppressant and diluent for gaseous emissions.
- The Petroleum and Explosives Safety Organisation is testing and analysing these crackers for safety and stability.
- An emissions testing facility has been established at CSIR-NEERI. This will test conventional and green crackers and monitor them for emissions and sound.

2. RENEWABLE ENERGY

2.1 Re-vitalising Ethanol blending

A consistent and flexible policy for ethanol blending is needed to derive the many advantages that it offers across sectors.

- Biofuels are renewable liquid fuels made from biological raw materials and have proved to be good substitutes for petroleum in the transportation sector.
- In order to promote bio-fuels in India, a National Policy on Bio-fuels was formulated by the Union Ministry of New and Renewable Energy in 2009.
- In January 2013, the Union government launched the Ethanol Blended Petrol (EBP) programme, which made it mandatory for oil companies to sell petrol blended with at least **5 per cent** of ethanol.
- Currently, the programme is being implemented in 21 states and 4 union territories with a target of achieving 5 per cent blending and progressively increasing to 10 per cent blending.
- In India, sugarcane molasses is the major resource for bio-ethanol production and inconsistency of raw material supply is the major cause behind the sluggish response to blending targets.
- The National Bio-fuels Policy, 2018, seeks to widen the range of feedstock for ethanol production from the present sugar-molasses to other waste such as rural-urban garbage and cellulosic and lingo-cellulosic biomass, in line with the “waste-to-wealth” concept.
- The permissible feedstock includes sorghum, sugar-beet, cassava, decaying potatoes, damaged grain including maize, wheat, rice, and most importantly, crop residue such as wheat and rice stubble.
- This allows farmers to sell their surplus output to ethanol manufacturers when prices slump.
- Under the policy, Government has set a target of 10% blending of bio-fuel by 2022.
- To achieve the target, the ethanol required is 300 crore litres.
- In view of the consistent under-supply of domestic ethanol from traditional sources, oil PSUs are establishing 12 2G (Second Generation) Ethanol bio-refineries across 11 states of the country.
- 11 States are Punjab, Haryana, Uttar Pradesh, Gujarat, Madhya Pradesh, Maharashtra, Karnataka, Odisha, Bihar, Assam and Andhra Pradesh.

2.2 Sustainable Alternative towards Affordable Transportation

- It is an initiative by Ministry of Petroleum which aimed at providing a Sustainable Alternative towards Affordable Transportation.
- It is a developmental effort that would benefit vehicle-users as well as farmers and entrepreneurs.

- Compressed Bio-Gas production plants are set up under the initiative by inviting Expression of Interest from potential entrepreneurs.
- It has a four-pronged agenda of
 1. Utilising more than 62 million metric tonnes of waste generated every year in India
 2. cutting down import dependence
 3. supplementing job creation in the country
 4. reducing vehicular emissions and pollution from burning of agricultural / organic waste.
- Bio-gas is produced naturally through a process of anaerobic decomposition from waste / bio-mass sources.
- The wastes are agriculture residue, cattle dung, sugarcane press mud, municipal solid waste, sewage treatment plant waste, etc.

2.3 Clean energy ministerial meeting (CEM)

- At the United Nations Framework Convention on Climate Change conference of parties in Copenhagen in December 2009, Clean Energy Ministerial meeting was proposed by U.S. Secretary of Energy.
- Its objective is to bring together ministers with responsibility for clean energy technologies from the world's major economies and ministers from a select number of smaller countries that are leading in various areas of clean energy.
- It is a high-level global forum to promote policies and programs that advance clean energy technology, to share lessons learned and best practices, and to encourage the transition to a global clean energy economy.
- It is focused on three global climate and energy policy goals - Improve energy efficiency worldwide, Enhance clean energy supply, Expand clean energy access.
- The framework for the CEM was adopted at the 7th CEM meeting in 2016.
- The 9th CEM meeting was recently held in Copenhagen, Denmark in 2018.
- It was held back to back with Mission Innovation ministerial meeting which took place in Malmo, Sweden.
- The cities of Malmö and Copenhagen are famously linked by the Oresund Bridge, chosen for the event as a powerful symbol of joining forces to accelerate the clean energy revolution.
- The 10th CEM meeting will be held in Vancouver, Canada in May, 2019. As host, Canada will highlight the leadership of women, Indigenous peoples and youth in the energy sector.

2.4 Mission Innovation

- Mission Innovation (MI) is a global initiative of 23 countries and the European Commission (on behalf of the European Union).
- It was announced at COP21 of UNFCCC in 2015, as world leaders came together in Paris to commit to ambitious efforts to combat climate change.
- It works to reinvigorate and accelerate global clean energy innovation with the objective to make clean energy widely affordable.
- It aims to accelerate public and private clean energy innovation to address climate change, make clean energy affordable to consumers, and create green jobs and commercial opportunities.

Year	Hosting Nations
2016	San Francisco, California
2017	Beijing, Republic of China
2018	Copenhagen, Denmark

- The 4th ministerial meeting will be held along with 10th CEM meeting.
- So far, mission innovation ministerial meetings were held back to back with CEM.



- As part of the initiative, participating countries have committed to seek to double their governments' clean energy research and development (R&D) investments over 5 years.
- India is the founding member of the Steering Committee and also a Member of the two sub-groups - Joint research and Capacity Building and Private Sector Engagement.
- CEM10/MI-4 is key to these efforts, providing a platform for:
 - i. High-level policy dialogue and sharing of best practices to help accelerate the transition to a low carbon future.
 - ii. International collaboration on clean energy innovation and adoption of clean energy policies and practices.
 - iii. Public-private engagement to build cooperation among industry, government, and civil society to scale up clean energy around the globe.

2.5 Project SUNRISE

- It is India – UK collaboration solar power project aiming to deliver low-cost photovoltaics to rural India.
- It unites 12 leading universities and several industrial collaborators from the UK and India in an equitable research collaboration.
- It will develop and implement the technology necessary to build a minimum of five solar-powered building demonstrators in rural Indian villages within the lifetime of the project.
- The project is funded by U.K. government's GCRF (Global Challenges Research Fund), established to support research that addresses challenges faced by developing countries.
- One of the key aims is to provide a real-life example which proves that this technology works and that it is appropriate within communities.

3. CLIMATE CHANGE

3.1 Assessing the Progress of Paris Agreement

The 24th Conference of the Parties (COP-24) meeting to the United Nations Framework Convention on Climate Change (UNFCCC) was held in Katowice, Poland.

- Average global temperatures have crossed a degree Celsius above preindustrial levels.
- Such concentration of carbon dioxide in the atmosphere (410 ppm) has never been seen by humans before.
- Resultantly, today's children are inheriting an earth that is out of control and heading to be 3-4^o C warmer by the end of the century.
- Perpetual growth is not viable for any species.
- Business-as-usual policies with high consumption by the rich are driving the destruction of ecosystems and mass extinction of species.
- The "sixth extinction", massive destruction of species on earth is ongoing.
- In this context, the [1.5 Degree Report](#), a special publication, was recently released by the Intergovernmental Panel on Climate Change (IPCC).
- It calls for far-reaching, speedy transformative changes by countries in order to stay below 1.5^o C.
- It emphasises on immediate and drastic drop in GHG emissions through technology and lifestyles, and on mitigation and adaptation.
- The Nationally Determined Contributions (NDCs) were planned ahead of the Paris COP-21.
- Under this, each country described the actions it would take and the levels to which GHG emissions would be reduced (mitigation).
- Countries also described what they would do to improve their capacity to live in a warmer world (adaptation).

- The extent to which these goals required support in the form of finance or technology transfer was also mentioned.
- Katowice Meeting focused on 3 key issues such as
 1. Finalization of guidelines/ rules for the implementation of Paris Agreement,
 2. The conclusion of 2018 Facilitative Talanoa Dialogue and
 3. The stocktake of Pre-2020 actions implementation and ambition.
- The guidance on adaptation recognizes the principle including equity and Common but Differentiated Responsibilities and Respective Capabilities (CBDR-RC).
- Parties have also agreed to initiate the work on setting up the new collective finance goals post-2020 from the floor of USD 100 billion.
- The guidance on Nationally Determined Contributions provides for Parties to submit different types of contributions including adaptation.
- The outcome on Talanoa dialogue also recalls the commitment of developed country Parties to a goal of mobilizing jointly USD 100 billion per year by 2020.

3.2 Rulebook for the 2015 Paris Agreement

Negotiators from 196 countries finalised a rulebook for the 2015 Paris Agreement at the climate change conference in Katowice, Poland.

- The Paris Agreement seeks to keep the global average temperatures “well below” 2°C from pre-industrial times.
- It specifies the steps that countries need to take in the fight against climate change.
- The rulebook prescribes how to do those things, and how each of them would be measured and verified.
- It holds the operational details of the Paris Agreement, the processes and guidelines for its implementation.
- Notably, the rulebook is a dynamic document, as new rules can be added, or existing rules amended.
- It would facilitate the implementation of Paris Agreement which is supposed to replace the existing Kyoto Protocol in 2020.
- Nevertheless, several countries and NGOs feel that the deal reached in Katowice, though welcome, was not enough.
- The Paris Agreement says every country must have a **climate action plan** to be periodically updated and submitted to the UN climate body.
- The rulebook now specifies what actions can be included in the action plan, how and when to submit them.
- Further, the Paris Agreement asks every member nation to submit information about their **greenhouse gas emissions** every two years.
- The rulebook now specifies
 - i. which gases to measure
 - ii. what methodologies and standards to apply while measuring them
 - iii. the kinds of information to be included in their submissions
- Article 4 of Paris Agreement mandates **nationally determined contributions** (NDCs) by countries.
- The rules now say that support shall be provided to developing country Parties for the implementation of Article 4.
- Parties shall provide the information necessary for clarity, transparency and understanding as applicable to their NDCs.
- The Paris Agreement demands developed countries to provide “**climate finance**” to developing countries and submit an account of this.

- The rulebook says what kinds of financial flows - loans, concessions, grants - can be classified as climate finance.
- It specifies how they should be accounted for and the kind of information about them needed to be submitted.

3.3 Talanoa Dialogue

- The countries put in place a road-map for 'Talanoa Dialogue' in COP 23 which is a year-long process to assess the countries' progress on climate actions.
- Under this, it was agreed that the next two climate conferences, in 2018 and 2019, will have special 'stock-taking' sessions.
- This stock-take would focus on the 'pre-2020 actions' being taken by different countries to reduce greenhouse gas emissions.
- It included the progress made by developed nations in their obligations to provide finance and technology support to the developing countries.
- It reflected a strong message to developed countries that post-2020 climate action as part of the Paris Agreement cannot be divorced from pre-2020 commitments.

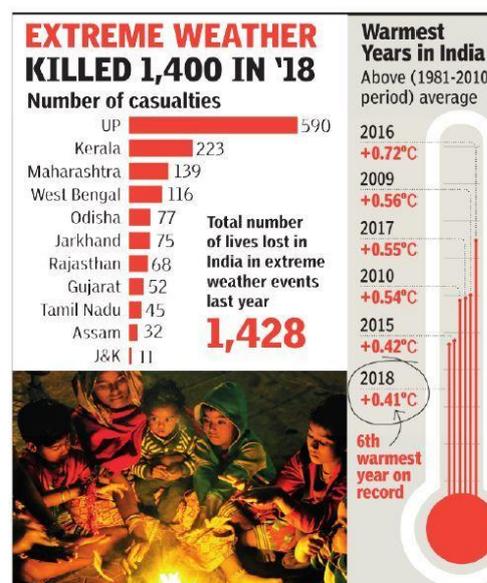
3.4 Biennial Update Report

- Union Cabinet has approved Submission of India's second Biennial Update Report (BUR) to the United Nations Framework Convention on Climate Change (UNFCCC).
- The biennial update report aims to provide an update to India's first biennial report to the United Nation's body on climate change.
- The report contains five major components including
 1. National circumstances.
 2. National greenhouse gas inventory.
 3. Mitigation actions,
 4. Finance.
 5. Technology and capacity building needs.
- The report has been prepared based on a range of studies conducted at the national level.

3.5 IMD Statement on Climate of India in 2018

A recently released IMD (India Meteorological Department) statement shows 2018 as the sixth warmest year on record.

- 2018 was the sixth warmest year on record, with the average temperature over India being "significantly above normal".
- [The 5 warmest years on record (nationwide records began in 1901) are, in order, 2016, 2009, 2017, 2010, 2015.
- Notably, 11 of the 15 warmest years were during the recent past fifteen years (2004-18).
- The 20 warmest years on record have been in the past 22 years, with the top four in the past four years.
- Rainfall over India as a whole during the southwest monsoon season was near normal with 90.6% of Long Period Average (1951-2000).
- But the northeast monsoon season rainfall was substantially below normal with 56% of LPA and was the sixth lowest since 1901.



- The seasonal rainfall during the northeast monsoon season over the core region of the south peninsula was also below average (66% of LPA).
- It comprises of 5 subdivisions - Coastal Andhra Pradesh, Rayalaseema, Tamil Nadu & Puducherry, South Interior Karnataka and Kerala.
- Out of these, Kerala received normal rainfall and the other four subdivisions received deficient rainfall.

3.6 Thawing of Permafrost

- Permafrost is any type of ground—from soil to sediment to rock—that has been frozen continuously for a minimum of **2 years** and as many as hundreds of thousands of years.
- It can extend down beneath the earth's surface from a few feet to more than a mile.
- Across the Arctic, communities and infrastructure are built on top of a thick layer of permafrost.
- But as global temperatures rise, this frozen soil is melting, causing homes and businesses to collapse and roadways to crumble.
- Now, a new study has found that most of the Arctic's built environment will be damaged by the thaw, even if nations meet their Paris Agreement climate targets.
- It has found that nearly 70% of infrastructure in the Arctic is built on permafrost that is at risk of thawing by mid-century.
- In addition, nearly half of the oil and gas drilling sites in the Russian Arctic are in regions where thaw-related ground instability can cause severe damage to the built environment.

3.7 Hindu Kush Himalaya Assessment Report

The International Centre for Integrated Mountain Development (ICIMOD) recently released the Hindu Kush Himalaya Assessment report.

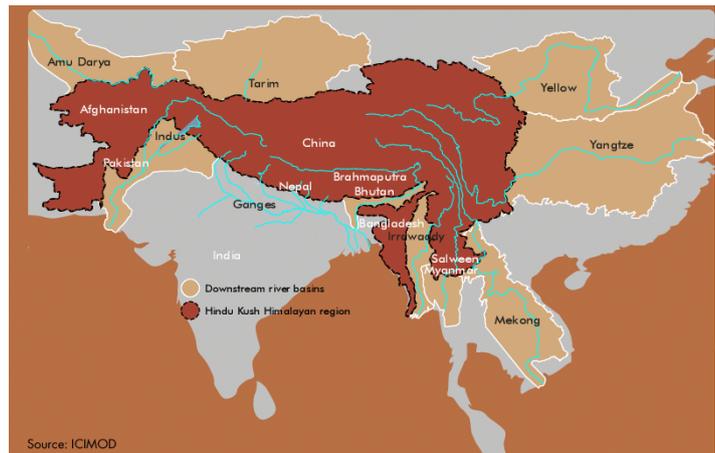
- It reveals that more than 35% of the glaciers in the region could retreat by 2100, even if the global temperature rise is capped at 1.5°C.
- This could destabilise the hydrology of large parts of South Asia, China and Myanmar.
- Regions in higher altitudes tend to warm faster than low-lying lands.
- So, a global temperature increase of 1.5°C could mean at least a 1.8°C temperature rise in the Hindu Kush Himalayas.
- This will have a major bearing on the ice-fields, which are the largest repository of permafrost outside the polar regions.
- Since the region's snow is the source of 10 major river systems, large-scale warming could drastically alter the river flows in these countries.

Hindu Kush Himalayan Region

- It extends 3,500 km over all or part of **eight countries** from Afghanistan in the west to Myanmar in the east.
- It is the source of ten large Asian river systems – the Amu Darya, Indus, Ganges, Brahmaputra, Irrawaddy, Salween (Nu), Mekong, Yangtze, Yellow River, and Tarim (Dayan).
- It provides water, ecosystem services, and the basis for livelihoods to a population of around 210.53 million people in the region.
- The basins of these rivers provide water to 1.3 billion people, a fifth of the world's population.
- The Himalayan range alone has the total snow and ice cover of 35,110 sq.km containing 3,735 cu.km of eternal snow and ice.

- The receding glaciers could cause a deluge in the rivers during the monsoon while the flows are likely to reduce during the dry seasons, with serious implications for irrigation, hydropower and ecosystem services.
- Also, the receding glaciers might be the reason for the changing monsoon.
- Hindu Kush Himalayan region is a heat sink in summer and a heat source in winter, and this influences the Indian summer monsoon.

- The number of intense precipitation days and intensity of extreme precipitation have increased overall in the last five decades.
- If these trends persist, the frequency and magnitude of water-induced hazards in the Hindu Kush Himalaya region will increase.
- This is a significant conclusion given that developments in the Himalayas are known to have a spin-off on the monsoon in the Subcontinent.
- However, more studies are required to firm up the links between extreme weather events in the higher reaches of the Subcontinent and the erratic weather in the plains.



- For this, more data sharing between the countries that share the Hindu Kush Himalaya is needed.
- Political differences between these countries should not come in the way of joint efforts to build resilience of vulnerable communities and shore up the region's water security.
- Such cooperation must go alongside meeting the Paris Climate Change Pact's goals.

3.8 Common Risk Mitigation Mechanism

- It is under the International Solar Alliance.
- It will be formally announced at the 24th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP 24) to be held in Poland in December.
- It has been taken over by the World Bank and it has mobilised \$1 million for preparatory work.
- The objective of CRMM is de-risking and reducing the financial cost of renewable energy projects in ISA-member countries.
- It will act as a pooled insurance with limited liability.
- Banks and multi-lateral institutions can contribute to the fund for a marginal premium.

4. ENVIRONMENTAL ORGANISATIONS, CONVENTIONS& TREATIES

4.1 Convention of Biological Diversity

- India has recently submitted its Sixth National Report (NR6) to the Convention on Biological Diversity (CBD).
- CBD is an international legally-binding treaty under UNEP with three main goals: conservation of biodiversity; sustainable use of biodiversity; fair and equitable sharing of the benefits arising from the use of genetic resources.
- The Secretariat of the Convention on Biological Diversity (SCBD) is based in Montreal, Canada.
- CBD was opened for signature at the Earth Summit in Rio de Janeiro in 1992 and entered into force in 1993. To date, there are 193 Parties.
- The CBD's governing body is the Conference of the Parties (COP), where the ultimate authority of all governments (or Parties) that have ratified the treaty meets every two years to review progress, set priorities and commit to work plans.
- The 14th COP was recently held in in Sharm El-Sheikh, Egypt with the theme "Investing in biodiversity for people and planet" and 2018 marked the 25th anniversary of the Convention
- It was concluded with the **Sharm El-Sheikh Declaration on Nature and Culture**, which will lead to further dialogue on the establishment of a multi-partner International Alliance on Nature and Culture to be launched at the CBD COP 15 in Beijing, China in 2020.

- The COP is also called as UN Biodiversity Conference.
- **The Cartagena Protocol on Biosafety to CBD** is an international agreement adopted in 2000 and entered into force in 2003.
- It aims to ensure the safe handling, transport and use of living modified organisms (LMOs) resulting from modern biotechnology that may have adverse effects on biological diversity, taking also into account risks to human health.
- The **Nagoya Protocol** on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to CBD was entered into force in 2014.
- It is an international agreement aims at sharing the benefits arising from the utilization of genetic resources in a fair and equitable way.
- **Global Biodiversity Outlook (GBO)** is the flagship publication of the CBD.
- It is a periodic report that summarizes the latest data on the status and trends of biodiversity and draws conclusions relevant to the further implementation of the Convention.

4.2 UN Environment Assembly

- The United Nations Environment Programme (UNEP), established in 1972, is the voice for the environment within the United Nations system.
- Its headquarters are in Nairobi, Kenya and it also has 6 regional offices in various countries.
- It is governed by the UN Environment Assembly of UNEP (formerly UNEP Governing Council) since 2013, and steered by the Committee of Permanent Representatives (CPR) which now meets annually.
- UN Environment assembly was created during the United Nations Conference on Sustainable Development, also referred to as RIO+20, in 2012.
- It is the world's highest-level decision-making body on the environment.
- It meets biennially to set priorities for global environmental policies and develop international environmental law.
- It addresses the critical environmental challenges facing the world today.
- Recent UN Environment Assembly is being held at Nairobi, Kenya.

4.3 Global Environment Outlook Report – UNEP

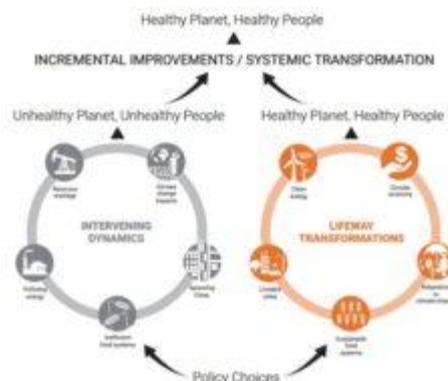
The sixth edition of the Global Environment Outlook (GEO-6) from the UN Environment Programme (UNEP) on the theme "Healthy Planet, Healthy People" was released recently.

- The GEO was unveiled at the UN Environment Assembly in Nairobi, Kenya.
- It is likely to add to the debate over who bears the greatest responsibility for the damage already borne by Earth.
- Some developed nations, led by the United States, had threatened not to "welcome" the GEO report.
- This is a procedural but nonetheless significant hurdle, for the nations to agree on the necessary cuts in waste, overconsumption and pollution.

Report Highlights

- **Premature deaths** - A quarter of all premature deaths and diseases worldwide are due to manmade pollution and environmental damage.
- The report notes on deadly smog-including emissions, chemicals polluting drinking water, and the destruction of ecosystems crucial to the livelihoods of many.
- These are driving a worldwide epidemic that hampers the global economy.
- **Inequality** - The GEO depicts a widening gap between rich and poor countries.
- The top 10% of populations globally, in terms of wealth, are responsible for 45% of GHG emissions, and the bottom 50% for only 13%.

- Pollution impacts are, however, borne more by the poorer citizens.
- Rampant overconsumption, pollution and food waste in the developed world leads to hunger, poverty and diseases elsewhere.
- **Health** - Poor environmental conditions cause approximately 25% of global disease and mortality, with around 9 million deaths in 2015 alone.
- Nearly 1.4 million people die each year from preventable diseases with lack of access to clean drinking supplies.
- E.g. diarrhoea and parasites linked to pathogen-riddled water and poor sanitation
- Air pollution alone causes 6-7 million early deaths annually.
- Chemicals pumped into the seas cause "potentially multi-generational" adverse health effects.
- Land degradation through mega-farming and deforestation occurs in areas of Earth which are home to 3.2 billion people.
- Unchecked use of antibiotics in food production will result in drug-resistant superbugs becoming the world's number one cause of premature death by mid-century.
- The report also called for a rapid drawdown in greenhouse gas emissions and pesticide use to improve air and water quality.



4.4 Kyoto Protocol Second Commitment Period

- Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change, which commits its Parties by setting internationally binding emission reduction targets.
- It was adopted in Kyoto, Japan in 1997 and entered into force in 2005.
- The detailed rules for the implementation of the Protocol were adopted at COP 7 in Marrakesh, Morocco, in 2001, and are referred to as the "Marrakesh Accords."
- It places a heavier burden on developed nations under the principle of "common but differentiated responsibilities."
- Under the Kyoto Protocol, industrialized nations agreed to cut their greenhouse gas emissions below 1990 levels.
- Its first commitment period started in 2008 and ended in 2012.
- The Doha amendment was made to Kyoto protocol in 2012 to extend the obligations of the developed countries for the second commitment period of 2013-2020.
- This period bridges the gap between the end of the 1st Kyoto period and the start of the new global agreement in 2020. Paris Agreement would replace Kyoto in 2020.
- During the 1st commitment period, 37 industrialized countries and the European Community committed to reduce GHG emissions to an average of five percent against 1990 levels.
- During the 2nd commitment period, Parties committed to reduce GHG emissions by at least 18 percent below 1990 levels in the eight-year period from 2013 to 2020.
- However, the composition of Parties in the second commitment period is different from the first.
- List of greenhouse gases (GHG) to be reported under the protocol
 - Carbon dioxide (CO₂),
 - methane (CH₄),
 - nitrous oxide (N₂O),
 - perfluorocarbons (PFCs),



- v. hydrofluorocarbons (HFCs),
 - vi. sulphur hexafluoride (SF₆) and
 - vii. nitrogen trifluoride (NF₃))
- Above GHG should be reported from five sectors - energy; industrial processes and product use; agriculture; land use, land-use change and forestry (LULUCF) and waste.
 - The report covers all years from the base year (or period) to two years before the inventory is due (e.g. the inventories due 15 April 2016 cover emissions and removals for all years from the base year to 2014).
 - 2nd commitment period requires ratification from a total of 144 of the 192 parties of the Kyoto Protocol to become operational.
 - India has ratified the second commitment period of the Kyoto Protocol.
 - As of 21 February 2019, 126 Parties have deposited their instrument of acceptance.
 - US have not ratified the Kyoto Protocol and Canada withdrew from Kyoto protocol in 2012.
 - Under the protocol, countries must meet their targets primarily through national measures and through additional market-based mechanisms such as
 - i. International Emissions Trading
 - ii. Clean Development Mechanism (CDM)
 - iii. Joint implementation (JI)
 - The Kyoto Protocol, like the Convention, is also designed to assist countries in adapting to the adverse effects of climate change.
 - The **Adaptation Fund** was established to finance adaptation projects and programmes in developing countries that are Parties to the Kyoto Protocol.
 - In the first commitment period, the Fund was financed mainly with a share of proceeds from CDM project activities.
 - In Doha, in 2012, it was decided that for the second commitment period, international emissions trading and joint implementation would also provide the Adaptation Fund with a 2 percent share of proceeds.

4.5 South Asia wildlife enforcement network

- The South Asia Wildlife Enforcement Network (SAWEN) is an inter-governmental wildlife law enforcement support body of South Asian countries namely - Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka.
- The announcement of formation of SAWEN was made in Governing Council of the South Asia Cooperative Environment Programme (SACEP) through Jaipur Declaration in 2008.
- It was officially launched in 2011 in Bhutan.
- It operates its activities from the Secretariat based in Kathmandu, Nepal.
- It promotes regional cooperation to combat wildlife crime in South Asia
- TRAFFIC, the wildlife trade monitoring network has been providing technical support for the SAWEN process since its inception.
- It launched Trilateral Transborder Wildlife Interception (TTWI) which aims reduction in illegal trafficking in wildlife products, particularly Indian one-horned rhinos and Bengal tigers.
- The funding agencies of this project - Rhinoceros and Tiger Conservation Fund, US Fish and Wildlife Service.

4.6 Suva Expert Dialogue

- It is a two-dialogue on Loss and Damage conducted in Bonn, Germany.
- It was organised to deliberate on issues in the mechanisms set up so far to address losses and damages caused by climate change impacts.

- It is seen as an important step in the the review process of the Warsaw International Mechanism for loss and damage, which was established at COP 19 UNFCCC (2013).

4.7 Montreal Protocol Assessment

- The latest Scientific Assessment panel on Montreal Protocol reveals a healing ozone layer, global warming reduction potential, and options for more ambitious climate action.
- The 2018 assessment was carried under the auspices of the Montreal Protocol in coordination with the World Meteorological Organization (WMO) and the United Nations Environment Programme.
- The Montreal Protocol on Substances that Deplete the Ozone Layer has been recognized as the most successful international environment treaty in history.
- It is the only environmental treaty which enjoys universal ratification of 197 UN numbers countries.
- Kigali amendment to Montreal protocol was entered into force from January 1, 2019, following ratification by 65 countries.
- The protocol and its amendments have banned the use of ozone destroying chemicals and the rate of ozone depletion seems to have slowed.
- The amendment calls for slashing the future use of powerful climate-warming gases in refrigerators, air conditioners and related products.
- Under the Amendment, all countries will gradually phase down HFCs by more than 80 percent over the next 30 years and replace them with more environmentally friendly alternatives.
- Action under the Amendment will help reduce the production and consumption of hydrofluorocarbons, potent GHGs, and thus avoid global warming of up to 0.4°C this century.

4.8 International Coral Reef Initiative (ICRI)

- It is an informal partnership between Nations and organizations which strives to preserve coral reefs and related ecosystems around the world.
- It was founded in 1994 by eight governments: Australia, France, Japan, Jamaica, the Philippines, Sweden, the United Kingdom, and the United States of America.
- It is an informal group whose decisions are not binding on its members.
- It was announced
 1. at the First Conference of the Parties of the Convention on Biological Diversity in December 1994
 2. at the high level segment of the Inter-sessional Meeting of the U.N. Commission on Sustainable Development in April 1995.
- India is a member of ICRI.
- Its actions highlight globally the importance of coral reefs and related ecosystems to environmental sustainability, food security and social and cultural wellbeing.
- **UN and ICRI** - UNEP established a Coral Reef Unit (CRU) in 2000 with an original mandate to oversee the funding of the International Coral Reef Action Network (ICRAN), a former Operational Network of ICRI.
- UNESCO's Intergovernmental Oceanographic Commission (IOC) was initially closely involved in ICRI, particularly its data arm the Global Coral Reef Monitoring Network (GCRMN).

4.9 STAPCOR

- ICRI has declared 2018 as the "International Year of the reef".
- In support of this declaration, UT of Lakshadweep administration in collaboration with the Zoological Survey of India organised an International Conference on **Status and Protection of Coral Reefs-2018 (STAPCOR)**.
- The theme of STAPCOR was "Reef for life".



- It was held in Bangaram Island with delegates from international and national, keynote speakers from United State of America, United Kingdom, Kuwait, Italy, France, Maldives and Sri Lanka.
- This is the 3rd STAPCOR event following those in 1998, and 2008 in celebration and support of the International Year of the Reef.
- It will promote partnerships between governments, academia, civil society and the private sector to encourage the sharing of information and best practices for the future of sustainable coral reef management.

4.10 Global Green Growth Institute

- It is a treaty-based international, inter-governmental organization dedicated to supporting and promoting strong, inclusive and sustainable economic growth in developing countries and emerging economies.
- It is headquartered in Seoul, South Korea.
- It aims to deliver impact through six strategic outcomes:
 - i. GHG emission reduction
 - ii. Creation of green jobs
 - iii. Increased access to sustainable services, such as, clean affordable energy, sustainable public transport, improved sanitation, and sustainable waste management
 - iv. Improved air quality
 - v. Adequate supply of ecosystem services
 - vi. Enhanced adaptation to climate change
- It currently has 30 Member countries and signatories.
- A further 13 countries (Partner countries) are currently in a process of accession, including India, Nepal, Pakistan, Myanmar, European Union etc.
- It was granted observer status in UN General Assembly and intergovernmental observer to UNFCCC and Green Climate fund.
- It is a founding member of the Green Growth Knowledge Platform together with the OECD.

4.11 IPBES

- The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) is an independent intergovernmental body, established in Panama City by 94 member States in 2012.
- It provides policymakers with objective scientific assessments about the state of planet's biodiversity, ecosystems and the benefits they provide to people, as well as the tools and methods to protect and sustainably use these vital natural assets.
- Its mission is to strengthen knowledge foundations for better policy through science, for the conservation and sustainable use of biodiversity, long-term human well-being and sustainable development.
- It has published assessment report on pollinators, pollination and food production.
- It is placed under the auspices of four United Nations entities: UNEP, UNESCO, FAO and UNDP and administered by UNEP.
- All the member countries of the United Nations can join the platform.
- A large number of NGOs, organisations, conventions and civil society groupings participate in the formal IPBES process as observers.
- Its secretariat is based in Bonn, Germany.
- India is a member of this platform. All neighboring countries except Myanmar are also part of this platform.

4.12 Alliance to End Plastic Waste (AEPW)

- The alliance is a not-for-profit organization that includes companies that make, use, sell, process, collect and recycle plastics.

- It is made up of nearly 30 member companies with a commitment of investing USD 1.5 billion over the next 5 years to help end plastic waste in the environment.
- It will develop and bring to scale solutions that will minimise and manage plastic waste and promote solutions for used plastics by helping to enable a circular economy.
- Member companies includes chemical and plastic manufacturers, consumer goods companies, retailers, converters, and waste management companies, also known as the plastics value chain.
- The alliance has been working with the World Business Council for Sustainable Development as a founding strategic partner.

4.13 Global Solar Council

- The Global Solar Council (GSC), CEO-level industry collaboration, was launched in 2015, following the historic United Nations Climate Change Conference (UN COP 21).
- It is international non-profit association of the national, regional and international associations in solar energy and the world 's leading corporations.
- It came into being as International Coalition of more than 30 nations, utilising maximum solar energy, decided to harness the renewable energy for the greater good.
- It is headquartered in Washington DC.
- As of now, 35 business organisations are participants of this council.
- International Solar Energy Society (ISES), an UN accredited long standing solar organization, is a founding member of the council.
- The principal members of the Global Solar Council include Australia, China, Europe, India and other Asian countries, Middle East, South America and the US.
- Chairman of India's National Solar Energy Federation Pranav R Mehta has recently chosen as the President of GSC.

4.14 Small Grants Program

- Global Environment Facility (GEF) Small Grants Program was established in the year of the Rio Earth Summit 1992.
- It provides financial and technical support to projects that conserve and restore the environment while enhancing people's well-being and livelihoods.
- It demonstrates that community action can maintain the fine balance between human needs and environmental imperatives.
- UNDP has been supporting the Ministry of Environment, Forest and Climate Change (MoEFCC) in implementing the Global Environment Facility (GEF) and financed Small Grants Program (SGP) in India since 1997.
- The program provides grants of up to \$50,000 directly to local communities including indigenous people, community-based organizations and other non-governmental group.
- The SGP has been working extensively in the areas of biodiversity conservation, climate change and land degradation.
- SGP in India aims to support the vulnerable communities through community led approaches towards environmental conservation and livelihoods enhancement.
- Projects under the SGP are implemented through
 1. National Host Institution – Centre for Environment Education (CEE)
 2. NGO partners and stakeholders that has presence in different parts of the country.

4.15 Forest Certification

- Forest certification is a global movement initiated in 1990s after Rio Earth Summit.



- It is a market-based non-regulatory conservation tool designed to promote sustainable management of forests and trees outside forests by an independent third party.
- Forest certification has been accepted as an efficient tool for forest management world over.
- As several developed countries have put trade restrictions on import of non-certified timber, non-timber forest products and wood-based goods into their countries, getting sustainable forest management certificates has become mandatory for exports.

4.16 UN IMO – GHG Emissions

- United Nations International Maritime Organization (IMO) have adopted a strategy to reduce greenhouse gas emissions from ships.
- It sets out a vision to reduce GHG emissions from international shipping and phase them out, as soon as possible in this century.
- The strategy includes a specific reference to “a pathway of CO₂ emissions reduction consistent with the Paris Agreement temperature goals”.
- It was adopted in its 72nd session at IMO Headquarters in London, United Kingdom.
- IMO is also supporting particularly developing States to implement and support energy efficiency in the shipping sector.

4.17 UNCCD

- Committee for the Review of the Implementation of the Convention to the UN Convention to Combat Desertification (UNCCD) reviewed the global Assessment of Land Degradation.
- The assessment indicates that 169 countries are affected by land degradation, desertification or drought.
- With regard to SDG target 15.3 (land degradation neutrality (LDN)), the assessment indicates that the proportion of degraded land for all land reported by country Parties is 19.2%.
- UNCCD was adopted in 1994 and entered into force in 1996.
- It is the only internationally legally binding framework set up to address the problem of desertification.
- The Convention addresses specifically the arid, semi-arid and dry sub-humid areas, known as the drylands, where some of the most vulnerable ecosystems and peoples can be found.
- 13th meeting of the Parties to the UNCCD was held in Ordos, China in September, 2017.
- In the meeting, 113 countries had agreed to specify concrete targets with clear indicators, to rehabilitate more land and reverse degradation.
- Ordos Declaration was signed in the summit which urges countries to step up efforts on all fronts to tackle desertification.

Kubuqi Model in Desertification Control

- Kubuqi Desert in Ordos, Inner Mongolia (Autonomous region in China) is the first desert in the world to achieve large-scale desertification control.
- The Project of greening of Kubuqi desert was under taken by China and it has become a name card for China's desertification control efforts.
- The project has been praised by UN Environment Programme for being an –eco-pioneerl in greening the world.
- The core pillars of the Kubuqi Model are government policy support, industrial investment, market-oriented participation of farmers and herdsmen and sustainable ecological improvement.
- It relies mainly on increasing local people's income in the greening efforts via the combination of ecology and industry, enterprise development and ecological management.



- The new **UNCCD 2018-2030 Strategic Framework** is the most comprehensive global commitment to achieve Land Degradation Neutrality (LDN) in order to restore the productivity of vast swathes of degraded land, improve the livelihoods of more than 1.3 billion people, and to reduce the impacts of drought on vulnerable populations.
- UNGA declared 2010 to 2020 the United Nations Decade for Deserts and the Fight Against Desertification.

5. GOVERNMENT INTERVENTIONS

5.1 Ground Water Extraction Guidelines

The Central Ground Water Authority (CGWA) has notified the new water-extraction guidelines recently.

- Ground water extraction in India is regulated by CGWA constituted under the Environment (Protection) Act of 1986.
- **Revised Guidelines** - It has introduced the concept of Water Conservation Fee (WCF).
- The WCF payable varies with the category of the area, type of industry and the quantum of ground water extraction.
- It is designed to progressively increase from safe to over-exploited areas and from low to high water consuming industries as well as with increasing quantum of ground water extraction.
- Through this design, the high rates of WCF are expected to discourage setting up of new industries in over-exploited and critical areas.
- It also acts as a deterrent to large scale ground water extraction by industries, especially in over-exploited and critical areas.
- The WCF would also compel industries to adopt measures relating to water use efficiency and discourage the growth of packaged drinking water units, particularly in over-exploited and critical areas.
- It encourages use of recycled and treated sewage water by industries and a provision of action against polluting industries.
- It mandates requirement of digital flow meters, piezometers and digital water level recorders, detailing the quantum of extraction.
- Also, water audit should be conducted by industries abstracting ground water of 500 m³/day or more in safe and semi-critical and 200 m³/day or more in critical and over-exploited assessment units.
- Industries should undertake roof top rain water harvesting and measures should be adopted to ensure prevention of ground water contamination in premises of polluting industries/ projects.
- There is also an exemption from requirement of No Objection Certificate for –
 1. Agricultural users
 2. Users employing non-energised means to extract water
 3. Individual households (using less than 1-inch diameter delivery pipe)
 4. Armed Forces Establishments during operational deployment or during mobilization in forward locations.
 5. Strategic and operational infrastructure projects for Armed Forces, Defence and Paramilitary Forces Establishments and
 6. Government water supply agencies.
- Other exemptions have been granted to strategic and operational infrastructure projects for Armed Forces, Defence and Paramilitary Forces Establishments and Government water supply agencies.

Concerns

- **Regulation** - The guidelines do not make any effort to ensure efficient and need-based utilisation of water for irrigation, which uses nearly 90% of the extracted groundwater.
- The domestic sector has also been exempted from any restrictions.

- Only 5% groundwater that is accessed by the industrial sector is proposed to be regulated for careful use.
- **Approval** - Some of the well-advised norms that are already in place have been relaxed for no good reason.
- Many commercial ventures, including beverages and drinking water bottlers, do not only consume water in bulk but also waste it in substantial measure.
- The power of issuing no objection certificates (NOC) for many kinds of industrial units has now been vested with district magistrates instead of the CGWA.
- Since the civic authorities lack wider perspective on this matter, they can be expected to be quite lenient in letting the commercial ventures tap it unchecked.
- **Norm relaxation** - The existing provision for mandatory recharging of groundwater by bulk consumers has also been diluted.
- They are now bound only to undertake rooftop water harvesting and not large-scale field projects for rainwater harvesting.
- **Fund utilisation** - The new guidelines propose water conservation fees (WCF) on groundwater use to generate resources for the state governments' water harvesting schemes.
- However, there is no guarantee that these funds will actually be used for this purpose.
- **Usage cap** - Though water charges have been levied, there is no cap on water withdrawals.
- Thus, this step will not suffice to discourage wasteful use by cash-rich consumers.
- **Re-use** - The new rules have virtually done away with the obligation to reuse the extracted water.
- This will result in the rampant overexploitation of this resource, causing a sharp dip in water table in many areas.

5.2 Supreme Court's Order on Eviction of Forest Dwellers - Forest Rights Act

The Supreme Court has ordered the state governments to evict over 10 lakh forest dwelling families whose claims have been rejected under the Forest Rights Act but the order was subsequently stayed.

- **Forest Rights Act** - The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act or FRA was passed by the Parliament in 2006 and came into effect in 2008.
- It was intended to correct the "historical injustice" done to forest dwellers from the colonial times. The traditional rights of such communities were derecognised by the British Raj in the 1850s.
- The Act recognises and vests the forest rights and occupation in forest land in the forest dwelling Scheduled Tribes.
- It also covers other traditional forest dwellers who have been residing in such forests for generations but whose rights could not be recorded.
- The Act recognises -
 - i. individual rights to forest land and livelihood
 - ii. community rights to forest 'land' exercised by their gram sabha
 - iii. community forest 'resource' rights, giving gram sabhas the power to protect and manage their forest
- Conservation plans and developmental projects in these areas would have to be approved by gram sabhas.
- **Concerns** - The implementation of the safeguards offered in the Act has not been that satisfactory.
- There are deep procedural flaws in processing of the claims to forest land, and there is a **high rejection rate**.
- Claims are being rejected without assigning reasons, or based on wrong interpretation of the provisions, or simply for lack of evidence or 'absence of GPS survey'.
- The rejections are not being communicated to the claimants, and their right to appeal is not being explained to them or facilitated for.
- The mere rejection of claims by the state therefore does not mean that their possession of land is a crime of "encroachment".



- **Petition in SC** - The petitions challenging the Forest Right Act were filed by Wildlife First, a non-governmental organisation, and retired forest officials.
- It relates to the challenge on constitutional validity of the FRA and the issue of preservation of forests in the context of it.
- **SC's present order** – SC has specifically directed governments in 21 States by name to carry out evictions.
- The families had filed claims to forest land under the Forest Rights Act, 2006 and on rejection of their claims the court has directed that the eviction be carried out on or before July 24, 2019.
- It ordered the States' Chief Secretaries to also file affidavits, explaining why the rejected claimants on previous court orders were not evicted.
- The court ordered the Forest Survey of India (FSI) to make a satellite survey and place on record the "encroachment positions."
- However, the order was stayed later by SC and gave the state governments 4 months to submit detailed affidavits about procedures followed to assess the claims.
- The directions came after the Union ministry of tribal affairs approached the court pleading for modification and a temporary stay on the implementation of the eviction order.
- The ministry maintained that Forest Rights Act is a welfare legislation and under the Act, the rejection of a claim does not ipso facto lead to the eviction of forest dwellers and tribals.
- The court also sought information on whether the claims were rejected after following due process of law and if state-level committees had monitored the processes, as per the mandate of the Act.

Forest Rights

- **Indian Forest Act, 1927** recognises traditional, customary rights of communities over forests.
- According to State of Forest Report, the share of unclassified forests, which are often inhabited by tribal communities, has come down to 14% from 17% in 2009.
- A severe blow to community forest rights came with the introduction of **Forest Conservation Act, 1980**.
- The act says traditional forest dwellers in areas under the forest department are encroachers.
- In contrast, the **Forest Rights Act, 2006**, tries to democratise Indian Forests, giving rights to communities that have traditionally survived on them.
- Resource (CFR) rights, as mentioned in section 3(1)(i) of the Forest Rights Act, 2006, gives communities ownership over their forests.
- It also empowers gram sabhas to collect, process, store and sell minor forest produce (MFP) such as cane, tussar and honey.
- MFPs account for up to 40% annual income of tribals.
- While CFR title gives communities right over forest management and conservation, community rights under FRA says that the land remains with the forest department and that the community can use it for specific developmental works such as constructing roads, anganwadi building etc.
- The other problem is that forest dwelling communities cannot deal in several commercially viable MFPs such as tendu leaves and bamboo.
- Tendu is a nationalised product in all states except in Maharashtra and Odisha.
- This means only forest development corporations can sell tendu and tribals can at best collect them and give to the corporations.
- Bamboo from forest areas, on the other hand, can only be commercially exploited after a transit permit by the forest department.
- This is in violation of FRA, which says that the power of issuing transit permits rests with the gram sabha.



5.3 Coastal Regulation Zone

Union cabinet has approved amendments to the Coastal Regulation Zone (CRZ) Notification.

- Ministry of Environment and Forests (MoEF) under the Environment Protection Act, 1986, issued the Coastal Regulation Zone notification for regulation of activities in the coastal area.
- The notification aims at enhancing activities in the coastal regions and promoting economic growth while keeping in mind conservation principles of coastal regions.
- As per the notification, the coastal land up to 500m from the High Tide Line (HTL) and a stage of 100m along banks of creeks, estuaries, backwater and rivers subject to tidal fluctuations, is called the Coastal Regulation Zone(CRZ).
- CRZ along the country has been placed in four categories, which are as follows
- **CRZ I - Ecologically Sensitive Areas**.
- They lie between low and high tide line.
- Exploration of natural gas and extraction of salt are permitted
- **CRZ II - Shore Line Areas**
- The areas that have been developed up to or close to the shoreline.
- Unauthorized structures are not allowed to construct in this zone.
- **CRZ III - Undisturbed Area**
- Rural and Urban localities which fall outside I and II.
- Only certain activities related to agriculture even some public facilities are allowed in this zone.
- **CRZ IV - Territorial Area**
- Area covered between Low Tide Line and 12 Nautical Miles seaward.
- Fishing and allied activities are permitted in this zone.
- Solid waste should be let off in this zone.

Recent Changes

- **CRZ-II Urban** - The CRZ-II urban category, as per the CRZ notification of 2011, pertains to areas “that have been developed up to or close to the shoreline”, and are legally designated municipal limits already provided with roads, water supply, sewerage connections and so on.
- Under the new notification, decision has been taken to permit current Floor Space Index (FSI) or Floor Area Ratio (FAR) in urban areas coming under CRZ-II which governs the size of buildings.
- This does away with the restrictions on construction which date back to the Development Control Rules of 1991.
- **CRZ- III Rural** - For rural areas, the newly approved notification adds a sub-category to CRZ-III.
- The new provision, CRZ-III A, applies development restrictions to a much smaller area of 50 meters from the high tide line, compared to the 200 meters that was earmarked as the no development zone (NDZ) earlier for densely populated areas.
- These are defined as places with a population of 2,161 per sq km as per the 2011 Census.
- Areas with a population density below that will continue to have 200 meters as the NDZ (No-Developmental Zone)
- **Changes in Regulatory Framework** - According to the new notification only such projects, which are located in CRZ I & IV will require the necessary clearance from the Ministry of Environment, Forest and Climate Change.
- The powers for clearances with respect to CRZ-II & III have been delegated at the State level.
- The new notification also relaxed the No Development Zone (NDZ) criteria.

- The notification also permits temporary tourism facilities such as toilet blocks, change rooms, drinking water facilities etc. in beaches.
- **Significance** - The notification aims to encourage construction of buildings and launch tourism activities in areas that are closer to the high tide line.
- Government has taken the view that both affordable housing availability and tourism will grow if restrictions on coastal zones are relaxed.
- However, for tourism expansion, the new scheme will allow temporary facilities such as shacks, toilet blocks and changing rooms, maintaining only a slim margin of 10 meters from the high tide line.

5.4 Assessing National Mission for Green India

A recent study looks critically at India's National Mission for a Green India, which highlighted that the goals under the mission assume arbitrary targets.

- The Green India Mission is one of the 8 missions under the *National Action Plan on Climate Change*.
- The mission aims at protecting, restoring and enhancing India's diminishing forest cover.
- It is intended at responding to climate change by a combination of adaptation and mitigation measures.
- It seeks to put a third of the country under forest cover by increasing forest and tree cover to the extent of 5 million hectares (mha).
- Besides, there are efforts at improving quality of forest/tree cover on another 5 mha of forest/non-forest lands.
- The mission is also planned with improving forest-based livelihoods.

5.5 NAPCC

National Action Plan on Climate Change (NAPCC) was published in 2008 by the then-Prime Minister's Council on Climate Change (Government of India).

The eight missions under the National Action Plan on Climate Change (NAPCC) are as follows:

- Green India Mission – Ministry of Environment, Forest and Climate Change
- National Water Mission – Ministry of Water Resources
- National Solar Mission – Ministry of New and Renewable Energy
- National Mission on Enhanced Energy Efficiency – Ministry of Power
- National Mission for Sustainable Agriculture – Ministry of Agriculture
- National Mission on Sustainable Habitat – Ministry of Housing and Urban affairs
- National Mission for Sustaining Himalayan Ecosystem – Ministry of Science and Technology
- National Mission on Strategic Knowledge for Climate Changes – Ministry of Science and Technology

Tree cover and Forest Cover

- The Ministry of Environment, Forest & Climate Change defines 'forest cover' in India as "all lands, more than one hectare in area with a tree canopy density of more than 10%"
- Similarly, 'tree cover' is defined as "tree patches outside recorded forest areas exclusive of forest cover and less than the minimum mappable area of 1 hectare".
- There is a third measure known as Tree outside forest (TOF).
- The 'India State of Forest Report 2017' defines TOF as "trees existing outside the recorded forest area in the form of block, linear & scattered size of patches".
- Since tree cover measures only non-forest patches that are less than 1 hectare, it is only a part of TOF.



5.6 Pradhan Mantri JI-VAN yojana

- The Cabinet Committee on Economic Affairs has approved the "Pradhan Mantri JI-VAN (JaivIndhan-VatavaranAnukoolfasalawasheshNivaran) Yojana"
- It is for providing financial support to Integrated Bio-ethanol Projects using lignocellulosic biomass and other renewable feedstock.
- It focuses to incentivize 2G Ethanol sector and support it by creating a suitable ecosystem for setting up commercial projects and increasing Research & Development in this area.
- The ethanol produced by the scheme beneficiaries will be mandatorily supplied to Oil Marketing Companies (OMCs).
- This is to further enhance the blending percentage under the ethanol blending program.
- Centre for High Technology (CHT), a technical body under the aegis of Ministry of Petroleum & Natural Gas, will be the implementation Agency for the scheme.

5.7 Scheme to Support Promotion of Biomass Based Cogeneration

- Scheme to Support Promotion of Biomass Based Cogeneration in Sugar Mills and Other Industries in the Country is under the Ministry of New and Renewable Energy.
- The programme provides financial support to companies in order to support the promotion of biomass-based cogeneration projects
- It will provide a Central Financial Assistance (CFA) for projects utilizing biomass like bagasse, agro-based industrial residue, crop residues, wood produced through energy plantations, weeds, wood waste produced in industrial operations, etc.
- Municipal Solid Waste is not covered under the programme.
- CFA will be provided at the rate of Rs.25 Lakh/MW (for bagasse cogeneration projects) and Rs.50 Lakh/MW (Nonbagasse Cogeneration projects) under the scheme.
- The CFA will be back-ended and will be released in one instalment after successful commissioning and commencement of commercial generation and performance testing of the plant.
- The CFA will be released to the term loan account to reduce the loan component of the promoter.
- It provides CFA for both small and large projects but will be provided only for projects which will be installing new boiler and turbines.
- Biomass based cogeneration projects which intend to add capacity to the existing plants will also be considered for grant of CFA. CFA for such projects will be considered only for enhanced capacity.
- CFA will be calculated on surplus exportable power as mentioned in Power Purchase Agreement (PPA).
- **Eligibility** - Registered Companies, Partnership Firms, Proprietorship Firms, Cooperatives, Public Sector Companies, Government owned Firms are eligible for financial support available under the scheme.
- To avail financial support the applicant must have availed term loan from any financial institution like Public Sector Banks, NBFC, Private Sector Banks, Central or State Cooperative Banks etc.
- CFA (Central Financial assistance) will not be provided under the scheme to the firms which have not availed term loan.

5.8 New Delhi Declaration on Asian Rhinos 2019

- There are 3 species of Asian Rhinos – Greater One-horned Rhino, Javan Rhino and Sumatran Rhino. All the subspecies have been pushed to the brink of extinction.
- The Asian Rhinos are found in 5 countries – India, Nepal, Bhutan, Indonesia and Malaysia.
- These 5 range countries signed a declaration ‘The New Delhi Declaration on Asian Rhinos 2019’ for the conservation and protection of the species at the recently held Second Asian Rhino Range Countries meeting.
- The declaration was signed to review the population of Asian Rhinos every four years to reassess the need for joint actions to secure their future.
- It also focused on strengthening of transboundary collaboration among India, Nepal and Bhutan for the conservation of Greater one-horned rhino.
- The Asian Rhino Range Countries meeting was organized by Union Environment Ministry in collaboration with IUCN Asian Rhino Specialist Group, WWF- India and Aaranyak, an NGO.
- In the first meeting hosted by Indonesia in 2013, Bandar Lampung Declaration was adopted
- A common action plan was agreed with the aim of increasing the populations of Asian Rhino species by at least 3% annually by 2020.

Species	IUCN Status
Greater One-horned Rhino	Vulnerable
Javan Rhino	Critically Endangered
Sumatran Rhino	Critically Endangered

5.9 Asiatic Lion Conservation Project

- Ministry of Environment has recently launched Asiatic Lion Conservation Project.
- It aims to protect and conserve the world’s last ranging free population of Asiatic Lion and its associated ecosystem.
- Habitat improvement, scientific interventions, disease control and veterinary care supplemented with adequate eco development will be carried out under the project.
- The project will be funded from the Centrally Sponsored Scheme - Development of Wildlife Habitat (CSS-DWH) with 60:40 share ratio of Central and State government.
- Asiatic Lion that once ranged from Persia (Iran) to Palamau in Eastern India were almost driven to extinction by hunting and habitat loss.
- According to 2015 census, it is found in Gir Protected Area Network that includes Gir National Park, Gir Sanctuary, Pania Sanctuary, Mitiyala Sanctuary adjoining reserved forests, protected forests.
- It is included in 21 critically endangered species for recovery programme and financial assistance under the species recovery component of CSS-DWH.

5.10 Flamingo Count

- It is the counting of flamingos that will be taken up across the country for the first time.
- It is undertaken by Bombay Natural History Society (BNHS) in collaboration with NGOs and local birdwatchers across the country.
- In India there are two species of flamingos – Greater Flamingo - *Phoenicopterus rosues* and Lesser Flamingo - *Phoeniconaias minor*.
- The taller of the two species is the greater flamingo. Lesser flamingos are more pink in colour and their legs are sorter.
- Greater flamingos have light pink beaks with a dark tip which are widespread in India
- It will migrate to South India during winter and spend their time in large reservoirs and mud flats.

Flamingo sanctuary

- During the colder times of the year, many of the Great Flamingos in Asia migrate to warmer climates.

- Great Flamingos migrate to India between the months of December to February, important flamingo migration hotspots in India are as follows

 1. **Maharashtra** - Sewri Mudflats, Thane Creek, Bhigwan.
 2. **Gujarat** - Flamingo City, Thol Lake, Khijadiya Bird Sanctuary, Nal Sarovar Bird Sanctuary.
 3. **Rajasthan** - Jawai Dam, Bharatpur Bird Sanctuary.
 4. **Odisha** - Chilika lake
 5. **Telangana** - Osman sagar lake
 6. **Andhra Pradesh** - Pulicat Lake

- Maharashtra state forest department has declared Western side of Thane creek as Flamingo sanctuary in 2012.
- The sanctuary aims to protect the flamingos and several other birds that are threatened by pollution and habitat destruction in the north-eastern Mumbai area.
- The sanctuary is a part of Sanjay Gandhi National Park, which has spread over three districts – Palgar, Thane and Mumbai Suburb.
- Greater Flamingoes has been recently spotted on the Coast of Hope Island, a part of the Coringa Wildlife Sanctuary in Andhra Pradesh.
- The greater flamingoes are the filter feeders and get their characteristic pink colour from their diet of brine shrimps and algae available in the coastal wetlands.

5.11 Asian Waterbird Census

- The Asian Waterbird Census (AWC) is part of the global International Waterbird Census (IWC).
- It is jointly coordinated by the Bombay Natural History Society and Wetlands International
- This citizen-science programme is supporting conservation and management of wetlands and waterbirds worldwide.
- The result of the census and information are used to promote national waterbird and wetland conservation and international cooperation along the Central Asian Flyway and East Asian – Australasian Flyway.
- A flyway is a geographical region within which a single or a group of migratory species completes its annual cycle – breeding, moulting, staging and non-breeding.
- CAF is one of the 9 flyways in the world.
- CAF covers northernmost breeding ground in Siberia to the southernmost non-breeding grounds in west and south Asia, the Maldives and the British Indian Ocean Territory.



5.12 Green Ganga App

- The application was launched recently by the Ministry of Water Resources during India Water Impact Summit, 2018.
- It was developed by Remote Sensing Centre of ISRO.
- It is used for geo-tagging of saplings and delineation of plantation boundaries under ongoing afforestation activities of NamamiGange programme.
- **India Water Impact Summit, 2018** was organized by the National Mission for Clean Ganga (NMCG) and the Centre for Ganga River Basin Management and Studies (cGanga).
- It is an annual event where stakeholders get together to discuss, debate and develop model solutions for some of the biggest water related problems in the country.
- **National Mission for Clean Ganga (NMCG)** was registered as a society in 2011 under the Societies Registration Act 1860.

- It acted as implementation arm of National Ganga River Basin Authority(NGRBA) which was constituted under the provisions of the Environment (Protection) Act (EPA),1986.
- **CGanga** is the new think-tank formed under the aegis of NMCG (National Mission for Clean Ganga).
- Its stated objective is to make India a world leader in river and water science.
- It is responsible for introducing new technologies, innovations and solutions into India.
- The Centre is headquartered at IIT Kanpur and represents leading science and technological institutes of the country.

NamamiGange Programme

- It is a flagship programme to accomplish the twin objectives of effective abatement of pollution, conservation and rejuvenation of National River Ganga.
- The 8 Main Pillars of the programme are,
 - i. Sewerage Treatment Infrastructure
 - ii. River-Front Development
 - iii. River-Surface Cleaning
 - iv. Bio-Diversity
 - v. Afforestation
 - vi. Public Awareness
 - vii. Industrial Effluent Monitoring
 - viii. Ganga Gram

Energy Conservation Building Code (ECBC)

- It was developed by Ministry of Power and BEE in 2017.
- The code sets parameters for builders, designers and architects to integrate renewable energy sources in building design with the inclusion of passive design strategies.
- It promotes low-carbon growth and lead to 30-50% energy savings by commercial buildings by 2030.
- In order for a building to be considered ECBC-compliant, it will need to demonstrate minimum energy savings of 25 per cent.
- Additional improvements will enable new buildings to achieve higher grades like ECBC+ or Super ECBC, leading to further energy savings of 35 per cent and 50 per cent respectively

5.13 ECO Niwas Samhita 2018

- Ministry of Power has recently launched the ECO Niwas Samhita 2018 which is an Energy Conservation Building Code for Residential Buildings (ECBC-R).
- ECBC for **commercial buildings** is already in place since 2017.
- ECBC-R aims to benefit the occupants and the environment by promoting energy efficiency in design and construction of homes, apartments and townships.
- It will assist architects and builders who are involved in design and construction of new residential complexes.
- Implementation of this code will have potential for energy savings to the tune of 125 Billion units of electricity per year by 2030, which is equivalent to about 100 million ton of Co2 emission.

5.14 First District Cooling System

- A UAE-based international cooling provider has entered into agreement with Andhra Pradesh government to set up India's first District Cooling system in its new capital Amravati.
- It is for a contracted cooling capacity of 20,000 refrigeration tonnes and it will be the UAE's company's first plant outside its Gulf Cooperation Council (GCC).
- It will meet cooling requirements for the State's Assembly, High Court, Secretariat and other government buildings.
- It support Amaravati to assess not in-kind cooling technologies to increase the environmental benefits of the project even further, including renewables, trigeneration and alternative refrigerants.
- Compared to other cooling systems, district cooling uses only 50% of primary energy consumption for cooling urban building thereby reducing carbon emissions.
- It also helps in improving the air quality and reducing general noise levels when compared to other traditional air conditioning systems.

5.15 Y S Malik Panel

- The government is set to tighten fuel efficiency norms for vehicles to push automobile manufacturers to shift to electric vehicles.
- In accordance with that, a panel, headed by Y S Malik, has presented a 15 point plan of action to aid car manufacturers to switch from Internal Combustion Engines (IECs) to Electric Vehicles (EVs).
- The report has been forwarded to the NITI Aayog and is still under deliberation.
- The report argued for tighter norms to have approximate induction of 3 to 5% EVs, as against total manufactured vehicles.
- The transport ministry has mandated fuel efficiency norms that require cars to be 30% more fuel efficient by 2022.

5.16 International Conference on Sustainable Water Management

- The first International conference on sustainable water management was recently organized in India.
- It was organized under the aegis of national hydrology project, Union Ministry of Water Resources, River Development and Ganga Rejuvenation.
- National hydrology project is a central sector scheme, helps in gathering hydro-meteorological data which will be stored and analysed on a real time basis.

5.17 Task Force to protect Wildlife

- India, Nepal and Bhutan are considering having a joint taskforce to protect wildlife across the Kanchenjunga Landscape, a trans-boundary region spread across Nepal, India and Bhutan.
- It will allow free movement of wildlife across political boundaries and checking smuggling of wildlife across the landscape.
- The landscape stretches along the southern side of Mount Kanchenjunga covers Nepal (21%), Bhutan (23%) and India (56%).

5.18 Integrated Development of Wildlife Habitats

- The Cabinet Committee on Economic Affairs has recently approved continuation of the IDWH beyond the 12th Plan period from 2017-18 to 2019-20.
- It is a centrally sponsored umbrella scheme consists of **Project Tiger, Development of Wildlife Habitats and Project Elephant**.
- The schemes would result in overall strengthening/ consolidation of tiger, elephant and wildlife conservation in the country.
- Besides, it would also address the Man-Animal conflict effectively and benefit the communities relocating from core protected areas.
- The implementation of the schemes would be done through the respective States in designated Tiger Reserves, Protected Areas and Elephant Reserves.

5.19 SALSA Project

- Subglacial Antarctic Lakes Scientific Access (SALSA) project is an integrative study of subglacial geobiology, water column and sedimentary organic carbon, and geological processes in West Antarctica.
- The project has 11 principal investigators from eight different institutions across the USA.
- It carries out research in Mercer Subglacial Lake, a hydrologically active subglacial lake beneath the Whillans and Mercer ice streams in West Antarctica.
- A subglacial lake is a body of liquid water located in between an ice sheet and the continental land mass. The water remains liquid because the ice sheet above the water acts as an insulator and traps geothermal heat from the Earth's crust.



- Many of the lakes are interconnected with water flowing from one lake to another other via streams and wetlands.
- Subglacial lakes are permanently cold and dark environments that could help to understand the evolution of life in these extreme environments on earth and other celestial bodies.
- Some lakes like Lake Vostok under the East Antarctic Ice Sheet retain water on the order of the 10,000 years, while others like Mercer Subglacial Lake only retain water on a decadal scale.
- The water present in Lake Mercer is thought to flow directly to the Ross Sea.

5.20 Vulture and Raptor Survey

- The first-ever vulture and raptor survey were held in the Wayanad Wildlife Sanctuary.
- It recorded 24 species of raptors and four species of vultures.
- It was organized by the Forest and Wildlife Department, and the South and North Wayanad Forest Divisions.
- A raptor is a bird that hunts and kills other animals for food. e.g Eagles, Falcons, Hawks etc
- They come under Schedule I of the Wildlife (Protection) Act, 1972 and have apex predator status in an ecosystem.
- Indian vulture, White-rumped vulture, Red headed vultures were also spotted.

5.21 ZSI Amphibian List

- An updated list of Indian amphibians was released by Zoological Survey of India (ZSI) recently.
- The current list bears the names of 432 amphibian species from India along with their IUCN status.
- In the list 19 species are being treated as critically endangered and 33 species as endangered.
- ZSI was established in 1916 to promote survey, exploration and research leading to the advancement in our knowledge of various aspects of exceptionally rich life.
- It has its genesis in the establishment of the Zoological Section of the Indian Museum at Calcutta in 1875.

5.22 River Information System

- River Information System is a combination of modern tracking equipment related hardware and software designed to optimize traffic and transport processes in inland navigation.
- RIS is being implemented under the overall responsibility of Inland Waterway Authority of India, a statutory body administered by the Ministry of Shipping.
- The system enhances swift electronic data transfer between mobile vessels and shore (Base stations) through advance and real-time exchange of information.

5.23 Minor Forest Produce

- Indian Forest Act 1927 defines "forest-produce" which connotes to those products whether found in, or brought from a forest.
- Minor Forest Produce (MFP) is a subset of forest produce.
- It got a definition in 2007 when the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, was enacted.
- It is defined as all non-timber forest produce of plant origin.
- It includes bamboo, brushwood, stumps, canes, Tusser, cocoon, honey, waxes, Lac, tendu/kendu leaves, medicinal plants and herbs, roots, tuber and the like.
- 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 sale.

5.24 Uttarakhand Disaster Recovery Project

- India signed a loan agreement with the World Bank for 96 Million US dollars for additional financing of Uttarakhand Disaster Recovery Project.
- The world bank, through the Uttarakhand Disaster Recovery project has been supporting the state government since 2014.
- The project helps to restore housing and rural connectivity, and to build resilience of communities.
- The funding will help in further reconstruction of bridges, road and river banks protection works.
- It will also help to increase the technical capacity of the state entities to respond promptly.

5.25 Ganga Praharis

- Ganga Praharis will boost Bio-Diversity conservation in order to educate, motivate and ensure protection of aquatic species of river Ganga.
- A new grassroot-level volunteer workforce is out there to protect the bio-diversity of river Ganga called Ganga Praharis.
- They are spread over Ganga basin states of Uttarakhand, Uttar Pradesh, Jharkhand, Bihar and West Bengal.
- They were roped-in by Wildlife Institute of India (WII), Dehradun as part of the “Biodiversity Conservation and Ganga Rejuvenation” project.
- The project is sponsored by National Mission for Clean Ganga (NMCG) under the aegis of the NamamiGange program.
- The Ganga Praharis will be the role models in inspiring other members of the community to join hands in the efforts for conservation of the biodiversity of river Ganga.
- Each Prahari shall work on the model of ‘Each One Make Ten’.
- The Ganga Praharis of the five main stem Ganga basin states will be linked through mobile applications such as Bhuvan Ganga app, my gov app and Swachhta app thereby creating a broad network among them.

5.26 Protecting the Biodiversity zones

- Goa State Biodiversity Board (GSBB) recently introduced a tagging system to ensure communities residing within the biodiversity zone get Access Benefit Share (ABS) from their profits.
- The tag will show the ingredients used are sourced from the nature.
- The sellers are supposed to pay 0.01 % of their annual profit to the GSBB.
- GSBB will then use this amount to protect the habitat from where the ingredients are procured.
- This initiative is also expected to boost the products’ sale.
- However very few industries has joined the scheme.

5.27 India Cooling Action Plan

- It was launched by the Ministry of Environment, Forest and Climate Change.
- The thrust of the Plan (ICAP) is to look for synergies in actions for securing both environmental and socio-economic benefits.
- It provides a 20-year perspective, with projections for cooling needs in 2037-38.
- Its goal is to provide sustainable cooling and thermal comfort for all while securing environmental and socio-economic benefits for the society.
- It seeks to
 - (i) reduce cooling demand across sectors by 20% to 25% by 2037-38,
 - (ii) reduce refrigerant demand by 25% to 30% by 2037-38
 - (iii) reduce cooling energy requirements by 25% to 40% by 2037-38,

(iv) recognize “cooling and related areas” as a thrust area of research under national S&T Program

(v) training and certification of 100,000 servicing sector technicians by 2022-23, synergizing with Skill India Mission

- Cooling is linked to human health and productivity.
- Linkages of cooling with Sustainable Development Goals (SDGs) are well acknowledged.

5.28 Flood Management and Border Areas Program

- The Union Cabinet has approved the Flood Management and Border Areas Program (FMBAP) recently.
- It will be implemented throughout the country for effective flood management, erosion control and anti-sea erosion.
- The catchment area treatment works will help in reduction of sediment load into rivers.
- It is framed by merging the components of two continuing XII Plan schemes titled "Flood Management Program (FMP)" and "River Management Activities and Works related to Border Areas (RMBA)"

5.29 The Draft River Basin Management Bill, 2018

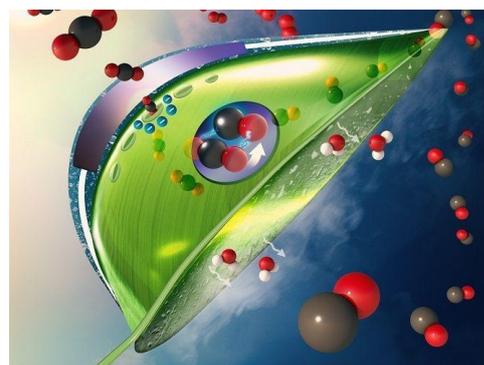
- The Draft River Basin Management Bill by the Ministry of Water Resources, proposes optimum development of inter-State rivers by facilitating inter-State coordination ensuring scientific planning of land and water resources.
- It aims to ensure comprehensive and balanced development of both catchment and command areas by taking basin/sub-basin as unit with unified perspectives of water in all its forms (including soil moisture, ground and surface water).
- The draft Bill has proposed to establish 13 River Basin Authorities for various river basins of the country which would result in optimum integrated development and management of inter-State River waters.

5.30 Vaccine to Protect Bees

- Scientists have recently developed world's first vaccine to protect bees against disease.
- It aims to tackle the drastic decline in insect numbers which could cause a global food crisis.
- The vaccine works by giving bees resistance to fight off severe microbial diseases that can be fatal for pollinator communities.
- UN-led research in 2016 found that more than 40 percent of invertebrate pollinators, particularly bees and butterflies, are facing extinction.
- Bees are vital for growing the world's food as they help fertilise crops around the globe, by transferring pollen from male to female flowers.
- Diseases are believed to be just one of a number of reasons for the loss of pollinators, alongside pesticides and intensive farming, which reduces the diversity of insects' nutrition.

5.31 Artificial Leaves

- Recently researchers have built artificial leaves which mimic the process that occurs in real plants, turning CO₂ into breathable oxygen through photosynthesis.
- The artificial leaf converts the carbon dioxide into carbon monoxide and oxygen.
- Artificial leaf under sunlight when placed inside a water-filled capsule with a semi-permeable membrane, the water evaporates through the membrane.
- This process slowly sucks in carbon dioxide through the membrane, where the device can get to work.





- From here, the oxygen can be released into the air or collected, while the harmful gas can be pulled from the device and used to create synthetic fuels like methanol.
- The artificial leaf unit is able to function in the outside environment like a natural leaf which is 10 times more efficient than even natural leaves.

Palau

- Palau is located in the western part of the Pacific ocean.
- It is made up of one large volcanic island and several smaller coral reef associated islands.
- In 2015, it designated almost its entire ocean territory as a marine protected zone. Palau became the second nation in the world after Fiji to ratify the Paris climate agreement in 2016.
- Several regions have already imposed bans, including the island of Bonaire in the Caribbean and the US state of Hawaii which passed a law earlier this year. Mexico has banned sunscreen in nature reserves

5.32 Palau to ban Sunscreen Products

- Palau is set to become the first country to impose a widespread ban on sunscreen in an effort to protect its vulnerable coral reefs.
- The ban comes into force in 2020.
- Scientists have been raising concerns about the impacts of sunscreen products on marine life for many years.
- Scientists are particularly worried over the role of two ingredients called oxybenzone and octinoxate which are used as sun protection factors as they absorb ultraviolet light.
- They are believed to make coral more susceptible to bleaching.
- Oxybenzone causes corals to bleach at lower temperatures, and it reduces their resilience to climate change.

6. PROTECTED AREAS

6.1 Sunderbans

- India has designated Sundarban Wetland as a Wetland of International Importance.
- It is the 27th Ramsar site from India.
- The Site is located within the largest mangrove forest in the world, the Sunderbans, that encompasses hundreds of islands and a maze of rivers, rivulets and creeks, in the delta of the Rivers Ganges and Brahmaputra on the Bay of Bengal in India and Bangladesh.
- Sundarban, the largest delta in the world, consists of 10,200 sq km of Mangrove Forest, spread over India (4200 sq km of Reserved Forest) and Bangladesh (6000 sq km approx of Reserved Forest).
- Another 5400 sq km of non-forest, inhabited region in India , along the north and north-western fringe of mangrove forest, is also known as Sundarban region in India .
- Hence, the total area of Sundarban region in India is 9600 sq km which constitutes the Sundarban Biosphere Reserve.
- Indian Sundarban is bound on the west by river Muriganga and on the east by rivers Harinbhaha and Raimangal.
- River Matla divides Sundarban Reserved Forest into Sundarban Tiger Reserve (on the east) and Reserved Forest of South 24 Parganas Forest Division.
- The Indian Sundarban, covering the south-westernmost part of the delta, constitutes over 60% of the country's total mangrove forest area and includes 90% of Indian mangrove species.
- The Site is also home to critically endangered northern river terrapin, the endangered Irrawaddy dolphin, and the vulnerable fishing cat.
- The Sundarban Tiger Reserve is situated within the Site and part of it has been declared a "critical tiger habitat" under national law and also a "Tiger Conservation Landscape" of global importance.

6.2 Ramsar Convention



- The convention was adopted in the year 1971 that provides the framework for the conservation and wise use of wetlands and their resources.
- This intergovernmental treaty came into force in 1975.
- It has been ratified by most of the world's nations, including the U.S., China and India.
- It has designated more than 2,300 sites of international importance.
- The convention has issued its first-ever global report on the state of World's wetlands.
- The report is titled as "Global Wetland Outlook".
- The report found that around 35% of wetlands were lost between 1970 and 2015.
- Wetlands include lakes, rivers, marshes and peatlands, as well as coastal and marine areas like lagoons, mangroves and coral reefs.
- In India, The Ministry of Environment, Forest and Climate Change is the nodal Ministry for wetlands conservation.
- Wetlands in India account for 4.7% of the total geographical area.

6.3 Vaduvor Bird Sanctuary

- Vaduvor Bird sanctuary is situated in Thanjavur, Tamil Nadu.
- Vaduvor lake is home to thousands of avian visitors every year from different continents.
- The lake is surrounded by fertile wetlands and offers a perfect spot for the birds for food, shelter and reproduction.
- It is a ideal spot when the temperture drops in their home countries in Europe, the Americas and sometimes Russia.
- The entire sanctuary is declared a protected area and the lake is periodically desilted.
- Ruff, spot billed duck, pin tailed duck, cotton teal and black headed ibis are the common visitors.

6.4 Satkosia Tiger Reserve

- It is being planned to use trained elephants to help ground-level forest guards to patrol deep in the forest of Satkosia Tiger Reserve.
- Satkosia spreads along the gorge over the river **Mahanadi** in Odisha.
- The area is also a part of the Mahanadi elephant reserve.
- Satkosia is the meeting point of two bio-geographic regions of India; the Deccan Peninsula and the Eastern Ghats, contributing immense biodiversity.
- The Reserve comprises of two adjoining Sanctuaries of central Odisha named as Satkosia Gorge Sanctuary and Baisipalli Sanctuary.

6.5 Pong Dam Wetlands

- The State Forest Department is organizing the annual census of waterfowl species at Pong wetlands of Kangra Valley, Himachel Pradesh.
- Water fowls are the birds that depend on water bodies for roosting and feeding.
- Pong is a man-made wetland formed by the construction of Pong Dam during 1974 across the Beas River.
- The reservoir is also known Maha Rana Pratap Sagar.
- It was declared a Ramsar Site in the year 2002.
- It is the only place in the country after the Bharatpur sanctuary in Rajasthan where the red-necked grebe descends every year.

- Other visitors include White Fronted Goose, Whooper Swan, Indian Skimmer, White rumped Vultures, Black bellied Tern.

6.6 Kawal Tiger Reserve

- Kawal tiger reserve is situated in Northern part of the Telegana state.
- The wildlife sanctuary in Kawal is the catchment area of river Godavari and Kadam.
- The indicator species of the sanctuary are Tiger and Nilgai.
- The reserve forms the southern end of the central Indian Tiger Reserve Landscape.
- It is also linked to the Tadoba Andhari Tiger Reserve in Maharashtra to its north and Indravathi Tiger reserve to its east
- The forest area found here is the southern tropical mixed dry deciduous forest and dry teak forest.

6.7 Phen Wildlife Sanctuary

- It is a popular buffer zone of Kanha national park, Madhya Pradesh.
- It lies in Southern region of Kanha tiger reserve, close to Madhya Pradesh and Chhattisgarh state borders.
- It was declared as a wildlife sanctuary in year 1983 by Government of Madhya Pradesh.
- The Fauna at this sanctuary mainly consists of the Tiger, Leopard, Wild boar, Cheetal, Sambar etc



6.8 World Wetlands Day 2019

- World Wetlands Day is celebrated every year on 2 February.
- This day marks the date of the adoption of the Convention on Wetlands on 2 February 1971, in the Iranian city of Ramsar on the shores of the Caspian Sea.
- The theme for 2019 is 'Wetlands and Climate Change'.
- India currently has 27 sites designated as Wetlands of International Importance (Ramsar Sites).
- India has designated Sundarban Wetland as a Wetland of International Importance.
- The latest added Sunderban is located within the largest mangrove forest in the world.
- The Sundarbans encompasses hundreds of islands and a maze of rivers, rivulets and creeks, in the delta of the Rivers Ganges and Brahmaputra on the Bay of Bengal in India and Bangladesh.

6.9 Shark Bay

- Shark bay is the world heritage-listed marine ecosystem situated in Australia.
- Since 2011 it has been devastated by extreme temperatures, when a brutal marine heatwave struck off western Australia.
- According to world heritage advisory committee shark bay is classified as the highest category of vulnerability to future climate change.
- Shark bay hosts the world's most extensive population of stromatolites – stump-shaped colonies of microbes that date back billions of years.

6.10 Centre for Wildlife Rehabilitation and Conservation

- It was established in 2002 with a primary aim to stabilize displaced animals and release them back into the wild.

- It is situated in Kaziranga National Park, Assam.
- It was founded by the Assam Forest Department and Wildlife Trust of India (WTI) with support from WTI's partner, the International Fund for Animal Welfare (IFAW).
- It is recognised by the Centre Zoo Authority (CZA).
- It is a systematic and scientific initiative to deal with wild animals in distress where immediate human intervention is required for their survival.
- The CWRC has five different types of animal enclosures for primates, carnivores, ungulates, birds and turtles & tortoises.

6.11 World Wildlife day

- The day of signature of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is celebrated as UN World Wildlife Day.
- It aims to celebrate and raise awareness of the world's wild animals and plants.
- The theme for 2019 is "Life below water: for people and planet".
- The theme aligns with goal 14 of UN Sustainable Development Goals.
- This is the first World Wildlife Day to focus on life below water.
- The oceans have an estimated market value of \$3 trillion, which makes up nearly 5% of world's gross domestic product.
- Nearly 40% of global livelihoods depend on the oceans for sustenance and craftwork as well as for their cultural and spiritual value.

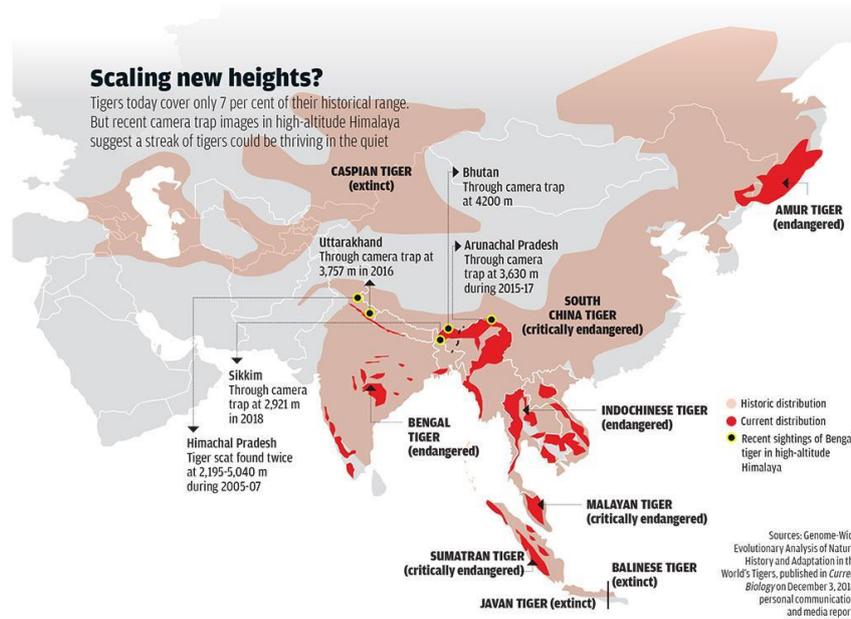
6.12 Kole wetlands

- It is spread over 13,632 hectares in Thrissur and Malappuram districts of Kerala.
- It is a Ramsar site and IBA (Important Bird and Biodiversity Area)
- The Kole fields account for more than 40% of the rice production in the State.
- It is situated in the Central Asian Flyway of migratory birds.
- The area contains subterranean habitats that are important habitats for some fresh water fish species which are endemic to southern Western Ghats.
- Mining & quarrying of sand and clay mining, granite quarry and Fishing & harvesting aquatic resources are some of the threats to the Kole wetlands.

7. BIO-DIVERSITY

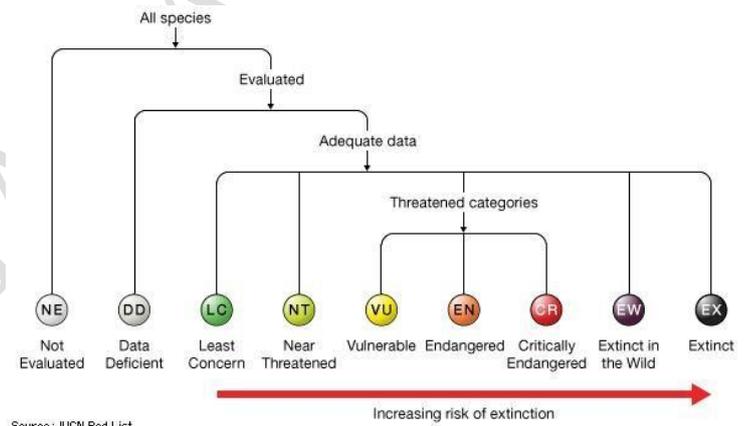
7.1 Royal Bengal Tiger

- A Royal Bengal Tiger was recently recorded in the high-altitude Himalayan State of Sikkim after 100 years of its first recorded occurrence.
- It was captured in **Pangolakha Wildlife Sanctuary** at an altitude of 2,921 m in Sikkim.
- This is not the first evidence of a tiger in high altitude Himalayan regions of the country.
- In December 2012, tiger cubs were found by the Idu Mishmi tribe in the Dibang valley of Arunachal Pradesh.
- The presence of tigers in the hilly areas of the Northeast was known even in 2006 when the first all-India tiger estimation was carried out. But the population was presumed to be low.
- In 2010, Northeast was included in the census exercise but Sikkim and areas above 2,000 m were excluded. Finally, these areas have found a place in the 2018 tiger census.



7.2 IUCN Red list

- International Union for Conservation of Nature (IUCN) is an international organization (NGO) based in Switzerland.
- IUCN is working in the field of nature conservation and sustainable use of natural resources.
- The organization is best known for compiling and publishing the IUCN Red List, which assesses the conservation status of species worldwide.
- The IUCN Red List of Threatened Species, founded in 1964, is the world's most comprehensive inventory of the global conservation status of biological species.
- When discussing the IUCN Red List, the official term "threatened" is a grouping of three categories: Critically Endangered, Endangered, and Vulnerable.



7.3 Great Indian Bustard

- The great Indian bustard (or simply Indian bustard), a large, white-and-brown bird with wing markings, is native to India and Pakistan.
- India effectively the only home of the bustards, now harbours less than 150 individuals in five States.
- It is listed in Schedule I of India's Wildlife Protection Act.
- It has almost lost its 90% of its original habitat.
- Hunting was one of the first factors that caused the decline of its population.
- Recently, several threats are including power lines are decimating its populations.
- The arid grassland that bustards thrive in are being made productive by increasing water availability and expansion of agricultural lands.
- More recently, their grassland homes are now sites of renewable power projects (wind turbines).
- Poor frontal vision and heavy bodies of bustards cannot manoeuvre away from cables in time.

Click [here](#) to know about sanctuaries that conserve Indian Bustard.

7.4 Olive Ridley Site

- A new olive ridley mass nesting site is going to be added in Odisha's wildlife map.
- Odisha forest department has started preparing the beach at the Bahuda river mouth in Ganjam district for mass nesting of olive ridley.
- The Bahuda rookery is located 20km to the south of Rushikulya rookery coast, a major mass nesting site of olive ridleys.
- **Kashmiri Stag**
- The Hangul Deer or Kashmiri Stag is the state animal of Jammu & Kashmir.
- It is the only sub-species of European red deer in India.
- The animal was classified as 'critically endangered' by the International Union for Conservation of Nature (IUCN).
- Dachigam National Park in Srinagar is considered to be the last undisturbed home of the Kashmiri stag.
- Similar in appearance to the European red deer, the Kashmir stag has a tiny white rump patch and a short dark tail.



7.5 Ganges River Dolphin

- Rise in Salinity in the water systems in the Indian Sundarbans has resulted in the decrease of population of the Gangetic River Dolphin.
- Gangetic River Dolphin is the National Aquatic Animal.
- It inhabits the Ganges-Brahmaputra-Meghna and Karnaphuli-Sangu river systems of Nepal, India, and Bangladesh.
- It is classified as "Endangered" by the IUCN Red list.
- It is listed on Appendix I of the CITES.

7.6 Himalayan Griffon Vultures

- Himalayan Griffon Vultures is the largest of the genus Gyps.
- It has been listed as "Near Threatened" under IUCN Red list of threatened species and under Appendix II in [CITES](#).
- Its habitat is mainly Terrestrial such as Rocky areas (eg. inland cliffs, mountain peaks) and Grassland.
- It is distributed from western China, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Afghanistan and Pakistan, east through the Himalayan mountain range in India, Nepal and Bhutan, to central China and Mongolia.



- It has become an almost annual, but rare, winter visitor to Thailand, Myanmar, Bangladesh, Cambodia and Thai-Malay Peninsula.
- The species population appears to be stable in Dehradun District, Uttarakhand.
- The current population trend is stable, but it is suspected that it may undergo population decline over the next 3 generations.
- It is mainly because of the impacts of diclofenac use in livestock.
- The species was recently sighted at the famous vulture habitat Penchikalpet forest range in Telangana.
- The significance of the sighting, the experts opined that Pala Rapu can become a winter migration destination for the birds from the north.

7.7 Rat Kangaroo

- Northern bettongs, sometimes referred to as rat-kangaroos, are truffle-eating Australian marsupials.
- The World Wildlife Fund recently reported that they have suffered a dramatic population decline and could become extinct without urgent action.
- Their numbers are down by 70% in the past 30 years.
- They are at risk from feral cats, land-clearing and wildfires, which have become more frequent and fierce in Queensland due to climate change.

7.8 Cinereous Vulture

- It is one of the heaviest and largest raptors in the world.
- It is listed as Near Threatened in IUCN Red list and in Appendix II of CITES.
- Its geographical range expands from European countries (such as Portugal, Spain, Croatia, Serbia etc), Middle East countries (Turkey, Lebanon, Saudi Arabia etc), Central Asia (Russia, Azerbaijan, Georgia, Kazakhstan, Tajikistan, Iran etc) to Asia (India, Afghanistan, Myanmar, Korea, Vietnam).
- It suffers an ongoing decline of population in its Asiatic strongholds, despite the fact that in parts of Europe numbers are now increasing.
- It generally occupies forest, shrubland and grassland.
- During the winter, it migrates from the mountainous regions of Europe and Asia to warmer places, including India.
- The species was recently spotted in the state of Jharkhand for the first time in the region.

7.9 Mugger Crocodile

- The Gujarat Forest Department has started evacuating mugger crocodile from two ponds on the Sardar Sarovar Dam premises on the Narmada.
- This evacuation is to facilitate a seaplane service at the Statue of Unity.
- The mugger/marsh crocodile is a species native to freshwater habitats from southern Iran and Pakistan to the Indian subcontinent and Sri Lanka.
- It is already extinct in Bhutan and Myanmar.
- So the mugger has been listed as vulnerable on the IUCN Red List since 1982.
- In India, it is protected under Schedule I of the Wildlife Protection Act, 1972 mainly to prevent their trade.
- The transfer of these reptiles in such large numbers is against the principles of the Act.
- Crocodiles need space on land to nest and also to come out of the waters during winters.
- So releasing them into the dam reservoir would mean that the female crocodiles may not be able to nest if the slope of the dam is more than about 40 degrees.
- It might also disturb the ecological balance.

7.10 Sarus Crane

- According to 2018 Census, the population of Sarus Crane in UP has steadily grown since 2013.
- The habitat is outside protected areas, in natural wetlands with low water depth, marshy and fallow areas and agricultural fields.
- So the population was threatened by habitat degradation and human callousness.
- The main reason attributed for their revival was the awareness created among the public.
- As a result farmers and fisherfolk involved in the protection of Sarus nests in wetlands as well as rice paddies.
- Sarus Crane is the world's tallest flying bird.
- As per the Wildlife Trust of India it is also India's only resident breeding crane.
- It is omnivorous, feeding on fish and insects, as well as roots and plants.
- They play a vital role in ecological balance by controlling the population of harmful insects and have significant cultural importance, while also being sociable.
- It is also the official State bird of Uttar Pradesh.
- It has marked been marked as 'vulnerable' by IUCN.

7.11 Golden Langur

- Assam announced the success of the Golden Langur Conservation Breeding Program in the State.
- Gee's golden langur is a leaf-eating monkey found only in northeastern India and Bhutan.
- It is currently marked endangered in the IUCN list.
- It inhabits evergreen and deciduous tropical forests.
- Like most fruit eating primates they play a vital role in forest repopulation i.e via seed dispersal, seed predation, and pollination.

7.12 Living Fossils

- The term "living fossil" is meant to describe an organism that has remained relatively unchanged over millions of years, or one that has no, or very few, close surviving relatives.
- It was originally used by Charles Darwin to describe ancient species, like the ginkgo tree or horseshoe crab that appeared little changed over millions of years.
- If a species does not constantly have to adapt to survive, it will have little need to change.
- The coelacanth (a fish) is the most famous and widely recognized species of "living fossil".



7.13 Amami Rabbits

- Japan's Environment ministry has started to catch feral cats on Amami Oshima island to avoid them from preying on Amami rabbits.
- Ammai rabbits are endemic to the Ryukyu Archipelago of Japan
- So it is also known as the Ryukyu rabbit.
- The Amami rabbit is a living remnant of ancient rabbits that once lived on the Asian mainland and it is often called a living fossil.
- The rabbit is a primitive, dark-furred rabbit.
- IUCN has classified the rabbit as endangered.

- The Amami rabbit is also classified as a Japanese National Monument.

7.14 **Black Soft shell Turtle**

- The rare turtle species are being bred in the ponds of Assam's shrines.
- India hosts 28 species of turtles, of which 20 are found in Assam.
- Recently black softshells hatchlings were released into the Haduk Beel (wetland) of Pobitora Wildlife Sanctuary, Assam.
- The black softshell turtle (*Nilssonina nigricans*) figures in the International Union for Conservation of Nature's (IUCN) Red List as "extinct in the wild".
- It is a freshwater turtle that is found in India and Bangladesh.
- Consumption of turtle meat and eggs, silt mining, encroachment of wetlands and change in flooding pattern have had a disastrous impact on the State's turtle population

7.15 **'Crying' Snake**

- A new species of 'crying' snake has been discovered in Lepa-Rada district of Arunachal Pradesh.
- It is a non-venomous crying keelback, whose zoological name is *Hebius lacrima*.
- 'Lacrima' means tear in Latin.
- The name for this keelback was suggested because of a dark spot under its eyes looking like black tear.
- The snake prefers to live near streams along paddy fields.
- It was found to feed on small fish, tadpole, frogs and geckos.
- The northeast is home to some 110 global snake species.

7.16 **Mysticellus franki**

- It is a mysterious narrow-mouthed frog that was spotted in the seasonal roadside puddles in Kerala's Wayanad district.
- It is a new species and belongs to a completely new genus, *Mysticellus*.
- *Mysticellus* is named after Latin 'mysticus', meaning mysterious; and 'ellus' meaning diminutive as the frog is just around 3 cm long.
- The species is named after evolutionary biologist Franky Bossuyt from Brussel's Vrije Universiteit.
- Adults have two black spots that look like eyes on their backs, a defensive feature that probably helps startle predators.
- The frogs' calls are extremely different as it resembles that of insects.
- Genetic studies further revealed that the frog is around 40 million years old and its nearest relatives live more than 2,000 km away, in Southeast Asia (including Indo-Burma, Malaysia and Vietnam).
- The genetic studies add strength to the theories that India and Southeast Asia were connected in the past by land bridges.

7.17 **Kelp forest**

- Climate change could lead to declines of underwater kelp forests through impacts on their micro biome.
- It was predicted that ocean warming and acidification can change microbes on the kelp surface, leading to disease and potentially putting fisheries at risk.
- Kelp Forests are underwater ecosystems formed in shallow water by the dense growth of several different species known as kelps.
- Kelps are actually extremely large brown algae, although they look like plants.



- They thrive in cold, nutrient-rich waters.
- Kelp attaches to the seafloor and eventually grows to the water's surface and relies on sunlight to generate food and energy.
- Kelps live further from the tropics than coral reefs, mangrove forests, and warm-water seagrass beds, so kelp forests do not overlap with those systems.

7.18 Pangolin

- Pangolin is scaly nocturnal anteater.
- Indian and Chinese Pangolin are the two species found in South Asia.
- Chinese Pangolin is found in the North Eastern part of India and Indian Pangolin is found in the rest of India.
- The pangolin is the most trafficked mammal in the world.
- It is hunted mainly for meat in India but the demand for its scales in China has made it more vulnerable.
- Almost 90% of smuggling of pangolin and pangolin scales is through the northeastern India.
- International Union for Conservation of Nature (IUCN) has classified Indian Pangolin as Endangered and Chinese Pangolins as Critically endangered.

7.19 Seaweed

- Seaweeds or Marine macro algae are plant-like organisms that generally live attached to rock or other hard substrata in coastal areas.
- Seaweeds are nutritious and will play a major role in food security.
- Seaweeds are rich sources of vitamins A and C, and minerals such as Ca, Mg, Zn, Se and Fe.
- They also have a high level of vegetable proteins and omega 3 and 6 fatty acids.
- About 844 seaweed species are reported from India, a country with a coast line of 7,500 km.

7.20 Great Indian Horn Bill

- A study has found that Great Indian hornbills can adapt to modified habitat.
- It is also known as Great piped Hornbill.
- It is found mostly in India and also in southwestern China, Bangladesh, western Thailand, mainland Southeast Asia.
- The great Indian hornbill lives primarily in evergreen and moist deciduous forests.
- It is on Appendix II of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- It is listed as vulnerable because of decreasing populations.

7.21 Great White Shark

- A major study decoded Great White Shark entire genome and found that it could hold new clues to the fight against cancer.
- The great white shark is also known as the great white, white shark or white pointer.
- It is one of the most powerful and dangerous predatory sharks in the world.
- They are a large shark and grow up to at least 20 feet long, or 6.1 meters.
- They are frequently centered in highly productive temperate coastal waters.
- It the only known surviving species of its genus Carcharodon.
- According to IUCN, the species is classified as vulnerable.



7.22 Bramble Cay melomys

- Australia officially declared a Great Barrier Reef rodent called Bramble Cay melomys extinct recently.
- A Cay is a low-lying island on a coral reef.
- It became the first mammal believed to have been killed off by human-induced climate change.
- The rodent lived solely on a tiny sand island in the Torres Strait, near the coast of Papua New Guinea.
- The species has not been seen since 2009.
- A key factor in its disappearance was repeated ocean inundation of the cay over the last decade, which had resulted in dramatic habitat loss.
- The Melomys rubicola is considered the Great Barrier Reef's only endemic mammal species.
- It was first discovered on the cay in 1845 by Europeans who shot the large rat for sport.
- According to International Union for Conservation of Nature (IUCN), Australia has one of world's highest rates of animal extinction.

7.23 Fernandina Giant Tortoise

- It is a rare Giant Tortoise (*Chelonoidis phantasticus*).
- It was feared to be extinct but has been found in a remote part of the Galapagos island of Fernandina recently.
- The IUCN listed it as critically endangered and possibly extinct.
- Its habitat is largely dry brush land at lower elevations, but much of that habitat has been destroyed by extensive lava flows.
- Fernandina is the third largest Galapagos Island and features the La Cumbre volcano, one of the most active in the world.

7.24 Wallace's giant bee (*Megachile pluto*)

- It is the world's largest bee that was rediscovered in a remote part of Indonesia.
- Wallace's giant bee was discovered in the 19th century by British naturalist Alfred Russel Wallace.
- The IUCN Red List of Threatened Species lists the bee as "vulnerable".
- It was nicknamed the "flying bulldog" as it is nearly four times bigger than the European bee.
- It lives in the Indonesian island region of North Moluccas and makes its nest in termite mounds

7.25 Hog Deer

- Recently searchers reported the presence of a small population of hog deer in Keibul Lamjao National Park (KLNP), Manipur.
- The study indicates that the western limit of hog deer is Manipur and not central Thailand as believed earlier.
- Two sub-species of hog deer have been reported from its range.
- 1. The western race is distributed from Pakistan and the Terai grasslands (along the Himalayan foothills, from Punjab to Arunachal Pradesh).
- 2. The eastern race of hog deer is found in Thailand, Indo-China, Laos, Cambodia, and Vietnam.
- The species has lost ground in most of its distribution range, a small and isolated population of under 250 was reported from Cambodia.
- The hog deer is an endangered species in the IUCN Red List and is protected under Schedule I of the Indian Wild Life (Protection) Act, 1972.



7.26 Invasion of Shola Grasslands

- Shola forest-grassland ecosystem is characterised by patches of forest of stunted evergreen shola trees in the valleys and grasslands on hill slopes.
- They are spread across Western Ghats of Tamilnadu and Karnataka.
- Over four decades, almost one-fourth of the grasslands in the high-altitudes of the ecosystem were lost.
- The exotic invasive trees like pine, acacia and eucalyptus that were earlier used for afforestation in these areas are primary reason behind it.
- Broadly, these grasslands in Tamil Nadu showed the highest rates of invasion than in Karnataka.
- Though the practise has been ceased in 1996, the exotics still invade these ecosystems.
- But the shola forests in the valleys have remained “relatively unchanged” over these years.
- The Anamalai-Munnar areas have also remained stable during this time.

7.27 Purple Frog

- It is endemic to the Western Ghats of India.
- It has been evolving independently for around 100 million years.
- It is listed as Endangered by the IUCN Red List.
- It is threatened by deforestation from expanding cultivation, in addition to consumption and harvesting by local communities.
- The tadpoles of this species are rheophilic, which means they thrive in running water.
- It was found that the speed with which water flows down the streams is one of the main factors that determine the presence and aggregation of these tadpoles.
- The damming effect is also slowing down the streams feeding water to the river.

7.28 Clownfish Hatchery

- Clownfish or anemonefish are most widely used in aquariums, these fishes form symbiotic mutualisms with sea anemones.
- Depending on species, anemonefish are overall yellow, orange, or a reddish or blackish color, and many show white bars or patches.
- National Bureau of Fish Genetic Resources (NBFGR) has launched a new project in coastal Maharashtra which aims to train villagers in the clownfish trade.
- For this purpose a clownfish hatchery will be established in Mumbai.

7.29 Symbiotic Mutualism

- Mutualism describes the ecological interaction between two or more species from which individuals of both species gain fitness benefit.
- Example - Flowering plants being pollinated by animals.
- Mutualism is often conflated with two other types of ecological phenomena, namely
 1. Cooperation - Cooperation refers to increases in fitness through within-species (intraspecific) interactions.
 2. Symbiosis - Symbiosis involves two species living in close proximity and may be mutualistic, parasitic, or commensal, so symbiotic relationships are not always mutualistic.

7.30 Wood Snake

- A species of wood snake that wasn't seen for 140 years has resurfaced in a survey conducted at the Meghamalai Wildlife Sanctuary.



- The wood snake is point endemic, which can be only found in Meghamalai forests and the Periyar Tiger Reserve landscape.
- The scientific name of the species is *Xylophis indicus*, and it is uniformly dark brown in color.

7.31 **Starry Dwarf Frog**

- A starry dwarf frog, a nocturnal amphibian which sports pale blue spots and brilliant orange thighs has been found in Wayanad district, Kerala.
- The frog has distinct physical characteristics such as its triangular finger- and toe tips, which closely resembled frogs in South America and Africa.
- The frog species is named as *Astrobatrachus kurichiyana* in the honor of Kurichiya tribal community of Kerala.
- The frog is not only a new species but different enough to be assigned to a new 'subfamily'.

7.32 **Pangolin**

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- Almost 90% of smuggling of pangolin and pangolin scales is through the northeastern India.
- International Union for Conservation of Nature (IUCN) has classified Indian Pangolin as Endangered and Chinese Pangolins as Critically endangered.

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- Seaweeds are nutritious and will play a major role in food security.
- Seaweeds are rich sources of vitamins A and C, and minerals such as Ca, Mg, Zn, Se and Fe.
- They also have a high level of vegetable proteins and omega 3 and 6 fatty acids.
- About 844 seaweed species are reported from India, a country with a coast line of 7,500 km.

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- It is on Appendix II of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- It is listed as vulnerable because of decreasing populations.

7.35 **Bump Head Parrotfish**

- Bumphead parrotfish (*Bolbometopon muricatum*), is an important component of coral reef ecosystem.
- It is categorized as 'vulnerable' in the Red List of the International Union for Conservation of Nature (IUCN).



- The fish is threatened due to limited knowledge about its distribution and abundance in Indian waters.
- According to recent studies, fishing and coral reef degradation threaten parrotfish in Andaman.

7.36 Hump Backed Mahseer

- The Humpback (or) Tor remadeviii is the largest known species of Mahseer and, across the world, is only found in the Kaveri river basin.
- The effects of construction of dams, regulated flows, deforestation, drought, pollution and sediment transport have a great toll on this river water species.
- Recently the fish has been added to the IUCN Red List as Critically Endangered.
- This fish is also called as tiger of the water, found in Pambar, Kabini and Bhavani rivers of the Karveri basin in the states Karnataka, Kerala and Tamil Nadu.

7.37 Mini Mum

- Mini mum frog is found in eastern Madagascar, it lives in the leaf litters of lowland forests.
- It is one of the smallest frogs in the world, reaching an adult body size of 9.7 mm in males and 11.3 mm in females, it could sit on a thumbtack.
- These frogs belong to the subfamily Cophylinae which is endemic to Madagascar.

7.38 Dhole

- Dhole (commonly known as the Asiatic wild dog) is an apex social carnivore in the tropical forests of South and South East Asia.
- In India Dholes are found in landscapes covering Karnataka portion of Western Ghats.
- IUCN red book lists Dholes as endangered.
- Generally dholes hunt in packs and tend to venture into forested landscapes adjoining protected areas.
- Anthropogenic factors, which fragment and alter landscapes seriously affect dholes.

7.39 India's Marine Meadows

- Tape seagrass grows up to 150 cm tall and is found extensively in the Indo-Pacific region, it acts as a feeding area for more than 1000 fish species.
- The grass can bury carbon under water sediments 40 times faster than tropical forests bury under the soil, thus acting as a major carbon sink.
- The tape seagrass ecosystem under waters is known as India's marine meadows, which can be extensively found in Andaman & Nicobar Islands.

7.40 Declining Megafauna Species

A research published in the journal *Conservation Letters* showed that at least 200 species of "megafauna" are decreasing in number.

- Over the past 500 years, humans' ability to kill wildlife at a safe distance has become highly refined.
- Hence, 2% of megafauna species have gone extinct in the period.
- Humans' meat-eating habits may be pushing at least 150 species of the planet's largest animals towards the threat of extinction.
- e.g. Chinese giant salamander is one of only three living species in an amphibian family that traces back 170 million years.
- Considered a delicacy in Asia, it's under siege by hunting, development and pollution.

- Nine megafauna species have either gone extinct overall, or gone extinct in all wild habitats, in the past 250 years.
- Direct harvest for human consumption of meat or body parts is the biggest danger to nearly all of the large species with threat data available.
- Thus, minimising the direct killing of these vertebrate animals is an important conservation tactic.
- Users of Asian traditional medicine also exert heavy tolls on the largest species through the consumption of various body parts.
- This might save many of these iconic species as well as all of the contributions they make to their ecosystems.
- In addition to intentional harvesting, a lot of land animals get accidentally caught in snares and traps, and the same is true of gillnets, trawls and longlines in aquatic systems, along with their habitat degradation.
- When taken together, these threats can have major negative cumulative effects on vertebrate species.
- In the future, 70% will experience further population declines and 60% of the species could become extinct or very rare.
- The report warned that preserving the remaining megafauna is going to be difficult and complicated.
- There will be economic arguments against it, as well as cultural and social obstacles.
- But if we don't consider, critique and adjust our behaviours, our heightened abilities as hunters may lead us to consume much of the last of the Earth's megafauna.
- Transforming to healthy diets by 2050 will require drastic changes.
- Global consumption of healthy foods, such as fruits and vegetables, will need to double, while overconsumption of foods like added sugars and **red meat** will need to be more than halved.
- At the same time, it will be equally important to take a differentiated approach for healthy and sustainable diets in developing countries and for poor populations.
- For many developing countries and the poor, under-nutrition and access to healthy foods remain persistent challenges.
- Small amounts of **animal-sourced foods** (ASFs) (like dairy, eggs, fish or chicken) for young children and women during pregnancy and lactation **are crucial** for nutrition and health, especially in poor populations.
- There is a strong association between reduction in stunting and ASF consumption.
- Hence, healthy and sustainable diets may look different from country to country and animal sourced foods serve as an inevitable part to tackle malnutrition among poor populations.

7.41 Decline in Insect Population

A study titled 'Worldwide decline of the entomofauna: A review of its drivers' was published recently.

- Insect populations are declining sharply worldwide, which could potentially cause the collapse of the planet's ecosystems.
- More than 40% of insect species could become extinct in the next few decades.
- The extinction rate is eight times faster than that of mammals, birds and reptiles.
- In addition to this, one third of insect species are endangered.
- Insect biomass is declining by 2.5% a year; there is a threat that all of the planet's insects could go extinct within a century.

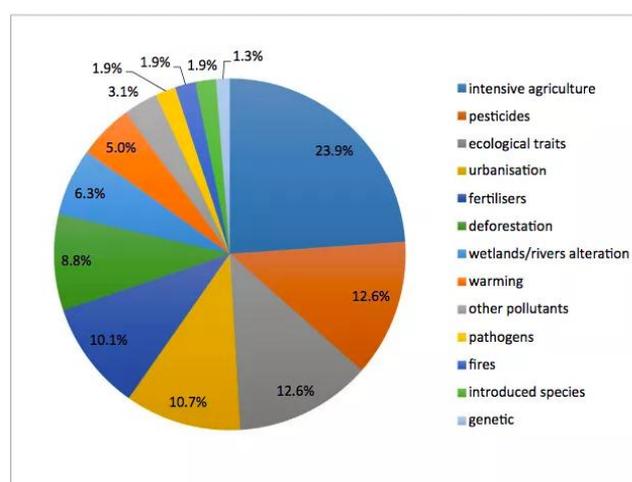


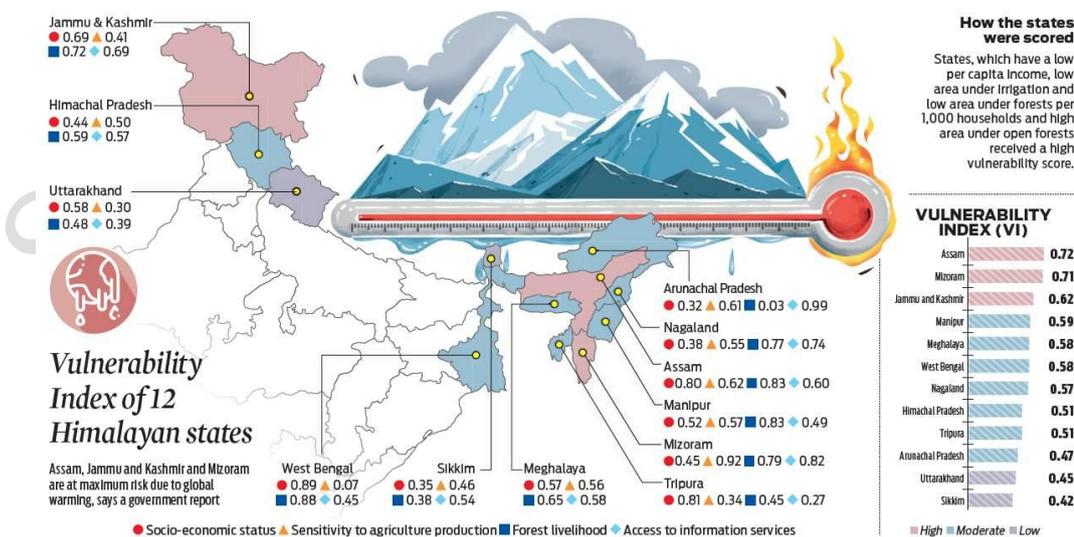
Fig. 6. Main factors associated with insect declines – see also Fig. 5.

- Large numbers of specialist insects, which fill a specific ecological niche, and general insects are declining.
- On the other hand, a small group of adaptable insects are rising in numbers, but nowhere near enough to arrest the decline.
- An earlier study found that flying insect populations in German nature reserves declined by more than 75% over the duration of a 27-year study.
- This indicates that die-off is happening even beyond areas affected by human activity, in locations meant to preserve biodiversity.
- The major causes for the decline in insect numbers include -
 - habitat loss
 - conversion to intensive agriculture, use of agro-chemical pollutants
 - urbanization
 - pollution, particularly from pesticides and fertilizers
 - biological factors such as pathogens and introduced species
 - climate change

8. INDEX AND REPORTS

8.1 Climate Vulnerability Report

- Climate Vulnerability Assessment for the Indian Himalayan Region Using a Common Framework is a first-of-its-kind report prepared by the Department of Science and Technology.
- According to the report, all the 12 Himalayan states in India are extremely vulnerable to global warming.
- It is based on 4 indicators such as
 - The economic and sociological status of the people and their health,
 - Possible impact on agriculture production,
 - Forest-dependent livelihoods and
 - Access to information services and infrastructure
- States having low per capita income, low area under irrigation and low area under forests per 1,000 households and high area under open forests received a high vulnerability score.
- Assam, Mizoram and Jammu & Kashmir topped the list.
- Sikkim is the least vulnerable state.



8.2 Climate Change Performance Index

- It is an annual publication by German watch and Climate Action Network Europe.
- It evaluates and compares the climate protection performance of 56 countries and the EU, which are together responsible for more than 90% of global greenhouse gas (GHG) emissions.
- 80% of the evaluation is based on objective indicators of emissions trend and emissions level.
- 20% of the index results are built upon national and international climate policy assessments by more than 200 experts from the respective countries.
- The CCPI ranking is qualified in relative terms (better–worse) rather than in absolute terms.
- Sweden leads the ranking, followed by Morocco and Lithuania in the CCPI 2019.
- Morocco significantly increased the share of renewable over the past five years and increased new renewable energy capacity.

8.3 Regulatory Indicators for Sustainable Energy (RISE)

- RISE report is published by World Bank.
- It rates 133 countries on electricity access, renewable energy, energy efficiency and access to clean cooking.
- It is to provide useful data to policymakers and help the private sector make informed decisions about investing in energy projects.
- It charts global progress on sustainable energy policies.
- The 2018 report finds that the world has seen a huge uptake in sustainable energy policies.

8.4 SDG India Index

- The index has been released by NITI Aayog in collaboration with the Ministry of Statistics & Programme Implementation (MoSPI), Global Green Growth Institute and United Nations in India.
- It tracks progress of all States and UTs on 62 Priority Indicators based on each aggregate performance across 14 SDGs selected by NITI Aayog.
- The score ranges between 0 (performing poor) and 100 (achieved national target in meeting SDG).
- According to the Index, Kerala, Himachal Pradesh and Tamil Nadu are progressing at a faster rate towards the SDG set for 2030.
- Among the UTs, Chandigarh is the front runner followed by Puducherry.
- U.P, Bihar and Assam are progressing at a slower rate.
- Tamil Nadu is the top scorer in eradicating poverty and also providing clean and affordable energy.
- The average score for the States was the worst in gender equality, in creating sustainable cities and communities, in enabling industry, innovation, and infrastructure, and in eradicating hunger.

8.5 Global Environment Outlook

- The Global Environment Outlook (GEO) report is often referred as UN Environment's flagship environmental assessment.
- The first publication was in 1997 and was originally requested by Member States.
- The Global Environment Outlook (GEO) is a consultative and participatory process to prepare an independent assessment of the state of the environment, the effectiveness of the policy response to address these environmental challenges and the possible pathways to be achieve various internationally agreed environmental goals.
- The Global Environment Outlook (GEO) informs environmental decision-making for governments and various stakeholders.

8.6 Living Planet Report

- The Living Planet Report, WWF's flagship publication is being released every two years.
- It is a comprehensive study of trends in global biodiversity and the health of the planet.
- The Living Planet Report 2018 is the 12th edition of the report and it provided scientific evidence to unsustainable human activity is pushing the planet's natural systems that support life on Earth to the edge.
- It considers the Living Planet Index (LPI), provided by the Zoological Society of London (ZSL).
- Living planet index is an indicator of population trends of different species and not an indicator of species extinction.
- It tracks the abundance of a large number of population of vertebrate species.
- It is currently based on timeseries data of population of species of mammal, bird, reptile, amphibian and fish from around the globe.
- The main result from this Living Planet Report is that globally, monitored populations of birds, mammals, fish, reptiles and amphibians have declined in abundance by 60% on average between 1970 and 2014.
