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ENVIRONMENT

CURRENT AFFAIRS

JUNE 2016 TO APRIL 2017

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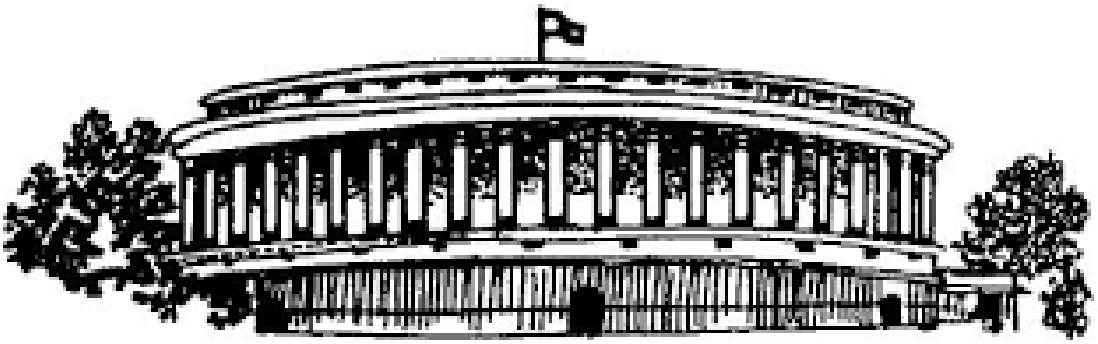

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I N D E X

ENVIRONMENT CURRENT AFFAIRS

JUNE 2016

1)NATIONAL DISASTER MANAGEMENT PLAN

Why in news?

- It is the **first major national plan for disaster management**.
- The plan aims to make India disaster resilient and reduces loss of lives.
- It is made keeping in mind the **Sendai Framework and Sustainable Development Goals (SDGs)**.

> **Sustainable Development Goals (SDGs)**
> At the Sustainable Development Summit on 25 September 2015, UN Member States adopted the 2030 Agenda for Sustainable Development, which includes a set of 17 Sustainable Development Goals (SDGs) to end poverty, fight inequality and injustice, and tackle climate change by 2030. The SDGs build on the Millennium Development Goals (MDGs).

Sendai framework

- The Sendai Framework is a 15-year non-binding agreement on disaster risk reduction.
- It replaced the earlier Hyogo Framework.
- It was adopted at the Third United Nations World Conference on Disaster Risk Reduction held at Sendai, Japan in March 2015.
- It aims for the substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries.

Four priority themes of the "Sendai Framework,"

- Understanding disaster risk,
- Improving disaster risk governance,
- Investing in disaster risk reduction (through structural and non-structural measures),
- Disaster preparedness- early warning and building back better in the aftermath of a disaster.

What are the highlights of the plan?

- **Comprehensive definition of disaster -** It covers all phases of disaster management: Prevention, Mitigation, Response and Recovery.
- It covers human induced disasters like chemical, nuclear etc.
- **Planning -**Planning for short, medium and long run respectively 5, 10, and 15 years to deal with disasters.
- It provides integration among all the agencies and departments of the Government.
- The plan also spells out the roles and responsibilities of all levels of Govt right up to Panchayat and Urban local body level in a matrix format.
- **Major activities -**It also identifies major activities such as early warning, information broadcasting, medical care, fuel, transportation, search and rescue, evacuation, etc. to serve as a checklist for agencies responding to a disaster.
- It also provides a generalised framework for recovery and offers flexibility to assess a situation and build back better.
- **Information & media regulation -** To prepare communities to cope with disasters, it emphasises on a greater need for Information, Education and Communication activities.
- It calls for ethical guidelines for the media,for coverage of disasters as well as self-regulation. The plan wants the media to respect the dignity and privacy of affected people.
- Also, in a move aimed to stop rumours and spread of panic, the plan directed the authorities to schedule regular media briefing (depending on the severity of the disaster) and designate a nodal officer for interacting with the media on behalf of the government

2)DRAFT WETLANDS (CONSERVATION AND MANAGEMENT) RULES

Why in news?

The new draft rules have been put into the public domain the government. In 2010, MoEF&CC had notified Rules for conservation and management of wetlands under the Environment Protection Act, 1986. The new rules will replace them.

What is the Importance of this notification?

National Green Tribunal (NGT) is hearing an application seeking directions to the government to identify all wetlands in the country as specified in the Wetlands Rules (Conservation and Management) 2010.

What constitutes a wetland?

- An area of marsh, peat land or water, permanent or temporary,
- With water that is static or flowing, fresh, brackish or salt
- All inland and coastal waters such as lakes, reservoirs, tanks, backwaters, lagoons, creeks, estuaries and man-made wetlands.
- But it does not include river channels and paddy fields.

The Wetlands (Conservation and Management) Rules, 2010

- Rules provided for the creation of a wetland was given by Central Wetlands Regulatory Authority (CWRA) ,
- It was the nodal agency for identification,conservation and protection of wetlands.
- The Rules, prohibited activities like –

1. Reclamation of wetlands,

2. Setting up of new industriesAnd expansion of existing industries,solid waste dumping, manufacturing or handling or storage or disposal ofhazardous substances,
3. Discharge of untreated waste andeffluents from industries, cities, townsand other human settlements,
4. Any construction of permanentnature and any other activity that islikely to have an adverse impact onthe ecosystem of wetlands.

Major changes from the old rules

- The Central Wetlands Regulatory Authority (CWRA), will be removed. The power of notification would rest with the chief ministers of respective states.
- There is no time limit for notification as against the period of 12 months stipulated in 2010 rules.
- The numbers of restricted activities have been reduced.
- Earlier the decision taken by CWRA could have been challenged before NGT by a citizen. No provision of citizen check is present under the new rules

PROGRAMS TO CONSERVE WETLANDS

National Wetlands Conservation Program of India:

- Started in 1987,it has been financially supportingwetland conservation activities all over India.
- Under the Programme 115 wetland have been identified for conservation and management till date.

Ramsar Convention:

- The Convention on Wetlands, signed in Ramsar, Iran, in 1971, is an Inter-governmental treaty. Convention provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources
- Three pillars of Ramsar Convention:
    1. Work towards the wise use of all their wetlands.
    2. Designate suitable wetlands for the list of Wetlands of International Importance (the "Ramsar List") and ensure their effective management.
    3. Cooperate internationally on Trans boundary wetlands, shared wetland systems and shared species.
- India is also a party to the Ramsar Convention under which 26 wetlands from India are included in the list of wetlands of international importance.

Montreux Record

- It is a register of wetland sites on the List of Wetlands of International Importance where changes in ecological character have occurred, are occurring, or are likely to occur as a result of technological developments, pollution or other human interference. It is maintained as part of the Ramsar List
- Loktak lake and keoladeo national park are both in Ramsar as well as in Montreux record

What are the Issues?

- The draft does away with the Central Wetlands Regulatory Authority, which had suo moto awareness of wetlands and their protection.
- The record of states in implementation of the rules has not been encouraging. It is observed that states are susceptible to yielding under local pressure, some states for not even notifying wetlands under the 2010 rules.
- It contains no ecological criteria for recognising wetlands, which was mentioned in 2010 rules.
- The protection has been diluted as restricted activities have been reduced drastically.
- No role to local people and institutions have been given.

Way forward

- **Scientific criteria for identifying wetlands**- an independent authority can help with respect to this.
- **Create a data bank on wetlands-**proper data of only Ramsar sites is present. In absence of proper data bank extent of wetland is not ascertained and encroachment becomes easier.
- **Proper checks and balances-** both on part of central government and citizens is required.
- **Rules should be people-centric-** involvement of town and country planning Board in identification of wetlands. More role to locals like fishing community, farming and pastoral community in management-they have experience as well as interest in their protection.

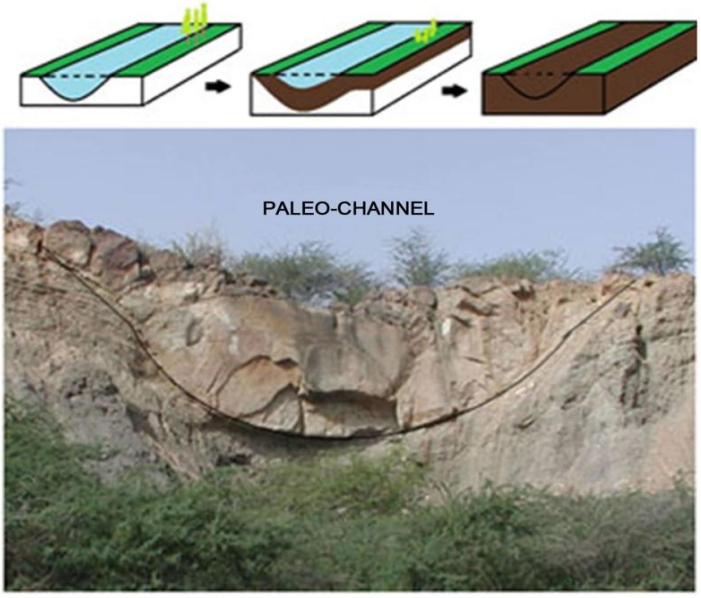
3) PALAEO CHANNEL

Why in news?

- Central Ground Water Board (CGWB) under Ministry of Water Resources, River Development and Ganga Rejuvenation has been putting great emphasis on studying the various aspects of Palaeochannels in India so that its ground water potential can be optimally utilized.

What is a Palaeo channel?

- It is a remnant of an inactive river or stream channel that has been either filled or buried by younger sediment.
- It is distinct from the overbank deposits of currently Active River channels because its river bed is filled with sedimentary deposits which are unrelated to the normal bed load of the current drainage pattern.
- Palaeochannel forms when river channels aggrade, depositing sediment on their bed.



What are its importances?

- **Geological importance -** Understanding the movement of faults.
- Preserving sediments and fossils useful for studying past rainfall, temperature, climate, global warming and climate change.

- Preserving evidences of older Erosional surfaces and levels.
- **Economic importance -**The old sediments contain deposits of minerals like Uranium, lignite and precious metals like gold and platinum.
- **Ground water source -** Because of better flushing mechanism in the ground water system of Palaeo channels and coarser nature of sediments ,the quality of ground water and recharge is often better than the surrounding environment.

4) DRAFT WIND-SOLAR HYBRID POLICY

Why in news?

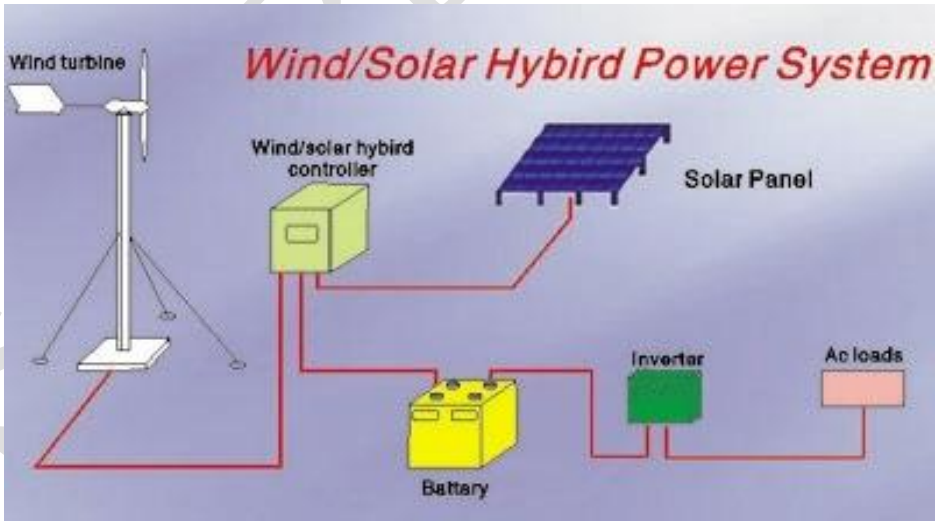
- The Draft National Wind-Solar Hybrid Policy aims at providing a framework to promote large grid connected wind-solar photovoltaic (PV) system.
- For optimal and efficient utilization of transmission, infrastructure is criticized for many reasons such as being restrictive and for lacking details about tariffs.

What are the Key features of the Policy?

- It proposes hybridization of existing solar PV and wind power plants apart from new projects.
- The draft policy proposes to provide the developer with the option of using the hybrid power for captive use, third party sale or sale to state electricity distribution utilities.

What are its significances?

- Given that the critical infrastructure such as land and evacuation network for wind or solar project accounts for about 10-12% of overall project cost, hybrid projects would benefit from common infrastructure.
- The variability in generation profile is likely to be reduced to some extent, as generation from both the sources is at different intervals and in complimentary seasons.
- This would partially address the concerns of distribution utilities over the grid stability arising due to the intermittent nature of wind or solar generation.



What are the issues with Policy?

- The draft policy is a good step, but is restrictive as it puts a cap on size of such units.
- The policy lacks in details relating to tariffs and financial incentives.
- It is restrictive in suggesting that hybrid capacity addition, for existing plants, must be limited to the sanctioned transmission capacity.

Way Forward

- The evacuation policy needs to be clear, transmission augmentation might need to be done in most cases, scheduling and forecasting of delivered power needs to be calculated accurately, and plant layout needs to make sure that wind mills don't cast any shadows on the solar panels.
- Central Electricity Regulatory Commission (CERC) needs to come up with an FIT (Feed in Tariffs) (FIT is a payment made to households or businesses generating their own electricity through the use of methods that do not contribute to the depletion of natural resources, proportional to the amount of power generated) for Wind Solar Hybrid framework.

5) SHAILESH NAYAK COMMITTEE REPORT

- The Report of the Committee to Review the Issues relating to the Coastal Regulation Zone, 2011, was submitted to the Ministry of Environment, Forests and Climate Change in January 2015.
- The ministry has disclosed the report after an order from the Information Commissioner last month ordering the ministry that it cannot deny the report under the Right to Information (RTI), Act.

What are the highlights of the report?

- The committee found that the 2011 regulations, especially with regard to construction, have affected the housing, slum redevelopment, redevelopment of dilapidated structures and other dangerous buildings.
- Since January 2015, several dilutions appear to be taken from this report, such as
- Allowing construction of monuments/memorials (Sardar Patel statue in Gujarat) in CRZ VI zones;
- Proposal to allow high-rise buildings (Chennai) in CRZ II zones within 500 metre of the high-tide line;
- Proposal to allow reclamation of land from sea (Mumbai) for facilities such as ports, roads, quays, harbours and others.
- The report proposes the devolution of powers to state and union territory governments along with local authorities as sought by several states.
- The report even suggests that both CRZ II and III zones (500 metres from the high-tide line that are developed and relatively undisturbed, respectively) should not fall under the environment departments of the State or Central Ministry, and instead be guided by the rules of State town and planning departments.
- It further proposes to reduce the "**no development zone**" to just 50 metres from existing 200 metres for "densely populated" areas.

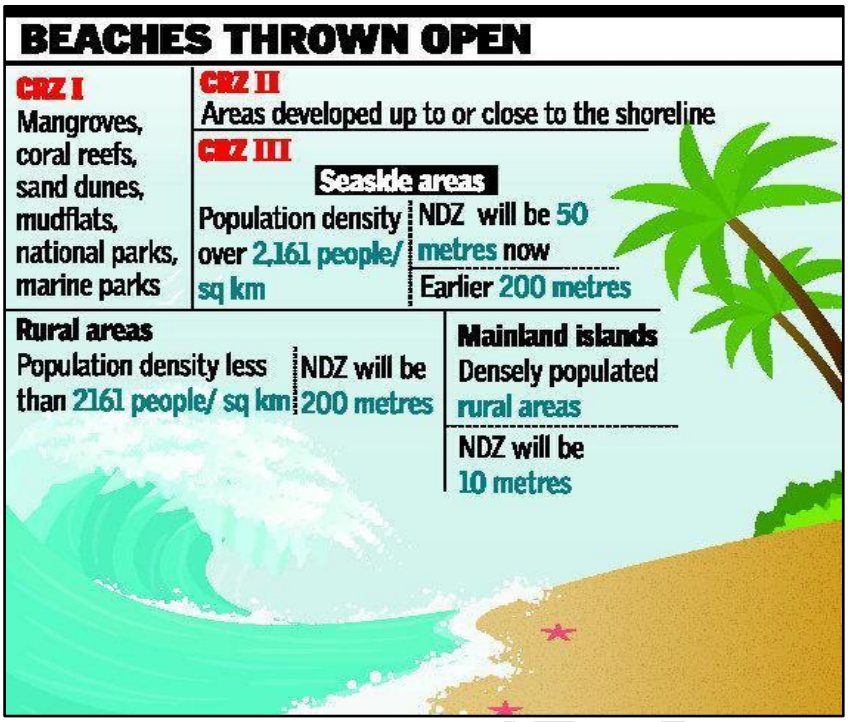
About Coastal Regulation Zone

- Under the Environmental Protection Act 1986, notification was issued in 1991 for regulation of activities in the coastal area by Ministry of Environment and Forests.
- These notification known as Coastal Regulation Zone Notification defined the Coastal Regulation Zone or CRZ as coastal land up to 500m from the High Tide Line and a range of 100m along banks of creeks, estuaries, backwaters and rivers subject to tidal fluctuations is CRZ.
- The 2011 notification tried to address (in how much ever limited manner) this space by creating the District Level Coastal Committees (DLCC), a space for coastal communities to participate in some aspects of regulatory decision-making on the coasts.
- While the exact role of these committees was not specified, and in many states the committees are yet to be fully functional, it was still a start.

Importance of the CRZ Notification

- India has a long coastline of 7516 km, ranging from Gujarat to West Bengal, and two island archipelagos (Andaman Island and Lakshadweep).
- Our coastal ecosystems provide protection from natural disasters such as floods and tsunamis to the 250 million people who live in our coastal areas.

- Coastal waters provide a source of primary livelihood to 7 million households



6) GYPS VULTURE REINTRODUCTION PROGRAMME

- It was launched last year by Government of Haryana.
- It is Asia's first Gyps Vulture Reintroduction Programme.
- The programme is an ex-situ means of conservation carried out in Jatayu conservation breeding centre.
- It is a facility within Bir Shikargah Wildlife Sanctuary for the breeding and conservation of Indian vultures in Pinjore town near Chandigarh, Haryana.

Four kinds of vultures are found in India and their status :

- **Gyps species**– It is also called Indian vulture, Long-billed, slender billed vulture- **Critically endangered**
- **Himalayan Griffon**– It is closely related to Indian Gyps- not endangered-only **Near Threatened**
- **Red-Headed Vulture- Critically endangered**
- **Egyptian Vulture- Endangered** as per IUCN

7) NEW MODEL TO STUDY URBAN HEAT ISLANDS

Why in news?

A new climate model to study the heat island effect in Abu Dhabi has been developed by researchers. The model, once completed, would help in tackling the effect across the globe.

What are urban heat islands (UHI)?

- It is defined as the rise in temperature of any man-made area, resulting in a well-defined, distinct "warm island" among the "cool sea" represented by the lower temperature of the areas nearby natural landscape.

- Due to Urbanization, there are negative impacts in the environment mainly by pollution, the modification of the physical and chemical properties of the atmosphere, and the covering of the soil surface. Considered to be a cumulative effect of all these impacts is the UHI.

How the effects can be reduced?

- Develop efficient cooling systems,
- Add vegetation to buildings,
- Cool the paved surfaces with reflective paint

8) TRANS BOUNDARY MANAS CONSERVATION AREA (TRAMCA)

- The monitoring of big cats across the Trans boundary Manas Conservation Area (TraMCA) covering Manas National Park (MNP) in Indian side and the Royal Manas National Park (RMNP) in Bhutan has found altogether 21 individual tigers.

Manas wildlife sanctuary

- It is located in Assam. It is contiguous with the Royal Manas National Park, Bhutan.
- It spans the Manas river and is bounded to the north by the forests of BhutanRiver Manas is a major tributary of Brahmaputra, which passes through the heart of the sanctuary.
- It has six national and international designations

1. *World Heritage Site,*
2. *National Park,*
3. *Tiger Reserve (core),*
4. *Biosphere Reserve (national),*
5. *Elephant Reserve (core) and*
6. *Important Bird Area*

- It has the highest legal protection and strong legislative framework under the provisions of Indian Wildlife (Protection) Act, 1972 and Indian Forest Act, 1927/Assam Forest Regulation 1891.
- It benefits from government support at both national and regional levels as well as involvement of national and international conservation organisations.
- The site provides critical and viable habitats for rare and endangered species, including tiger, greater one-horned rhino, swamp deer, pygmy hog and Bengal florican.

9) CARBFIX PROJECT

Why in news?

- Recent reports show that the project was able to solidify 95% of the injected 250 tonnes of CO_2 into calcite in 2 years, using 25 tonnes of water per tonne of CO_2.

Whatis it?

- It is a project in Iceland that aims to lock away CO_2 by reacting it with basaltic rocks. Carbonated water is injected into the rocks so that it reacts with Calcium, Magnesium or Silicate material present in Basaltic rocks. This is called enhanced weathering.
- Thus, the CO_2 is captured permanently without releasing any harmful by-products

10) Eurasian Otter

- Eurasian Otter were discovered from **Sapura**Tiger Reserve, MP **and Kanha-Pench Corridor.**
- It is restricted to Himalayas and in some parts of the Western Ghats.
- It is one of the **rarest Indian mammal.**
- It is classified as '**Near Threatened'** under IUCN.

11) Popular tress in Kashmir

- The pine forests of Kashmir have diminished significantly in last few decades due to large scale timber extraction.
- In the search for alternative, the Social Forestry Department introduced the ***populous deltoids***,
- Introduction of the species boosted the veneer and ply-based industry.
- In recent years, however, people have been raising concern over the increased instance of infections caused by the cotton produced by the poplars.
- As a result, HC of J&K has ordered the felling of all Poplar trees in the valley

10) ALTERNATIVE TO BT COTTON

Why in news?

- The Union government is working to develop a suite of BT cotton genes that can be integrated into traditional varieties and be made available to farmers.
- It would be a joint collaboration of Council of Scientific and Industrial Research (CSIR) and the Department of Biotechnology (DBT).

About BT Cotton

- BT Cotton is a genetically modified variety of cotton that contains insecticidal genes sourced from soil bacterium targeted at key cotton pests.
- It is the only GM crop that is legally allowed in India at present.

11) CLIMATE SMART AGRICULTURE

What is CSA?

- Climate smart agriculture (CSA) is an integrative approach to address these interlinked challenges of food security and climate change.
- It is supported by Food and Agricultural Organisation (FAO).

What are the objectives?

It basically aims at three main objectives:

- Sustainably increasing agricultural productivity, to support equitable increases in farm incomes, food security and development.
- Adapting and building resilience to climate change at multiple levels.
- Reducing and/or removing greenhouse gas emissions, where possible.

What are the CSA approaches?

It include four major types of actions -

- Expanding the evidence base and assessment tools to identify agricultural growth strategies for food security that integrate necessary adaptation and potential mitigation.
- Building policy frameworks and consensus to support implementation at scale.
- Strengthening national and local institutions to enable farmer management of climate risks and adoption of context-suitable agricultural practices, technologies and systems.
- Enhancing financing options to support implementation, linking climate and agricultural finance.

12) SPACE COLLABORATION TO TACKLE CLIMATE CHANGE

Why in news?

- The monitoring of GHG emissions can be done effectively and accurately by space satellites.
- Keeping this mind, 60 space-faring nations have agreed to engage their earth observing satellites, coordinate their methods and data to monitor human-induced GHG emissions.
- They will establish ‘an independent, international system’ to centralize data from satellites.

Significance

- This would help to get the best data possible on climate change with most authenticity.
- The satellites would also be used to verify the efforts of nations towards fulfilling their commitments under the Paris Agreement.
- The goal now will be to inter-calibrate these satellite data so that they can be combined and compared over time.
- The decision was taken at a meeting at New Delhi, which was called upon at the invitation of ISRO and French space agency Centre national d'études spatiales (CNES).

13) EFFICIENT AND SUSTAINABLE CITY BUS SERVICE PROJECT

Funding agreement

- India has signed a $9.2-million grant agreement with the World Bank for the 'Efficient and Sustainable City Bus Service Project' aimed at improving the efficiency of the transport and reduce greenhouse gas emissions.
- The project will be classified under Global Environment Facility (GEF) grant with IBRD as the implementing agency.
- The total cost of the programme is $113 million. The rest will be funded by the Centre, state and city governments for the funding of buses and ancillary infrastructure.

About the project

- The project has been designed to specifically focus on identifying institutional, regulatory and fiscal constraints to operation of sustainable city bus services.
- The project will complement Union Government's Bus Funding Scheme, which was launched to promote public transport in cities by modernizing their bus services.
- It will introduce modern Management Information Systems and Intelligent Transport Systems for better planning and management of operations.
- It will also provide technical support to drivers and vehicles for better fuel efficiency, etc.

14) CULLING OF ANIMALS

Why in news?

- Environment Ministry recently provided a spate of clearances allowing culling of several species in different states.
- The state Boards were permitted to declare animals that were coming in conflict with humans like nilgai, rhesus monkey, wild pigs etc. **as vermin** in Bihar, HP and Uttarakhand

Significance

- This means that those who kill these animals will, for a year, will not be subject to the jail terms and fines that hunting these animals typically invite.
- Wild animals are protected by the Wildlife (Protection) Act, 1972 under which animals and birds are classified, on the basis of threats they face, into four schedules.
- The highly endangered tiger is in the highest Schedule 1 and hares in Schedule 4.
- Each class gets different grades of protection and the law allows all, except Schedule 1 animals, to be temporarily slotted as Schedule 5 or 'vermin.'
- Nilgai, wild pig and rhesus macaque come under schedule 2 and 3.
- In response to a petition, SC refused to stay the notification that allowed for the culling.

Animal Welfare Board

- It is a statutory advisory body advising the Govt. on animal welfare laws and promotes animal welfare.
- It has questioned the "vermin" decision and called it arbitrary.
- It was established in 1960 under Prevention of Cruelty to Animals Act, 1960 and works under MoEF.

JULY 2017

1) AIR POLLUTION REPORT BY IEA

Why in news?

The "Energy and Air Pollution, World Energy Outlook Special Report" has been released in June.

What are the Observations of the report?

- The report identifies sources for three big pollutants:
    1. NOx (nitrates) -transport is the major contributor of nitrates.
    2. SO2 (sulphates) - power sector (thermal power stations, back-up generators) for sulphates.
    3. PM2.5 (particulate matter) – residential sector, biomass burning for cooking and heating.
- The report acknowledges the role of Environmental Protection Amendment Rules (EPA) 2015 in strengthening emission standards for new and existing plants
- But even with all existing policies, absolute growth in emissions (especially PM2.5), coupled with strong population growth, means the number of premature deaths linked to outdoor air pollution will still grow significantly.

What are the Suggestions of the report?

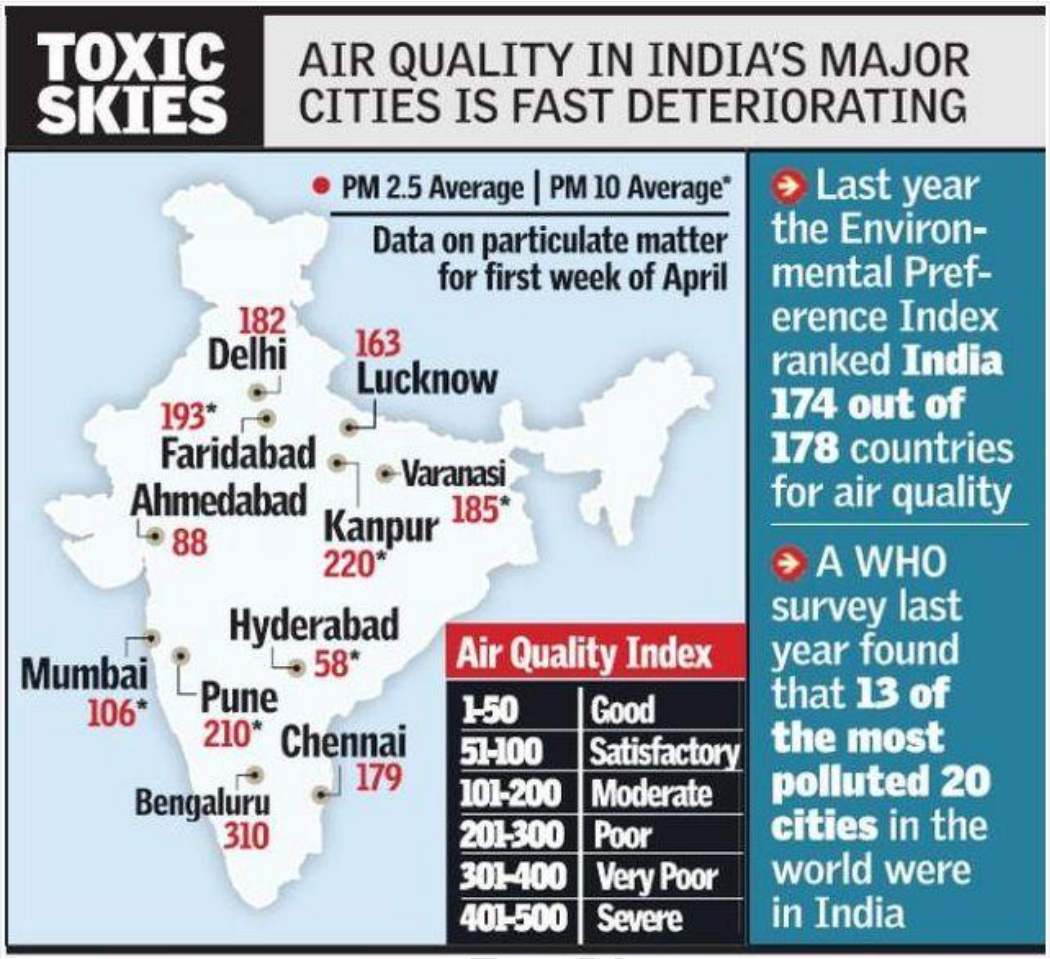
1. Set an ambitious long-term WHO-benchmarked air quality goal.
2. A clean air strategy for the energy sector by avoiding pollutant emissions, Innovate to reduce pollution abatement costs and reduce emissions.
3. It calls for effective monitoring, enforcement, evaluation and communication using reliable data

Air Pollution in India

- A new Report of International Energy Agency (IEA) has said that due to rising energy needs in India, air quality is bound to deteriorate further unless preventive steps are taken.
- A study shows that India has overtaken China's air pollution levels and that the average particulate matter exposure for Indians was even higher than that for Chinese.
- As per the latest analysis released by the Central Pollution Control Board (CPCB), in 2015, 41 Indian cities with a million-plus population faced bad air quality in nearly 60% of the total days monitored.

Situation of air quality in India

- Less than 1% of India's population lives in areas that meet WHO air quality guidelines. This could increase to almost 10 per cent by 2040, if stringent air pollution regulations are in place.
- India houses 1/6th of world's population but uses only 6% of
- Its energy. With energy use bound to rise pollutants like nitrates, sulphates and particulate matter is bound to increase.
- Without policy efforts, sulphates and particulates would roughly double by 2040 and nitrates would grow almost 2.5 times



What are Measures taken?

- By thenew power sector regulation, SO2 is likely to be restricted to around 10% relative to current situation.
- NOx emissions growth could be contained to 10 per cent in 2040 by new passenger car standards (BS VI).
- Further, efforts to promote access to clean cooking facilities (Solar cooker, PM Ujwala scheme) for poor households have to be continued to moderate PM2.5 rise to around 7 per cent.

Measures against vehicular pollution in India

- Odd-even policy- being practiced in Delhi.
- Increasing cost of diesel vehicles as proposed by Budget 2016-17.
- NGT's direction of banning entry of diesel vehicles older than 10 years.
- Ban on sale of heavy diesel private vehicles.
- Implementation of BS-VI announced by government.

Strong measures needed

- Need to put pressure on policymakers and the polluters by improving the functioning of Air Quality Index
- They must be mandated to provide full and regular information within a given time-frame.
- Better public transport system and urban planning
- New measures like Congestion charges, license quota system, registration capping, parking charges, staggered working hours etc. should also be considered.

What are the Challenges?

- Weak norms and implementation.
- Though control technologies for nitrates and sulphates are installed, they are often suboptimal or operate inefficiently.

Way forward

- Ambitious long-term WHO-benchmarked air quality goal should be set.
- A clean AIR strategy for the energy sector: Avoid pollutant emissions, Innovate to reduce pollution abatement costs and reduce emissions should be made.
- Effective monitoring, enforcement, evaluation and communication using reliable data. Data must be put in open format to enable multiple channels of dissemination including novels methods like mobile apps.
- Energy sector must work closely with a range of stakeholders to tackle air pollution successfully.
- An action plan when the quality for air is bad. In China, for instance drastic measures like shutting down of schools, limiting production from factories etc. are taken when air quality goes severely bad.

2) OZONE LAYER HEALING OVER ANTARCTICA

Why in news?

- Atmospheric scientists have seen signs of the fixing of the ozone hole above the Antarctic.
- The ozone hole has shrunk by more than four million Sq. kms since 2000 which is the year when ozone depletion was at its peak
- It is determined by the scientific world that the healing is a direct result of the curb on the release of chlorofluorocarbons following from the Montreal protocol of 1987.

Ozone Hole

- Ozone hole is a region of exceptionally depleted ozone in the stratosphere over the Antarctic that happens at the beginning of Southern Hemisphere spring (August–October).
- The thinning increasing the penetration of UV rays on the earth surface thereby increases the risks of its adverse impacts such as skin cancer.
- The Antarctic ozone hole is an area of the Antarctic stratosphere in which the recent ozone levels have dropped to as low as 33 percent of their pre-1975 values.

What are the Causes of ozone depletion?

- The presence of chlorine-containing source gases primarily CFCs and related halocarbons
- The ozone depletion can take place in the gas phase, but it is dramatically enhanced in the presence of polar stratospheric clouds (PSCs), these polar stratospheric clouds form during winter, in the extreme cold.
- The role of sunlight in ozone depletion is the reason why the Antarctic ozone depletion is greatest during spring. During winter, even though PSCs are at their most abundant, there is no light over the pole to drive chemical reactions.
- Most of the ozone depletion happens in the lower layers of Stratosphere and not in the upper layers.
- In recent times, natural processes such as El Nino and volcanic eruptions have slowed down the process of healing

What has caused the healing?

- The most dominating factor in the depletion of ozone layer is the release of Chlorine from CFCs molecules. The Montreal Protocol has led to reduction in the production and release of CFCs in the atmosphere.
- According to scientists, there are three stages in the ozone recovery process:
    1. Reduced rate of decline.
    2. Levelling off of the depletion.
    3. Ozone increase linked to reduction of the levels of CFC

    (Once the CFCs reduce to a certain level, the pace of recovery process will increase automatically)

What are the Significance?

- Reduction of UV radiations has tremendous health and environmental benefits.

- It points towards the success of global efforts towards environmental protection. The success of Montreal Protocol should encourage the international community to come together with higher dedication, optimism and vigour to fight other common problems.

Montreal Protocol

- International treaty designed to protect the environment against the impact of harmful substances
- Created in 1987 following the discovery of a large hole in the Earth's ozone layer over Antarctica
- Came into force in 1989 with the main aim of ending the use of chlorofluorocarbons (CFCs)
- CFCs replaced by hydro fluorocarbons (HFCs)
- Amendment proposed after scientists discovered that, while they pose no threat to the ozone layer, HFCs contribute to global warming by trapping heat radiating off the Earth
- The protocol has undergone a number of revisions since it was introduced and has been successful in eliminating more than 100 fluorinated gases

Kigali Agreement

- India joins the nations of the world in lauding the Hydroflurocarbon (HFC) Amendment to the Montreal Protocol, agreed to at the 28th Meeting of Parties at Kigali, Rwanda.
- India and some other developing countries — Iran, Iraq, Pakistan, and oil economies like Saudi Arabia and Kuwait — will cut down their HFCs by 85 per cent of their values in 2024-26 by the year 2047.- S

3) GANGA CLEANING

Why in News?

- 231 projects under clean Ganga mission have been inaugurated simultaneously at various locations across the states through which the river flows.

What are the efforts taken to clean the river?

Namami Gange

- The Namami Gange programme is an umbrella programme to ensure effective abatement of pollution and conservation of the river Ganga and all its tributaries.
- It focuses on pollution abatement interventions namely

1. Interception,
2. diversion and
3. treatment of waste water flowing through the open drains through bio-remediation

- Appropriate in-situ treatment use of innovative technologies sewage treatment plants (STPs) effluent treatment plant (ETPs)
- Rehabilitation and augmentation of existing STPs and immediate short term measures for arresting pollution at exit points on river front to prevent inflow of sewage etc.
- Aims to make more than 1600 panchayats on the banks of Ganga open defecation free.
- 8 biodiversity centres would be developed along the Ganga for restoration of identified priority species
- It focuses not merely on the main river but also on the tributaries (like Rāmgangā, Kali and Yamunaas a first priority).
- Funding fully to be taken up by centre.
- Use of technology like SMS based pollution level monitoring, coordination with ISRO's Bhuvan.

What is the structure of the committee?

- National level committee chaired by Cabinet secretary- assisted by NMCG (National mission for clean Ganga)
- State level committee chaired by chief secretary- assisted by SPMG (State program management group)

- District level committee chaired by District collector.
- Its implementation has been divided into -
  1. Entry-Level Activities (for immediatevisible impact)Construction and beautification of Ghats are included in this level
  2. Medium-Term Activities (to beimplemented within 5 years of timeframe)
  3. Long-Term Activities (to beimplemented within 10 years)

What are the main features?

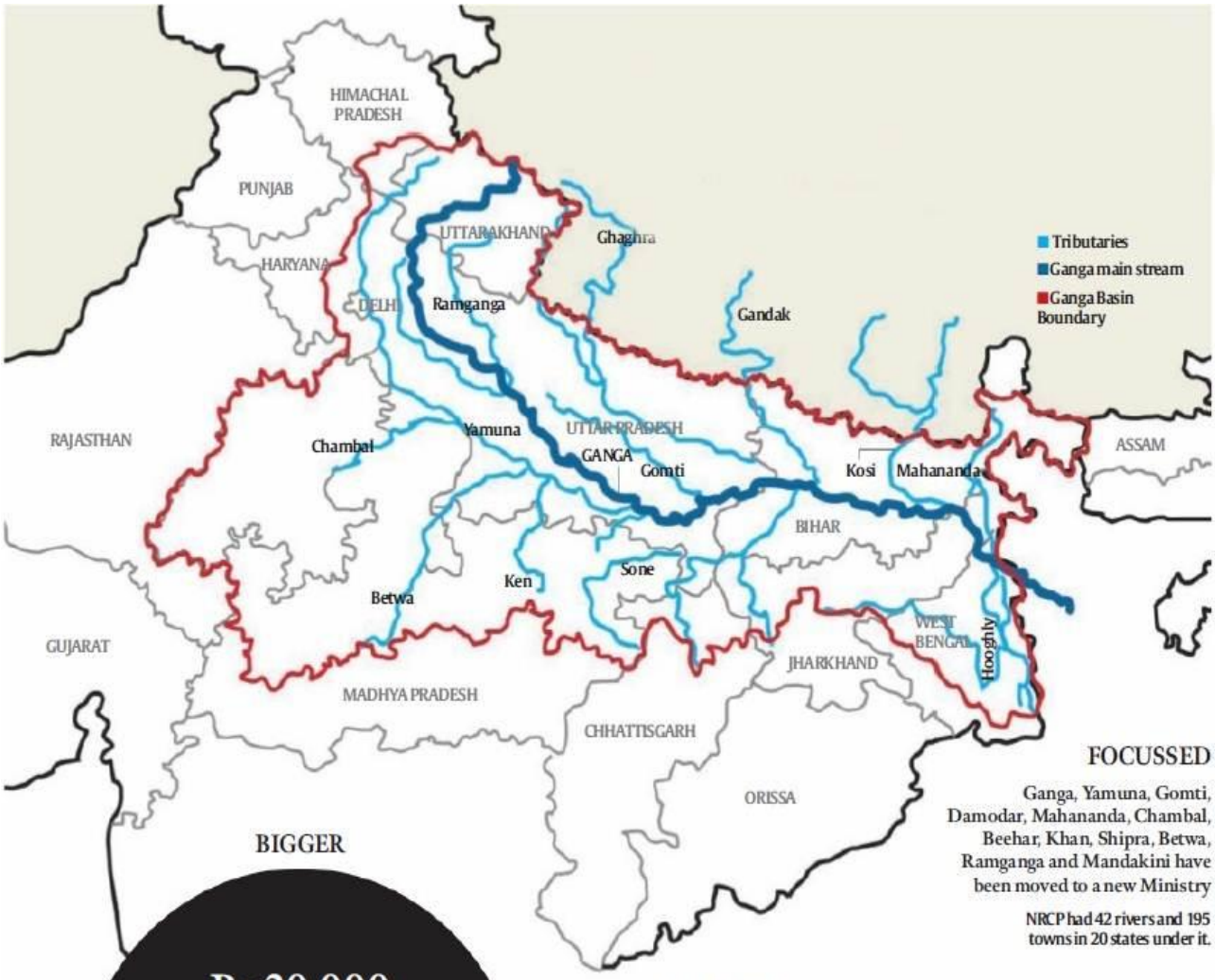
- NMCG will take action only in the event when required action is not taken by CPCB (central pollution control board).
- A special focus of the revamped structure would be to maintain required ecological flows in the river Ganga with the aim of ensuring water quality and environmentally sustainable development.
- For taking up fast track creation of sewerage treatment infrastructure in Ganga basin, an innovative model based on Hybrid Annuity has also been approved.
  In order to ensure transparency and cost effectiveness, a provision for concurrent audit, safety audits, research institutions and financial framework has been made.

Ganga Action Plan

- Ganga Action Plan (GAP) Phase-I launched in 1985.
- Later GAP Phase-II was initiated in 1993for improving ganga water quality
- In May, 2015, the Government approved the Namami Gange programme as to take up initiatives for rejuvenation of river Ganga and its tributaries as a Central Sector Scheme with hundred per cent funding.

NGRBA: National Ganga River Board Authority

- Established on 20 February 2009 under Section 3 of the Environment Protection Act, 1986.
- It declared the Ganga as the "National River" of India.
- The chair includes the Prime Minister of India and chief ministers of states through which the Ganga flows.
- The NGRBA has resolved that no untreated municipal sewage or industrial effluent will be discharged into river Ganga by year 2020.
- **Cabinet approves the River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016.**
- **Salient Features:** Order will provide for Creation of the National Council for River Ganga (Rejuvenation, Protection and Management), as an Authority for overall responsibility for superintendence of pollution prevention and rejuvenation of river Ganga Basin



FOCUSSED

Ganga, Yamuna, Gomti, Damodar, Mahananda, Chambal, Beehar, Khan, Shipra, Betwa, Ramganga and Mandakini have been moved to a new Ministry

NRCP had 42 rivers and 195 towns in 20 states under it.

BIGGER

Rs 20,000 crore

Budgeted for 5 years for Namami Gange. This is in addition to the Rs 2,037 cr outlay for 2014-15 announced in the Budget, and the Rs 100 cr for beautification and development of ghats in Kedarnath, Haridwar, Kanpur, Varanasi, Allahabad, Patna and Delhi

Rs 6,855.45 crore

Spent by Centre and states together (Rs 5,225.63 cr and Rs 1,629.82 cr respectively) in 30 years from 1985 to March 31, 2015 under Namami Gange's predecessors: Ganga Action Plan, River Action Plan, and National River Conservation Plan (NRCP)

CENTRALISED

NAMAMI GANGE IS **100%** CENTRALLY FUNDED

The intention is to "ramp up progress" of the Ganga clean-up mission, the government has said in a release

NRCP (including earlier avatars) started as 50-50 scheme (1985)

Became a 100% central scheme in 1997

Then, 70-30 Centre-states (for new projects) in 2001

4)KENDRAPADA SHEEP

- It was conferred '**rare and singular species'** tag by the Union government.
- A threatened breed of sheep **found only** in coastal Jagatsinghpur and Kendrapara districts of **Odisha.**
- It is also known as **'Kuji Mendha'.**
- Kendrapada sheep are primarily used for production of mutton. The other product of economic importance is their skin.
- However, unchecked rearing could lead to adverse impact. Thus, sheep farmers need to be sensitized on their commercial viability.
- The new status will give a boost towards their conservation efforts.

5) KERALA BIRD ATLAS PROJECT

- Kerala Bird Atlas is an ambitious citizen science project, to map the distribution and abundance of birds of an entire Indian state.
- This is the first time in India that birds in an entire state are being mapped. (Only similar effort was made in Mysore few years back.)
- The programme is being coordinated by the Hume Centre for Ecology and Wildlife Biology, a conservation organization in the district, in association with the Bird Count India and e-bird.
- Kerala has the distinction of having six bird monitoring schemes, which includes recording common birds,
- The project has begun in Wayanad district.

6) OIL DEGRADING BACTERIA TO UNDERGO FIELD TRAILS

Why in news?

- The Malabar Botanical Garden and Institute of Plant Sciences, Kozhikode, has joined hands with Bharat Petroleum Corporation Limited (BPCL) for field trials to establish the oil-degrading properties of three new strains of bacteria.
- The key hydrocarbon-degrading enzyme produced by the bacteria has been isolated and purified and laboratory tests have been successful.
- This active enzyme (***Catechol 2, 3- dioxygenase***) produced from three new strains of oil-degrading bacteria (two species of *Burkholderia* and one species of *Pseudomonas*) is going to be used in pilot plant in Kochi.

What is Bioremediation?

- It means the use of microorganisms to degrade environmental pollutants.

Advantages of Bioremediation

- Less expensive
- Employed in areas that are inaccessible without excavation
- Clean up petroleum pollutants from the environment conserving aquatic wildlife without negatively affecting bio-diversity.

Bioremediation related technologies

- **Bioventing** - an in situ remediation technology that uses microorganisms to biodegrade organic constituents in the groundwater system.
- **Bioleaching** - extraction of metals from their ores through the use of living organisms instead of using harmful chemical substances such as cyanide etc.,
- **Land farming** - ex-situ waste treatment process that is performed in the upper soil zone Contaminated soils, sediments, or sludge are transported to the Landfarming site,and periodically turned over (tilled) to aerate the mixture
- **Composting** - Aerobic bacteria and fungi decompose the organic matter into compost used as fertilizer.
- **Bio-augmentation** - the addition of bacterial cultures required to speed up the rate of degradation of a contaminant.
- **Bio-stimulation** - modification of the environment to stimulate existing bacteria capable of bioremediation.

7) REPORT ON ANIMAL AND PLANT DISCOVERIES 2015

Why in news?

The report is released by the Ministry of Environment and Forest with the help of the studies of scientists and experts of Botanical Survey of India (BSI) and Zoological Survey of India (ZSI).

What are the notable Findings of the report?

- India's biodiversity has improved with 445 new species been added to the list in 2015.
- The most discoveries were made in the Eastern Himalaya region, which accounts for 19% of the total discoveries followed by the Western Ghats (18%) and Andaman and Nicobar Islands (15%).

Notable Additions

Animals

- Rock gecko (Hemidactylus yajurvedi) found in Kanker Chhattishgarh
- New frog species (Fejervarya gomantaki) from the Western Ghats
- A shiny new species of fish (Barilius ardens), from the Western Ghats

Plants

- A new species of ginger Zingiber bipinianum in the South Garo hills of Meghalaya
- A species of mushroom (Bondarzewia zonata) collected from north Sikkim at an altitude of 2,829 m.

> ***About BSI and ZSI***
>
> - The Botanical Survey of India is an institution set up by the government of India in 1890 with the objective of identifying the plant resources of this country.
> - The Zoological Survey of India was established in 1916 to survey explore and research the fauna.
> - The Headquarters of both the institutions are situated at Kolkata with many regional centres.

8)SICK BUILDING SYNDROME (SBS)

- In recent years the health problems due to indoor pollution is increasing, a syndrome called Sick Building Syndrome (SBS)
- The quality of air in and around buildings is seriously affected by gases (like CO2, CO, radon, volatile organic compounds), particulates, microbial contaminants or any mass or energy stressor that can induce adverse health conditions.
- A big problem is absence of an effective air quality measurement system.

9) GREEN HIGHWAYS POLICY

Why in news?

The government recently launched the initial plantation drive on 1,500 km of National Highways at a cost of about Rs 300 crore under the National Green Highways Mission.

What is it?

- The Union government had last year launched Green Highways (Plantation, Transplantation, Beautification and Maintenance) Policy 2015.

- The policy aims to take care of the ecological needs, help the environment and local communities, and generate employment by planting trees along all the highways in the country.

What are the Key features?

- Financing: 1% of the total project cost (TPC) of National Highways will be kept aside in a Green Highways Fundto be used for plantation and its maintenance.
- Strict auditing: Release of money to the empanelled agencies only if they have achieved a survival rate of 90% in the previous year.
- The implementation and progress of plantation will be monitored via images by ISROand audit will involve modern IT tools
- Contracts will be given to NGOs, private cos. and govt. organisations with proven track record.

What are the benefits?

- The community involvement in tree plantation directly benefits local people by generating employment. Government plans to link it to MNREGA as well.
- The trees can reduce the impact of air pollution, dust as well as noise pollution due to their quality of acting as a natural sink
- It will help in arresting soil erosion at the embankment slopes
- Plants along highway median strips and along the edges reduce the glare of oncoming vehicles that can sometimes cause accidents.

10) GREEN CORRIDOR PROJECT

Why in news?

Recently eight states have proposed to issue tenders worth Rs 5,000 crore for the projects.

What is green corridor project?

- A project for evacuation of renewable energy from generation points to the load centres by creating intra-state and inter-state transmission infrastructure.
- The intra-state transmission component of the project is being implemented by the respective states and the Power Grid Corporation of India (PGCIL) is implementing inter-state component.
- It is being implemented in two parts

1. Power Grid is setting up the first corridor connecting states rich in renewable energy.
2. A second corridor would connect the solar parks in Andhra Pradesh, Madhya Pradesh, Karnataka, Rajasthan and Gujarat.

- The present renewable capacity of the country is 40,000 MW. The Grid can handle 30,000 MW. An additional system for 10,000 MW would be issued by September of this year.

How it is funded?

- It is a Rs. 40,000 crore transmission network project. The intra-state projects are worth Rs 11,000 crore.
- German bank KFW and the National Clean Energy Fund will pick up 40% of the tab each and the rest 20 per cent will be with the respective states.
- These projects will be awarded through transparent bidding to speed up transmission for upcoming solar parks.

What are its Significance?

- Distribution network is one of the weakest links in India's power infrastructure. This is a step towards mending that.
- This is a step towards realizing India's target of achieving 175 GW energy from renewable sources.
- The problem of voltage fluctuation in integrating conventional grids with renewable energy grids would be taken care of by the German technology and support.

AUGUST 2017

1) FLOOD MANAGEMENT

Why in news?

Uttar Pradesh, Bihar and Madhya Pradesh were devastated by floods in August, this year. The main reasons were heavy rainfall in Himalayan foothill region, while U.P and Bihar at the times of floods had under normal rainfall recorded.

What is Flood?

Flood is a state of higher water level along a river channel or on coast leading to inundation of land that is not normally submerge. Flood therefore is a natural disaster which causes considerable damage to the crops, livestock and human life.

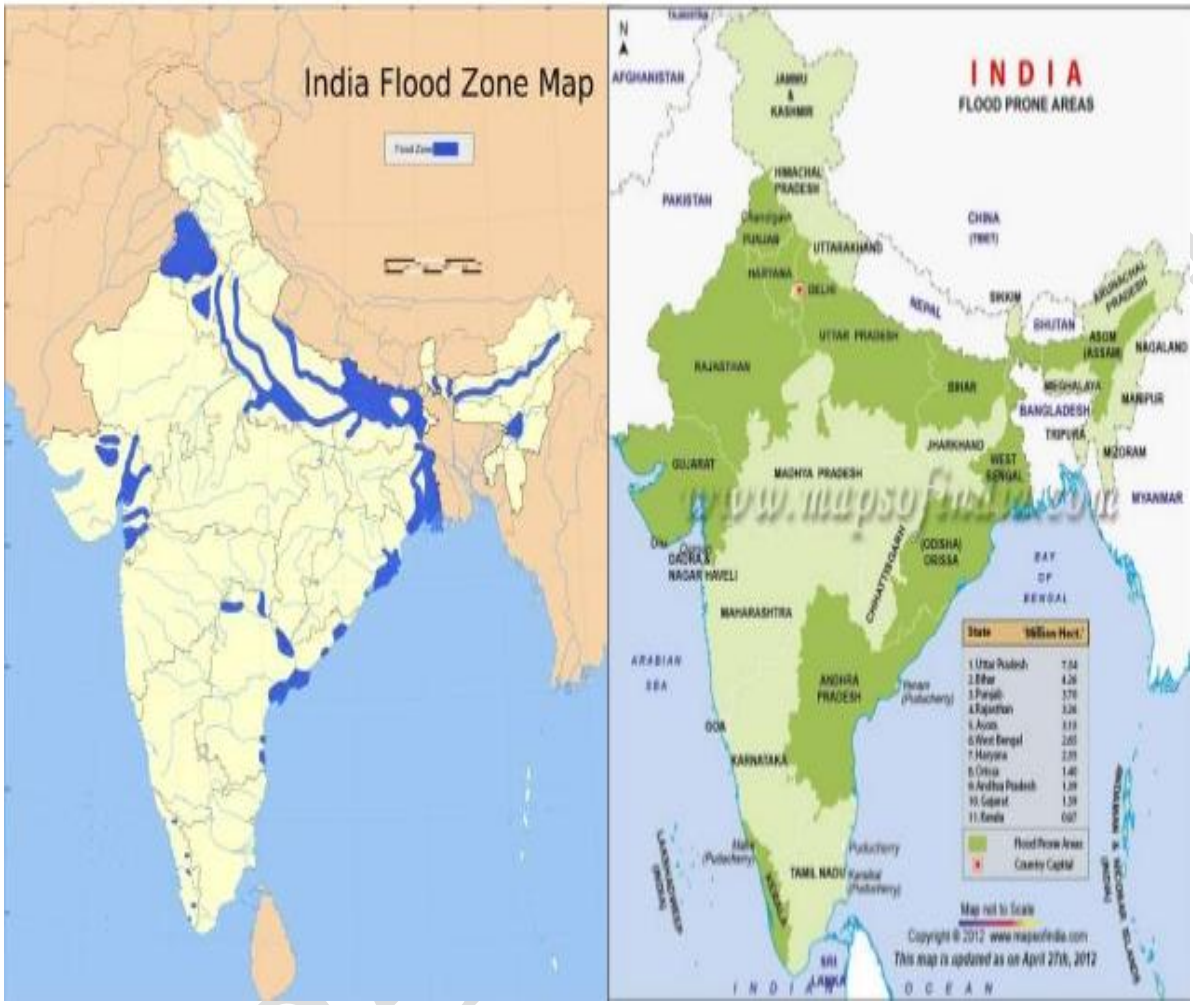
Causes of contemporary floods

- The rivers bring heavy sediment load from catchments.
- These, coupled with inadequate carrying capacity of rivers are responsible for causing floods.
- Drainage congestion and Erosion of river-banks.
- Obstruction of free-flow in rivers: Silting in deltaic areas
- About 75% of the annual rainfall in India is concentrated in 3-4 months of the monsoon season.
- As a result there is very heavy discharge from rivers during the period causing widespread floods.
- Cyclones and Cyclonic circulations and cloud bursts cause flash floods and lead to huge losses.
- Storm Surges and Coastal Inundation.
- Meandering tendency of rivers
- Urban Flooding: In the cities and the towns is a recent phenomenon caused by increasing incidence of heavy rainfall in a short period of time, indiscriminate encroachment of waterways, inadequate capacity of drains and lack of maintenance of the drainage infrastructure. For ex: Chennai floods.

What is the Institutional Framework for flood management?

- As per the constitutional provisions, flood management is a state subject.
- The central government has taken various initiatives: enactment of the National Disaster Management Act, December 2005 and setting up of the NDMA.
- The National Executive Committee (NEC) with the Secretary of GOI of the ministry; and State Executive Committees (SECs) will cover the disaster aspect of flood management.
- FMPS Flood management Plans: The central ministries and departments concerned and the state governments will prepare their FMPs which will be holistic, participatory, inclusive, eco-friendly and gender-sensitive in nature and the implementation of which will result in a flood- resilient India. The plans will focus on the community and the collective efforts of the government and NGOs.

Flood prone zones , areas in INDIA



FLOOD MANAGEMENT

I. Minimizing flood risk

- Phase-I: These activities include identification and marking of flood prone areas on maps, preparation of close contour and flood vulnerability maps by the Central Water Commission (CWC)/ Ganga Flood Control Commission (GFCC)/Brahmaputra Board,
- Phase-II: These include implementation of the schemes for expansion and modernisation of the flood forecasting and warning network, execution of flood protection and drainage improvement schemes, The efforts of the CWC, IMD, NRSA and the state governments will be integrated
- Phase-III: Implementation of activities, which include construction of dams and catchment area treatment (CAT) works in India as well as neighbouring countries.

II. Hard management techniques

- Dams: used to trap and store water, which can be released later.
- Embankments or Artificial levees: these are raised banks which makes the river's cross section larger and so it can hold more water. They can be expensive but are effective. In the US they are called levees, somewhere breached
- during Hurricane Katrina and flooded large amounts of adjacent land

- Flood walls/ River defences/ Coastal defences are built around settlements to protect them from floods. They look artificial and are expensive but are effective.
- Storage areas: Where water can be pumped out of the river and stored in temporary lakes. It can then be pumped back later.
- Dredging the river basins
- Inter-basin transfers

III. Soft management techniques

- Washlands: are sections of the flood plain which are allowed to flood, therefore they are usually left as sports fields and nature parks.
- Land use zoning/ flood plain zoning: is designed to prevent development in areas most prone to flooding and developments is only allowed in 'safe' areas.
- Afforestation: The planting of trees in a river's catchment to increase interception, reduces soil runoff and also the uptake of water through the soil.
- Warning systems: issued by flood protection agencies toenable people to react to the danger.

IV. Capacity Development and Response

- Flood Education
- Emergency search and Rescue
- Emergency relief

Way forward

- More consultative decision-making process in operations of large and medium dams that have an impact across state boundaries. This is important, the floods in Bihar can be attributed to release of waters from Bansagar dam, MP.
- A nation-wide Silt Management Policy. This can prevent the future floods of those types which took place in Bihar.

National Disaster Management Authority guidelines:

- Shifting the focus to preparedness by implementing FMPs.
- Ensuring regular monitoring of the effectiveness and sustainability of various structures and taking appropriate measures for their restoration and strengthening.
- Continuous modernization of flood forecasting, early warning and decision support systems.
- Ensuring the incorporation of flood resistant features in the design and construction of new structures in the flood prone areas.
- Drawing up time-bound plans for the flood proofing of strategic and public utility structures in flood prone areas.
- Improving the awareness and preparedness of all stakeholders in the flood prone areas.
- Introducing appropriate capacity development interventions for effective FM (including education, training, capacity building, research and development, and documentation.)
- Improving the compliance regime through appropriate mechanisms.
- Strengthening the emergency response capabilities.

2)ECOLOGICAL EXPERIMENTAL ZONES

Why in news?

China will set up several national ecological experimental zones to carry out reforms in the “ecological civilization” in a bid to improve the environment damaged by fast-paced development in the past three decades.

Ecological civilization

- It is a term that describes the final goal of environmental reform within a given society.
- It implies that the changes required in response to global climate disruption are so extensive as to represent another form of human civilization, one based on ecological principles.
- Broadly construed, ecological civilization involves a synthesis of economic, educational, political, agricultural, and other societal reforms toward sustainability.
- Although the term was first coined in the 1980s, it did not see widespread use until 2007, when "ecological civilization" became an explicit goal of the Communist Party of China (CPC).
- In April 2014, the United Nations Alliance of Civilizations and the International Ecological Safety Collaborative Organization founded a sub-committee on ecological civilization.
- Ecological civilization emphasizes the importance of a long-term perspective on the current climate crisis, the need for major environmental reforms, and the need to reimagine the nature of society after these reforms.

What is the aim of the initiative?

- The aim is to incorporate certain ecological friendly practices in these zones which are also aligned with the development needs.
- Consequently, these zones can be projected as 'ecological civilizations'
- The best practices will be replicated all across the country.
- Major progress to be achieved by 2017 and full-fledged systems to be established by 2020.
- Targets were set in the plan, including the water quality of over 90 per cent of water systems in the province will reach optimal level, 23 cities will enjoy good air quality on over 90 per cent of days, and forest coverage will pass 66 per cent by 2020.

How it is implemented?

- Establishing a property rights system of natural resource assets as well as systems that reflect market values of ecological products, thereby introducing economic incentives into ecological protection.
- Optimising land and space planning by explicitly reserving land and space for ecological protection, and never overstepping the 'red line'.
- Improving officials' performance evaluation to reflect their 'ecological performance' such as resource depletion or environmental degradation on their watch.
- Compiling natural resource balance sheet and natural resource asset auditing.

What is the Significance?

- The strategy is something which the world especially developing countries like India would look forward to and to replicate the efficient policies.
- Its success can be a boon to the world environment as China is the biggest polluter in the world

3) STEPS TAKEN FOR PROTECTION OF ENDANGERED SPECIES:

Why in news?

- In a written reply to a question in Lok Sabha on steps taken for protection of endangered species, this information was given by Minister of Environment, Forest and Climate Change.

What are the details?

- Legal protection: has been provided to wild animals against hunting and commercial exploitation under the provisions of the Wild Life (Protection) Act, 1972. (For ex: Schedule 1 animals etc.,)

- The Wild Life (Protection) Act, 1972 has been amendedand made more stringent. The punishment for offences under the Act has been enhanced. The Act also provides for forfeiture of any equipment, vehicle or weapon that is used for committing wildlife offence(s).
- Protected Areas:
    - National Parks.
    - Sanctuaries.
    - Conservation Reserves and Community Reserves.
    - Covering important wildlife habitats have been created all over the country under the provisions of the Wild Life (Protection) Act, 1972 to conserve wild animals and their habitats.
- Financial and technical assistance by centre under:
    1. 'Integrated Development of Wildlife Habitats' -- Recovery programs for sixteen species have been prioritized for taking up such recovery programs which include:
    2. Mammals: Snow Leopard, Bustards (including Florican), Hangul, Nilgiri Tahr, , Asian Wild Buffalo, Manipur Brow-antlered, Malabar civet, the great one-horned rhinoceros, Asiatic Lion, Swamp deer
    3. Aquatic: River Dolphin, Marine Turtles, Dugongs and coral reefs,
    4. Birds: Edible-nest Swiftlets, Nicobar Megapode, Vultures, and Jerdon'sCourser.
- 'Project Tiger' and 'Project Elephant' for providing better protection to wildlife, and improvement of its habitat.

The Wildlife Protection Act, 1972

- It is an Act of the Parliament of India enacted for protection of plants and animal species.
- Before 1972, India only had five designated national parks.
- Among other reforms, the Act established schedules of protected plant and animal species; hunting or harvesting these species was largely outlawed.
- The Act provides for the protection of wild animals, birds and plants; and for matters connected therewith or ancillary or incidental thereto.
- It extends to the whole of India, except the State of Jammu and Kashmir which has its own wildlife act.
- It has six schedules which give varying degrees of protection.

1. Schedule I and part II of Schedule II provide absolute protection - offences under these are prescribed the highest penalties.
2. Species listed in Schedule III and Schedule IV are also protected, but the penalties are much lower.
3. Schedule V includes the animals which may be hunted.
4. Schedule VI the plants are prohibited from cultivation and planting.
    - The hunting to the Enforcement authorities have the power to compound offences under this Schedule (i.e. they impose fines on the offenders). Up to April 2010 there have been 16 convictions under this act relating to the death of tigers.

Definitions under the Act (Section 2)

Animal

- Includes amphibians, birds, mammals, and reptiles, and their young ones, and also includes, in the cases of birds and reptiles, their eggs.
- "Animal article" means an article made from any captive or wild animal, other than vermin, and includes an article or object in which the whole or any part of such animal has been used and an article made therefrom.

Hunting

- It includescapturing, killing, poisoning, snaring, or trapping any wild animal, and every attempt to do so
- Driving any wild animal for any of the purposes specified in sub clause
- Injuring, destroying or taking any body part of any such animal, or in the case of wild birds or reptiles, disturbing or damaging the eggs or nests of such birds or reptiles.

Taxidermy
It means the curing, preparation or preservation of trophies.
Trophy
- It means the whole or any part of any captive or wild animal (other than vermin) which has been kept or preserved by any means, whether artificial or natural.
- This includes:
  (a) Rugs, skins, and specimens of such animals mounted in whole or in part through a process of taxidermy
  (b) Antler, horn, rhinoceros horn, feather, nail, tooth, musk, eggs, and nests.

Uncured trophy
- It means the whole or any part of any captive animal (other than vermin) which has not undergone a process of taxidermy.
- This includes a freshly killed wild animal, ambergris, musk and other animal products.

Vermin
- It means any wild animal specified in Schedule V.

Wildlife
- includes any animal, bees, butterflies, crustacean, fish and moths; and aquatic or land vegetation which forms part of any habitat

4)ENVIRONMENT AWARENESS ACTIVITIES BY MOEF

Swacchta Pakhwada Campaign

- It is a part of the Government's effort to accelerate efforts to achieve total sanitization and cleanliness by October 2, 2019 under Swacchh Bharat Mission.
- The Corporate Affairs Ministry observed Swachhta Pakhwada and asked firms and other stakeholders to carry out activities related to cleanliness for a fortnight.
- Similarly, the Ministry of Environment, Forest and Climate Change organised the Swacchh Bharat Pakhwada earlier this month.
- It is totally voluntary and aims at creating awareness, targeting programmes, inviting pledges, spending of CSR etc.

Eco-Clubs

- The Eco-Clubs established under the National Green Corps programme of the Ministry carried out various activities relating to Swacchhta such as Safai Abhiyan at nearby commercial areas and cleaning of public wells, ponds and rivers of the locality.
- Other activities like tree plantation drive/greening neighbourhood, nukkad 'nataks'were performed;
- Volunteers took pledges on related themes; organised rallies and poster and slogan competitions on related themes.

National Green Corps Programme

- National Green Corpsis a major initiative of MoEF for creating environmental awareness.
- It was launched in 2001-02 and aims at building cadres of young children working towards environmental conservation and sustainable development.
- It is operated through Eco-clubswhich are set up in schools and registered as members of NGC.
- This programme exposes school children to in-depth field experiences, and provides opportunities to convert their ideas into creative action.
- The programme has a cascading effect as it seeks to redirect the consciousness of students towards environment friendly attitudes and actions and goes beyond schools, promoting school-society interactions to sensitize the society.

Rashtriya Garima Abhiyaan :

It is a national campaign to Eradicate the practice of manual scavenging and rehabilitate the manual scavengers

5)UDAIPUR DECLARATION

A meeting of BRICS ministers on Disaster Management was held in Udaipur, Rajasthan.

- It ended with the adoption of Udaipur Declaration-
- It laid bare the common thread of challenges on disaster issues faced by all the BRICS nations.
- These were:
  1. mainstreaming of disaster risk reduction,
  2. use of advanced technology in providing early warning
  3. need for adequate funding to deal with rehabilitation and reconstruction after a disaster
  4. the impact of climate change on disasters

6) PORTABLE KIT FOR CHROMIUM CONTAMINATION

- Bhabha Atomic Research Centre (BARC) has developed a portable kit to check chromium contamination in water.
- As per Indian standard IS10500 for drinking water, the maximum permissible concentration of Cr(VI) in drinking water is 50 microgram per liter
- Chromium is widely used in various industries like leather, steel, chrome plating, paint manufacturing, wood preservation etc.
- Hexavalent Chromium Cr(VI) is toxic and the World Health Organization has classified it as carcinogenic and can cause stomach ulcers and cancers and severe damage to kidneys and liver

7) DISASTER RISK INDEX OF THE WORLD:

Why in news?

- The report is released by the United Nations University Institute for Environment and Human Security (UNU-EHS) and Bundnis Entwicklung Hilft in cooperation with the University of Stuttgart in Germany.
- India ranked 77th position
- Ranking No.1, the island state of Vanuatu displayed the greatest risk in 2016.

What are the details of the report?

1. Risk: Inadequate infrastructure and weak logistic chains substantially increase the risk that an extreme natural event will become a disaster.
2. Response: Challenges mostly lie in the 'last mile' of the logistics chain: organizing transportation despite destroyed streets or bridges and ensuring fair distribution when there is a shortage of (for example) water, food, and shelter.
3. Relief: Crumbling transport routes, unreliable electricity grids, and dilapidated buildings not only hinder humanitarian aid from overseas, but also delay crucial aid.

8) EASTERN HIMALAYAN SYNTAXIS IS MOVING NORTHWARDS:

- Optically Stimulated Luminescence (OSL) thermo-chronometry is a new technique being used to study the northward movement of the Himalayan syntaxis (convergence of mountain ranges, or geological folds), a gorge along the Parlung river in Tibet.

- The eastern Himalayan syntaxis is an ideal location to study the effects of erosion on tectonics — very tall mountains over 7,000 metres high and powerful rivers.
- Making a study about the movement of this Himalayan syntaxis will give a wide picture about the topography and landforms.

9) COUNTRY'S FIRST TIGER REPOSITORY

- Country's first repository on tigers, under the new Tiger Cell of Wildlife Institute of India (WII)
- Working with the National Tiger Conservation Authority (NTCA) on tiger conservation and population estimation, the WII has generated a huge database of more than 23,000 images of tigers to be maintained by the tiger cell
- The repository will help in identification of possible source of tiger skin if caught at any place, studying projects before clearances
- The Tiger Cell will assist in population assessment of tigers, law enforcement, wildlife forensics, infrastructure development, smart patrolling and advisory role in policy formulation

10) GREENLAND SHARK

- Scientists have estimated that Greenland shark is the Earth's oldest living animal with a backbone
- For the age estimates, a complex and indirect system combining chemical tracking, mathematical modelling and growth measurements focusing on the shark eye lens was used
- The shark eye lens form while the shark is still developing inside the mother's uterus and measures of carbon in them won't change after birth
- As per the estimates, the female gray shark or the Greenland shark, was born in the icy waters roughly between 272 to 400 years ago, and died only recently
- Until now, that record holder was a bowhead whale that hit 211 years old.

11) DEFORESTATIONAND SUMMER RAIN IN GANGA BASIN, NORTH-EAST

Why in news?

Using satellite data and regional climate models, IIT Bombay researchers have found that deforestation (converting woody savanna to crop land) in north-east India and north-central India has led to a 100-200 mm reduction in summer monsoon rainfall in these two regions.

What are the Observations?

- During the initial phase of a monsoon, oceanic sources play a major role in bringing rain and charging the soil with moisture.
- But at the end of the monsoon period, evotranspiration from vegetation contributes to rainfall. Evotranspiration is a local moisture source for rainfall. Recycled precipitation contributes to 20-25 per cent of the total monsoon rainfall during the end of the monsoon and is very prominent in the Ganga Basin and north-east India.
- Because of deforestation, there is 1-2 mm reduction per day in rainfall during the end of the monsoon in the Ganga Basin and north-east India.
- So Land use and Land-cover changes has to be regulated.

12) DEADLY DISEASES CAUSED BY AIR POLLUTION

- According to WHO 1/8th of the deaths in the world are caused by air pollution
- The major diseases caused by the air pollution are as follows:
    1. Ischemic heart disease
    2. Stroke
    3. Chronic obstructive lung disease
    4. Lung cancer
    5. Acquit respiratory tract among children

12) GLOBAL GREEN AWARD

Why in news?

The steering committee of the International Union for Conservation of Nature and Natural Resources (IUCN) informed Dr. Dhrubajyoti Ghosh, the first Indian environmental activist to receive the Luc Hoffman award.

Details of the awardee?

- He mapped the area of East Kolkata wetland which is a swathe of water bodies spanning over 100 sq. km.
- This is fast shrinking due to illegal filling of fishponds.
- He innovatively calculated the economic value of its loss and presented it in Net Present Value which could be easily used in GDP and other mathematical calculations.
- For this he was presented Luc Hoffman award.
- He also studied about what happens to the city sewage, after it reaches wetlands.

THE EAST CALCUTTA WETLANDS

- It is known as the East Kolkata Wetlands are a complex of natural and human-made wetlands lying east of the city of Calcutta
- The wetlands cover 125 square kilometers, and include salt marshes and salt meadows, as well as sewage farms and settling ponds.
- The wetlands are used to treat Kolkata's sewage, and the nutrients contained in the waste water sustain fish farms and agriculture.
- The East Kolkata Wetlands host the largest sewage fed aquaculture in the world
- The East Calcutta Wetlands were designated a "wetland of international importance" under the Ramsar Convention on August 19, 2002.

Flora

- There are about 100 plant species, which have been recorded in and around the East Calcutta Wetlands.
- Several kinds of water hyacinths grow across these wetlands.
- Local farmers and fisher folk use water hyacinth to create a buffer between land and water to minimize erosion.
- The area is also home to large numbers of coconut and betel nut trees.
- Many varieties of vegetables are farmed here, including cauliflower, eggplant, pumpkin, sunflower and sacred basil. Tracts of land are dedicated to paddy cultivation as well.

Fauna:

- Numerous species of fish are farmed in the sewage fed ponds called bheris in the East Kolkata wetlands.
- The area is also home to marsh mongoose and small Indian mongoose.
- Palm Civet and Small Indian Civet are significant in and around East Calcutta Wetlands.
- Approximately 20 mammals are reported from this region.
- It is the Type locality of a mammalian species, called Salt Lake Marsh Mongoose.
- Over 40 species of birds can be spotted at the wetlands.
- The process of urbanization however, is leading to the disappearance of many bird species from the area

Sewage treatment

- Kolkata is an example of how natural wetlands are sometimes being utilized in developing countries.
- Using the purification capacity of wetlands, the Indian city of Kolkata (Calcutta) has pioneered a system of sewage disposal.
- Built to house one million people,

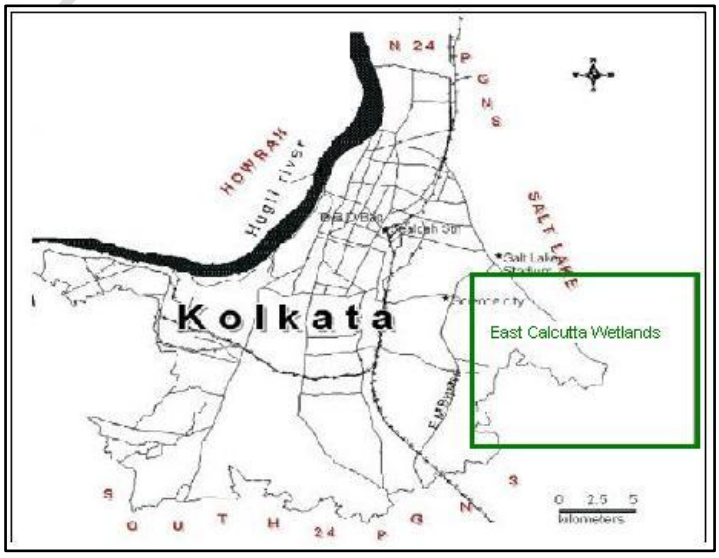
- Kolkata is now home to over 10 million, many living in slums.
- But the 8,000-hectare
- East Kolkata Wetlands Ramsar Site, a patchwork of tree-fringed canals, vegetable plots, rice paddies and fish ponds and the 20,000 people that work in them daily
- It transform one-third of the city's sewage and most of its domestic refuse into a rich harvest of fish and fresh vegetables.
- Through a series of natural treatment processes including the use of Eichhornia crassipes and other plants for absorbing oil, grease and heavy metals the Cooperative has turned the area into a thriving fish farm and nature park. In 2005/06, the Cooperative00 and shared income of more than US$55,000 among its members. The sold fish worth is over US$135,0

Controversy

- Recently illegal landfills are on the rise and the wetlands are being slowly assimilated in the stream city.
- This unprecedented land development and urbanization are creating concerns about the impact on the environment.
- This is because the wetlands serve as a natural sponge absorbing excess rainfall and doing its bit to reduce pollution.
- Wetlands are under threat due to exponential expansion of real-estate projects in eastern Kolkata especially in the Salt Lake and Rajarhat sectors.

Microbial Biodiversity

- Microbial Diversity is an integral part of biodiversity which includes bacteria, archaea, fungi, algae, protozoa and protists
- East Kolkata Wetland shows an immense diversity of flora and fauna both at the macro and micro level.
- Microbial richness of a region is its unseen asset that needs to be explored and conserved.
- Soil samples collected from ECW shows the presence of various new strains of microbes which are not only ecologically important but also have commercial value
- These include Actinobacteria which are responsible for the degradation of nitro phenol, nitro aromatic compounds, pesticides and herbicides;
- Proteobacteria related to the bioremediation of heavy metals, degradation and recycling of woody tissues of plants, oil contaminated soil and toxic compounds and nitrogen fixation along with the cyanobacters;
- Other bacteria playing important roles in metal accumulation, oil degradation, antimicrobial compound production, enzyme production etc.



SEPTEMBER 2016

1)OCEAN WARMING AND ITS EFFECTS

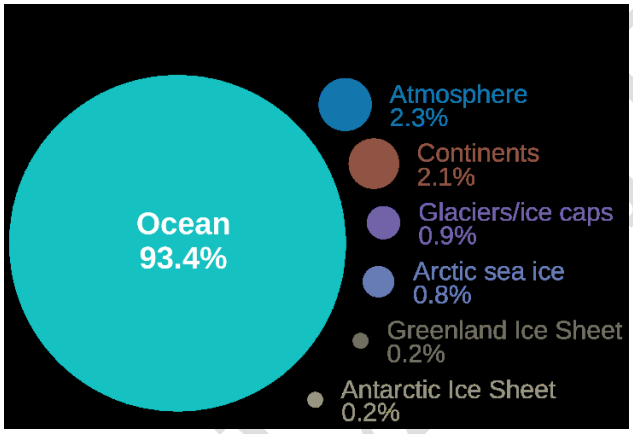
Why in news?

Recently a research report "Explaining ocean warming: causes, scale, effects and consequences"released by the International Union for Conservation of Nature (IUCN) – has shown the effects of ocean warming.

What are the Observations and Concerns?

Oceans Impacted

- World's waters have absorbed more than 93 per cent of the enhanced heating from climate change since the 1970s, curbing the heat felt on land but drastically altering the rhythm of life in the ocean.
- Ocean has been shielding us and the consequences of global warming.

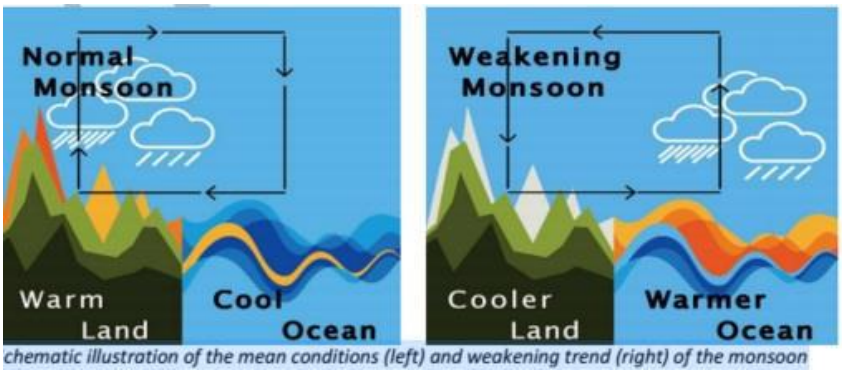


Food security

- Food security of India and several other major key food producing countries are threatened by changing weather patterns due to warming of the oceans, which may well be the "greatest" hidden challenge for the present generation
- Rainfall patterns affected: already been changes to precipitation patterns in a number of areas of the planet resulting from large-scale atmospheric tele-connections with ocean warming
- Increased rainfall in some mid-latitude and monsoon areas and decrease over various sub-tropical regions.

How yield is impacted?

- Correlations between wheat and maize yields with the NAO (North Atlantic Oscillation) and PDO (Pacific Decadal Oscillation), so changes in these ocean-focused atmospheric patterns have direct implications on food production.
- Similarly *ceteris paribus*, increasing temperatures tend to reduce rice, pulses and maize yields.
- Global warming is making the spread of diseases among animals and humans. This is threatening food security across the planet



chematic illustration of the mean conditions (left) and weakening trend (right) of the monsoon

What are the Impacts on eco-system?

- Changes in the ocean are happening between 1.5 and 5 times faster than those on land. Such range shifts are potentially irreversible
- Climate change is altering the hibernation periods of animals, disturbing their breeding patterns and metabolism
- Large-scale climatic anomalies affecting marine predator foraging behaviour and demography
- Proliferation of East Antarctic Adélie penguins in response to historical deglaciation

What are the effects on Fisheries?

- At sea, warming temperatures will cause changes to the abundance and range of marine species used for food.
- Huge implications for the billion people who depend on fish for their principal source of protein and Fishing and aquaculture industries linked to this harvesting
- Along with ocean warming, we also have increasing atmospheric temperatures.
- According to NASA's records, July month was the hottest month ever on the planet since we started taking records back in 1880. But now NASA has updated 'the record warm to August'. This continued a streak of 11 consecutive months dating back to October 2015.
- Generally, the seasonal temperature cycle typically peaks in July, but unusually August 2016 wound up tied with July 2016 for the warmest month ever recorded.
- Around 12% of the ice sheet was found to be melting almost one month earlier than the previous top three dates for when more than 10% of the ice had begun to melt.
- The average summer temperature was 8.2 degrees Celsius (46.8 degrees Fahrenheit) in Tasiilaq on Greenland's southeast coast, the highest since records began in 1895.
- The Greenland ice sheet, a potentially massive contributor to rising sea levels, lost mass twice as fast between 2003 and 2010 as during the entire 20th century, researchers said in December.
- According to study by University of Washington**:** This year, Arctic sea-ice has reached the second lowest extent ever recorded by satellites.
- A yacht of the Polar Ocean Challenge was able to sail the Arctic's Northwest passage in only 14 days as it was "almost totally ice free"

Effect on polar bears according to a new study

- Sea ice season across all polar bear subpopulations in the Arctic has reduced by **seven weeks** since 1979.
- Polar bears depend on sea ice to hunt seals, their main prey. They use the ice as a platform to ambush seals at breathing holes or break through the ice to reach their dens.
- The findings of the study are being used by the International Union for Conservation of Nature to decide the conservation status of the species.

2) NATIONAL GANGA COUNCIL

Why in news?

The Union Cabinet under the chairmanship of PM has cleared the River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016.

What is the significance?

- The Order enforces an institutional structure for policy and implementation and empowers National Mission for Clean Ganga (NMCG) to discharge its functions in an independent and accountable manner.
- A mission status will be granted to the Authority with corresponding power under the Environment (Protection) Act (1986).

What are the major implications?

- The new council for River Ganga will replace the existing National Ganga River Basin Authority (NGRBA) for pollution prevention and rejuvenation of Ganga.
- Setting of an Empowered Task Force that will ensure the existence and implementation of an action plan under various Departments, Ministries and States.
- The NMCG will have a two tier structure with a Governing Council and an Executive Committee.
- The NMCG will comply with the decisions of the National Ganga Council.
- At the state level, State Ganga Committees would be formed for proper implementation.
- Similarly, District Ganga Committees would be formed in each Ganga Bank District and they shall be monitored by the State Committees.
- The special focus of the revamped structure would be to maintain ecological flows in Ganga with an aim to ensure water quality and environmentally sustainable development.
- An innovative model based on Hybrid Annuity has also been approved for fast track creation of sewerage and treatment infrastructure in the Ganga basin.

Way forward

- The NMCG will now have the power to issue orders and also exercise the powers under the Environment Protection Act. It can now fine polluters.
- NMCG will only take action in case of non-compliance when CPCB (Central Pollution Control Board) does not do so.
- CPCB can also take action jointly with NMCG.
- The said infrastructure will ensure ecological flows, abatement to pollution and rejuvenation of the river.
- The authority will also be able to impose restrictions on polluting industries and carry out inspections to ensure compliance.

3)WHO STUDY ON AIR POLLUTION LEVELS

Why in news?

- Fine particulate matter from industries, cars and biomass is causing premature mortality as observed by WHO.
- A study conducted by the World Health Organisation and made public in September 2016 revealed that air pollution could have killed at least 600,000 Indians in 2012.
- This is about a fifth of the 3 million who died worldwide because they were exposed to fine particulate matter (PM2.5).

Method of the study

- The study findings are based on data derived from satellite measurements, air transport models and ground station monitors for more than 3000 locations, both rural and urban.
- It also relies on publicly available national data on pollutant levels.

Major causes of Air Pollution

- Air pollution is caused when air in the atmosphere is filled with particulate matter.
- The largest source air of pollution in cities is from vehicle exhaust fumes.
- Filters that are not changed regularly in your air conditioning units will accumulate dirt and cause the spread of pollutants in the air you breathe inside your home.
- Chemicals and toxic pollutants likes sulphur dioxide, nitrogen oxides and carbon dioxide react with water molecules in the atmosphere to produce acid rain. These pollutants come from factories, automobiles and any industrial or manufacturing plants.
- Another source of air pollution is from dust and dirt that goes airborne due to every day labour in the agricultural and construction industry.
- Dust is lifted from tractors working on fields, and from land clearing and general demolition in the construction industry.
- Using household chemicals without adequate ventilation is a major source of indoor air pollution.
- Volcanoes, dust storms, and forest fires are causes of natural air pollution

What are key points from the study?

- India comes just behind China which witnessed an estimated 800,000 deaths in same period, according to study.
- The detailed study for India suggested the reason for deaths in absolute number as shown below.
    1. 2,49,388 Deaths due to Ischemic heart disease
    2. 1,95,001 deaths due to stroke
    3. 1,10,500 deaths due to Chronic Obstructive Pulmonary Disease (COPD)
    4. 26,334 deaths due to lung cancer
- According to study, the actual impactof air pollution is a "conservativefigure," as it does not include theseparate impacts on health fromother air pollutants such as nitrogenoxides (NOx) or ozone (O3).
- According to study, all regions of the world are affected, however, populations in low-income cities are the most impacted.
- As per the study, of all of pollutants, fine particulate matter has the greatest impact on health. PM 2.5 is responsible for aggravating or is directly responsible for many cardiovascular diseases and lung cancer.

Significance

- There is nothing new to be known about air pollution. But the WHO report serves as an eye opener again. The study points out the level of impact in numerical terms.
- It shows the degree of neglect andindiscriminate levels of pollution inour country and its adverse impacts.
- This should serve as warning topolicy makers and the citizenryabout the negative consequences ofPM 2.5.
- There is a need of collective effort from all the stakeholders to mitigate the impacts of air pollution.

Way forward

- The forest cover should be protected. Adequate forest coveris essential for maintaining the quality of air.
- Green belts should be created. Such areas should bedeveloped around densely populated cities.
- There should be strict restriction for establishment of largebuildings and industries along the Green belt areas.
- Automobile engines should be redesigned in such a way thattheir emissions cause minimum pollution.
- The burning of fossil fuels produces harmful gases and particulate matter that are released into the air. Alternatives to this should be promoted especially green energy technologies.
- Provide cleaner fuels and scientifically designed cook stoves to reduce indoor pollution.
- Industrial areas should be located at a safe distance from the residential areas.
- Forest fires should be checked. Adequate preventive measures should be adopted to protect the forests.
- Cheap devices for controlling air pollution should be developed.

4)GM MUSTARD

Why in news?

- Technical sub-committee of India's genetic engineering regulator has concluded that the genetically modified variety DMH-11 (Dhara Mustard Hybrid 11) did not "raise any public health or safety concerns for human beings or animals".
- Regarding this a report was released by the regulator, Genetic Engineering Appraisal Committee (GEAC), which sought suggestions from the public over the next 30 days.

What are the Details of the report?

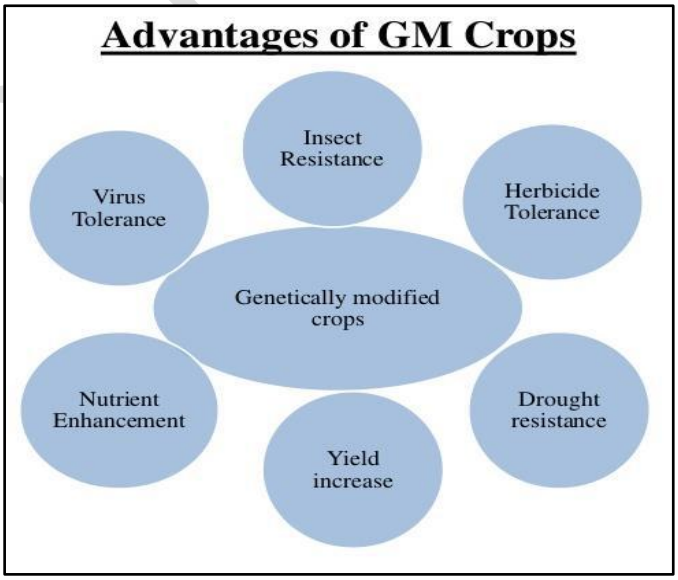
- The introduced proteins i.e. Barnase and Barstar are expressed at negligible to non-detectable levels in the edible parts and have been derived from commonly occurring non-pathogenic bacteria.
- None of the three proteins has been shown to be toxic or allergenic through bioinformatics and acute toxicity studies in experimental animals.

Process of approval

- Suggestions from the public will have to be evaluated by GEAC to see if evidence on bio-safety has been ignored.
- If there are no such concerns, the GEAC will have to decide whether to recommend DMH-11 for commercial cultivation.
- The GEAC's recommendation will then have to be approved by the environment minister whose decision will be final.

What are the Arguments in support of GM mustard?

- In 2014-15, India imported 14.5 million tonnes of edible oils valued at $10.5 billion. Therefore, the need to raise domestic crop yields and cut dependence on imports.
- Country's cotton production has gone up more than 2½ times since BT hybrids were first planted in 2002. Also, no adverse effects on human have reported (consumption of cotton seed oil, etc.).
- We import edible oil from GM crop using countries. Delhi University's CGMCP has pledged to distribute the GM mustard for free



What are the Key Concerns?

- Impacts could GM crops have on the environment and wildlife are not researched properly.
- Insect resistant crops may affect non-target and helpful insects like butterfly, honey bee etc.,
- Also pests and insects could develop resistance to the toxin
- There is also a chance that herbicide resistant plants produce uncontrollable weeds or so called "super weeds"

Barnase and Barstar genes are used for engineering male sterility in plants. Targets the TA29 gene.

Bio informatics - is the application of computer technology to the management of biological information.

5) GANGETIC DOLPHINS

Why in news?

- Scientists and wildlife conservationist feel that the development of the Ganga under the National Waterway 1 project is threat to the survival of the gangetic dolphins.
- Ganges River Dolphin is a sub-species of river dolphins, found in the Ganga and Brahmaputra rivers.

Background

- The Centre has planned to develop a 1600-km waterway between Allahabad and Haldia for inland transportation under a Rs. 4200-crore World Bank-aided project.
- The first phase of the project from Haldia to Varanasi (1300 km) is now underway.
- The NW1 is seen as a logistics gateway for northern India with the potential to reduce traffic congestion.
- The stretch that covers that NW1 is also home to river dolphins.
- There are almost 2500 river dolphins in Ganga and there population is diminishing.
- River dolphins have been classified as "endangered" by IUCN (International Union for Conservation of Nature) in 1966.
- These species are practically blind and rely on bio-sonar waves to move around.

6) HERITAGE HEROES AWARD

Why in news?

- Assam-based ecologist and conservation activist BibhutiLahkar has become the first Asian to be awarded theprestigious Heritage Heroes Award by the InternationalUnion for Conservation of Nature (IUCN).
- He received the award at the IUCN's World ConservationCongress.

What is the Work of the awardee?

- He has been working to save the grasslands, flora and fauna of Manas National Park area for the past two decades.
- He currently engaged as Manas Landscape Administratorfor Aaranyak, an NGO working for biodiversity conservation in Northeast India.
- He was instrumental in connecting Manas Wildlife Sanctuary with the Royal Manas National Park in Bhutan.
- He had also conducted a GIS survey of the Manas area and his research findings were highly beneficial in the Manas Tiger Conservation.

What is Heritage Heroes Award?

- The Heritage Heroes award is given by IUCN. It aims to recognise the outstanding efforts of a few brave people, around the four corners of the world, who relentlessly invest efforts to make a difference in the way natural World Heritage sites are conserved, sometimes despite life-threatening situations.
- The objective of this initiative is to inspire people to value the importance of natural World Heritage sites and recognise the need to collectively invest in their conservation.
- These events will make the Bt cotton variety much more resistant to bollworm attacks.
- Higher protein expression will also address the growing vulnerability of Bt cotton to pink bollworm.
- Both CGMCP and NBRI events come at a time when there is growing susceptibility of pink bollworm and whitefly in the currently grown Bt hybrids.

7) HABITAT DESTRUCTION OF LAGGAR FALCON IN MADURAI

Why in news?

- The Laggar falcon, once numerous in number, now has only two birds of this species surviving on the rock cliffs of Arittapatti in Madurai.
- They are probably the only birds spotted in the entire south Indian region in the last two years.

About Laggar Falcons
Laggar Falcons are an indigenous raptor species with white and grey plumage, which can hunt and fly at speeds of up to 180 kmph. It resembles the lanner falcon but is darker overall.

Reasons for the decline in number

- Indiscriminate sand quarrying on the Vaigai river bed and indiscriminate granite and stone quarrying in many parts of Madurai has led to loss of habitat of these birds.
- Felling of palm trees in these areas, which is a nesting spot of many raptor species, is also one of the reasons for the disappearance of the bird

8) CARBON NEUTRAL AIRPORT

- Carbon neutrality occurs when the net carbon emissions over an entire year are zero or when the airport absorbs or offsets the same amount of emission that was generated.
- This achievement is accredited by ACI under Airport Carbon Accreditation that monitors the efforts of airports to manage and reduce their carbon emissions.
- The Indira Gandhi International Airport in Delhi has become Asia-Pacific's only and one of the world's few airports to achieve a "carbon neutral" status.
- Currently, 25 airports in the world, most of them in Europe, have earned carbon neutral status.
- The Indira Gandhi International airport boasts of green buildings, solar power plants, rainwater harvesting system etc., which have helped reduce and offset carbon emissions.
- The airport has taken a series of measures to reduce carbon footprint, including setting up of a 7.84MW solar power plant.
- This would mean, Delhi Airport will get highest level of certification "level 3+ neutrality" available to airports across the world.

9) GIANT PANDA

The IUCN has said in a report that the Panda is now classified as Vulnerable instead of endangered species

10) NEW SPECIES OF PIKA

- A new Pika species named "Ochotona sikamaria" has been discovered in the higher altitudes of Himalayas in Sikkim
- The new species was discovered by the study based on genetic data and skull measurements
- The study has been published in the journal, "Molecular Phylogenetic and Evolution"
- These members of the Pika family look like tailless rats
- They are highly susceptible to climate change like increasing temperature

11) INDIAN PAINTED FROG

- A rare Indian painted frog was spotted for the first time in Bejjur forest in Telangana, Adilabad.
- The find had been made in an area that fell outside the mapped distribution area of the species
- the species is found in tree holes, burrows, pollution free wetlands and riverine areas
- This animal is listed among the least concern by IUCN

Bejjur Reserve Forest

- The Bejjur Reserve Forest lies on the banks of Pranahita River in the eastern part of Telangana district.
- The Peddavagu stream cuts across the Bejjur Reserve Forest.
- There are over 50 types of trees. There is presence of rare striped hyena, leopard almost all ungulates except the gaur.

12) PRAKAMPANA-2016

- The three day long Joint Disaster Management Exercise named Prakampana ('Cyclone' in Sanskrit) was held in Visakhapatnam (Vizag) in September 2016
- The armed forces, in association with the National Disaster Management Authority and the NDRF participated in these exercises.
- The exercise was aimed at synchronizing resources and efforts of all agencies involved in disaster management
- It was conducted by the Eastern Naval Command in liaison with concerned Centre and State authorities.
- Prakampana is a synergy between armed forces and civil administration during the Humanitarian Assistance and Disaster Relief (HADR) situations

13) DESI GM ALTERNATIVE TO MONSANTO

Why in news?

Indian scientists have developed two new sets of indigenous transgenic events in cotton cultivation that is a potential alternative to Monsanto seeds.

What are the Highlights?

- Scientists at Delhi University's Centre for Genetic Manipulation of Crop Plants (CGMCP) have developed two independent 'events' for insertion of the cry1Ac gene.
- Cry1Ac gene isolated from a soil bacterium Bacillus thuringiensis (BT) and is toxic for American bollworm insect.
- The other promising indigenous GM event is whitefly-resistant cotton developed by the National Botanical Research Institute (NBRI), Lucknow.
- Scientists have isolated and cloned a gene from an edible fern Tectaria macrodonta.
- The geneTma12 encodes a protein toxic to whitefly.

What is the Significance?

- The two CGMCP new events will decrease dependence on Monsanto's Bollgard II.
- The levels of cry1Ac protein expression is known to be much higher than that of Bt cotton varieties developed by Monsanto, Bollgard I and Bollgard II technologies.
- The cry1Ac protein expression in the two events declines over the growing season, but the overall level is 2-3 folds higher than MON531, Monsanto's cry1Ac event.

14) AVIATION CLIMATE DEAL

Why in News?

International Civil Aviation Organisation approved a landmark accord at its assembly session in Montreal to curb aviation pollution.

What is about the Deal?

- The proposal includes a mechanism for a `carbon emission tax' on airlines in order to offset emissions in the aviation sector.

- The agency's carbon offsetting system is expected to slow the growth of emissions from commercial flights costing the industry less than 2 percent of revenues.
- The accord requires participating countries to reduce emission by 2020 and limit it after it comes into effect from 2021.
- Participation in the deal is voluntary from 2021 to 2026. The deal becomes mandatory from 2027.

India's Stand

- Although India has ratified the Paris Climate Deal, it has not agreed to the Aviation Climate Accord.
- India feels that reducing "emissions" in the sector would be injustice to the country's growing economy.

What is carbon neutrality?

- Carbon neutrality occurs when the net carbon emissions over an entire year are zero or when the airport absorbs or offsets the same amount of emission that was generated.
- This achievement is accredited by ACI under Airport Carbon Accreditation that monitors the efforts of airports to manage and reduce their carbon emissions.
- Countries like US and China have agreed to go with the accord while Russia has refused to participate during the voluntary period.

OCTOBER 2016

1. NEW URBAN AGENDA - HABITAT – III

Why in news?

- The New Urban Agenda was **officially adopted at the UN Conference on Housing and Sustainable Urban Development** (referred as "Habitat III") held recently in Quito, Ecuador.
- The UN's Habitat conferences are held in a bi-decennial cycle, with previous editions being held in Vancouver (1976) and Istanbul (1996).

What is New Urban Agenda?

- It is a **set of 175 commitments** that countries need to adhere to tackle the staggering challenges of urbanization.
- It sets the **global vision of sustainable urbanization** for the next 20 years.
- It is a **roadmap for building cities** that can serve as engines of prosperity and centres of cultural and social well-being while protecting the environment.
- It also provides **guidance for achieving the Sustainable Development Goals** and provides the underpinning for actions to address climate change.

Constituents of the New Urban Agenda

In the New Urban Agenda, leaders have committed to:

- **Provide basic services for all citizens:** These services include: access to housing, safe drinking water and sanitation, nutritious food, healthcare and family planning, education, culture and access to communication technologies.
- **Ensure that all citizens have access to equal opportunities and face no discrimination:** The New Urban Agenda calls on city authorities to take into account the needs of women, youth and children, people with disabilities, marginalized groups, older persons, indigenous people, among other groups.
- **Promote measures that support cleaner cities:** In the Agenda, leaders have committed to increase their use of renewable energy, provide better and greener public transport, and sustainably manage their natural resources.
- **Strengthen resilience in cities to reduce the risk and the impact of disasters:** Some of the measures include: better urban planning, quality infrastructure and improving local responses.

- **Take action to address climate change by reducing their greenhouse gas emissions:** Leaders have committed to involve not just the local government but all actors of society to take climate action taking into account the Paris Agreement on climate change which seeks to limit the increase in global temperature to well below 2 degrees Celsius.
- **Fully respect the rights of refugees, migrants and internally displaced persons regardless of their migration status:** Leaders have recognized that migration poses challenges but it also brings significant contributions to urban life. Because of this, they have committed to establish measures that help migrants, refugees and IDPs make positive contributions to societies.
- **Improve connectivity and support innovative and green initiatives:** This includes establishing partnerships with businesses and civil society to find sustainable solutions to urban challenges
- **Promote safe, accessible and green public spaces**
- Human interaction should be facilitated by urban planning, which is why the Agenda calls for an increase in public spaces such as sidewalks, cycling lanes, gardens, squares and parks.
- Sustainable urban design plays a key role in ensuring the liveability and prosperity of a city.

Significance of New Urban Agenda

- **More than half of the world's population now lives in cities**. So it makes sense that the New Urban Agenda will significantly shape the UN 2030 Agenda for Sustainable Development.
- Sustainability is at the core of the "New Urban Agenda" with a substantial focus on various **"transformative commitments for sustainable urban development"**, linking it further with themes like social inclusion, urban prosperity and resilience.
- It commits to a **"vision of cities for all"** where "all inhabitants" are able to "inhabit and produce just, safe, healthy, accessible, affordable, resilient, and sustainable cities and human settlements."

What is the relevance for India?

- For India, the New Urban Agenda is significant because of the following reasons-

1. Though the pace of urbanization was slow until now, with only 31.16% of Indians living in cities, it is expected to accelerate.
2. It took 40 years for 230 million Indians to become urban citizens. For the next 250 million, it is expected to take only 20 years.
3. Presently, cities are anything but liveable, crumbling under congestion, pollution and lack of basic facilities for a huge segment of the population—65 million people—who live in slums.
4. The Agenda provides a vision wherein government initiatives like Smart Cities, AMRUT and 'Housing for All' can be seamlessly integrated.

Concerns

- Since it is a **non-binding document** without concrete mechanisms for implementation, its ability to effect change is limited.
- The agenda is built around a series of Sustainable Development Goals (SDGs), particularly **SDG 11**, which aims to "make cities and human settlements inclusive, safe, resilient and sustainable". However, the New Urban Agenda has been criticised for lacking direct links to the targets set out within Goal 11.
- Under the umbrella of smart cities, using open data networks for better urban planning provided an optimistic, technology-based future for cities. However, questions about the security, ethics, and oversight of large-scale information gathering remain largely unanswered.

Way Forward

- **All countries will need to step up their commitments if the aspirations set out in Habitat III are to be achieved**. Key concepts, such as integrated planning and models for local-national government cooperation, will need further work.

- With the New Urban Agenda as a road map, it is hoped that we can rise to the challenge of creating more liveable, resilient and sustainable cities. Because without global urban transformation, we cannot achieve sustainable development as a whole.
- As for India, UN Habitat plans to review country-level progress on its New Urban Agenda in Kuala Lumpur in 2018. India's performance on improving the quality of life in its cities will be watched.

2) KIGALI AGREEMENT

Why in news?

- 197 countries have struck a new landmark deal at Kigali in Rwanda to reduce the emissions of category of greenhouse gases (GHGs) which leads to hydro fluorocarbons (HFCs)
- Its reduction could prevent up to 0.5 degrees Celsius of global warming by year 2100.

What is the Significance?

- The Kigali Amendment amends the 1987 Montreal Protocol to now include gases responsible for global warming.
- The Kigali Agreement or amended Montreal Protocol for HFCs reduction will be binding on countries from 2019.
- It also has provisions for penalties for non-compliance.
- It is considered absolutely vital for reaching the Paris Agreement
- Target of keeping global temperature rise to below 2-degree Celsius compared to pre-industrial times
- Under it, developed countries will also provide enhanced funding support estimated at billions of dollars globally. The exact amount of additional funding from developed countries will be agreed at the next Meeting of the Parties in Montreal in 2017.

Different timelines

- All signatory countries have been divided into three groups with different timelines to go about reductions of HFCs. This agreement shows a new form of grouping:

1. First group: It includes richest countries like US and those in European Union (EU). They will freeze production and consumption of HFCs by 2018. They will reduce them to about 15% of 2012 levels by 2036.
2. Second group: It includes countries like China, Brazil and all of Africa etc. They will freeze HFC use by 2024 and cut it to 20% of 2021 levels by 2045.
3. Third group: It includes countries India, Pakistan, Pakistan, Iran, Saudi Arabia etc. They will be freezing HFC use by 2028 and reducing it to about 15% of 2025 levels by 2047.

Steps taken by India: Eliminating use of HFC-23

- India announced domestic action on HFC-23 (trifluoro-methane), a super greenhouse gas with a GWP of 14,800, which is produced as a by-product of HCFC-22 (chloro-difluoro- methane). Currently, HCFC-22 is the most commonly used refrigerant in India.
- India has mandated five manufacturers who fully control the domestic market to capture and incinerate HFC-23 so that it is not released intothe atmosphere.
- This action will eliminate release of HFC-23 equivalent to about 100 million tonne of Carbon dioxide emissions over the next 15 years.
- It also directed the companies to create and maintain sufficient storage capacity to ensure that all HFC-23 is stored
- Companies have been asked to internalize the cost of this environmental externality and create sufficient storage facility to take care of down time and run the incinerators to ensure that HFC-23 is not released in the atmosphere.

What is the Montreal Protocol on Substances?

•The treaty was originally signed in 1987 and substantially amended in 1990 and 1992 is aimed at reducing the production and consumption of ozone depleting substances in order to protect the earth's fragile ozone layer.

•This agreement was one of the few success of multilateral negotiations

3) WWF'S LIVING PLANET REPORT 2016

Why in News?

- Global population of mammals, fish, amphibians and reptiles declined by 58 percent between 1970 and 2012, according to World Wide Fund for Nature (WWF) report.

Highlights of the report

- The report is compiled with data from the Zoological Society of London (ZSL) to measure the abundance of biodiversity.
- The index tracks about 14, 200 populations of 3700 species of vertebrates.
- Biodiversity population is expected to fall 67 percent by 2020, if the current situation persists.
- Rivers and lakes are the worst hit with animal population down by 81 percent since 1970.
- The report points out we have ushered in the era of **Anthropocene,** a geological period dominated by humans**.**
- The report warns that increased human pressure could trigger human-nature conflicts.
- It can increase the risk of water and food insecurity and competition over natural resources.

Causes

- The report states that food production to meet the complex demands of an expanding human population is the primary factor responsible for the destruction of habitats and overexploitation of wildlife. At present, agriculture occupies about one-third of the Earth's total land area and accounts for almost 70 % of water use.
- Forest areas are cleared up farming and logging. As of now, only 15 percent of the Earth's land area is protected for nature.
- Poaching and exploitation for food is another major factor, due to unsustainable fishing and hunting.
- Pollution is another problem. Many sea animals are being harmed due to high levels of pollutants.
- Pollutants also travel down the food cycle and harm other animals.

The Upside

- Population of endangered species like tigers are known to be increasing. The Giant Panda has recently been removed from the list of endangered species.
- The Paris Climate Treaty 2015 which has been ratified by most nations also holds hope of bringing positive climate change.
- Additionally, the UN sustainable development goals for 2030 will help proper implementation of sustainable development policies.

4) ANTHROPOCENE EPOCH – HUMAN INFLUENCED AGE

Why in news?

- An expert group at the World Geological Congress in Cape Town recommended that the new Anthropocene epoch, start from the mid-20th century, be officially declared. The approval process is likely to take at least two years and requires ratification by three other academic bodies.

What is Anthropocene?

- The Anthropocene, coined in 2000 by the Nobel prize-winning scientist Paul Crutzen, is a proposed epoch that begins when human activities started to have a significant global impact on Earth's geology and ecosystems.
- Neither the International Commission on Stratigraphy nor the International Union of Geological Sciences has yet officially approved the term as a recognized subdivision of geological time
- An epoch is a subdivision of the geologic timescale that is longer than an age and shorter than a period.
- Epochs are most commonly used for the younger Cenozoic Era, where a greater collection of fossils has been found and palaeontologists have more detailed knowledge of the events that occurred during those times.
- We are currently living in the Holocene Epoch of the Quaternary Period
- The **Holocene epoch** began 12,000 years ago at the end of the last ice age. All human civilisations have developed during this climatically and geologically stable period.

Evidences of the Anthropocene

- Since the 1950s, human beings have begun to alter the earth's surface and atmosphere in unalterable ways. Human activity has:
- **Pushed extinction rates**: The Earth is on course to see 75% of species become extinct in the next few centuries if current trends continue.
- Doubled the nitrogen and phosphorous in our soils in the past century with fertiliser use. This is likely to be the largest impact on the nitrogen cycle in 2.5bn years.
- Left a permanent layer of airborne particulates in sediment and glacial ice such as black carbon from fossil fuel burning.

Need for recognition

- It sends out the statement that humans have fundamentally changed the planet to the point it will preserve sediments for millions of years to come that record a world that is now fundamentally different to the one that preceded it.
- For the first time since the dawn of Darwinian Theory — which showed human beings as just another character on the evolutionary stage — the world, literally, is of our own making.
- The significant geological changes, which usually take thousands of years, have occurred in less than a century and the long-term impact of an inhospitable planet may well be something we deal with sooner than expected.

Concerns in declaring Anthropocene as a separate epoch

- The Anthropocene is in many ways different to traditional geological units and so is harder to define using traditional techniques.
- Many would argue that it is too short a timescale and there is need to wait and make judgment once the planet has gone through this pulse of rapid change and has stabilised into a new state.

Way forward

- The Anthropocene marks a new period in which human's collective activities dominate the planetary machinery. This name change stresses the enormity of humanity's responsibility as stewards of the Earth.
- The hope now is that mankind and its leaders can collectively and consciously take their new responsibility seriously.

5) INDIA RATIFIES PARIS CLIMATE DEAL AT U.N.

Key facts

- India is the 62nd country to ratify the agreement and accounts for 4.1 per cent of the emissions.
- Ratified on 147th birth anniversary of Mahatma Gandhi, also observed as the International Day of Nonviolence by UN.
- The Paris Agreement entered into force on 4 November 2016, thirty days after the date on which at least 55 Parties to the Convention accounting in total for at least an estimated 55 % of the total global greenhouse gas emissions have deposited their instruments of ratification, acceptance, approval or accession with

6) NEERDHUR

- Recently National Environmental and Engineering Research institute (Neeri) and CSIR has developed "NEERDHUR" a novel multi-fuel domestic cooking stove
- Apart from wood, other fuel like coal, Cow dung and agricultural residue can also be used in it.
- Saves 50% fuel and has high thermal efficiency
- wood usage is halved and helps save the pressure on environment-Neerdhur has been approved and certified by Ministry of New and Renewable Energy (MNRE) and meets the emission Parameters of bureau of Indian Standards (BIS)-
- Will help in improvement of Women's Health in rural areas

7) CARBON PRICE

- A carbon price is a cost applied to carbon pollution to encourage polluters to reduce the amount of greenhouse gas they emit into the atmosphere
- There are two main types of carbon pricing:

1. **Emissions trading systems (ETS):** An ETS sometimes referred to as a cap and trade system, it caps the total level of greenhouse gas emissions and allows those industries with low emissions to sell their extra allowances to larger emitters.
2. **A carbon tax** directly sets a price on carbon by defining a tax rate on greenhouse gas emissions or more commonly on the carbon content of fossil fuels.Mahindra & Mahindra became first Indian firm to announce an internal Carbon Price of $10 per ton of carbon emitted-What is internal carbon price?

- It is an internationally recognised business tool that enables companies to create resources which are invested in low carbon technologies, which help reduce future emissions and lower operating costs

8) INDIA'S FIRST GREEN CORRIDOR

- The 114-km-long Manamadurai to Rameswaram stretch of Southern Railway became India's First Green Corridor ,
- All the trains' bio toilets in this route will have Bio toilets and there would be zero discharge of human waste on tracks in the section.
- Rameshwaram railway station had already been developed as a "Green Station"to handle the bio-toilets in the coaches.
- Indian Railway had developed the environment friendly 'IR-DRDO Bio-toilets', in association with Defence Research and Development Organisation (DRDO)-
- Indian railways aims to install human waste discharge free -bio-toilets in all its coaches and the same would be completed by September 2019-
- It will help in proving cleanliness and hygiene besides preventing corrosion of the tracks-
- It is part of the Swachh Bharat Mission.

9) KASHMIR'S RED STAG

Why in news?

- IUCN (International Union for Conservation of Nature) all set to declare Kashmiri Red Stag or Hangul as a 'critically endangered' species-
- Earlier it was considered as a subspecies of red deer. Hence, IUCN categorized it as 'Least Concern' by clubbing with European and other 'red deer' species of the world.

What are the reasons for decline?

1. Hangul has been hunted over centuries,
2. Fragmentation of forested habitat,
3. Land encroachment for grazing

Kashmiri Red Stag or Hangul

- It is known for its giant antlers bearing 11 to 16 points-
- Only one viable population left today in the wild is largely confined to the Greater Dachigam Landscape (1,000 sq.km.), encompassing the Dachigam National Park (NP) and adjoining protected areas-
- It is one of three critically endangered species in Jammu and Kashmir. The other two are **markhor, the Tibetan antelope** or 'chiru'.
- It was designated as State Animal of Jammu & Kashmir in 1980's
- It is listed under Schedule-I of the Indian Wildlife (Protection) Act, 1972 and J&K Wildlife (Protection) Act, 1978 and has also been listed among the top 15 species of high conservation priority by the Government of India.

Way forward

At the local scale, this would certainly attract the immediate attention of biologists, park managers and policy makers to invest more efforts, time and funds to safeguard the dwindling population of Hangul in India which has regional and international value

10) REPORT ON PALAEO CHANNEL OF NORTH WEST INDIA

Why in news?

- **Union Minister of Water Resources, River Development and Ganga Rejuvenation** released a Report on Palaeo Channel of North West India

What does the report says?

- The committee studied piles of **sediments, their shapes and features** which appeared to have been brought by a "big river" and are reminiscent to ones found in present-day Ghaggar, Ganga and Yamuna.
- The report is an assertion of the assumption that River Saraswati **originated from Adibadri in Himalaya to culminate in the Arabian Sea** through the Runn of Kutch.
- It is based on the **study of the land texture** of states of North-West India And has also taken account of the **geological changes** that had occurred in the past
- The river had **two branches:**

1. **Western** branch - present-day **Ghaggar-Patialiwali** rivulets
2. **Eastern** branch - **Markanda and Sarsuti** (also known as Tons-Yamuna)

- The confluence of the **branches** was near **Shatrana**, 25 km south of **Patiala**.

11) SEAWEED CULTURE IN INDIA

- In India the Gulf of Mannar, Gulf of Kutch, Calh Bay, Lakshadweep and Bay islands are the important areas for seaweed culture
- Research programmes on seaweed resources and their culture were taken up by the Central Marine Fisheries Research Institute and Central Salt and Marine Chemicals Research Institute
- Seaweed -It gained prominence during 13th century, after the discovery of agar-agar in Japan and Algonac Acid in European continent.
- It is considered as the medicinal food of the 21st century.
- Many seaweeds are rich in Vitamins and minerals and are eaten in various parts of the world.
- China produces over half of the world's seaweed harvest and Indonesia 27% of world production.
- Most of that seaweed ends up in our food, though there is a growing market in seaweed-based cosmetics and drugs.

12) ANTARCTIC CIRCUMPOLAR EXPEDITION

Why in news?

More than 50 researchers from 30 countries are to carry out the first scientific full circumnavigation of Antarctica in an attempt to measure pollution and climate change.

What is it?

ACE is the first project of the newly-created Swiss Polar Institute (SPI) to "enhance international relations and collaboration between countries, as well as to spark the interest of a new generation of young scientists in polar research."

Significance

- The Antarctic Circumpolar Expedition (ACE) will be the first scientific mission to study all the major islands in the Antarctic ocean, as well as the Antarctic land mass.
- **Antarctica acts as global thermometer for any ecological change.**
- A better understanding of Antarctica is critical, not just for its preservation, but for the whole planet
- Global collaboration – **More than 50 researchers from 30 countries have collaborated for the expedition**.

Pollution and biodiversity:

- ACE will help to make strategies to reduce pollution in Antarctic region which is important for entire world.
- Help to map the effect of pollutants on whales, penguins and albatrosses in the Southern Ocean. information on whales is important for the conservation and management of the Antarctic marine environment
- Investigate the extent to which micro plastics have reached the Southern Ocean ecosystem and whether they have entered the food web.
- **Biodiversity:** the rise in sea water will affect the aquatic habitants of the Antarctic sea and impact on beaches and places near the sea where humans live will be impacted too.
- **Climatology:** Scientists will also take ice core samples and study biodiversity on the continent in an attempt to reveal conditions before the onset of the Industrial Revolution.
- Our understanding of Monsoon, **ENSO, Madden Julien oscillation**etc. will be enhanced

13) WORLD'S LARGEST MARINE PARK

Why in news

EU and 24 countries sign long-awaited landmark dealagreement to protect 1.1m sq km of water in SouthernOcean.

Key facts

- It will be world's largest marine park covering more than
- 1.5m sq km of the Ross Sea around Antarctica.

- It will be set aside as a no-take "general protection zone", where no fishing will be allowed.
- The protections are set to expire in 35 years.
- The agreement was signed at meeting of Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR).
- The agreement was facing opposition from China and Russia, which have fishing industries in the region.
- It is the first marine park created in international waters

Significance

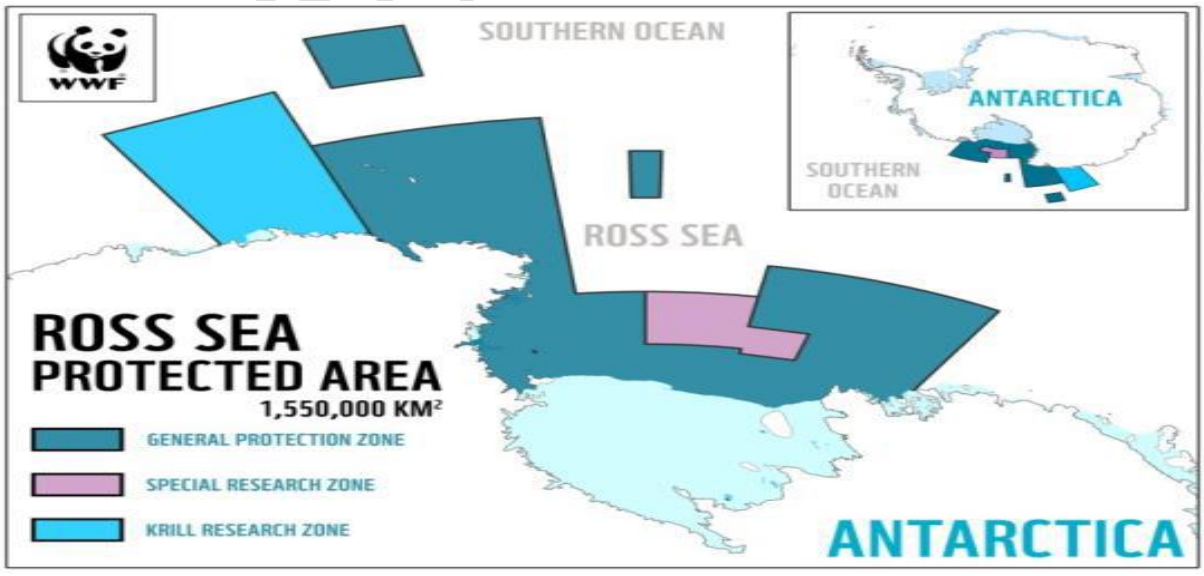
- It will set a precedent for further moves to help the world achieve the IUCN's recommendation that 30% of the world's oceans be protected.
- This is important not just for the incredible diversity of life that it will protect, but also for the contribution it makes to building the resilience of the world's ocean in the face of climate change.

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

- It was established by international convention in 1982 with the objective of conserving Antarctic marine life.
- It has 25 Members, and a further 11 countries have acceded to the Convention.
- India is also a member of this commission. It is headquartered in Tasmania, Australia.

About Ross Sea

- It is sometimes called the "Last Ocean" because it is largely untouched by humans and hence the least altered marine ecosystem on Earth
- Its nutrient-rich waters are the most productive in the Antarctic, leading to huge plankton and krill blooms that support vast numbers of fish, seals, penguins, and whales.
- Home to high concentrations of wildlife and an incredible array of animals, many found nowhere else on the planet.
- Ross Sea is a living laboratory providing scientists with the last chance to understand how a healthy marine ecosystem functions.



NOVEMBER 2017

1) MARRAKESH COP

Background

- In the latest CoP of the UNFCCC held at Marrakesh, Morocco more than 190 countries negotiated to prepare the fine print for Paris deal. It sought to make the rules that would help in the implementation of the law i.e. Paris Agreement.
- The countries have agreed to complete the rule book by 2018 as the Agreement would come into force from 2020.

Concerns

- Differences between the developed and developing countries persisted over crucial issues pertaining to climate finance, adaptation funds and scaling up reduction in emissions of greenhouse gases.
- The developed countries were successful in getting their OECD report on climate finance acknowledged into the formal negotiations, despite developing countries claiming that it had used dubious accounting methods. This OECD report could now become one of the bases for defining climate finance.
- Principles of equity and differentiated responsibilities remain on table but no progress on operationalizing them in the Paris Agreement rulebook.
- The road map for rich countries to provide US $100 billion annually starting 2020 looks more dubious than before.
- No space for deeper emission reductions or increased climate finance by rich countries before 2020.
- The replenishment of funds for adapting to climate change though, was one of positive developments from the Marrakesh conference. There was a demand for replenishing the adaptation fund under the Paris agreement and that was done with $80 million. However, discussion over it will continue in the next CoP.
- The issue of providing loss and damage finance to vulnerable countries also will be taken up next year.
- India's call for 'Climate Justice' finds no placeholder. India unable to find even a rhetorical entry for 'lifestyle issues' at Marrakech.

2) DELHI SMOG

About

- Delhi witnessed the worst smog in almost two decades, with consistently hazardous pollution levels being recorded for over a week.
- The air quality was 10 times worse than the safe levels.
- A number of factors were seen as responsible for the smog- stubble burning from Punjab and Haryana, vehicular pollution, Diwali crackers and rising levels of dust from construction and allied activities formed the major reasons.
- Adverse weather conditions, such as low wind speed coupled with drop in temperature and high humidity, which had blocked dispersal of pollutants, deteriorated the conditions further.

Measures taken

- Odd-Even policy.
- Ban on 10 years old diesel vehicles.
- SC had ordered the Centre and NCR states to divert commercial vehicles not destined for Delhi and levy environmental compensation charge on commercial vehicles to discourage them from passing through Delhi.
- But the Issues with the above is these measures are not comprehensive.
- Not all measures have been implemented well by the states.
- Even the ECC that has been collected has not been fully utilized.

Suggestions for traffic cause of smog :

- Comprehensive road transport policy whereby promotion of public transport is needed. Several studies have shown that public transport provides more than 65 per cent of Delhi's commuting needs but occupies less than five per cent of road space.
- This should be coupled with imposing disincentives to purchase private vehicles. In this a combination of pollution taxes, rationalizing licensing and registration of vehicles, congestion tax, car free areas etc. should be implemented.
- Urban planning should be long-term which should give enough space for non-motorised transport like cycling and walking.
- The challenge is political will as automobile is one of the most important industry in India.

Stubble Burning

- Burning of agricultural waste add greenhouse gases that cause global warming, besides pollutants such as carbon monoxide, ammonia, nitrous oxide and sulphur dioxide and a high quality of PM2.5 that severely affect human health. It not only pollutes the air but also deprives the land of useful nutrients.
- Stubble burning in the northern States significantly contributes to the poor air quality in large parts of the Indo-Gangetic Basin, with local and cascading impacts felt from Punjab all the way to West Bengal.
- It is one of the most significant reasons for increasing pollution in the NCR region in winters that has become a regular menace.

Efforts taken

- Punjab has imposed a prohibition on the burning of paddy straw.
- It further launched initiatives aimed at better utilisation of biomass, including as a fuel to produce power.
- NGT has banned crop burning in the NCR region.

Issues

- The root of the problem is financial- removing crop residues is expensive and thus is not preferred by the farmers.
- Further the use of mechanized harvesters which don't cut the crop more close to the ground is aggravating the problem. The present efforts fail to address this issue.
- The efforts of utilizing biomass do not match the scale of agricultural residues
- Present efforts fail to address farmers' anxiety to remove the surplus from the fields quickly to make way for the next crop.
- There is no mission mode approach to the annual crisis.

Suggestions for agricultural cause of smog:

- Most of the biomass is burned during the winter when the demand for fodder is rising and thus the surplus material could be efficiently utilized.
- Power production from biomass, mechanized composting and bio-gas production should be scaled up by increasing investment.
- Conservation agriculture needs to be popularized which would encourage farmers to use newer low-till seeding technologies allowing much of the crop residues to remain on site, and curb the release of a variety of pollutants.
- Paddy straw can be used for making animal feed, cardboard, paper and other products. Thus, if sufficient financial incentives are given to the farmers, they would not resort to burning them.
- There is also a need to develop rice varieties that are both rich in grain yield and high in straw quality.

Environmental Emergency

- The NGT had prescribed certain measures to be taken if pollution levels breach prescribed levels. For example, it said that if PM 10, PM 2.5 are in excess of 500, 300 respectively, a state of environment emergency should be declared.
- The measures could include a temporaryshutdown of thermal power plants, temporary closure of all construction activity in affected areas etc.

3) DISASTER RISK REDUCTION

- The Asian Ministerial Conference on Disaster Risk Reduction, 2016 was concluded recently at New Delhi.
- The Conference sought to pave the way towards implementationof the Sendai Framework in the Asian region.

Key Highlights

India-UN Agreement

- India and United Nations Office for Disaster Risk Reductionsigned a Statement of Cooperation.
- The **Statement underlined the guiding principles, objectives and areas of cooperation between India and UNISDR** towards the effective implementation and monitoring of the Sendai Framework on Disaster Risk Reduction (SFDRR).
- India will partner with UNISDR to work towards strengthening the capacity of Asian countries in ensuring risk resilient development.
- It will also facilitate the **sharing of knowledge and experiences, and collaborative efforts** towards addressing critical regional challenges.

Focus on Vulnerable Sections

- India laid stress on working towards the protection of vulnerable sections especially women.
- Women are disproportionately affected by disasters. But they have unique strengths and insights which should be effectively channelized. The need to train a large number of women volunteers to support special needs of women affected by disasters was emphasized.

Use of Technology

- There should be investment in risk mapping globally.
- New technology needs to be utilized in enhancing the efficiency of the disaster risk management efforts.
- Social media and mobile technologies must be properly applied in this.

Local Capacity

- The local body form part of decision making and are the first to act on disaster management.
- Thus, there is a need to focus on building on local capacity and initiative and ensuring that the opportunity to learn from a disaster is not wasted.
- The regional plan would support national laws and national actions and advocated stronger disaster laws.
- There is a need to bring about greater cohesion in international response to disasters.
- The Conference came to an end with the adoption of the 'New Delhi Declaration' and the 'Asian Regional Plan for Implementation of the Sendai Framework'.

New Delhi Declaration

- It was a political statement spelling out the commitment of participating governments towards preventing and reducing disaster risk, and strengthening the resilience of communities, nations and the Asian region.
- Recognising the need to accelerate the implementation of global frameworks, it committed to a people-centred and whole-of-society approach towards DRR.
- It also emphasises the need to enhance the capacity of communities and ensure participation of all stakeholder groups towards achieving resilience.

Asian Regional Plan for Implementation of the Sendai Framework

- It focused on the methodology to reduce disaster risk at national and local levels.
- It has arrived at a longer term road map of cooperation and collaboration, spanning the 15-year horizon of the Sendai Framework, as well as a two-year action plan to further disaster risk reduction with specific, actionable activities.

Established in 2005, AMCDRR is a biennial conference jointly organized by different Asian countries and the United Nations Office for Disaster Risk Reduction (UNISDR). So far, six AMCDRR conferences have been organised. India had also hosted the second AMCDRR in New Delhi in 2007

4) CLEAR THE AIR FOR CHILDREN: UNICEF STUDY

Why in news?

- The UNICEF recently concluded a study called 'Clear the Air for Children'.
- In the study which is based on satellite imagery it has categorised the affected areas based on the quantum of particulate matter, ranging from 10 to 60 μg/m3.

What are major findings of the report?

- Two-hundred and twenty million children in South Asia region including India, among nearly 300 million globally, currently live in areas where outdoor air pollution exceeds international guidelines by at least six times
- Many of these children are already disadvantaged by poverty and deprivation. Some are already at heightened risk from conflicts, crises and the intensifying effects of climate change.
- Globally, air pollution affects children in low-income and middle-income countries more.

Impact

- The impact of such high level of pollution is commensurately shocking. Every year, nearly 600,000 children under the age of five die from diseases caused or exacerbated by the effects of indoor and outdoor air pollution.
- Millions more suffer from respiratory diseases that diminish their resilience and affect their physical and cognitive development
- The effects of indoor air pollution kill more children globally than outdoor air pollution, especially in Africa and Asia where the use of solid fuels for cooking is prevalent.
- Chronic exposure to high pollution increases risk of miscarriage and early labour in pregnant women, and low birth weight.

Some suggestions by the report

- It emphasised that nations need stronger measures to cut back on the sources of air pollution, which cannot be contained within borders and spreads across regions.
- Air pollution moves across borders, both national ones as well as sub-national ones, and so coherent government policies are needed to address these trans-boundary risks
- At a global scale, better monitoring of air pollution is required.
- Public investment in healthcare for the children is required to make them more resilient against such new risks.

5) GREAT INDIAN BUSTARD (GIB)

- The Rajasthan government is formulating a long-term plan to save this bird from extinction in collaboration with the Wildlife Institute of India (WII).
- It will take into consideration important measures like controlling the population of stray dogs and implementing recovery actions programmes in collaboration with different stakeholders.

GIB

- It is found in the exclusively in north-western plains particularly parts of Rajasthan and also Pakistan.
- It is one of the heaviest flying birds.
- It is critically endangered bird.
- The reasons are depleting habitat, i.e. grasslands especially due to development of infrastructure intrusions.
- It is the state bird of Rajasthan

6) FLY ASH UTILIZATION POLICY

Why in News

- The Maharashtra state cabinet has recently approved the State Thermal Power Plant Ash Utilisation Policy,With this it has become the first state to adopt thispolicy.
- The policy seeks to curb transport of fly ash producedin the coal-based thermal plants and stipulatesmeasures to utilize all coal waste at source.

What us the need for such policy?

- Ash content of Indian coal is approximately 30-45% while imported coals have 10-15%.
- A large quantity of ash is thus being generated at coal/lignite-based thermal power stations in the country,

Key features of thePolicy

- The government has announced cluster development of ash-based industries, such as cement, in the vicinity of all thermal power plants.
- Fly ash can be used for making cement, pre-fabricated building material, bricks, laying roads, housing and industrial buildings, dams, flyovers, reclaiming low-lying areas, wasteland development, stowing of mines and all other construction works.
- The government has directed departments like Rural Development, PWD, Urban development, Tribal, Social Justice and premier schemes such as Housing for All, Pradhan Mantri and Mukhya Mantri Sadak Yojana to use at least 15% ash component in their works.
- The coal ash can be used in the agricultural land to increase its productivity and hence agriculture department has also been roped in to promote the fly ash among farmers.
- The government has also decided to export fly ash after treating it with cenospheres, which is expected to generate revenue of Rs 1,500 crore.
- The government has decided to set-up a company, Maha Gen Management Services (MahaGeMS), to manage the ash generated at all government-run and private thermal plants in the state.

Significance

- It will help in cutting down air pollution as much of the fly ash pollutes the air while transportation.
- This would help in saving the ash transportation cost, a whopping Rs. 2000 crore at present, which is borne by the power stations.
- This could lead to cutting the cost of power to consumers.
- This would become the source of additional revenue for the government.

7) DELHI DECLARATION ON AGRO BIODIVERSITY MANAGEMENT

About

- The first International Agro biodiversity Congress (IAC) held in new Delhi has adopted New Delhi Declaration on Agro biodiversity Management.

- In the declaration, 900 participants from 60 countries have urged researchers and policy-makers to strengthen and promote complementary conservation strategies to conserve and use agro biodiversity.

Major Highlights

- The Congress addressed seven themes:
  1. Agrobiodiversity for food and nutrition.
  2. Agrobiodiversity for adaptation to climate change.
  3. Intellectual property rights (IPRs) and access and benefit-sharing (ABS) and farmers' rights.
  4. Quarantine, biosafety and biosecurity issues.
  5. Conservation strategies and methodologies.
  6. Science-led innovation for agrobiodiversity management and sustainable use.
  7. Capacity-building and strengthening partnerships.

8) CORAL BLEACHING AT GREAT BARRIER REEF HIGHEST EVER

- A study report that 2,300-kilometre long Great Barrier Reef in Australia has suffered its most severebleaching in recorded history.
- The Bleaching is due to warming sea temperaturesduring March and April of this year, with themaximum damage on its northern, pristine part.
- Scientists estimate that the northern region, regionwith most damage, will take at least 10-15 years toregain lost corals. However, the issue could be thepossibility of a major bleaching event occurringbefore that, hampering the recovery.
- The southern two-thirds of the reef has escaped with minor damage.

Coral Bleaching

- It occurs when abnormal environmental conditions, such as warmer sea temperatures, cause corals to expel tiny photosynthetic algae, draining them of their colour.
- Algae are vital to the coral, which uses the organic products of photosynthesis to help it grow.
- The loss of algae makes the host vulnerable to disease and means it will eventually die.
- However, coral can recover if water temperature drops and the algae are able to recolonize them

9) LOKTAK LAKE

Why in news?

- The MoEF recently constituted a four-member team for conservation and management of the Loktak Lake.
- The team will review the implementation of various work carried out with financial assistance provided by the central and state governments so far for the conservation and management of the Lake. It will also suggest further interventions required for conserving the lake in a holistic manner.

About

- Loktak Lake is the largest freshwater lake in Northeast India located in Manipur.
- It is famous for the phumdis which is heterogeneous mass of vegetation, soil, and organic matter at various stages of decomposition floating over it.
- Keibul Lamjao is the only floating national park in the world. It is located near Moirang in Manipur.
- The Keibul Lamjao National Park is the last natural refuge of the endangered Sangai deer.
- Human activity has led to severe pressure on the lake ecosystem.

10) MISSION ELECTRIFICATION

About

- It is an initiative of the Railway Ministry to reduce dependence on diesel by electrifying nearly 90% of railway tracks in the next five years.
- The Indian Railways will now set targets for ourselves to complete the electrification in a time-bound manner.
- It aims to speed up the present average rate of electrification of 1,700 route kilometres per year by doubling it next year.
- A mobile application called **Rail Saver** was also launched to enable railway officials to keep a track of energy consumption and trends.
- The government has tied up with PSUs for increasing the pace of route electrification and also with Ministry of Science of Technology for developing and utilizing renewable energy technologies.

Significance

- The largest component of greenhouse emission comes from transportation after power generation. Hence transportation will play a key role in reducing the ill effects of such emissions.
- Indian Railways consumes 2% of the country's total power generation. The power could be effectively utilized in other sectors.
- This would also make the travel through Railways faster.
- This will help in reducing the energy bill of railways considerably. Railways' expenditure on energy is second highest after salaries and pensions. It expects to reduce fuel bill by Rs 10,000 crore annually through electrification of major routes.

DECEMBER 2016

1) FIRST 2G ETHANOL BIO-REFINERY IN PUNJAB

Why in News?

The first, 2nd generation ethanol bio-refinery will be set up in **Bathinda in Punjab by HPCL.**

What are the Benefits of Bio-ethanol Plants?

- Provide additional sources of **remuneration to farmers.**
- **Reduction in CO_2 emissions** from the paddy straw which currently is burnt after harvesting.
- It will produce about **30,000 tonnes of bio-fertiliser** per annum that can be used as soil nutrient.
- It will produce more than **1 lakh kilograms of Bio-CNG** per annum which can cater to transport and clean cooking requirements.
- These Bio-refineries shall produce around **35-40 crore litres of ethanol** annually, thus contributing significantly towards the EBP programme

What are the Issues with first generation?

- One of the major drawbacks is that they come from **biomass that is also a food source**.
- This has **led to increase in the volumes of crops being diverted away from the global food market** and is blamed for the global increase in food prices over the last couple of years
- Some biofuels have negative Net energy gain meaning that the energy expended to produce the biofuel is more than the energy gained from that harvest

Advantages of next generation biofuels

- They come from **non-food biomass, but still compete with food production for land use**.
- 3rd generation biofuels present the best possibility for alternative fuel because they don't compete with food. However, **there are still some challenges in making them economically feasible**.

Way Forward

- It needs to be ensured that the production of biofuels does not lead to food shortages, water shortages, high food prices, deforestation and other ecological damages.
- Biofuels are alternative sources to fossil fuels which can help India not only lower its import bill on oil but also help conserve environment.

GENERATIONS OF BIOFUELS

1.First Generation Biofuel

- They are produced directly from food crops.
- Crops such as wheat and sugar are the most widely used feedstock

2.Second Generation Biofuel

- They are produced from marginal croplands unsuitable for food production or non-food crops such as wood, organic waste, food crop waste and specific biomass crops. For example- Jatropha Thus, it overcomes over food vs fuel debate in first generation biofuel.
- It is also aimed at being cost competitive in relation to existing fossil fuels and increasing Net energy gains.

3.Third Generation Biofuel

- It is based on improvements on the production of biomass by taking advantage of specially engineered energy crops such as algae as its energy source.
- The algae are cultured to act as a low-cost, high-energy and entirely renewable feedstock.
- Algae will have the potential to produce more energy per acre than conventional crops.

4.Fourth Generation Biofuels

- Fourth Generation Bio-fuels are aimed at producing sustainable energy and also capturing and storing carbon dioxide.
- This process differs from second and third generation production as at all stages of production the carbon dioxide is captured which can be then geo-sequestered.
- This carbon capture makes fourth generation biofuel production carbon negative rather than simply carbon neutral, as it is 'locks' away more carbon than it produces.

2) NGTDIRECTIONS ON SAMBHAR LAKE

Why in news?

National Green Tribunal (NGT) has directed the Rajasthan government to cancel allotments of salt pans in the Sambhar Salt Lake that fall within the wetland.

About Sambhar Lake

•Sambhar Salt Lake is India's largest inland salt lake.
•It is located in Nagaur and Jaipur districts of Rajasthan. It is surrounded on all sides by the Aravali hills.
•It has been designated as a Ramsar site and also an Important Bird Area.
•The site is important for a variety of wintering waterbirds, including large numbers of flamingos.

Final NGT order

It directed the Rajasthan government to:

- Cancel allotments of salt pans in the Sambhar Salt Lake that fall within the wetland and run contrary to the mandate of Wetland Rules, 2010.
- Not to make any further allotments or permit new salt pans within the wetland areas or in the 'no construction zone' identified for the said purpose in accordance with the Wetland Rules, 2010.
- Examine the sensitive issue in light of observations and recommendations made by the two expert committees in the year 2010 and gave six months' time to implement the recommendations which should not be later than the 2017 monsoon.

Issues involved

- The illegal business of brine extraction in the Sambhar Lake was first highlighted in the Vinod Kapoor fact-finding report in 2010.
- The report had mentioned that 15-20 bore wells were operating in every bight of land during that period and over exploitation of water resources had lowered the groundwater level by almost 60 metres in the area.
- In the PIL, it was alleged that in and around the Sambhar Lake, commercial and other activities detrimental to the eco-system of the wetland.
- These activities were being carried out contrary to the provisions of the Wetland (Conservation and Management) Rules framed under the Environment Protection Acts of 1986 and 2010.

NGT bans open waste burning

- NGT has specifically banned open burning of waste on lands, including at the landfill sites.
- The Tribunal announced a fine of INR 5000/- in case of simple burning and INR 25,000/- in case of bulk waste burning.

ABOUT NGT

- It has been established in 2010 under the National Green Tribunal Act 2010.
- It has been established for effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources.
- It also includes enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property and for matters connected therewith.
- It is a specialized body equipped with the necessary expertise to handle environmental disputes involving multi-disciplinary issues.
- The Tribunal is not bound by the procedure laid down under the Code of Civil Procedure, 1908, and is guided by principles of natural justice.

- The Tribunal is mandated to make and endeavour for disposal of applications or appeals finally within 6 months of filing of the same.
- New Delhi is the Principal Place of Sitting of the Tribunal and Bhopal, Pune, Kolkata and Chennai shall be the other four place of sitting of the Tribunal.
- It adjudicates matters relating to following Acts-

1. Water (Prevention and Control of Pollution) Act, 1974
2. Air (Prevention and Control of Pollution) Act, 1974
3. Environment (Protection) Act, 1986
4. The Public Liability Insurance Act, 1991
5. Forest Conservation Act
6. Biological Diversity Act

3) SAFETY MEASURES IN COAL MINES

Why in news?

- An open cast coal mine collapsed in Lalmatia in Jharkhand killing at least 23 miners.
- A solid floor of 300 metres length and 110 metres width of the overburden dump area slid down by about 35 metres involving around 9.5 million cubic metres of earth material.
- It the worst such disaster in over a decade.

Background

- Digging up more coal has become a national priority for India to meet its electricity needs.
- Alongside ship-breaking, mining is the most dangerous profession in India.
- NHRC in its 2014 report titled 'Views on Mine Safety in India' says:
    1. The frequency of incidents has increased in recent years.
    2. There has been a fatality every seven days in 2016.

What are the reasons for such accidents?

- Poor safety conditions for workers.
- Not following Standard Operating Procedures (SOPs).
- Careless use of explosives.
- PSUs outsource work to private companies that do not follow rules and regulations. e.g.
- To prevent flying of coal dust water is not sprayed on open cast mines.
- Trucks are not covered with tarpaulin sheets.
- This is despite the Coal Mines (Nationalisation) Act 1973, which nationalized private sector, accused of neglecting safety Standard Operating Procedures

Prescribed Safety Precautions in Open Cast Coal Mines

- Retaining wall along the slopes should be made strong enough to stop collapsing of mines
- All cranes, lift trucks and similar handling equipment should be constructed, operated and maintained in accordance with relevant safety standards as defined by the government
- Miners should stay clear of suspended loads
- Only trained and competent persons should be authorised to sling loads
- Precautions should be taken against exposure to airborne contaminants, harmful physical and chemical agents present in the working environment

Open-pit, open-cast or open cut mining

- It is a surface mining technique of extracting rock or minerals from the earth by their removal from an open pit or borrow
- This form of mining differs from extractive methods that require tunneling into the earth, such as long wall mining.
- Open-pit mines are used when deposits of commercially useful minerals or rocks are found near the surface; that is, where the overburden (surface material covering the valuable deposit) is relatively thin or the material of interest is structurally unsuitable for tunnelling (as would be the case for sand, cinder, and gravel).
- For minerals that occur deep below the surface—where the overburden is thick or the mineral occurs as veins in hard rock—underground mining methods are used to extract the valued material.
- Open-pit mines that produce building materials and dimension stones are commonly referred to as "quarries".
- This is mining of minerals at the surface by excavating large strips of land as shown in the adjoined figure, without making subsurface tunnels as is done in underground mines.
- Retaining walls are made along steeper slopes to prevent collapse of pit benches.
- Its benefits include lower cost and higher safety level.
- It causes ground water contamination and high chances of exposure to radioactive substances.

What are Other Issues involved in mining?

- Environmental degradation
- Human Rights violation of local residents mostly tribal. Eg. Tribals constantly fear of their displacement
- Hiring of contract labourers from outside the area to circumvent protests by locals.
- Labourers do not enjoy social security. Employment of child labour.
- Outright corruption in projects sanctions for minerals exploitation.
- Illegal mining by land owners and mafia.
- Mining areas, especially coal mining, are located near Maoist zones adding to security costs.

Government initiatives on mining safety

- Mines Act 1952 covers protection of health and safety of workers in mines.
- Major incidents are investigated by the Oil Industry Safety Directorate and a committee set-up by the Ministry of Petroleum and Natural Gas.
- Root Cause Analysis (RCA) and lessons learnt report is shared with oil companies to prevent similar incidents.
- Ministry of Mines has recently started Anti-collision system for dumpers, electronic tele monitoring system, slope stability system and gas monitoring system in some areas.

What needs to be done?

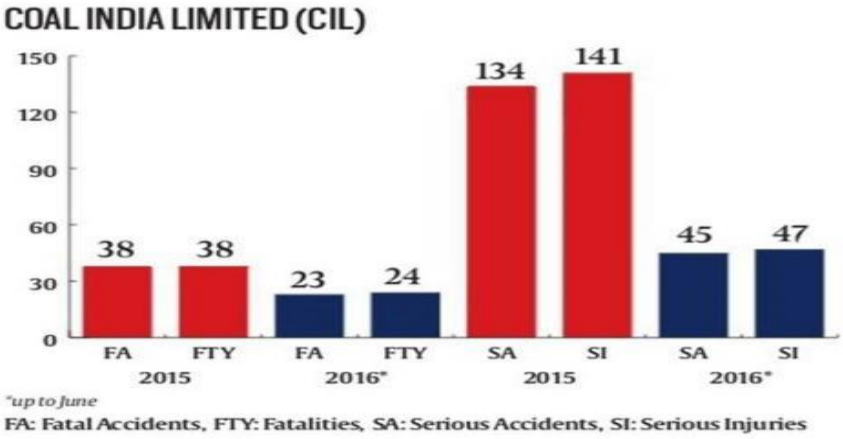
- NHRC in its 2014 report mentioned the need for the mining sector to adopt best practices including-
- Using scientific 'training need assessment' for officers and workers
- Developing effective training delivery mechanisms
- Working on comprehensive specialised training on accident investigation.
- Occupational health is not integrated with primary healthcare. It is the mandate of the Labour Ministry. This has to be shifted to Health Ministry for better synergy and finance allocation.
- A regulator on occupational health safety is needed.

Occupational Hazards

Occupational hazard is a danger to a worker that is the result of the occupation he/she is involved in. The danger can range from diseases to even death. Examples:

- Silicosis in stone crushing industry due to fine silica getting deposited in lungs.
- Frostbites to soldiers posted on high mountains.

Graph showing fatal mining accidents :



Way forward

- Safety standards as prescribed by ILO and national standards related to safety should be strictly adhered to.
- Any lapse or negligence on the part of those entrusted with safety requirements must be thoroughly investigated and punished.
- The mining industry is a labour intensive industry. Therefore the government and the companies involved needs to devise a multi-pronged strategy that encompasses occupational safety along with protection of the rights of local residents and the environment

4) CYCLONE VARDAH

Why in News?

- Cyclone Vardah made a landfall on Chennai on December 10, 2016 uprooting trees, causing heavy rainfall and bringing the metropolitan to a standstill.

What is a Landfall?

- A landfall is the intersection of the centre of tropical cyclone with a coastline.
- A landfall is often accompanied by strong winds, lashing rain and rising sea waves.

What are Cyclones?

- Cyclones are tropical storms/rapidly rotating wind systems formed over tropical oceans.
- They are characterized by low-pressure centres, a closed low-level atmospheric circulation, strong winds and thunderstorms that cause heavy rain

Tropical Storms/ Cyclones in India

- India is exposed to nearly 10% of the world's tropical cyclone owing to its long coastline.
- Majority of cyclones originate in the Bay of Bengal and therefore mostly hit the east coast of the Indian sub-continent.
- The Indian coast line was hit by other cyclones in 2016 such as Roanu and Nada.
- Tropical storms are known by different names in different parts of the world such as Hurricane in the Atlantic, Typhoon in the Pacific and Cyclone in the Indian Ocean.

About Cyclone Vardah

- Cyclone Vardah is **a tropical storm that originated in the Bay of Bengal.**
- It slammed Chennai and adjacent parts of Andhra Pradesh coast. According to Assocham, Tamil Nadu has to bear a loss of around Rs. 6,749 crore ($1billion) due to the destruction caused by Vardah.
- The storm triggered by the cyclone has caused **damages to buildings, uprooted trees,** and damaged banana plantations, papaya groves, rice paddies and others.

Preparedness of state government

- Post December 2015 floods, Chennai became a sitting example of bad land use, lousy urban planning and failure of disaster management machinery.
- The state government has been building storm water drains, removing encroachments, de-silting water bodies, bridges and culverts.
- It has also been organizing its early warning and disaster response machinery**.**

Present Status

- The state's response to Cyclone Vardah does show some improvement however, a lot is yet to be done.
- There are more than 55,000 encroachments on the banks of the Adyar and Couum rivers and the Buckingham Canal.
- Building storms drains may not be enough as Chennai grapples with many other natural shocks other than flooding due to heavy rain such as cyclones, heat waves and water scarcity.
- Chennai's growth agenda is posing a serious threat to its potential to absorb natural shocks.
- Even if the Paris climate deal is honoured, a 2 degree rise in temperature has been predicted. This in turn would lead to a rise in sea level.
- Chennai is looking at a 4.9 metres sea level rise along its coastline from a 2 degree temperature rise.
- Other metropolitan cities such as Mumbai, Kolkata and Kochi are worse off and are looking at a vulnerable future.

Recommendations

- The **availability of open, unbuilt lands and water bodies must be maintained**
- **Native vegetation cover and a healthy network of water bodies** are needed to regulate micro climate and enhance local water security.
- **Making climate sensitive choices** when it comes to urbanization and development is the need of the hour.

5) SUPREME COURT: AIR POLLUTION IN DELHI NCR

Why in news?

The Supreme Court approved a comprehensive action plan to tackle air pollution emergencies in the capital.

Salient Features

- The court **directed the centre to adopt reports submitted by the Environment Pollution Control Authority (EPCA),** which list steps to be taken whenever air quality deteriorates beyond a certain level
- EPCA's reports categorize **four levels of air pollution in the National Capital Region (NCR) centred around Delhi**, based on atmospheric particulate matter (PM) levels.
- The plan sets in motion a series of steps that every authority-central government, Delhi government, municipal corporations and Delhi's neighbouring states-need to take as pollution levels spike

Pollution watch

Air pollution will be classified into four categories of air quality—moderate to poor, very poor, severe, very severe or emergency.

MODERATE TO POOR

Moderate would be the condition when PM 2.5 and PM 10 levels are between 61-90µg/m³ and 101-250µg/m³ respectively. Poor would be when PM 2.5 and PM 10 levels are between 91-120µg/m³ and 251-350µg/m³ respectively.

Steps

1. Ban on garbage burning in landfills
2. Regulate brick kilns and industries causing pollution

VERY POOR

When PM 2.5 and PM 10 levels are between 121-250µg/m³ and 351-430µg/m³, respectively.

Steps

1. Ban on diesel generators
2. Enhance parking fee by 3-4 times
3. Increase bus and metro rail frequency
4. Ban use of coal/firewood in hotels and open eateries

SEVERE

When PM 2.5 and PM 10 levels are above 250µg/m³ and 430µg/m³, respectively.

Steps

1. Close brick kilns, hot mix plates and stone crushers
2. Shut down Badarpur power plant
3. Intensify use of public transport, introduce differential pricing to encourage off-peak travel
4. Mechanised cleaning of roads and sprinkling of water to reduce dust

SEVERE+ AND/OR EMERGENCY

When PM 2.5 and PM 10 levels cross 300µg/m³ and 500µg/m³, respectively, and persist for 48 hours or more.

Steps

1. Ban entry of diesel truck traffic to Delhi (except essential commodities)
2. Ban construction activities
3. Introduce odd-even road rationing scheme

Additionally, a task force is to be set up to take other steps like shutting of schools.

µg/m³: microgram per cubic meter

6) RISING TEMPERATURES CAUSES SOIL TO RELEASE MORE CO2

Why in News?

- Rising global temperatures is triggering carbon release from the soil, according to a study published in the journal **Nature.**
- More carbon dioxide in the air would accelerate planetary warming.

What is it?

- Soils have accumulated vast amounts of organic matter especially in **Tundra and Boreal forests.**
- As the soil warms, **microbial activity picks up and carbon or methane is released**. Both of which are active greenhouse gases which contribute to global warming.
- The study says that **temperature rise of 1degree Celsius will result in the release of 30 pentagrams of carbon** which is double the amount emitted due to human activities annually.
- The **massive jump in emissions can prove to be a serious setback** to the efforts being made to keep the global temperatures from rising above 2 degree Celsius

7) BACTERIA RESISTANT TO "LAST RESORT" ANTIBIOTIC

Why in News?

- Scientists at the Ohio State University have identified bacteria resistant to **carbapenems** in a swine farming operation.
- The WHO adopted a global action plan to combat anti-microbial resistance in May 2015.

- As per the global action plan, all member countries are to submit national action plans to combat anti-microbial resistance by May 2017.

What is it?

- Scientists have recovered 18 isolates of multiple **Enterobacteriaceae** species harbouring the beta-lactamase gene IMP-27, which confers **resistance to carbapenem antibiotics**.
- This family of bacteria includes **pathogens such as Escherichia Coli.**
- Carbapenems are termed **"critically important" for human health by WHO.**
- **Carbapenems are a last line of defence against drug-resistant bacteria**. It is used to **treat diseases when no other antibiotics are known to work.**

8) WINTER FOG EXPERIMENT

Why in news?

- **Ministry of Earth Sciences (MoES)** has launched Winter Fog Experiment **(WIFEX 2016-17**) to achieve better understanding of fog life cycle at Indira Gandhi International Airport (IGIA), Delhi.
- The main **scientific objective of this project is to study the characteristics and variability of fog events** and associated dynamics, thermodynamics and fog microphysics.

What is the need for such experiment?

- The **physical and chemical characteristics of fog**, meteorological factors responsible for its genesis, sustenance, intensity and dissipation are poorly understood.
- Recent studies on **fog in India during the past 10-15 years have prompted significant socio-economic concern** due to increase in frequency, persistence and intensity of fog occurrence over the northern parts of the country.
- It is one of the **major weather hazards, impacting aviation, road transportation, economy and public life** in the world's most densely populated region.

Significance of experiment

- It **will help to achieve better understanding of fog life cycle** and ultimately improve capability in fog prediction.
- It will **help reduce its adverse impact on aviation**, transportation and economy, and loss of human life due to accidents.

ABOUT FOG

•Fog is a visible mass consisting of cloud water droplets suspended in the air or near the Earth's surface.
•Maximum fog occurrence over the Northwest India is about 48 days (visibility < 1000m) per year, and occurs mostly during the December-February time period.
•Land use changes and increasing pollution in the region are responsible for growing Fog occurrence.

9) GIRAFFES PUT ON EXTINCTION WATCH LIST

- Scientists have put Giraffes on the official watch list of threatened and endangered species worldwide calling it **"vulnerable".**
- Giraffe population has **shrunk nearly 40 percent in 30 years**

10) FOREST FIRE

Why in news?

- Parliamentary **Standing Committee on Science and Technology** submitted its report on forest fires.
- It said that the frequency of **forest fires across Central Indian forests and the Himalayan Pine forest** have increased by 55% in 2016.

- The States of Odisha, Chhattisgarh, and Madhya Pradesh accounted for 1/3rd of the forest fires.
- The committee observed that **Chir pine needles, which are highly inflammable due to its high resin content**, are a prominent factor in occurring and spreading of forest fires. In comparison, incidents of fire in broad leaves forests were found to be minimal.
- The Committee suggested that **a national policy on managing forest fires should be prepared.**

What are the Major Recommendations?

- **Planting of broad tree leaves in forests**, and after a period of five years, systematic replacement of chir pine trees in forests by broad leaves.
- Procurement of sweeping machines to **clear roadsides of chir pine needles and dry leaves** in vulnerable areas.
- Advocated large-scale incentives and programmes (including under the MGNREGA) to **collect pines for use as fuel, and other incineration.**
- A dedicated **toll-free number for reporting incidents** of forest fire in each state.
- Use of corporate social responsibility funds for **creating awareness campaigns on forest fires.**
- Environment **ministry should train fire brigade officers** of all states and equip them with forest fire equipment so that in the event of forest fires **they do not have to depend on outside agencies like NDRF.**
- **Creation of ponds and other water harvesting structures** within the forest area to not only reduce river bank erosion but also as a handy tool for supply of water to douse forest fires.

11) AMMONIA DETECTED FIRST TIME IN TROPOSPHERE

Why in news?

- Researchers for the first time detected **trace amount of Ammonia in upper troposphere.**
- It was most concentrated in the upper layer of the troposphere **above India and China due to high agricultural emission from livestock farming and fertilisation.**

Why is this Discovery Important?

- It shows that ammonia released on Earth's surface due to agricultural processes survives all the way to the upper troposphere, and is not washed out completely by monsoon.
- It means that **ammonia not only pollutes the local ecosystem but also plays a role in formation of Aerosols**.
- The accumulation of aerosols in the troposphere is thought to have a cooling effect, as clouds reflect the sun's energy.
- It may provide an **alternative way to mitigate the human-induced effects of climate change.**

Aerosols

- Aerosols are **tiny particles made from super-fine solid particles and liquid droplets** carried in the atmosphere
- They often act as **'cloud condensation nuclei'** around which cloud droplets are formed.
- Aerosols can also **modify the size of existing cloud particles**, and change how the clouds reflect and absorb sunlight, leading to haze and much redder sunrises and sunsets

12) WATER DAY

Why in news?

The central government has decided to observe **April 14** every year as "water day".

Background

- **Water is increasingly becoming a scarce** resource with **per capital availability of water going down** to 1545 cubic meters as per the 2011 census as compared to 1816 cubic meter as per 2001 census.

- The importance of economic use and better management of water arises as most of the water is not available for use and secondly **it is characterized by its highly uneven spatial distribution.**
- The Water Day is being observed to raise **the awareness among people about conservation of water**, minimizing wastage and need for more equitable distribution both across and within states.

Way Forward

- National Water Commission as recommended by Mihir Shah Commission should be implemented.
- Efforts should be made to **promote and raise awareness about efficient use of water among people.**

MIHIR SHAH COMMITTEE RECOMMENDATIONS

- Committee has suggested that an **urgent overhaul of the current water management system** is required
- Change is required both in **surface water as well as ground water management policies** to face the new challenges that are emerging
- The committee has suggested a **restructuring of Central Water Commission and Central Ground Water Board**. It has recommended the establishment of **National Water Commission to be established** as the nation's apex facilitation organization dealing with water policy, data and governance.
- It has suggested **that industrial water should be brought under its ambit**, which is rapidly increasing.
- Panel has warned against the perils of dependence on large dam projects and also about the dismal spread of irrigation facilities over decades
- The **Gujarat and Madhya Pradesh model of participatory last-mile connectivity** should be deployed across the country.
- States should only **concentrate on technically and financially complex structures**, such as main systems up to secondary canals and structures at that level.
- Tertiary level canals and below, minor structures and field channels should be handed over to Water Users Associations of farmers and Integration into the planning and cost developing process for all irrigation projects.
- The key recommendation of the committee is to shift focus from construction to decentralized management and maintenance in order to ensure that the promise of "Har khet ko pani" under Pradhan Mantri Krishi Sinchai Yojana does not go unfulfilled

13) WORLD MOUNTAIN DAY

Why in News?

World Mountain Day which is celebrated every year on **December 11** recognises **the mountain culture as a unique blend of livelihoods and physical conditions**.

Why is it Important to Conserve the Mountain Culture?

- The mountain culture is **closely linked to its livelihood** and therefore it must be protected against the onset of globalisation.
- **Isolation created by uneven topography** has helped to maintain the unique mountain culture.
- This **culture is now degrading due to migration** as well as climate change.

What are the Problems at Hand?

- Due **to water shortage and degradation of grazing** land as a result of dam-building activity has made livelihood difficult for the mountain people.
- **Mountain farmers produce much less than their counterparts** in the plains and also get less in return due to long supply chains and high transport costs.

- **Mass migration of the highland people** to the plains in search of livelihood has led to the destruction of the traditional knowledge of the mountain people.
- **Mass tourism is also undermining the mountain culture** of the Himalayan region.

Recommendations

- New **economic avenues must be generated** for the mountain people to prevent mass migration
- **Control on tourist visits to the Himalayas** and sensitizing them towards its culture
- Encouraging **community based mountain tourism** for equitable distribution of income

14) ECO-SENSITIVE ZONE: SANJAY GANDHI NATIONAL PARK

Why in news?

Final Notification for an Eco-Sensitive Zone (ESZ) area of 59.46 sq kms was notified by the government in Sanjay Gandhi National Park in Mumbai.

ESZ Guidelines classify activities under three categories:

- **Prohibited:** Commercial Mining, Setting of Saw Mill, Setting of industries causing pollution, establishment of major hydroelectric projects etc.
- **Regulated:** Felling of Trees, Establishment of hotels and resorts, erection of electrical cables, drastic change of agricultural systems etc.
- **Permitted:** Ongoing agriculture and horticulture practices by local communities, rain water harvesting, organic farming etc.
- Many states are opposed to ESZ because of presence of minerals and resources side by side.
- Local people in many areas are also opposed to ESZ for loss of livelihood due to restriction placed by it on various activities.

Way Forward

- Local communities should be incentivized and their participation should be ensured for successful implementation of ESZ.
- State governments should balance the need for development, aspirations of local people and environmental conservation needs.

What is Eco-Sensitive Zone?

- It is created to act as a buffer for further protection around Protected Areas (PAs) such as National Parks and Wildlife sanctuaries.
- Activities around such areas are regulated and managed so as to protect the environment.
- ESZ is notified under Section 3 of the Environment (Protection) Act, 1986 by the Union Ministry of Environment and Forest.

Sanjay Gandhi National Park-

- It is part of Western Ghats Biodiversity complex.
- **Mammals** found - leopard, wild boar, four-horned antelope, black-naped hare, wild cat, jackal and porcupine
- **Birds**- Lesser grebe, Purple Heron, Smaller Egret, Lesser Whistling Teal, Pariah Kite
- **Reptiles** - Indian Cobra and Viper

15) ATMOSPHERIC MOISTURE AFFECTING RAINFALL AND DROUGHT

Why in News?

- According to a study, atmospheric rivers (AR) and low level jets (LLJ) play a major role in the occurrence of extreme rainfall events, and their absence leads to droughts.
- The study was published in Annual Review of Environment and Resources.

What is it?

- **Atmospheric rivers** are 1-2.km high and 300-500 km wide wind systems **which carry huge amounts of water vapour**. They stretch over a distance of 2000kms.
- When Atmospheric Rivers make a landfall, they often release water vapour in the form of rain or snow. These events can turn extreme as well.
- Atmospheric rivers **carry 90 percent of ocean moisture transported to the mid-latitudes**.
- Similarly most of the moisture transported from ocean to land in the tropics is via low level jets.
- While Atmospheric Rivers is an extra-tropical phenomenon, low level jets occur in both tropical and extra-tropical region.
- Atmospheric rivers are essential as they provide rain and snow that is crucial to water supply.
- Rainfall from low level jets occurs only in summer while that from Atmospheric Rivers could occurs in winter as well.

Significance

- A detailed **study of moisture transport can help make accurate future climate predictions.**
- It could help **make better rainfall forecasts in monsoon region**.
- Studying atmospheric rivers and low level jets could throw light on the role of transport of moisture in intense rainfall events and droughts.

16) SOLAR POWER IN INDIA

Why in News?

- Solar Energy Corporation of India (SECI) called for **bids to install 1 GW rooftop solar power projects on central government buildings.**
- It is not only SECI's largest tender but also **the single-largest green energy tender in the world in the rooftop category**.
- The project puts **India on track to fulfil the promise made under the Paris pact to fight climate change.**
- India has promised to get at least 40% of its total installed power from non-fossil fuel sources by 2030.

What is the Current Situation in India?

- In 2014, PM put a target of **generation of 175GW of energy by 2022 through solar power.**
- The solar sector saw an impressive CAGR of 59% since 2012.
- The installed capacity of the solar sector at the end of FY2016 was pegged at 6.8GW.
- The **share of renewable energy has also increased from 12.5% in FY2013 to 14.1% in FY2016**.
- India has the **capacity to achieve 479GW of solar power and 410GW of wind power by 2047**.

Challenges

- One of the biggest challenges facing the country today is **developing the renewable energy infrastructure and integrating the solar energy with the current supply.**
- Despite the fact **that India's installed capacity of renewable energy is in excess of its demand**, yet there are areas that have no electricity or power cuts are frequent.

JANUARY 2017

1) KYOTO PROTOCOL

Why in News?

- Recently the Union Cabinet had approved the ratification of the second commitment period (2013-2020) of the Kyoto Protocol on containing the emission of greenhouse gases.
- The Centre gave its nod to ratify the secondcommitment period of the Kyoto Protocol
- Till now, 75 countries have ratified the second commitment period

Background

- 2nd commitment period its second commitment period wasadopted in 2012. But, only 65countries have so far ratified, which falls short of 144 countries needed
- For mechanism to come into force.The Doha amendments, made in 2012,had extended the legal obligation ofdeveloped countries to take targetedgreenhouse gas emission cuts until 2020
- It should be noted that a new climatechange agreement for the post-2020Period, called Paris Agreement 2015 has already entered into force andreplaced the Kyoto Protocol.
- Under the Paris Agreement, every country including developedcountries have the freedom to decidefor itself what action it will take.

Classification of Parties to the Kyoto protocol

- Annex I:These are the industrialized (developed) countries and "economies in transition" (EITs). EITs are the former centrally-planned (Soviet) economies of Russia and Eastern Europe. The European Union-15 (EU-15) is also an Annex I Party.
- Annex II: made up of members of the Organization for Economic Cooperation and Development (OECD).
- Annex II Parties are required to provide financial resources to enable developing countries in reducing their greenhouse gas emissions (climate change mitigation) and manage the impacts of climate change (climate change adaptation).
- Annex B: Parties listed in Annex B of the Kyoto Protocol are Annex I Parties with first or second round Kyoto greenhouse gas emissions targets.
- Non-Annex I: Parties to the UNFCCC not listed in Annex I of the Convention are mostly low-income developing countries. Developing countries may volunteer to become Annex I countries when they are sufficiently developed.
- Least-developed countries (LDCs):49 Parties are LDCs, and are given special status under the treaty in view of their limited capacity to adapt to the effects of climate change.

About Kyoto Protocol

- The Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 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."
- Its first commitment period started in 2008 and ended in 2012.
- The protocol was developed under the United Nations Framework Convention on Climate Change-UNFCCC.
- The participating countries have ratified the Kyoto Protocol and committed to cutting the emissions of the Green House Gases such as Methane (CH_4), Nitrous oxide (N_2O), Hydro fluorocarbons (HFCs), per fluorocarbons (PFCs), Sulphur hexafluoride (SF_6) and carbon dioxide (CO_2).
- Kyoto Protocol places commitments on developed nations
  1.To undertake mitigation targets
  2.To provide financial resources and
  3.Transfer of technology to the developing nations
  4.To compensate for the sting of "binding targets,"
- The protocol provided several mechanisms to developed countries
  1.Emissions trading
  2.Clean development mechanism
  3.Joint implementation

Mechanisms to stimulate green investment

- **Emission Trading**: Emissions Trading-mechanism allows parties to the Kyoto Protocol to buy 'Kyoto units' (emission permits for greenhouse gas) from other countries to help meet their domestic emission reduction targets.
- **Clean Development Mechanism (CDM):** Countries can meet their domestic emission reduction targets by buying greenhouse gas reduction units from (projects in) non Annex I countries to the Kyoto protocol.
- **Joint Implementation**: Any Annex I country can invest in emission reduction projects (referred to as "Joint Implementation Projects") in any other Annex I country as an alternative to reducing emissions domestically.

Initiatives by India to Counter Climate Change

- **National action plan on climate change (NAPCC):**
  Government of India has launched eight Missions as part of NAPCC in specific areas which include assessment of the impact of climate change and actions needed to address climate change.

1. National Solar Mission National Mission for Enhanced Energy Efficiency
2. National Mission on Sustainable Habitat
3. National Water Mission
4. National Mission for Sustaining the Himalayan Ecosystem
5. National Mission for a "Green India"
6. National Mission for Sustainable Agriculture
7. National Mission on Strategic Knowledge for Climate Change
8. National Action Programme to Combat Desertification: It is proposed to initiate activities such as assessment and mapping of land degradation, drought monitoring and early warning system, drought preparedness plans, and on-farm research activities for development of indigenous technology etc.

2) ANTARCTIC GLACIAL MELTING

Why in news?

In recent months, unprecedented rates of glacier melts have been reported both in the Antarctic and the Arctic.

What is the issue?

- A massive crack in Antarctica's 4th biggest ice shelf has surged forward by at least 10 kms since Jan 2017 due to the melting of glacial ice.
- The last existing permanent ice sheets of the earth are found only in Antarctica. These sheets are mass of glacier ice, which covers the surrounding terrain that makes the continental glacier.
- The Antarctic ice sheet is 14 million sq km in area and holds a large amount of frozen fresh water. (In comparison, the area of India's land mass is about 1.3 million sq km.).
- The **Larsen ice shelf** is a series of shelves that occupy distinct embayment along the coast. From north to south, the segments are called as Larsen A(which collapsed in 1995), Larsen B(collapsed in 2005) and Larsen C (the largest among the three)
- Recently it was found that there is a crack along the Larsen C shelf in the Antarctic, which is expected to break off at any time.

What are the Causes of Glacial melt?

- **Ice age**: A long-term reduction in the temperature of the earth's surface and atmosphere, resulting in the presence or expansion of continental and polar ice sheets is termed as **glacial periods** or ice age. The periods of warmer temperatures were known as **inter-glacials.** The ice ages are believed to have been caused by small shifts in the earth's orbit.
- **Albedo mechanism**: There are some factors that speed up glacier melt. Dirt & dust carried by air, bacteria and algal pigments in the meltwater, any other pigments in the glacier can all reduce the reflection of the sunlight, thus increasing the absorption of heat energy by the ice.
- **Co2 Concentration**: Carbon dioxide concentrations have crossed 400 ppm in the atmosphere and are the highest in the past 4,00,000 years.
- **Other factors**: Temperature of the water and ocean currents (these are still not entirely understood even by the modern day scientists)

What are the Consequences?

- **Collapse of ice shelves**: Large chunks of ice breaking away from an ice shelf speed up the collapse of the entire shelf. Thus, if Larsen C collapses by itself, it will speed up the melting of the glacier it is connected to.
- **Rising sea levels**: This is a nonlinear process caused by Increasing surface melt, calving or breaking of glacial ice. If all the ice over the Antarctic were to melt, sea levels would rise by about 60 meters.
- **Economic logjam**: large and densely populated cities are located mostly along the coast and in low-lying deltas. Protecting the coast itself is an expensive undertaking.

What is the impact on India?

- The **East coast** is vulnerable to intensive storms, which then lead to flooding, salt-water intrusion, loss of land and livelihoods.
- On the **West coast**, the major concern is coastal erosion and flooding from sea level rise.
- **Potential coastal impacts** needs also to be understood not just as a coastal phenomenon, but also as an issue that ripples through the entire economy.
- For instance, flooding in Chennai two years back did not affect just the land, but went through the economy as a whole and the estimated losses were about $2.2 billion.

What are the measures that can be taken by India?

- Enforce the **coastal regulation zones**.
- **Protect vulnerable districts** and communities which rely on ecosystems and the sea for their livelihoods.

- **Regional agreements** related to climate refugees need to be initiated as it open to refugees from the neighbouring countries.
- The process and the resultant collapse of glacial melts are now recognized as unstoppable. Thus it is clear that regional and global planning is essential to combat such extreme events and adapt to the changing times.

3) OLIVE RIDLEY

Why in News?

54 carcasses of Olive Ridley turtles were found on the Shore of **Hope Island,** off the coast of Kakinada **(Andhra Pradesh)** in last one month indicating that their breeding season has been severely affected this year.

Why there population declining?

- Rampant and irresponsible use of **mechanized fishing boat** under which turtles are stuck and crushed.
- Despite being exhorted by fisheries department, boat owners are still unwilling to use **Turtle Excluder Device (TED)** to help turtles pass through the net probably because of **lack of awareness**.
- Direct harvest of Adults and Eggs contribute to dwindling population.
- Yet another reason is **unavailability** of TED in the open market.
- **Gahirmatha** located in the **Bhitarkanika Wildlife Sanctuary, Odisha** houses the world largest mass nesting site of these turtles.
- Past few years, Sandy stretches of **Hope Island** of the **Coringa Wildlife Sanctuary, Andhra Pradesh** have also emerged as a breeding ground for these turtles.

About Olive Ridley Turtles

- They are smallest and most abundant of all the sea turtle species. They are Omnivores.
- Gets their name from olive green colouration of its heart shaped shell.
- They are found only in warmer waters, including the southern Atlantic, Pacific and Indian Oceans.
- In India, the Gahirmatha beach and the Rushikulya and Devi river mouths of Odisha are famous as the world's largest Olive Ridley rookery.
- They are known for their arribadas (synchronised mass nesting) during which time tens of thousands of female turtles come ashore to nest in the span of a few days.
- Their breeding season is from October to February where female can lays 100-150 eggs at one time
- The Olive Ridley turtles are the smallest and most abundant of all sea turtles inhabiting warm waters of Pacific, Atlantic and Indian Ocean
- Despite high population, their numbers have declined significantly in past few year. They have been categorized as Vulnerable in IUCN Red list and Listed as Schedule I species in the Wildlife (Protection) Act, 1972, thereby being offered maximum protection.
- The main cause for death of turtles has been trawling of mechanized boats.

Steps taken by Indian government

- **Operation Oliva**: The Indian Coast Guard recently launched'Operation Oliva' in Odisha with a mission tosave the endangered olive ridley turtles.
- This is an effort to ensure olive ridley turtles breeding and to cut off intruding fishingvessels.
- These **rescue efforts** have been launched atthe three major nesting sites of theturtles:-
  1. **Gahirmatha Marine Sanctuary**
     - It is Located within the close vicinity of the Bhitarkanika National Park and is Odisha's only Turtle Sanctuary.
     - The marine sanctuary stretches from Dhamra river mouth (in north) toMahanadi river mouth (in south)

2. Devi river mouth

- It is one of the principal distributaries of Mahanadhi.
- It flows through Jagatsinghpur district and Puri district across Odisha and joins Bay of Bengal.

3. Rushikulya beach

- It is one of the major/important rivers of Odisha state and covers entire catchment area in the districts of Kandhamal and Ganjam district of Odisha. The Rushikulya originates at an elevation of about 1000 metres from Daringbadi hills.
- Daringbadi is called the ' Kashmir of Odisha '.
- It meets the Bay of Bengal at Puruna Bandha of Chhatrapur block.
- Its tributaries are the Baghua, the Dhanei, and the Badanadi etc. It has no delta as such at its mouth.

4) POLACHIRA WETLANDS

Why in News?

- Recently the **27th annual waterfowl** census was conducted in the **Polachira Wetlands,** in **Kollam, Kerala**
- This year **15 Eurasian spoonbills** were sighted at Polachira.
- They are **migratory birds** breeding from **the UK and Spain in the west** through to Japan in the **East**.

About Polachira Wetlands

- The wetlands are the **breeding ground for the Migratory Birds** from all around the world.
- Some of the birds sighted during the census are **Comb ducks, Black headed** ibis, Painted storks, Glossy Ibis, Indian moorhen, **Eurasian coot, Pheasant-tailed jacana**, **Grey heron**, **large cormorant and large egret.**

Significance of Wetlands

- It helps to maintain sedimentation and balance of soil, helpful in water, carbon and nutrient cycles.
- It helps to regulate the amount of water as excess water from rainfall and floods gets absorbed and can be used in times of need.
- It is source of livelihood through fishing and rice farming to travel, tourism and water provision.
- Wetlands host a large variety of life, protect our coastlines, provide natural sponges against river flooding and store carbon dioxide to regulate climate change.
- They provide habitat for wildlife and migratory birds and help in conservation of environment.

5) IDUKKI WILDLIFE SANCTUARY

Why in News?

Recently there was a birds and butterfly survey at the Idukki Wildlife Sanctuary (Kerala).

THE HIGHLIGHTS OF THE SURVEY

- Newly spotted birds in the sanctuary - Scally Thrush, Booted Warbler, Paddy field Warbler, Blue Rock hill, etc.
- The rarely sighted newly spotted butterfly species - Malabar Hedge Hopper, Malabar Tree Nymph, etc.
- It is becoming a favoured destination for migratory birds as it is closely located to Idukki Arc Dam.

ABOUT IDUKKI WILDLIFE SANCTUARY

The Forest type:

1. West Coast Tropical Evergreen forests,
2. Semi Evergreen forests,
3. Moist Deciduous Forests,
4. Hill shoals and Grass Lands.

- Average rainfall is 3800mm
- The highest peak is Vanjur Medu (1272m).

Biodiversity -

- Common animals found are - Elephant, Sambar, Barking Deer, Mouse deer, Bonnet macaque, Nilgiri Langur, Malabar giant squirrel.
- Birds: Osprey (fish eagle), listed in the IUCN red category, Great Indian Hornbill, Grey-headed Bulbul, etc.

6) CHINA BANS IVORY TRADE

Why in news?

- China has announced to ban all ivory trade and processing activities by the end of 2017, a move described by wildlife conservationists as a "potential game changer" for African Elephants.
- As per the new rule, owner of ivory products can either keep them or give them as gifts or sell them at supervised auctions with official approval.
- The move follows a resolution at the Convention on International Trade in Endangered Species (CITES) in South Africa last October to close domestic ivory markets.

Present situation

- Though ivory trade is ban in international market since 1989, legal domestic markets have continued in many countries around the world.
- As per Great Elephant Census, 2016 population of African elephants have declined by 30% in past 7 years primarily because of poaching with just 415,000 left in the wild.
- China has the biggest ivory market in the world - some estimates suggest 70% of the world's trade ends up there where it is seen as a status symbol and prices can reach as high as $1100 per kg.
- Conservationists estimate that more than 20,000-30,000 elephants were killed for their ivory last year, with similar tolls in previous years.

Impact

- Setting such an aggressive timeline to close- once and for all-the largest domestic ivory market in the world is globally significant and will immensely boost conservation efforts.
- It will make it harder for Ivory traffickers to sell their illegal stocks.
- Such ban will pressurize countries like Britain, Japan and especially neighbouring Hong Kong (world biggest legal retail market for elephant ivory) to close their ivory markets.

7) HAKKI HABBA

- It is a three day bird festival which was held at Daroji Sloth Bear Sanctuary near world famous Hampi inBallari district, Karnataka.
- It was the 3rd edition jointly organized by State's Forest Department and Eco tourism Board in association with thelocal birdwatchers' association.
- The first two editions were held inRanganathittu Bird Sanctuary, Mandyadistrict and Kali Tiger Reserves, UttaraKannada district.
- The objective of the festival is to createawareness among the people about conservation of birds.
- Birds like Great Indian Bustard, Bar-headed geese, Partridges, Painted Sand grouses, Yellow throated bulbul, Great horned Owl, Black Storks were sighted along the bank of River Tungabhadra in Hampi.

SLOTH BEARS

- Indian Sloth bears are a species of bear found only in India, Nepal and Sri Lanka.
- It is nocturnal animal, locally known as KARADI, lives in open scrub forests having outcrop of rocks, boulders and caves as shelter.
- They have poor vision and hearing but good sense of smell.
- Daroji sanctuary established in 1994 is biggest sloth bear sanctuary in Asia.
- Current status: IUCN RED list – Vulnerable, in CITES included in Appendix I and Schedule I of wildlife protection act, 1972.

8) BAN ON IMPORT OF EXOTIC ANIMALS SKIN

Why in News?

Director General of Foreign Trade **has prohibited the import of skins of animals like reptiles and furs of minks, foxes and chinchillas**.

Present Situation

- India's import policy allows import of raw hides, skin, leather, fur, skins of reptiles, mink, fox etc.
- But they are subjected to regulation under Wildlife (Protection) Act, 1972 and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- The Prevention of Cruelty to Animals Act, 1960 allows the slaughter of animals only for subsistence but this too is regulated to minimize the pain and suffering of animals.

Way forward

- Various nations are switching to cruelty-free alternatives like fake snake, mock croc, faux fur etc. so that animals don't have to be slaughtered for their skin feeding fur, skin and leather industries.
- Also animals are not fabric and thus no amount of justification can be enough to wear their skin/fur.
- With this ban, India showed its commitment to eliminate unnecessary pain and suffering to animals.

ABOUT CITES

- Came in force in 1975, Also called Washington Convention
- It is an international agreement between governments aiming to ensure that international trade in specimens of wild animals and plants does not threaten their survival.
- It is a legally binding treaty where different species are categorized into groups called Appendices.
- **Appendix I:** Includes species threatened with extinction, trade only in exceptional situation.
- **Appendix II:** Includes species not necessarily threatened with extinction, trade strictly regulated.
- **Appendix III:** species that are protected in at least one country, which has asked other CITES Parties for assistance in controlling the trade.

9) DEER ANTLERS

Why in News?

Kerala has sought permission from Union government to allowthe use of Antlers of Spotted and Sambhar deer in Ayurvedic medicines by amending Wildlife Protection Act, 1972.

What is an antler?

Antlers are extension of Deer's skull and all the three species of deer found in Kerala Spotted deer, Sambhar deer and Barking deer shed their antlers annually which regrow again.

Background:

- State governments and other wildlife authorities have hugequantity of antlers in their custody as their sale and use arebanned in India under Wildlife Protection Act, 1972.
- Though proposal only includes collection of antlers already shed, it may trigger the reckless hunting of deer.

What does the act says?

- The Act of 1972, has included antler in the definition of wildlife trophy which is defined as the "whole or any part of any captive animal or wild animal".
- Trophy hunting is the shooting animals for pleasure where trophy is the animal (or its head, skin, antler or any other body part) that the hunter keeps as a souvenir.
- Wildlife and wildlife trophies are considered as owned by the government.
- The Act prescribes imprisonment up to 3 years and fine of Rs. 25,000 for offences involving wildlife trophies.

What are uses of the antlers?

Antlers have medicinal values to invigorate spleen, strengthen bones/muscles, boost blood flow, etc.

What is the present situation?

- State government has decided to approach to the centre for amendments to the Wildlife Protection Act, 1986 for using the antlers for medicinal purposes.
- The authorities were destroying the fallen horns of deer by setting them on fire, whichmakes them unusable for the medicinal purposes.

10) ZINGIBER PSEUDO SQUARROSUM

- A new species of ginger discovered by Botanists of Botanical Survey ofIndia (BSI) in Andaman & Nicobar Island
- It belongs to Genus Zingiber having medicinal values to treat abdominal pain and anti-helminthictroubles.
- Common species of ginger- Zingiber officinale.

FEBRUARY 2017

1) WORLD WETLANDS DAY

Why in news?

- World Wetlands Day was celebrated at **Bhoj Wetlands** on **February 2** to mark the Day the Convention on Wetlands was adopted in the Iranian City of Ramsar in 1971.
- The theme of World Wetlands Day for 2017 was '**Wetlands for Disaster Risk Reduction**'.

ABOUT WETLANDS

- Wetlands are areas of land where the water level remains near or above the surface of the ground for most of the year.
- There are several kinds of wetlands such as marshes, swamps, lagoons, bogs, fens and mangroves.

What are the Importance of Wetlands?

- Wetland directly and indirectly support lakhs of people, providing goods and services:
- They help stabilize water supplies, cleanse polluted waters, protect shorelines and recharge groundwater aquifers and provide food, timber, drinking water, medicines.
- They help check floods, prevent coastal erosion and mitigate the effects of natural disasters like cyclones and tidal waves.

- Wetlands can act as sponges, storing peak rainfall and releasing water gradually during lean season.
- The extensive food chain and biological diversity in wetlands make them 'biological supermarkets'.

Wetlands in India and Their Conservation

- According to the Directory of Asian Wetlands (1989), wetlands occupy 18.4% of the India's area.

National Wetland Conservation Programme (NWCP)

- Under the programme, which was started in 1985-86, 115 wetlands have been identified till now by the Ministry of Environment and Forest and Climate Change which requires urgent conservation and management initiatives
- Aim of the Scheme: Conservation and wise use of wetlands in the country so as to prevent their further degradation.
- Objectives of the Scheme:

1. To lay down policy guidelines for conservation and management of wetlands in the country.
2. To undertake intensive conservation measures in priority wetlands.
3. To monitor implementation of the programme.
4. To prepare an inventory of Indian wetlands.

What are Other Suggested Measures for Wetland Conservation?

- Assessment of wetland ecosystem health should be made a part of District level disaster planning processes.
- Wetland management, conservation and restoration plans should have an in-built component of disaster risk reduction to address the likely impacts of disasters on ecosystem health.
- States should constitute Wetland Authorities as nodal agencies for integrated policy, planning and regulation of wetlands.
- Representation of Disaster Management Authorities should be ensured within the State Wetland Authorities.
- Mass awareness campaigns should be undertaken to educate stakeholders from all walks of society, particularly local communities on the value of wetland ecosystems.

RAMSAR CONVENTION ON WETLAND

•The Convention on Wetlands, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.
•Major obligations of countries which are party to the Convention are:
1. Designate wetlands for inclusion in the List of Wetlands of International Importance.
2. Promote, as far as possible, the wise use of wetlands in their territory.
3. Promote international cooperation especially with regard to trans boundary wetlands, shared water systems, and shared species.
4. Create wetland reserves.
Bhoj wetlands is situated in Madhya Pradesh and is one of the 26 sites that India has designated under the Ramsar Convention.

2) SOLID WASTE MANAGEMENT-BUFFER ZONE

Why in News?

- **Central Pollution Control Board (CPCB)** has issued draft guidelines proposing to **maintain buffer zones around landfills** to minimize/prevent the impact of landfill waste disposal.
- The proposed guidelines will **apply to all future treatment plants** while the existing plants will have to incorporate measures such as planting trees and using odour free technology.

What is the Current Status?

- The current practice of solid waste management in India includes a host of options such as **composting, vermin-composting, biogas, refuse derived fuel (RDF), pelletization and waste-to-energy measures**.
- Disposal of garbage in landfill sites is the least preferred but a widespread option in India.
- It affects the neighbouring environment by **fostering air, water, land and noise pollution.**
- Close to 62 million tonnes of **solid waste is generated every year in the country**. Out of this, 43 million tonnes is collected and only 12 million tonnes treated.
- The only guideline for landfills as of now is that they be at least 500 metres ways from habitable zones.

Pros

- The proposed **buffer zones will act as a barrier** and will provide assistance against flawed handling of waste during storage and transportation.
- It will help protect the surrounding environment against negative impacts of the landfill.
- It will promote responsible land management and conservation practices.

Cons

- The CPCB has in its draft guidelines allowed waste-to energy power plants to come within **20-100 metres** of residential areas.
- This is a far cry from **300-500 metres** specified in the solid waste management manual of the **Swacch Bharat Mission.**
- Unlike previously, the draft guidelines mention **"incineration"** as one of the methods of waste disposal.

Significance

- The proposed buffer zones will act as a barrier and will provide assistance against flawed handling of waste during storage and transportation.
- It will help protect the surrounding environment against negative impacts of the landfill.
- It will promote responsible land management and conservation practices.

BUFFER ZONE

Buffer Zone refers to an area of no construction. Such an area is designated in order to segregate two regions (for environmental protection).
The term buffer zone was first specified by the government in Municipal Solid Waste (Management and Handling Rules), 2000.
The revised rules as under Solid Waste Management (SWM) Rules, 2016 made it a duty of CPCB to issue guidelines regarding buffer zones.
According to the SWM Rules, 2016, "a buffer zone of no development shall be maintained around solid waste processing and disposal facility, exceeding five tonnes per day of installed capacity."

3) FOOD LEGUMES RESEARCH PLATFORM (FLRP)

Why in News?

On February 15, 2017 Union Cabined approved the setting up of Food Legume and Research Platform in Madhya Pradesh (Amlaha, Sehore) with the collaboration of International Centre for Agricultural Research in Dry Areas (ICARDA) and India council of agricultural Research (ICAR).

What are the Highlights?

- Department of Agricultural Research under the Ministry of Agriculture would be linchpin between ICAR and ICARDA for all the technical modification in Agreement and establishment of FLRP.

- The Food Legumes Research Platform (FLRP) would be provided satellite Hubs in West Bengal (for pulses) and Central Arid Zone Research Institute (CAZRI), Rajasthan (for Natural Resource Management).
- Cabinet gave the In-Principle Approval to ICARDA for setting up of FLRP.

Why Legumes Research Platform is needed?

- Food security is the mammoth task in front of Government.
- Research in Legumes (Pulses Crop) would play a pivotal role in this aspect.
- Global Climatic pattern is changing which in turn affecting the agriculture output. Thus, research in food Legume is need of the hour.
- India accounts 25% of world food legumes production.
- Thereby, making it a good destination for accelerating the production of more varieties and nutritious food legume using genomics techniques.
- This platform will contribute significantly towards reducing poverty, improving food security, improving nutrition and health, and sustaining the natural resource base

Significant of Research Platform

- Platform would work under the **framework of "Research for Development (R4D)" and its impact on farmers.**
- The research would carry out for **Improving rangeland and pasture productivity.**
- The ICARDA research expertise is in dry land area, which in turn, would be utilised in selected water deficient regions of MP and Rajasthan
- The research platform would work on crop-livestock systems, alternative feed resources and water productivity in arid regions.

FOUR DIMENSIONAL BENEFITS OF PULSES (LEGUME CROP)

Reducing poverty

- Pulses give 2-3 times higher market price than other cereal products.
- These are locally produced by community action, especially by women.
- Crop residue provide high protein value to livestock feed thereby cutting the cost of raising

Food Security

- It provides affordable source of protein.
- Give more food by using less land.
- Involves less risk due to its ability to withstand drought.
- Often grown in rotation as it fulfils the soil nutrients requirement (nitrogen)

Improving nutrients and health

- Contains 3-4 time higher protein content than cereals crops.
- Rich in nutrients like Calcium, Iron, Zinc and vitamin A.
- Beneficial to women and child who are the risk of anaemia.

Sustainability for Environment

- Pulses leads to nitrogen fixation, thereby reducing the cost and environmental impact of chemical fertiliser.
- Leafy cover of pulses prevent to soil erosion.

International Centre for Agriculture Research in the Dry Areas (ICARDA)

- ICARDA is a non-profit agricultural research for development institute, established in 1977.
- Organisation aims is to improve the livelihoods of the resource-poor across the world's dry areas

4) INDIA AND STATE GLOBAL AIR REPORT 2017

Background

- It is the **first report on air quality by using the latest global data from 1990 to 2015.**
- Report is conducted jointly by the independent research institute; 'Health Effects Institute (US-based non-profit corporation)' and The Institute of Health Metrics and Evaluation (Independent research institution-University of Washington).
- The report provides information under various titles **of 'Air Pollution level and Trend', 'Global Burden of Disease'** and 'Health burden due to air pollution'.

Highlights of the report

- As per the report, approximately, 90% of the world's population lives in areas with unhealthy air in 2015.
- There is a 7% increase in the concentration of ground-level ozone, especially in developing countries.
- Efforts to curb pollution from the burning of coal will not show results soon on the quality of air global scale.
- Exposure to PM2.5 (Particulate Matter) is considered as the fifth (most or highest?) risk factor for death, which is accounting for about 4.2 million deaths across the globe.
- The highest concentrations of PM2.5 in 2015 related to combustion sources are in South and Southeast Asia, China, and Central and Western sub-Saharan Africa.

India and State Global Air Report 2017

- The report highlighted that there is a significant increase in inhalable fine particles of PM 2.5 since 1990.
- Outdoor air pollution has increased the death rate in India, surpassing the most polluted country China.
- India is now competing against China for being the highest air pollution health burdens in the world, with both countries facing some 1.1 million early deaths from air pollution in 2015.
- The report highlights that the underlying reason for increasing pollution in India can be attributed to its growth, which is happening in terms of industries and its consumption of coal as the main source of energy.
- The report takes the cognisance of a new pollutant 'ozone'. Though the casualties in India from ozone are far less than the well-known PM 2.5. However, the rate of increase in ozone-related deaths is alarming.
- The report is significant for India in providing more comprehensive pollution monitoring road map than currently in use Air Quality Index.

5) CHENNAI OIL SPILL

Why in news?

Two vessels collided off the Kamarajar Port at Ennore nearChennai resulting in oil spill in the sea.

Ecological Footprint of Oil Spill

- Damage to fish, turtles, crabs among other marine animals.
- Loss of livelihood to fisherman as venturing out into the seawas not safe.
- Consumers' reluctance to buy sea food added to woes offisherman.
- Environmental damage to coastal areas.
- Heavy metals released along with oil will poison marine lifeall the way up the food chain.

Why Oil Spills are difficult to contain?

- When oil hits the sea, its surface is quickly dispersed by the wind, while sea currents spread the lower layers in contact with the water.
- This twin action creates a large, ever-expanding film of oil called a "slick".
- Along the shore, the oil mixes with sand and debris to form a thick viscous sludge that gradually oxidizes into a toxic brown mass that experts like to call "chocolate mousse"

Measures at National and International Levels to Contain Harmful Impacts of Oil Spills

- The **National Oil Spill-Disaster Contingency Plan (NOS-DCP),** which was adopted in 1996, has routinely been updated and revised to reflect the latest in international safety and regulatory standards. But, **it completely failed in taking action on the ground.**
- **A state contingency plan has not been prepared** even after Coast Guard demanding states to formulate a local plan to fight such disasters for over 20 years now.
- The International Convention on Civil Liability for Oil Pollution, 1969, of which India is a signatory, provides for adequate compensation for the damages involving oil tankers and has strict liability for ship owners.
- But, the domestic liability regime for environmental damage has been weak and underdeveloped.
- There's an **absence of clear definitions of environmental damage.**
- Several jurisdictions in Europe include ecological and economic losses in environmental damages while **most others limit to compensate only economic harm.**
- Such an exclusion of ecological damage leads tomost long-term damage to marine environment, bio-diversity and natural resources go uncompensated.

BIOREMEDIATION TECHNIQUES:

Oil zapper

- It is essentially a cocktail of five different bacterial strains that are immobilized and mixed with a carrier material (powdered corncob).
- It feeds on hydrocarbon compounds present in crude oil and oily sludge and converts them into harmless CO_2 and water.

Oilivorous-S

- It is a tad different from Oil zapper is an additional bacterial strain that makes the former more effective against sludge and crude oil with high-sulphur content.
- Both Oil zapper and Oilivorous-S can be used in situ, thereby eliminating the need to transfer large quantities of contaminated waste from the site, a process that poses more threats to the environment.

Way Forward

- There is a need for a comprehensive legal mechanism to address issues of fault and no-fault based liability for environmental harms and introduce civil penalties for the same.
- Responsibility for any negligence on the part of any actor should be fixed.
- A detailed report should be prepared to learn from the mistakes or lapses and rectify them.

5) BHARAT STAGE IV DEADLINE

What is the issue?

- As a response to precipitous decline in air quality, the government had initiated theBharat Stage IV (BS-IV) that were supposed to come into effect across the country fromApril 2017.
- But most players in the automobile sectorare now asking the government to relax thedeadline.

BS NORMS

- BS emission standards, introduced in 2000, have been set up to regulate the output of air pollutants from internal combustion engine equipment, including motor vehicles.
- The different norms are brought into force in accordance with the time line and standards set up by the Central Pollution Control board.
- The BS norms are based on European regulations.
- In 13 major cities, Bharat Stage IV emission standards were put in place in April 2010.
- Typically, the higher the stage, the more stringent the norms.
- The current norms in India are BS IV in 33 cities and BS III in the remaining country.
- Implementation of the BS V standard that was earlier scheduled for 2019 has now been skipped.
- BS VI, originally proposed to come in by 2024 has been now advanced to 2020, instead.

Why is the shift to BSIV necessary?

- The studies suggest that vehicular pollutions one of the key contributors to the high levels of pollution in Indian cities.
- A recent study on Delhi's pollution showedthat 28% of the pollution is due to vehicularemissions.
- The shift to BS IV will require cleaner fuelquality and improvements in engines andexhausts like fitting the vehicles with diesel particulate filter (DPF), selective catalyticreduction (SCR) etc.
- Hence this will reduce the vehicular pollution there by increasing the air quality.

Why the industry's demand is flawed?

- Currently the automobile sector wants arelaxation of the deadline again.
- This reflects poorly on the industry'scommitment to improving air quality.
- The overall demand for private vehiclesis quite rigid in India and, therefore, anyincrease in cost that affects all producersequally will not significantly impact industry level sales in the long run.
- The vehicular pollution, significantly worsensthe health of all Indians therefore cannotbe taken lightly on the cost of economicDevelopment.
- Also, being at the frontline of global standards, will improve the ability of Indian automobile sector to compete globally

What is the way forward?

- The government should remain firm on auto emission norms deadline.
- Given the alarming rise in pollution levels, the government might even consider advancing the BS VI deadline from 2020 to an earlier date.
- Europe has achieved the result only afterfacing stiffer timelines. Also, the industry's tendency to lobby fordelays can be checked if deadlines arestaggered.
- If the environmental norms are applied in onego, the deadline of BS-IV norms applied tosales of older technology vehicles will makeit worthless.
- But a staggered deadline will allow companiesto gradually shift production to better engine and avoid a situation where producers arestuck with unsold inventory.

6) RIP TIDES

Why in News?

- **ISRO** in collaboration with a private lifeguard agency appointed by the Goa government has **conducted a study (Ripex 2017) on rip tides** along the beaches of Goa.

What are Rip Tides?

- Rip tides (also known as ebb jet or tidal jet) **are powerful currents running perpendicular to the shore.**
- They **pull the water out into the ocean**.

- The term rip tide is a misnomer as tides occur due to moon's gravitational pull while **rip currents are caused due to shape of the shoreline or due to formation of sandbar.**
- These currents may extend 200 to 2,500 feet lengthwise and less than 30 feet in width.
- Rip tides **are dangerous because they catch swimmers unaware and pull them deep into the ocean.**

7) INDIA'S ONLY ACTIVE VOLCANO

Why in News?

- Barren Island is the **only active Volcano** along the volcanic chain from Sumatra to Myanmar. Moreover, it is the **only** active volcano in India.
- The Volcano erupted on January 23, 2017. The first Record of Volcanic eruption on significant scale was in 1787. Since 1991, the volcano has been showing sporadic activity and erupted in 2005.

Barren Volcanic Island

- The Island is situated in Andaman Sea, of the north-eastern part of Port Blair (Andaman and Nicobar Islands).
- It is a **Submarine emergent Volcano**, which lies above the subduction zone of India and Burmese plate.
- The Island is uninhabited and devoid of any significant vegetation and wild life.

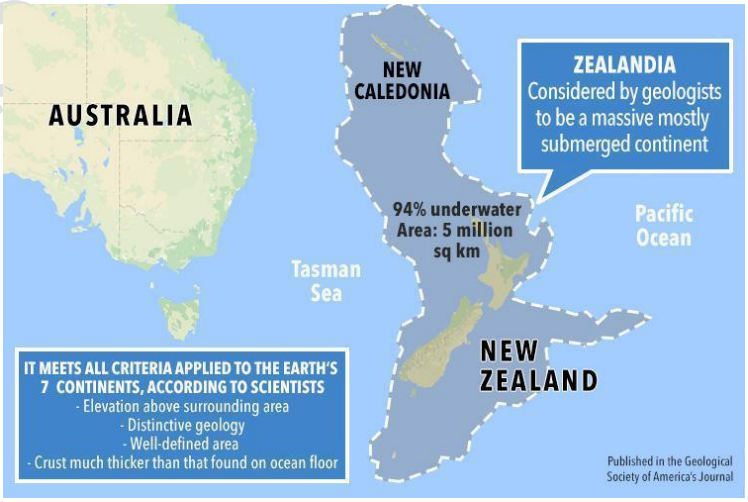
OTHER VOLCANOES IN INDIA

- Doshi Hill is an extinct volcano in north-west part of Aravalli range of Mahendergarh (Haryana).
- Dhinodhar Hills is an extinct volcano in Kutch district of Gujarat.
- Narcondam Island in Andaman and Nicobar is a volcanic island and classified as dormant volcano by Geological Survey of India. The island is listed under UNESCO World Heritage Sites and famous for its endemic Narcondam Hornbill.
- Baratang Island in Andaman is famous for Mud volcanoes

8) NEW CONTINENT: ZEALANDIA

Why in news?

- A study published by the Geological Society of America,found that New Zealand and New Caledonia are part of a huge 4.9 million sq. km single slab of continental crust that is separate from Australia.
- The study says that Zealandia should be considered a geological continent, rather than the previously-held theory that it was a collection of continental islands and fragments.



About Zealandia

- Zealandia is about half the size of Australia, but only 7 percent of it is above sea level.
- Most of that terrestrial land makes up the two large islands of the country of New Zealand the North Island and the South Island.
- Zealandia is a very tectonically active region. Part of it is on the Australian plate, while the other part is on the Pacific plate.
- New Caledonia, a collection of islands governed by France, makes up the northern tip of Zealandia.
- The submerged part of Zealandia is rich in mineral deposits.
    - Zealandia's submerged fossils provide valuable clues to life during those time periods.

CRITERIA FOR CONTINENTS:

1. Elevation above surrounding area
2. Distinctive Geology
3. Well defined area
4. Crust much thicker than that found on ocean floor

9) IRRAWADDY DOLPHINS

- As per the 2017 census report by **Odisha** state forest department there are **55 Irrawaddy dolphins** present in water bodies of **Bhitarkanika National Park** and **Gahirmatha Marine Sanctuary**.
- In recent years **Chilika Lake** emerged as primary habitat of these dolphins with record count of 121 this year.
- Worldwide population of **Irrawaddy dolphins** is estimated to be less than **7500**, Bangladesh has 6000.
- Besides Irrawaddy dolphins other dolphin species that were reported are **Humpback, Bottlenose** and **Pan tropical spotted dolphin** species.

ABOUT IRRAWADDY DOLPHINS (ALSO COMMONLY KNOWN AS SNUBFIN DOLPHINS)

- They can be found in rivers, lakes and seas across southern Asia, from the northwest Bay of Bengal, in India, to the south of Indonesia.
- Major threats: incidental mortality in gillnets and other fisheries gear; Habitat loss due to Dams, Deforestation, Mining (ex. Sand, gravel mining, etc); Live captures for display purposes, pollution from agrochemicals, etc.
- IUCN Red list of endangered species status: **Vulnerable Species**

10) MEDICINAL PLANT FROM KERALA

Why in News?

- Scientists at the Jawaharlal Nehru Tropical Botanic Garden and Research Institute (JNTBGRI) confirmed the multiple**therapeutic properties of Neurocalyx calycinus**.

About the plant

- It is **used by the Cholanaikkan tribe** to treat inflammations and wounds.
- It is **endemic to Western Ghats and Sri Lanka**.
- In local parlance it is known as 'Pacha Chedi'.
- The **anti-inflammatory activity** of the leaves was found to be similar to the drug diclofenac sodium.
- The **plant also possesses high Vitamin E content** and cytoprotective activity in its cell lines, increasing its prospects as an anti-cancer drug.

Significance

- Pre-clinical trials have proved the **plant's efficacy in acting as an analgesic, anti-cancer, anti-oxidant, wound and burn healer, immune system development** etc.

- Patenting its herbal formulations would help in **protecting the traditional knowledge of India**.
- Commercial benefits of the usage of this plant can also **benefit the dwindling Cholanaikkan Tribe**

Cholanaikkan Tribe
•It is a particularly vulnerable group of Kerala.
•They live in the deciduous forests of Karulai and Chungathara ranges in Nilambur in Malappuram district
•They are the only surviving hunter gatherer tribe in India. They do not engage in farming.
•They are the only tribal community in Asia that lives in rock-cave shelters.

11) KAZIRANGA NATIONAL PARK

Why in news?

Kaziranga National Park has consistently increased its **One Horned Rhino** population **(Population in 2015 – 2401)** because of rigorous conservation efforts in past few years.

Kaziranga National Park (Assam)

- Situated on the bank of river **Brahmaputra** it is one of the oldest wildlife conservancy reserves of India.
- It was declared a **Wildlife Sanctuary in 1950** and later in **1974** was notified as Kaziranga National Park under the **Wildlife (Protection) Act, 1972.**
- It is popularly known as the home of the **"Big Five" -** One Horned Rhinoceroses, Tigers, Asiatic wild buffalos, **Eastern Swamp Deer**, and **Elephant**.
- It hosts **two-thirds** of the world's Great One-horned rhinoceros (68% of worldwide population).
- It has one of the **highest densities** of **Tigers** in the wild in the world and also houses almost entire population of the **Eastern Swamp Deer**.
- In **1985** it was declared as a **World Heritage Site** by **UNESCO** for its unique natural environment and **Tiger reserve** in **2006**.

Indian Rhino Vision 2020 (IRV 2020) has been launched in 2014 to achieve a wild population of at least 3,000 Greater one-horned rhinos in the Indian state of Assam by year 2020.

12) DRAFT ORDER ON BAN ON PESTICIDES

Why in News?

The Government of India has decided to ban the use of 18 pesticides following the recommendations of the **Anupam Varma Committee**.

More on the Ban

- Complete ban of 12 pesticides would come into effect from January 1, 2018 while the rest 6 would be banned from December 31, 2020.
- The GOI has also sought objections and suggestions on this draft order from all stakeholders before taking a final decision.
- The **Central Insecticide Board and Registration Committee (CIBRC)** approves the use of pesticides in India.

Anupam Varma Committee

- This committee was constituted in July 2013 to **review the use of 66 pesticides** which are either banned or restricted in other countries.
- The Committee recommended **banning 13 pesticides, phasing out 6 by 2020 and reviewing 27 others in 2018.**
- The Committee did not review the use of **Endosulfan** as the matter was pending with the Supreme Court at that time.

Endosulfan

- Endosulfan is a hazardous pesticide which is banned in 80 countries.
- It was used by the Karnataka Cashew Development Corporation and Kerala Government over cashew plantation to combat tea mosquito after 1970s.
- It has been found to be responsible for various mental and physical deformities among the population of the two respective states.
- In 2011, Supreme Court banned Endosulfan pan-India.

Significance of the Ban

- The pesticides proposed to be banned are harmful not just to humans and animals but also leech into the soil and water bodies and harm the aquatic ecosystem.
- Therefore, the ban comes as a welcome step.
- India is likely to improve its reputation in countries (where the concerned pesticides are banned) which imports food related products (both manufactured and raw) from India.

13) WORKSHOP ON PREPARATION OF HEAT WAVE ACTION PLAN

Why in News?

National Disaster Management Authority (NDMA) and Government of **Telangana** organised a workshop on Preparation of **Heat Wave Action Plan** in order to mitigate the impact of the impending heat wave in 2017.

What are Heat Waves?

- Heat wave is a **period of abnormally high temperatures** (more than the normal maximum temperature) **during summer months**.
- It is predominantly prevalent in **North-western parts of India during March-June**. In some parts, it extends up to July.
- The **Indian Meteorological Department (IMD)** has underlined the following criteria for heat waves:

1. Heat wave is not to be considered till the temperature of a station reaches at least 40°C (for plains) and 30°C (for hilly regions).
2. When normal maximum temperature of a station is less than or equal to 40°C , then a departure of 5 to 6 degrees from the normal is to be considered heat wave while a departure of 7 degrees is to be considered severe heat wave.
3. When normal maximum temperature of a station is more than 40°C then a departure of 4 to 5 degrees from the normal is to be considered heat wave while a departure of 6 degrees is to be considered severe heat wave.
4. In case the normal temperature of station is more than 45°C then heat wave is to be declared irrespective.

- Heat waves often lead to dehydration, stress, heat exhaustion and sometimes a fatal heat stroke as well.
- **NDMA** released the Guidelines for Preparation of Action Plan – Prevention and Management of Heat Wave in 2016**.**
- With better preparedness andmitigation measures under place, casualties due to heat wave can be minimized if not eliminated.

14) HUMAN ANIMAL CONFLICT -NAGARHOLE TIGERS

Why in news?

In one month, seven tigers including a six month-old cub have died in the Nagarhole-Bandipur reserves in Karnataka.

Nagarhole National Park

- Nagarhole National Park also known as Rajiv Gandhi National Park, is a national park located in Kodagu and Mysore district in Karnataka.
- This park was declared as a Tiger reserve under Project Tiger in 1999.
- The reserves form an integral part of the Nilgiri biosphere which holds world's single largest tiger population estimated over at 570 tigers.
- It is located to the north-west of Bandipur National Park and the Kabini reservoir separates the two parks.
- Bandipur and Nagarhole hold more than 221 tigers cumulatively.
- In terms of tiger mortality, however, the two reserves have taken a huge hit since 2010, with 68 deaths

What is the reason for the deaths?

- Protection against poachers and habitatmanipulation has seen the prey baseincrease.With the increase in the weaker tigers (injured or older tigers and younger males) are pushed to the periphery.
- Coffee and arecashew nut plantations are prevalentnear Nagarhole Tiger Reserve.
- Tigers enter the plantation in search ofrabbits and wild boars.
- They get caught in the barbed-wire fencecannot extricate itself from the wire and dies.
- They also get trapped in the snares setupby humans.
- The snare is a loop of wire in the form of anoose.
- When an animal enters the noose, anyslight weight on the dangling string makes it tighten. The more the animal struggles, thetighter it gets.

Why snares have been set up?

- The snares are often set for rabbits and wildboars.
- They are source of food for locals and theestate owners encourage it as a way to dealwith the crop loss due to boar raids.
- They result in killing the tigers, and thepanicked people who set the trap, dump thebody of the tiger and clears the evidence ofthe snares.
- Forest officials ended up in this speculationbecause the body of the tigers dead are leftwith nails, claws and skin untouched.
- Thisrule out the role of poachers.
- The post-mortem showed of some dead tigersshowed that they have had lost their caninesand their stomachs were empty
- This confirms that the tigers that are unableto hunt in the wild move to the peripheriesto hunt slow-moving livestock.
- The recent government order allowinghunting of wild pigs to reduce crop damagemay be a prime driver for the increase in the number of snares.

What hasbeen done?

- The forest department resolved to weed out all these traps.
- Elephant camps have been mobilised to aidthe search.
- Over 200 snares were found in the first two days the operations are concentrated around Lakshmana Tirtha River.
- There is no way to find out who has place the traps. Also the forest officials do not want to antagonise locals as they need them for conservation.

- This trend will continue as long as "unscientific" ways of dealing with crop loss continue.
- In the reserve and surrounding areas, the anger among the people is generally against wild boars and elephants.
- Dynamites and Pellet Guns have been used against elephants, while cases of electrocution have also been witnessed, this also should be seriously addressed.

15)OPERATION SAVE KURMA

- In a major success in the fight against wildlife crime, Wildlife Crime Control Bureau (WCCB), Ministry of Environment, Forest and Climate Change, coordinated "**Operation Thunder Bird**" in India, from January 30-February 19, 2017.
- Operation Thunderbird is the code-name forINTERPOL's multi-national and multi-species enforcement operation.
- WCCB has convened a species specific operation on turtles, code named **Operation Save Kurma.**

WCCB-Wildlife Crime Control Bureau

- It is statutory multi-disciplinary body under the Union Ministry of Environment, Forests and Climate Change (MoEFCC) to combat organized wildlife crime in the country.
- It was established in June 2007 by amending the Wildlife (Protection) Act (WLPA), 1972, a special Act to protect the wildlife and fauna in the country.
- It is mandated to collect and collate intelligence related to organized wildlife crime and disseminate it to state and other enforcement agencies for immediate action
- It advises Union Government on issues relating to wildlife crimes having national and international ramifications, relevant policy and laws

16) THE NATIONAL BIODIVERSITY CONGRESS (NBC)

- It was held in Thiruvananthapuram, hosted by the Kerala Biodiversity Board.
- NBC is one of the significant biodiversity mega events of the country.
- It aims to identify practical, evidence-based case studies at the regional level to support the plan of action.

Key Facts

- The focal theme of 2017 NBC was "Mainstreaming Biodiversity for Sustainable Development".
- National Biodiversity Conference, governed by a national advisory committee comprising biodiversity conservation experts was also held.
- Number of experts in field of biodiversity conservation had delivered keynote address and plenary lectures on variety of key issues related to biodiversity conservation, sustainable utilisation and benefit sharing.

MARCH 2017

1) ELEPHANT CENSUS

Why in news?

Four States - **Odisha, West Bengal, Chhattisgarh and Jharkhand** have decided to conduct elephant census synchronously.

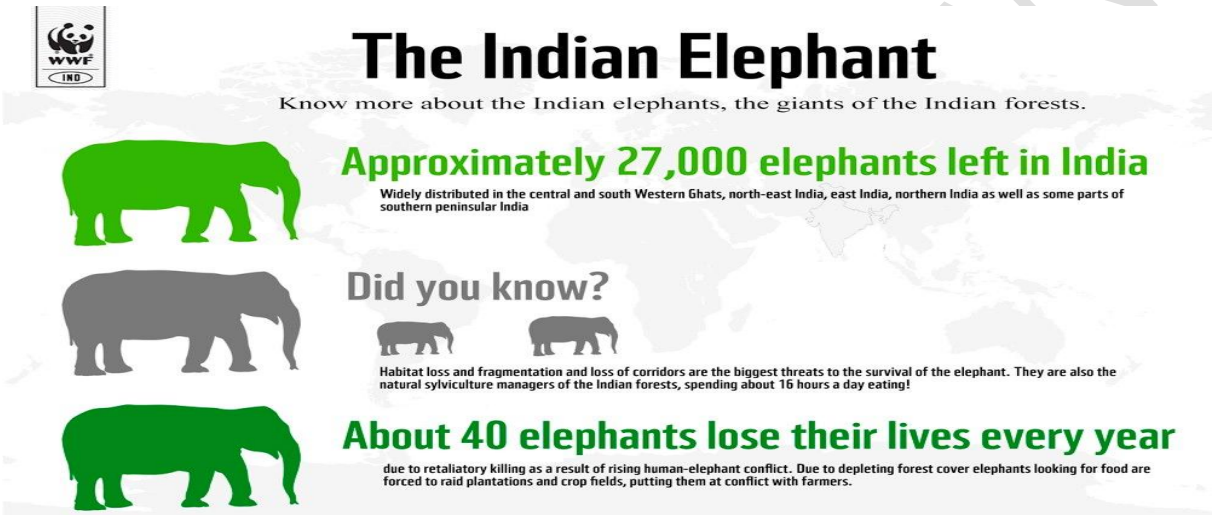
Why this census is significant?

- This will be the first regional synchronous elephant census with an identical set of rules for **direct and indirect counting methods**.
- The **direct elephant counting method** is based on sightings of elephants.

- In the **indirect method,** surveyors follow a **dung decay formula** for arriving at population estimationwhich is **being used by Tamil Nadu and Karnataka at present.**
- A variation of about 8% to 9% has been noticed between the two methods.

What are the advantages of synchronised census?

- Elephants travel long distances and an exhaustive information base on regional elephant distribution will helpplan a proper intervention for their conservation in the long run.
- The synchronised census **will indicate the size, distribution, structure and density of the elephant population** in the region.
- A simultaneously conducted census would **eliminate underestimation, duplication.**
- This approach helps to produce a **good map on the distribution of elephants in different landscapes**, highlighting the abundance and density of elephants.
- This will lead to **better regional planning.**



2) CENTRE LAUNCHES SURVEY ON GANGETIC DOLPHINS

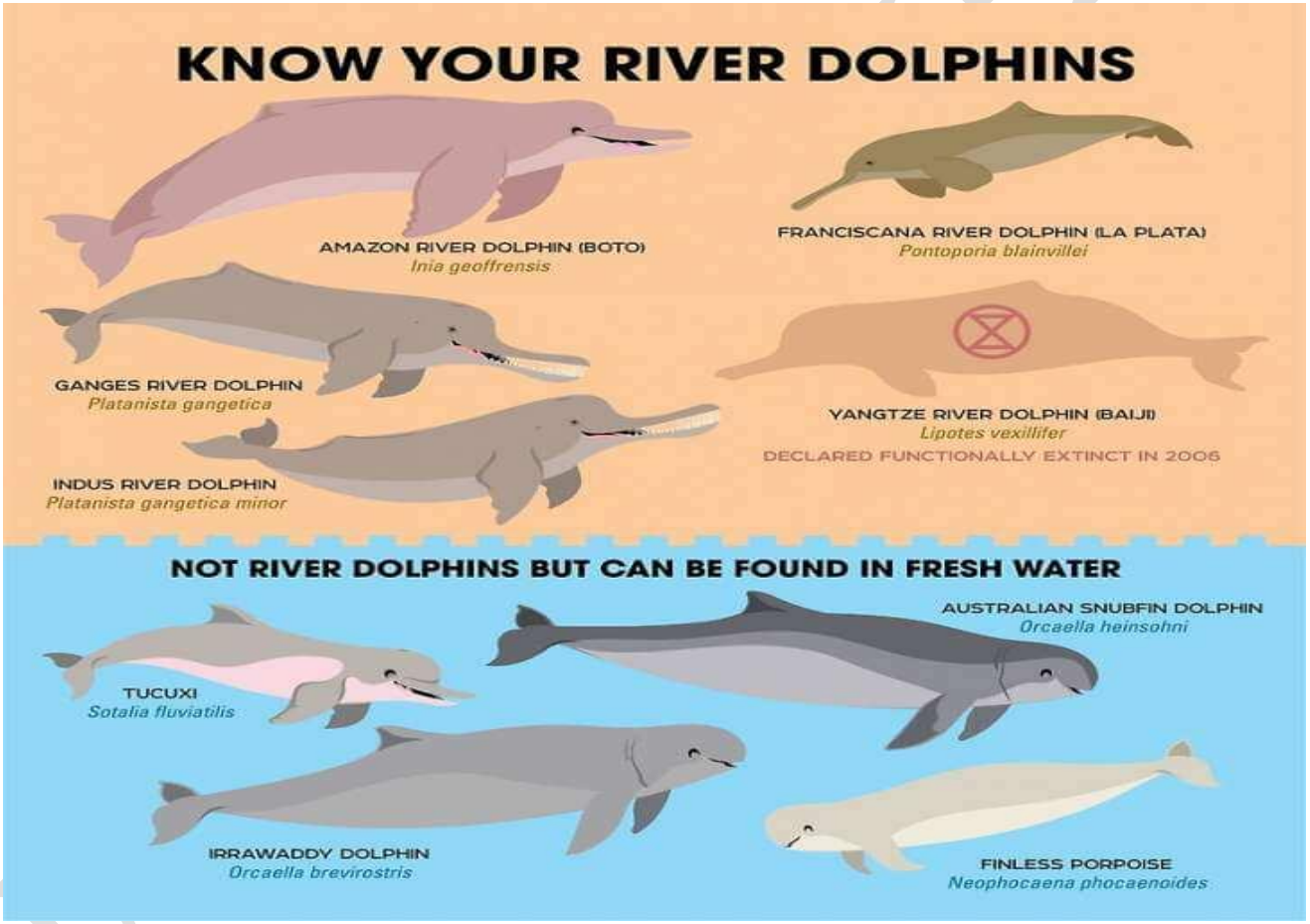
The Centre has launched the **first ever across-the-river survey** in the Ganga to determine the **population of aquatic life**, including that of the endangered Gangetic dolphin.

Key facts

- The survey will create a **baseline scientific data** for the government to take measures to improve quality of the river water.
- The first leg of the census was launched on March 1 from Narora(in U.P) to Bijnor (covering distance of nearly 165 km) to **establish the number of the national aquatic animal.**
- A study to figure out fish species composition in the 2525 km-long river has been also been kick started from Harshil in Uttarakhand.
- The survey is being conducted through **Wildlife Institute of India** (WII), an autonomous institution of Environment and Forest Ministry, **under Namami Gange programme.**
- The study will find out stretches where dolphin is habituating, what are the conditions there and the level of threat the long-snouted species is facing in a particular belt.
- Apart from number of dolphins, number of ghariyals and turtles in the river will also be ascertained.
- Besides populace count, the study will help **know distribution pattern of aquatic life in the river,** extent of **threat level they are facing and their habitat conditions.**

About Gangetic Dolphins:

- The Ganges River dolphin, or Susu, inhabits the Ganges-Brahmaputra-Meghna and Karnaphuli-Sangu river systems of Nepal, India, and Bangladesh.
- This vast area has been altered by the construction of more than 50 dams and other irrigation-related projects, with dire consequences for the river dolphins. It is classified as endangered by the IUCN.
- This dolphin is among the four "obligate" freshwater dolphins – the other three are the baiji now likely extinct from the Yangtze river in China, the bhulan of the Indus in Pakistan and the boto of the Amazon River in Latin America.
- Although there are several species of marine dolphins whose ranges include some freshwater habitats, these four species live only in rivers and lakes.
- Being a mammal, the Ganges River dolphin cannot breathe in the water and must surface every 30-120 seconds.
- Because of the sound it produces when breathing, the animal is popularly referred to as the 'Susu'.



3) WESTERN GHATS ISSUE

- After several years of discussions, the government has finally notified nearly **57,000 square km area in the Western** Ghats region as **ecologically sensitive area (ESA)** where all kinds of mining activities, large constructions, thermal power plants and highly polluting industries would no longer be allowed.
- The 56,825 square km of land is spread over six states of Gujarat, Maharashtra, Goa, Karnataka, Kerala and Tamil Nadu.
- The notification covers an area that is slightly less than the 59,940 square km of area identified by a committee headed **Kasturirangan** in 2013.

Background

- Western Ghats is a 1,500-km biodiversity-rich geological formation along the western Indian coast, which is also **rich in minerals**.
- Demarcation of an ESA is an **effort to protect the fragile eco-system from indiscriminate industrialisation**, mining and unregulated development.
- Two committees were appointed in the last eight years to identify the areas that needed to be kept out from such activities.

1. The Western Ghats Ecology Expert Panel, headed by noted environmentalist **Madhav Gadgil** had recommended that the entire region should be made out of bounds for new industrial activities.
2. Headed by **Kasturirangan**, had suggested that only about 37 per cent of the entire region needed be demarcated into an ESA.

- State governments and local populations at many of the identified places had resisted the formation of ESA fearing loss of livelihood and a ban on developmental activities.

Importance of Western Ghats:

- It is a UNESCO World Heritage Site.
- It is one of the eight **"hottest hot-spots"** of biological diversity in the world.
- It has over 7,402 species of flowering plants, 1,814 species of non-flowering plants, 6,000 insect species and 290 freshwater fish species.

Way ahead

- All new **"Red" category industries** and the **expansion of such existing industries shall be banned.**
- Other kinds of projects and activities, like **operation of hydropower plants**, and **"orange" category of industries,** will be **strictly regulated in the ESA**.
- New expansion projects of building and construction with built-up area of 20,000 square meters and above shall be prohibited too
- Concerned state governments and other stakeholders have 60 days' time to raise objections or make suggestions on the decision to notify the area as ESA.
- If no changes have to be made, the notification will become final.

Gadgil committee Kasturirangan committee

- It designated the entire Western Ghats as an ESA
- The report distinguishes between cultural and natural landscape.
- It classified Western Ghats into Ecologically Sensitive Zones (ESZ) 1, 2&3.
- Cultural landscapes include human settlements, agri fields and plantations and covers 58.44% of the Western Ghats.
- 90% of the remaining natural landscape is marked as an ESA.
- It called for complete ban on high capacity storage dam and sand mining in ESA 1.
- It called for a complete ban on mining, quarrying and sand mining in this area but allowed HEP after scrutiny.
- It suggested the formation of a Western Ghats Ecology Authority (WGEA), a statutory authority which enjoys the powers under the Environment (Protection) Act
- It proposed to strengthen the existing legal framework
- The major criticism it faced was that it was **more environment-friendly** and is not in tune with the ground realities.
- Usage of techniques like remote sensing while ignoring ground realities have created many errors in the report

4) WORKSHOP ON ARSENIC PROBLEM

Why in news?

- Workshop on Arsenic problem in **ground water and its remediation in Ganga Basin** was recently held.
- It was chaired by Union Minister of Water Resources, River Development and Ganga Rejuvenation Shri Uma Bharti. It was organized by **Central Ground Water Board (CGWB).**

Background

- There is an urgent need to start a nationwide **movement to make people aware about the arsenic problem.**
- The government has underlined the need to make people aware about the negative impact of Arsenic in Ganga basin area.
- It has also proposed to prepare an exhaustive work plan to meet the challenges posed by presence of arsenic in ground water on the basis of the outcome of this workshop.

Arsenic in groundwater

- Arsenic in ground water is a **geogenic contaminant** i.e. caused by natural geologic processes.
- Arsenic-containing groundwater in Ganga River basin is hosted by the sediments deposited by the rivers during the late Holocene age (<12 thousand years).
- Incidence of high arsenic in groundwater reported from various parts of the country, particularly in the Ganga- plains is a serious threat to the health of human being.
- Over the last three decades numerous measures have been initiated which includes alternate arrangement for supply of arsenic free water to the affected populace and providing arsenic removal plants.
- Arsenic occurrences in ground water in these areas is highly sporadic in nature and all the sources in these areas are not necessarily contaminated.
- Technological options to combat arsenic menace, in groundwater, to ensure supply of arsenic free water, in the affected areas can be in-situ remediation of arsenic from aquifer system, ex-situ remediation of arsenic from tapped groundwater by arsenic removal technologies, use of surface water source as an alternative to the contaminated groundwater source, tapping alternate safe aquifers for supply of arsenic free groundwater or combination of above techniques.

What has the government done in this regard?

- The government is tapping alternate **safe aquifers, for supply of arsenic free groundwater in many areas.**
- Under the **National Aquifer mapping programme (NAQUIM)** of CGWB special attention has been given to this aspect and water wells have been constructed tapping arsenic free aquifers using state of the art technology in parts of Ballia and Ghazipur districts of Uttar Pradesh.
- The growing arsenic occurrences demands a systematic translation of success stories of one place/region to another and formulating a comprehensive plan to mitigate the arsenic problem through a wider consultation process.

5) REMOVAL OF SEEMAI KARUVELAM TREES

Why in news?

- The Madurai bench of the Madras high court has directed the Tamil Nadu government to enact a law with prohibitory and penal clauses within two months to eradicate seemai karuvelam trees (prosopis juliflora).
- It also directed the government to release perennial funds to the district collectors in the state for removing of the seemai karuvelam trees.

What's the issue?

- The seemai karuvelam tree that sucks a lot of water has invaded into water bodies and dry lands of government and private people.
- Since such trees ultimately affect the agricultural activities, a batch of cases for their eradication was filed before the high court bench.

About Seemai Karuvelam trees

- The Karuvelam tree, or prosopis juliflora as its known biologically, is a species native to West Africa and was brought to Tamil Nadu in 1960s as fuel wood.
- Slowly, these seeds started drifting into dams and rivers, causing problems.
- Apparently, the plant is such that no other species can co-exist with it, and it has already caused drying up of several water bodies in the state, adding to the woes of the water-starved state.
- According to a report, Karuvelam tree absorbs more than four litres of water to obtain one kilogram of biomass.
- It cannot even shelter birds as it produces less oxygen and more carbon dioxide.
- If it does not have sufficient water it begins absorbing groundwater.
- If there is no groundwater, it starts absorbing humidity from the surroundings.
- It can also turn the groundwater poisonous.

6) IMD WARNING THAT EVEN HILL STATIONS WILL BE HOTTER THIS YEAR

Why in news?

India Meteorological Department has forecast "above normal" temperatures across most of the country.

Key facts

- The IMD weather model, used to prepare the forecast, shows a 47% probability of summer temperatures being above normal.
- Himachal Pradesh, Uttarakhand, Jammu and Kashmir are expected to be particularly hot with predicted temperatures, on average, likely to be well above 1 degree C above their normal summer temperatures.
- Punjab, Delhi, Haryana, Rajasthan, Uttar Pradesh, Gujarat, Madhya Pradesh, Chhattisgarh, Bihar, Jharkhand, West Bengal,Odisha and Telangana are other States in the "core heat zone" that are likely to see significantly warmer temperatures.
- The summer forecast is in line with a generally warm trend over previous months. 2016 was the warmest year in a century, according to the IMD, with the country 0.91 C warmer than the 1961-1990 average.
- Studies indicate increasing trends in the frequency and duration of heat waves over the country.
- This can be attributed to increasing trends in the greenhouse gases and the warming of the sea surface temperatures over the equatorial Indian and Pacific oceans.

About IMD:

- The India Meteorological Department (IMD), also referred to as the Met Department, is an agency of the Ministry of Earth Sciences of the Government of India.
- It is the principal agency responsible for meteorological observations, weather forecasting and seismology.
- IMD is headquartered in New Delhi and operates hundreds of observation stations across India and Antarctica.
- IMD is also one of the six Regional Specialised Meteorological Centres of the World Meteorological Organization.
- It has the responsibility for forecasting, naming and distribution of warnings for tropical cyclones in the Northern Indian Ocean region, including the Malacca Straits, the Bay of Bengal, the Arabian Sea and the Persian Gulf

7) WORLD WILDLIFE DAY

- World Wildlife Day was **celebrated on March 3rd,**Theme for 2017 is **"Listen to the Young Voices.**
- Given that almost **one quarter of the world's population is aged between 10 and 24,** vigorous efforts need to be made to encourage young people, as the future leaders and decision makers of the world, to act at both **local and global levels to protect endangered wildlife.**
- World Wildlife Day 2017 encourages youth around the world to rally together to address ongoing major threats to wildlife including habitat change, over-exploitation or illicit trafficking.

Background

- On 20 December 2013, at its 68th session, the United Nations General Assembly (UNGA) proclaimed 3 March, the day of signature of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), as UN World Wildlife Day to celebrate and raise awareness of the world's wild animals and plants.
- The UNGA resolution also designated the CITES Secretariat as the facilitator for the global observance of this special day for wildlife on the UN calendar.

About CITES:

- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international regulatory treaty between 182 member states.
- It was formed in 1973 and regulates the international trade in over 35,000 wild species of plants and animals.
- The focus of the convention is not solely on the protection of species. It also promotes controlled trade that is not detrimental to the sustainability of wild species.
- It has become the best-known conservation convention in the world.

How does CITES work?

- The convention works primarily through a system of classification and licensing. Wild species are categorised in Appendices I to III.
- This often reflects species' threat status on the Red List of the IUCN, the International Union for Conservation of Nature's Red List of Threatened Species first created in 1964.
- Appendix I prohibits trade in species classified as highly endangered. Appendix II allows

trade under very specific conditions. This requires exporting countries obtain a permit, but not the importing country. Appendix III species require only a certificate of origin to be traded.

- National CITES management authorities may issue permits once scientific authorities show non-detriment findings. In other words, scientific evidence must demonstrate that species sustainability will not be adversely affected by trade. Where data is lacking, the precautionary principle applies.

8) OLIVERIDLEY

Why in news?

Tens of thousands of eggs laid by Olive Ridley sea turtles this year in Gahirmatha Sanctuary in Odisha, one of the world's largest nesting grounds, are getting destroyed due to shrinking coastal space.

Background

- 6,04046 turtles have come to lay eggs at Nasi II island of Gahirmatha from February 22.
- The turtles had largely given the island a miss in 2016, with only 50,000 coming to nest.
- Since the small island cannot host all those that turned up this year, only 50% of eggs may survive.

ABOUT GAHIRMATHA MARINE SANCTUARY

- **Gahirmatha Marine Sanctuary** is a marine wildlife sanctuary located in **Odisha**.
- It extends from **Dhamra River** mouth in the north to **Mahanadi river** mouth in the south.
- It is very famous for its nesting beach for olive ridley sea turtles.
- It is the one of world's most important nesting beach for turtles.
- ***Olive Ridley sea turtle*** has found place in **Schedule – I of Indian Wildlife (Protection) Act, 1972 (amended 1991).**
- All the species of sea turtles in the coastal water of Odisha are listed as "endangered" as per IUCN Red Data Book.
- The sea turtles are protected under the 'Migratory Species Convention' and CITES (Convention of International Trade on Wildlife Flora and Fauna).
- India is a signatory nation to all these conventions.
- The 'Homing' characteristics of the Ridley sea turtles make them more prone to mass casualty.

9) JAL KRANTI ABHIYAN

Why in news?

- National conference on **Jal Kranti Abhiyan was held in Delhi**.
- Participating in the conference representatives from water user associations, NGOs and other agencies gave useful suggestions to make Jal Kranti Abhiyan a success.
- The daylong conference was organized by Ministry of Water Resources, River Development and Ganga Rejuvenation as part of Jal Kranti Abhiyan.
- About 700 participants representing various stakeholder groups such as farmers, Panchayat members, officials, NGOs and students attended the conference.

ABOUT JAL KRANTI ABHIYAN:

- Jal Kranti Abhiyan was launched on June 05, **2015** to **consolidate water conservation and management** in the country through a holistic and integrated approach **involving all stakeholders** making it a mass movement.
- One of the main objectives of the Jal Kranti Abhiyan is "**strengthening grass root involvement of all stakeholders including Panchayat institutions and local bodies for Participatory Irrigation Management**."
- There are four important components of Jal Kranti Abhiyan viz. **Jal Gram Yojana**, **Development of Model Command Area**, **Pollution Abatement** and **Mass Awareness Programme**.
- Under Jal Gram Yojana two water stressed villages in each district of the country are to be selected and a comprehensive water security plan is formulated to achieve water security for these villages.
- So far 726 such villages have been identified against the total target of 828. Integrated Water Security Plan for 180 Villages have been prepared and 61 of them have been approved.

10) WEB PORTAL FOR OBTAINING CRZ CLEARANCES

- The government has launched the **web portal for obtaining Coastal Regulation Zone clearances**, here today.

Key facts:

- The Portal is a web-based system for obtaining clearances required from the Environment Ministry under the "Coastal Regulation Zone" (CRZ) by the Project proponents.
- The system will enable the Project proponents and the concerned State/Union Territory bodies like the State Coastal Zone Management Authorities (SCZMAs) and Municipal/Town Planning agencies in tracking the status of their proposals.
- The Portal is a **very user-friendly initiative, which enables submission of applications for CRZ clearance in a single-window interface** and facilitates quick flow of information related to CRZ clearances. The portal allocates a unique identity for each proposal for all future references. It is accessible from any computer with internet facility.
- The objectives of the web portal include – **enhancing efficiency, transparency and accountability in the process of CRZ clearances and ease of business**

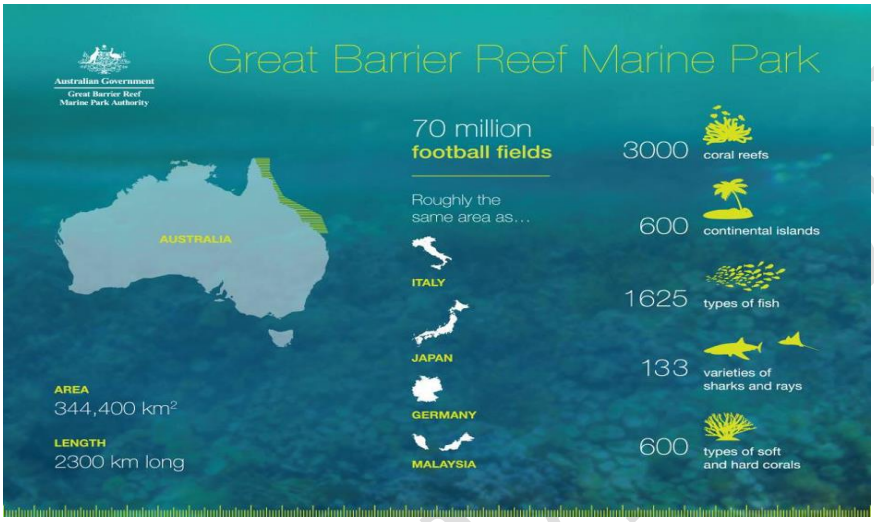
ABOUT COASTAL REGULATION ZONE:

- Under the **Environmental Protection Act 1986**, notification was issued in 1991 for regulation of activities in the coastal area by Ministry of Environment and Forests.
- This notification known as Coastal Regulation Zone Notification defined the Coastal Regulation Zone or CRZ as coastal land up to 500m from the High Tide Line and a range of 100m along banks of creeks, estuaries, backwaters and rivers subject to tidal fluctuations is CRZ. According to Coastal Regulation Zone notifications, it is divided into 4 zones:
- **CRZ I** – It refers to the ecologically sensitive areas, essential in maintaining ecosystem of the coast. These lie between the HTL and LTL. Only exploration of natural gas and extraction of salt is permitted.
- **CRZ II** – These areas form up to the shoreline of the coast. Authorized structures are not allowed to be constructed in this zone.
- **CRZ III** – This includes rural and urban localities. Only certain activities relating to agriculture and public utilities allowed here.
- **CRZ IV** – This includes the aquatic area up to the territorial limit (12 nautical miles). Fishing and allied activities permitted in this zone. Solid waste can be let off in this zone.

11) GREATBARRIER REEF

Why in news?

- Australia's **Great Barrier Reef** is experiencing an unprecedented second straight year of **mass coral bleaching**.
- Scientists have warned many species would struggle to fully recover.
- More bleaching was being observed in the central part of the reef, which last year escaped widespread severe bleaching.



Background

- The 2,300-km reef suffered its most severe bleaching on record last year due to warming sea temperatures during March and April. Nearly two-thirds of shallow-water corals in a 700-km stretch of the reef's northern section were lost to last year's bleaching event.

Way ahead

- The surveys will determine the extent and severity of the bleaching.
- The latest bleaching has increased the urgency of tackling climate change in Australia, without sufficient emissions reductions annual mass bleaching of the Great Barrier Reef by 2050 is possible

> ***What is Coral Bleaching?***
>
> Bleaching occurs when abnormal environmental conditions, such as warmer sea temperatures, cause corals to expel tiny photosynthetic algae, draining them of their colour. Corals can recover if the water temperature drops and the algae are able to recolonize them.

12) FIRST "PRISTINE AIR-QUALITY MONITORING STATION AT PALAMPUR"

- National Physical Laboratory (NPL) has established an **atmospheric monitoring station** in the campus of Institute of Himalayan Bioresource Technology (IHBT) **at Palampur (H.P.)**
- At an altitude of 1391 m for generating the base data for atmospheric trace species & properties to serve as reference for comparison of polluted atmosphere in India.

Key facts

- The station houses calibrated **state-of-the-art-equipment for the continuous measurements of ambient and greenhouse gases** (CO, NO, NO2, NH3, SO2, O3, PM1, PM2.5, PM10, hydrocarbons, black-carbon, CO2 & CH4), and weather parameters.
- Because of Palampur's pristine air, and the **capability of the new monitoring station for detection of small amounts of pollutants**, the impact of faraway pollution sources can be measured precisely.
- In addition, this new station has the **experimental facilities to investigate the aerosol/cloud interactions**, and such investigations would be helpful **in generating a better understanding of the Earth's climate system**.
- The data generated by pristine station at Palampur will act as background data for the measured pollution at various cities in the country.
- The **generated background data will be shared with different pollution control boards and agencies**and would assist policy decisions for the abatement of air pollutants.
- In India, air quality parameters are mostly measured in industrial and residential areas, however, **data for air quality of pristine atmosphere is not available in India.**
- NPL's station will contribute to fill this important gap.
- The NPL's station will also serve as a base station for inter-comparison of air quality monitoring equipment being used in India to improve quality of monitored data in India.

13) GANGA, YAMUNA TERMED 'LIVING PERSONS'

- For the first time in the country, the **Uttarakhand High Court** has declared that the rivers **Ganga and Yamuna** were **"living persons."**
- On March 15, **New Zealand** River**Whanganui** became the first in the world to be granted a legal human status.

Background

- The Uttarakhand High Court **declared the rivers Yamuna and Ganga as legal or juridical persons,**enjoying all the rights, duties and liabilities of a living person.
- The two issues before the High Court were:

1. **Removal of illegal constructions** on the banks of a canal in Dehradun, and
2. **The division of water resources** between U.P &Uttarakhand (not resolved since the formation ofthe new state).

What does this mean?

- The Ganga and Yamuna, **all their tributaries, streams are declared** as juristic or legal persons or living entities having the status of a legal person with all corresponding rights, duties and liabilities of a living person **in order to preserve and conserve river Ganga and Yamuna.**
- Recognizing the rivers as a living entity grants them new found legal identity and all rights laid out in the Constitution of India.
- The **two rivers thus have the right to be legally protected and not be harmed/destroyed**. They can also be parties to disputes. The rights, experts say, can be used to protect the interests of the rivers.

What necessitated this move?

- Both the rivers have been in a state of neglect and even though several government initiatives, including the Centre's **Namami Gange programme, are aimed at restoring their health, not much has been achieved yet.**

- Over 1500 million litres of **raw sewage is discharged into the Ganga every day**. This joins 500 million litres of industrial waste dumped by more than 700 highly polluting industries located along it.

Way ahead:

- The court ordered that the Director of the Namami Gange programme, the Uttarakhand **Chief Secretary, and the Advocate-General of Uttarakhand would serve as "parents" for the rivers** and would be the human faces to "protect, conserve and preserve" the rivers and their tributaries.
- The court has also directed the central government to constitute the Ganga Management Board within eight weeks to look into the issue of cleaning and maintaining the river.

14) WORLD FORESTRY DAY

- **World Forestry Day** or **International Day of Forests** is celebrated worldwide every year on **21st of March** at the international level **in order to increase the public awareness among communities** about the values, significance and contributions of the forests to balance the life cycle on the earth.
- Theme for World Forestry Day 2017 is "**Forests & Energy**".

Background:

- The World Forestry Day was established in the year 1971 at the 23rd General Assembly of European Confederation of Agriculture.
- It was decided to be celebrated as an annual event celebration on **21st of March** by the **United Nations Food and Agriculture Organization**.

15) WORLD WATER DAY

- **World Water Day** is being observed globally today (**22nd March**).
- It is to mark the importance of water to human civilisation and nature.
- The **United Nations organisation** sets a theme each year. Theme this year: **wastewater**.

Background:

- World Water Day is **part of a global mission to get safer water for all.**
- It's a **day for people to learn, get involved and take action**.
- The United Nations General Assembly designated March 22 as World Water Day in 1993 following a resolution taken in Rio, Brazil in 1992.
- This is the 24th year, and it's organised by UN Water in collaboration with governments and partners.

16) ENVIRONMENT MINISTRY OFFICIAL TO CHAIR ANIMAL WELFARE BOARD

Why in news?

- The Animal Welfare Board of India (AWBI), a statutory advisory body under the Union Ministry of Environment, Forests and Climate Change (MoEF), will now be permanently chaired by a senior MoEF official, according to a notification made public by the government.
- The notification specifies that for the next three years, the Board would be chaired by the Director-General (Forests) for its term.

Background:

- In its 55-year history the organisation has always been chaired by somebody outside government, such as veterinarians, animal welfare activists or retired judges. This is the first time that a government official is chairing the body.

About Animal Welfare Board:

- The Animal Welfare Board of India was established in 1962 under Section 4 of The Prevention of Cruelty to Animals Act, 1960.
- The Board consists of 28 Members, who serve for a period of 3 years.
- The Board was initially within the jurisdiction of the Government of India's Ministry of Food and Agriculture. In 1990, the subject of Prevention of Cruelty to Animals was transferred to the Ministry of Environment and Forests, where it now resides.
- It frames a range of rules on how animals ought to be humanely treated everywhere.

17) EARTH HOUR

Why in news?

- Earth hour was observed across the globe on **March 25th**.
- It was the **tenth anniversary** of the Earth Hour this year.

What is it?

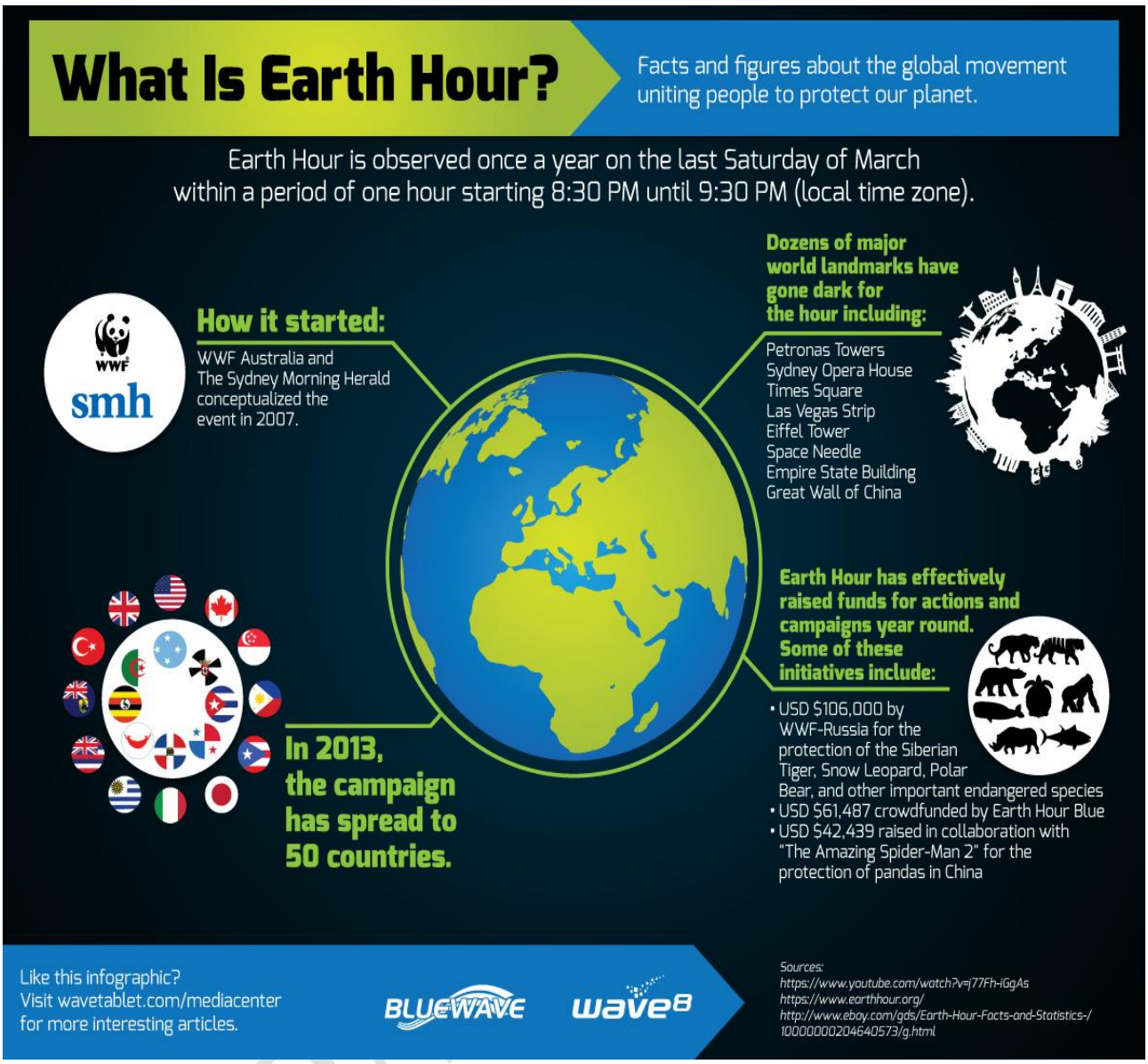
- Earth Hour is a worldwide movement for the planet organized by the **World Wide Fund for Nature (WWF)**.
- The event is held worldwide annually encouraging individuals, communities, households and businesses to turn off their non-essential lights for one hour, from 8:30 to 9:30 p.m. on the last Saturday in March, as a symbol for their commitment to the planet.

Background:

- It was famously **started as a lights-off event in Sydney, Australia in 2007**.
- Since then it has grown to **engage more than 7000 cities and towns worldwide.**
- Today, Earth Hour engages a massive mainstream community on a broad range of environmental issues. **The one-hour event continues to remain the key driver of the now larger movement.**

Why do we need earth hour

- Global warming and climate change have dominated the scientific discourse in the past more than one decade. With ever rising population of the world, the climate change has put the humankind at a great risk along with other species.
- Global warming, rising levels of pollution due to ever increasing industrialisation, declining forest cover and rising sea levels are some of the dangers that drastically affect the workings of life on the earth.
- Though the largest polluters are big industries, the WWF tries to make the masses more and more aware about the impending dangers of adverse climate so that they could put pressure on the respective governments to frame environment-friendly policies and laws.
- With Earth Hour, the WWF aims to engage people across the globe to adopt more sustainable lifestyle. Turning off lights for an hour is just an annual reminder that if the world does not mend its ways, it will be heading to a dark age, literally.



18) EAST KOLKATA WETLANDS

What is the issue?

- The state government is planning a proper utilisationof the land currently lying along the east Kolkata wetlands.

Ramsar Site

- A Ramsar Site is a wetland (shallow waters) which is designated to be of international importance under the Convention on Wetlands,
- It came into force in 1975 and takes its name from Ramsar, the Iranian city where the convention was adopted.

What is the significance of East Kolkata Wetland?

- The east Kolkata wetlands is the **biggest ecological asset of the city and a Ramsar Site**
- The east Kolkata wetlands are a fascinating natural resource to which tremendous value has been added bytraditional knowledge.
- The wetlands have been historically created by a natural shift of the **Bidyadhari, a tributary of theGanga.**
- The land on which Kolkata is built slopes to the east.
- So the British created canals to take out the city's waste water into in the wetlands.

What happens to this waste water?

- The traditional knowledge is used to treat this waste water.
- For the past century, the waste water has been first fed into settling ponds.
- There the biodegradation of organic components takes place.
- Then the nutrient-rich sewage is transferred into a fish pond to improve the organic quality of the water.
- Fish is grown in this pond and the used water is transferred to fields to irrigate crop.

How else is the wetland helpful?

- In the 12,500 hectares of wetlands, water bodies' account for almost 50%, agricultural land - 39%, garbagelandfills - 5% and urban and rural settlements over 10%.
- The wetlands grow 10,500 tonnes of fish per year and 150 tonnes of vegetables per day, providing livelihoodfor over 50,000 people.
- The solid waste brought to the landfills is composted in pits and used for growing paddy and vegetables.
- The natural process saves Rs 500 crore annually in sewage treatment costs.

What is the current problem?

- The government has assured to **maintain the balance between ecology and development.**
- But the reality is that the **wetlands are slowly and steadily disappearing.**
- Satellite imagery indicates that in Bhagabanpur, a part of the wetlands**, water bodies have shrunk from 77% to14% of the area since 2002.**
- This is corroborated by census data which say that during the 2001-11 decade, there was a **fourfold rise in thenumber of houses and population density in the area**.
- The **nature of theliquid waste coming to the wetlands from the city is changing.**
- The presence of **non-biodegradable chemicals is increasing as income and lifestyle in the city change.**
- With the increase in lead and mercury used for the manufacture of batteries, paint and glass, city will have toforget about relishing the fish and vegetables that come out of the wetlands.
- Therefore the timely **warning to be taken seriously to reduce the chemicals in the sewage and to save thewetlands**.

19) METHOD TO STUDY ARCTIC'S GREEN ICE

Why in news?

A **massive bloom of phytoplankton growing *under* Arctic sea** ice in conditions that should have been far too dark for anything requiring photosynthesis to survive.

How was this bloom possible?

- Using **mathematical modelling**, researchers from the Harvard School of Engineering and Applied Sciences (SEAS) found that **thinning Arctic sea ice may be responsible for these and more blooms in the future**, and could potentially cause significant disruption in the Arctic food chain.
- Every summer, **when the sea ice retreats, sunlight hitting the open water triggers a massive bloom of plankton**

What are significance of Phytoplankton?

- Phytoplankton underpins the entire Arctic food web.
- The plankton plumes attract fish, which attract larger predators and provide food for indigenous communities living in the Arctic.

- Phytoplankton shouldn't be able to grow under the ice because ice reflects most sunlight back into space, stopping it from reaching the water below.

Reasons for artic thinning?

- But over the past decades, Arctic ice has gotten darker and thinner due to warming temperatures, allowing more and more sunlight to penetrate to the water beneath.
- Large, dark pools of water on the surface of the ice, known as melt ponds, have increased, lowering the reflectivity of the ice.
- The ice that remains today is thin and getting thinner.
- The team's mathematical modelling found that while the melt ponds contribute to conditions friendly to blooms, the biggest culprit is ice thickness.

Way forward

- Twenty years ago, only about 3 to 4 percent of Arctic sea ice was thin enough to allow large colonies of plankton to bloom underneath.
- Today, the researchers found that nearly 30 percent of the ice-covered Arctic Ocean permits sub-ice blooms in summer months.
- The meter decline in sea ice thickness in the Arctic in the past 30 years has dramatically changed the ecology in that area
- The researchers hope their model will be helpful for planning future expeditions to observe these blooms and measuring the impact this shift will have on ecosystems.

APRIL 2017

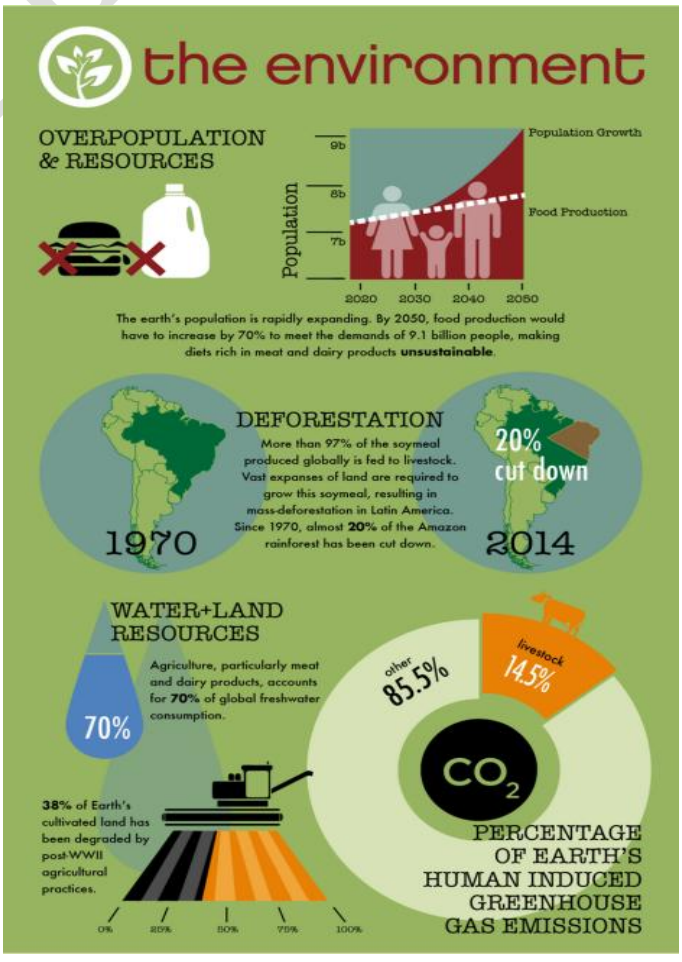
1) MODIFY DIET TO SAVE THE PLANET

Why in news?

Recent study found that change in diet pattern would save the environment.

Key findings

- India could **save water and reduce Global-warming** emissions if people added more vegetables and fruits like **melon, oranges and papaya** to their diet **while reducing wheat and poultry.**
- India's **population** is forecast to **rise to 1.6 billion by 2050,** and to ensure there is enough available freshwater, water use will have to be cut by a third.
- But population growth will also lead to an **increase in demand for food**, putting more pressure on water through farming.
- By 2050 irrigation will account for 70% of total water use in India up from the current 50% **unless farming methods change and diets shifttowards food that needs less water to grow**



What does the statics says?

- Modest dietary changes could help meet the challenge of developing a resilient food system in the country.
- Changing food habits to save water, found **that freshwater use could be reduced by up to 30%** by lowering consumption of wheat, dairy and poultry in favour of fruits and vegetables.
- In 2011, **India was the world's fourth largest emitter of greenhouse gases from farming behind China, Brazil and the United States**, according to the World Resources Institute.
- Livestock accounts for almost two thirds of total agricultural emissions, mainly from manure and feed production, according to government statistics.

What should be our diet?

- The best kind of diet would also **include legumes**, and swap fruits requiring more irrigation, **like grapes, guava and mango**, with more water-efficient crops such as melon, orange and papaya.
- The dietary changes would also **lower the risk of cardiovascular diseases and cancer in humans**, while protecting the planet by cutting greenhouse gas emissions.

2) ALGAL BLOOM MAY SPARE INDIAN WATERS

Why in news

Recently researchers found that **the coastal States of India may not suffer from the massive algal bloom** that has been reported from the Arabian Sea.

Background

- Ocean-watchers had earlier reported that **a bloom of the size of Mexico, which originated in the Gulf of Oman**, had reached the Arabian Sea and feared that it could reach Indian shores.
- Indian National Centre for Ocean Information Services, (INCOIS), Hyderabad, confirmed that **the algal species green Noctiluca scintillans had bloomed**. The presence of the **green algae gives deep green colour to the ocean in the areas of spread**.
- Researchers at INCOIS say that the current bloom was unlikely to impact the coastal States of the country.

How it wasfound?

- The researchers use **remote sensing technique** for the identification of the bloom species.
- In-situ studies were also carried out earlier by deploying research vessels to understand the various phases of the algal bloom.
- Analysis of the satellite imageries of the bloom areas indicated that **it extended from Oman to Gujarat.**
- The bloom develops in the Arabian Sea as a result of a continuous **process of winter cooling and convective mixing.**
- Though the extension of the bloom towards Gujarat coast varies annually, typically it remains about 15 km away from the shore.

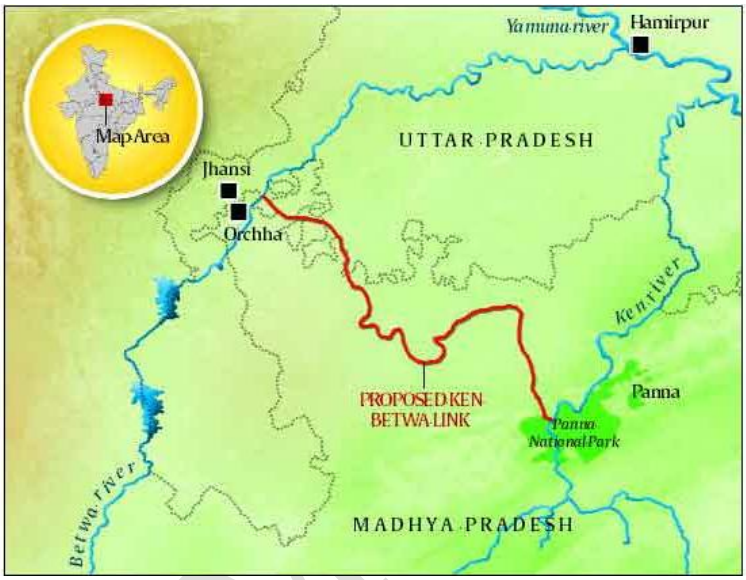
What are the effects?

- During this process, **decomposition occurs by the microbes and oxygen that is dissolved in water is consumed for their oxidation**.
- The decomposition reduces dissolved oxygen from the water column and causes adverse effect on fish.
- Secondly, degrading **Noctiluca cells release ammonia in the water increasing toxic level and it causes fish mortality**,
- Earlier studies in the bloom area had indicated that there was no significant increase in ammonia or decrease in dissolved oxygen during degrading stage of the bloom in the off shore waters of Gujarat.

3) KEN-BETWA LINK HITS GREEN HURDLE

Why in news?

India's apex forest advisory body- the **Forest Advisory Committee (FAC)**, has imposed tough conditions on the Ken-Betwa river interlinking project.



Background

- Given the ecological and environmental impact posed by the project, the project had to pass multiple authorities for clearance.
- A forest advisory clearance was seen to be the last step before the project was to begin.

What has the FAC said?

- As compensation for the pristine **Panna tiger** habitat that would be inundated by the project.
- The **Water Ministry had agreed to acquire about 8,000 hectares** of forest land from the Madhya Pradesh government and revive them as forest.
- But the FAC said t**his land was not good enough as it was fragmented**, and, to meaningfully revive a forest that is part of tiger habitat, the land acquired ought to be contiguous.
- This would require, according to the FAC, "revenue lands/non-forest lands by way of purchase or otherwise by the project proponents and the government".
- While a State can relatively allocate forest land for Central projects, transferring private or revenue land is harder, time-consuming and costly.
- The FAC has also asked for the project's main canal to be re-aligned.

About the project:

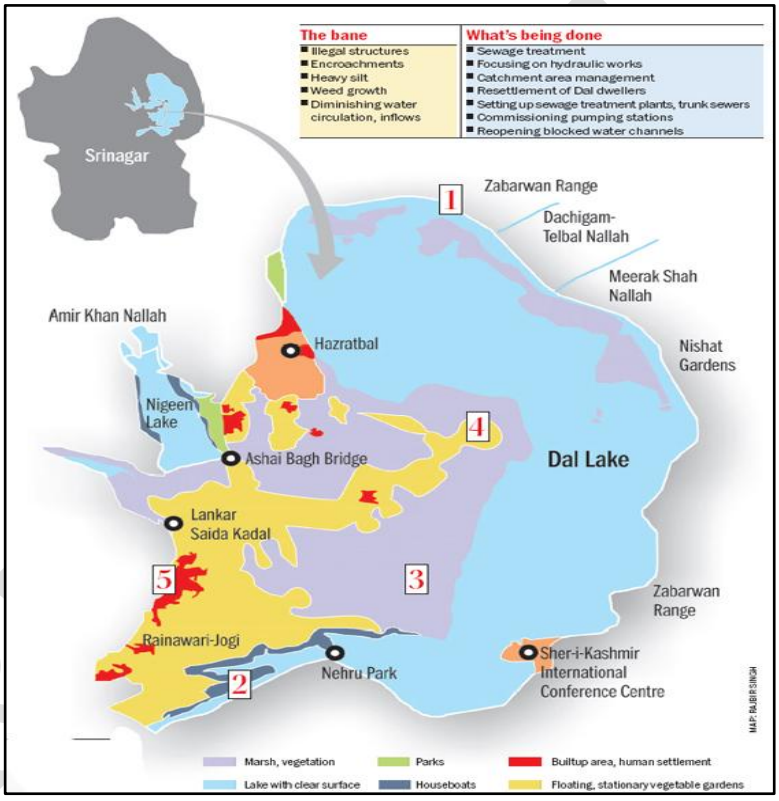
- The Ken and Betwa **rivers in the states of Uttar Pradesh (UP) and Madhya Pradesh (MP)** are to be linked under an historic agreement that marks the first such project in India's ambitious and controversial national river-linking project.
- The project envisages **construction of a dam across river Ken in Chhatrapur district in Madhya Pradesh** to irrigate 6.35 lakh hectare area of land, drinking water purposes and generation of 78 MW hydropower.
- The project comprises two powerhouse of 2×30 MW and 3×6 MW each, two tunnels of 1.9 km long upper level, 1.1 km long tunnel lower level and a 221 km long Ken-Betwa link canal, proposed on the left bank of the river.
- The **project will provide irrigation facilities for 6,35,661 hectares of land** in Panna, Chhatrapur, Tikamgarh districts in Madhya Pradesh, and Banda, Mahoba and Jhansi districts in Uttar Pradesh.

4) POLLUTION IN DAL LAKE

Why in news?

- The Jammu & Kashmir High Court has come down heavily on authorities for failing to preserve the famous Dal Lake.
- The court has ordered a slew of measures to contain the ever growing pollution and encroachments in and around the water body.

What are the measures?



- **Re-structure and refurnish** existing Sewage Treatment Plants (STPs).
- Rope in non-governmental and other organisations for technical experience and install CCTV cameras to strengthen the LAWDA's (Lakes sand water development authority) Enforcement Wing.
- Implement a rehabilitation project for lake-dwellers who are being displaced as part of the conservation programme.
- Seek guidance of the World Wildlife Fund, which has created a network called the India Water Stewardship Network and Alliance for Water Stewardship, to ensure sustainable water management.
- Examine whether **a non-profit trust can be formed**, like a 'Dal Lake Fund'. It can be given the task of restoration of the lake.
- Encourage good Samaritans to save the lake. This can be done by encouraging school and college students to take part in **community service programmes**, focusing specifically on clean environment in and around the lake.

About Dal lake:

- Dal Lake is the second largest lake in Jammu and Kashmir and is integral to tourism and recreation in Kashmir. It is named the "**Jewel in the crown of Kashmir**"
- Mughal gardens on the shore, such as **Shalimar Bagh and Nishat Bagh** were built during the reign of Mughal Emperor Jahangir.
- The lake covers an area of 18 square kilometres and is part of a **natural wetland** which covers 21.1 square kilometres, including its floating gardens. **The floating gardens are known as "Rad" in Kashmiri**.
- The lake is located within a catchment area covering 316 square kilometres in **the Zabarwan mountain valley, in the foothills of the Shankracharya hills**, which surrounds it on three sides.

5) VEHICLES SOURCE OF SMOG-CAUSING AMMONIA

Why in news?

- **Vehicle tail pipes** may be a more **important source of smog-causing ammonia** that hovers over big cities than agriculture emissions, a new study suggests.

How it had been found?

- Researchers from Princeton University outfitted vehicles with sophisticated sensors to detect ammonia levels and focused on six cities – Philadelphia, Denver and Houston in the US, and Beijing, Shijiazhuang and Baoding in China.
- Holes were drilled into the bodies of the vehicles to attach sensors. By measuring ammonia levels during various times of the day at different points of entry into the cities.

> ***Vembanad:***
>
> - Vembanad is the **longest lake in India**, and the largest lake in the state of Kerala.
> - Spanning several districts in the state of Kerala, it is **known as Punnamada Lake in Kuttanad, Kochi Lake in Kochi**.
> - Several groups of small islands including Vypin, Mulavukad, Vallarpadam, and Willingdon Island are located in the Kochi Lake portion. Kochi Port is built around the Willingdon Island, and the Vallarpadam Island.
> - The **Nehru Trophy Boat Race** is conducted in a portion of the lake.
> - Government of India has identified the Vembanad wetland under **National Wetlands Conservation Programme**.
> - The Vembanad Wetland system was included in the **list of wetlands of international importance, as defined by the Ramsar Convention** for the conservation and sustainable utilization of wetlands in 2002. It is the largest of the three Ramsar Sites in the state of Kerala.

Key facts of the findings:

- Researchers found that ammonia emissions from cities were much larger than recognised and occurred at the very times when unhealthy particulate matter is at its worst, and when agricultural emissions are at daily or seasonal lows.
- Researchers noted that vehicle emissions of ammonia were co-emitted with nitrogen oxides.
- These chemicals combine to form ammonium nitrate, which can be seen from the brown colour in urban haze, researchers said.
- Ammonia emissions from vehicles are **especially important during cold weather** (e.g. during winter or the morning rush hour) when agricultural emissions are at their lowest and when haze pollution is at its worst.
- Vehicle tailpipes actually are a more important source of ammonia's contribution to the haze that hovers over big cities.

6) ECOLOGICAL DAMAGE TO VEMBANAD

Why in news?

- A committee constituted by the Ministry of Environment, Forest and Climate Change, has held the Cochin Port Trust (CPT) responsible for CRZ violations in Vembanad, which was classified as **a Critically Vulnerable Coastal Area in the CRZ 2011 notification**.

Concerns

- The committee is concerned because such reclamation can cause large-scale damages to the site.
- Also, activities in violation of CRZ provisions will definitely affect the ecological health of a very sensitive ecosystem like Vembanad, which is **a declared Ramsar site**, **a Critically Vulnerable Coastal Area**, and **a protected wetland system**.

7) A SHRINKING HOME FOR ENDEMIC BIRDS

Why in news?

- According to a study by IUCN experts, **17 Western Ghats species have smaller ranges** than what was thought earlier.
- The study used land cover, forest type (satellite imagery), temperature, precipitation and 'citizen science' using the eBird online birding checklist.

Highlights of the study

- The study found that for **17 of 18 bird species, the distribution was smaller than what IUCN earlier estimated.**
- IUCN overestimated the habitat of these bird species by up to 88%. Of the 18 species, habitats of 12 were overestimated by over 50%.
- An example is the **Malabar grey hornbill** which IUCN classifies as **'Least Concern'** and believes is distributed across 2.3 lakh sq.km in Kerala and Karnataka.
- But when researchers used a spatial modelling technique, they found its range was just 43,060 sq. km, or, nearly 81% less than the estimates. This would put the bird in the **'Near Threatened'** category.
- Again, the Nilgiri pipit appears to have lost 88% of its habitat, making **it "endangered" rather than "vulnerable."**

Concerns

These species are in danger because as per the IUCN guidelines, '**less vulnerable**' species receive a lower conservation focus.

8) EL SALVADOR BAN ON METAL MINING

- El Salvador has made history after becoming the **first country in the world to ban metal mining**.
- El Salvador is the **most densely populated country in Latin America** and, while rainfall is plentiful, holding on to the water is a major issue because of unsustainable farming practices and inadequate industrial controls that have led to **widespread soil erosion and the almost total destruction of its forests**.
- More than **90% of El Salvador's surface waters are estimated to be polluted by toxic chemicals**, heavy metals and waste matter.
- The water crisis has steadily deepened since the pro-business Arena Party granted an array of permits for mineral exploration.

9) FUNGUS THAT EATS PLASTIC MAY HELP CLEAN ENVIRONMENT

Why in news?

- Scientists have identified a **soil fungus**, which uses enzymes to rapidly break down plastic materials.

Key facts

- **Aspergillus tubingensis** is a fungus, which ordinarily lives in the soil. In laboratory trials, the researchers found that it also **grows on the surface of plastics**.
- **It secretes enzymes onto the surface of the plastic**, and these break the chemical bonds between the plastic molecules, or polymers.
- Using advanced microscopy and spectroscopy techniques, the team found that the **fungus also uses the physical strength of its mycelia** the network of root like filaments grown by fungi to help break apart the polymers.
- The fungus was **found in Pakistan**.

Significance of this discovery

- Humans are producing ever greater amounts of plastic — much of which ends up as garbage.
- Since plastic does not break down in the same way as other organic materials, it can persist in the environment over long periods of time.
- Attempts to deal with plastic waste through burying, recycling, incineration or other methods are variously unsustainable, costly and can result in toxic by-products, which are hazardous to human health.
- The new discovery is an advance that could help deal with waste problem that threatens our environment.

10) GRASSOLINE MAY POWER FUTURE FLIGHTS

Why in news?

In the quest of more sustainable energy sources, scientists have developed **grassoline**— a biofuel derived from grass that could one day power aircraft.

Background

- Researchers investigated methods that can disintegrate and treat grass until it can be used as a fuel.
- Due to its vast abundance, grass is the perfect source of energy.

How was it done?

- To improve its biodegradability, the grass is **pre-treated at first**.

- Then **bacteria are added which convert the sugars in the grass into lactic acid** and its derivatives.
- This lactic acid can serve as **an intermediate chemical to produce other compounds such as biodegradable plastics (PLA) or fuels**.
- The lactic acid was then converted into **caproic acid**, which was further converted into decane. **Decane can be used in aviation fuel**.

Way ahead

- Right now the amount of biofuel that can be made from grass is still limited to a few drops.
- The current process is very expensive, and engines should be adapted to this new kind of fuel.
- Researchers hope to make improvements in this regard.

11) New tree-living crab species found in Kerala

- Scientists have discovered a **new species of long legged**, **tree-dwelling crabs in Western Ghats of Kerala**.
- This is the **first report of its kind** to offer a record of an **arboreal crab — a species that lives in trees**.
- The new species named **Kani maranjandu** after the Kani tribe in Kerala, are substantially different from other congeners.
- The characteristic traits of the crab include the structure of its **hard upper shell**, its **male abdominal structure** and reproductive parts and diagnostic elongated walking legs.

12) ECO TOURISM PLANNED AT CHILIKA LAGOON

Why in news?

- The Odisha government is pushing for massive infrastructure improvement around the **Chilika lagoon**.
- IPE Global, which has been asked to prepare a tourism master plan for the Chilika Lake and its catchment area, with emphasis on preservation of the ecosystem and natural habitat, has proposed 10 key projects with an estimated investment of Rs.57 crore.

Background:

Chilika, with a wetland spread over nearly 1,165 sq. km and more than 25 pristine islands, has been attracting tourists from all corners of the globe, but its tourism potential could not be harnessed due to huge infrastructure gap.

About Chilika Lagoon:

- It is the largest coastal lagoon in India and the second largest lagoon in the world after The New Caledonian barrier reef in New Caledonia.
- It is the largest wintering ground for migratory waterfowl found anywhere on the Indian sub-continent.
- It is one of the hotspot of biodiversity in the country, and some rare, vulnerable and endangered species listed in the IUCN Red List of threatened Animals inhabit in the lagoon for at least part of their life cycle.
- Chilika was designated as the 1st "Ramsar Site" of India.
- The Nalaban Island within the lagoon is notified as a Bird Sanctuary,
- Chilika Lagoon lies in the districts of Puri, Khurda and Ganjam of Odisha State along the eastern coast of India.

13) ENDANGERED VAQUITA PORPOISES

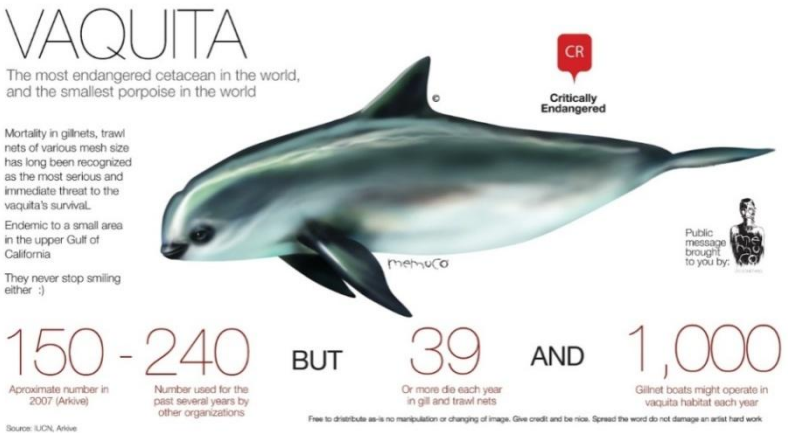
Why in news?

- In a bid to save **the world's smallest species of porpoise** from extinction, the Mexican government has announced plans to place some of them in a temporary refuge.
- The plan would be carried out with the help of international organisations.

Porpoises

- Porpoises are among the smallest members of the cetacean family (whales, porpoises and dolphins).
- They are only distant relatives of dolphins (they last had a common ancestor roughly 15 million years ago).
- There are only seven species of porpoise; the most popular being the widely distributed harbour porpoise.

- Scientists warned in February that there are only 30 vaquita remaining, saying the species faced extinction by 2022.



- The plan is controversial with conservationists, some of whom say the vaquita is not an animal that can thrive in captivity.

VAQUITA MARINA PORPOISE:

- The Vaquita (Phocoena sinus) is **the world's smallest cetacean**. Its name means "little cow" in Spanish.
- A dark ring around the eyes is its most striking feature, along with a proportionally large dorsal fin.
- The vaquita is unique among the porpoises as it is the only species of that family found in warm waters, and the size of the dorsal fin is believed to be an adaptation to that, allowing for extra body heat to dissipate.
- Vaquita **only live in the northern Gulf of California**, **the Sea of Cortez, and Mexico.**
- Like many other species of porpoise, vaquita tend to be shy and elusive, avoiding boats when approached. **They are most commonly sighted in shallow waters up to 50 metres deep**.
- It is classified as **critically endangered** by the IUCN.

14) A FROG'S MUCUS COULD TREAT FLU

Why in news?

- Researchers have found that **skin mucus secreted by a colourful, tennis ball-sized frog species**- Hydrophylax bahuvistara, found in Kerala can be used to develop an **anti-viral drug** that can treat various strains of flu.

Key facts

- The secretion from frog contains peptide, or chain of amino acids.
- The researchers have named the newly identified peptide **Urumin**after the urumi, a sword with a flexible blade that snaps and bends like a whip.
- **Urumin is not toxic to mammals**, but "appears to only disrupt the integrity of flu virus".
- It seems to work by binding to a protein that is identical across many influenza strains, and in lab experiments, it was able to neutralise dozens of flu strains.
- More research is needed to determine if urumin could become a **preventive treatment against the flu in humans**, and to see if other frog-derived **peptides couldprotect against viruses like dengue and Zika.**

15) EARTH DAY

- Earth Day 2017 is being celebrated around the world on **April 22**.
- This year's campaign is dedicated to an ambitious goal – **to achieve global climate and environmental literacy** in the space of three years, by Earth Day 2020.
- Earth Day was first celebrated in 1970. **The idea for it was first proposed at a UNESCO conference a year earlier**, when activist John McConnell suggested a day to honour the planet and the idea of peace.
- It was made into an international day in 1990 and now is celebrated by over 193 countries every year.
- The aim of the day is to bring **attention to environmental issues** to spark changes that will result in a healthy, sustainable environment.
- This includes addressing climate change and finding **ways to protect the planet for future generations**.

16) NORTH INDIA TO GET ITS FIRST DNA BANK FOR WILD ANIMALS

Why in news?

- In a milestone for wildlife conservation in the country, **Indian Veterinary Research Institute (IVRI)** is planning to set up a DNA bank for wild animals, **the first of its kind in North India**.
- Scientists have so far collected samples of 140 species. **A DNA bank exists in Hyderabad at present**.

What is it for?

- Through the DNA bank, scientists at IVRI's Centre for Wildlife will be able to **tell the name and schedule of the species if they get only a part of the meat, hair, blood, skin or bone of any animal.**
- The move will help **clamp down on wildlife poaching and smuggling**, and also aid in research on wildlife species.

Need for DNA Bank

- Forest and police officials at times catch poachers and recover animal parts but the species of the animals is difficult to determine.
- Experts at times are able to suspect the species based on the type of meat or bone and the population of animals present in the area of origin of the body parts.
- But if scientists get any animal's meat, hair, blood or any other part from which cells can be obtained, they will compare it with the DNA bank to know the name and schedule of species.
- The schedule of the species will help in knowing that whether animal falls in endangered category or not.

17) INDIAN WOLF' IN SUNDERBANS

- An Indian wolf (Canis lupus pallipes) has **reportedly been sighted for the first time in the Sunderbans**.
- The forest department is yet to verify the veracity of the claim.
- The sighting is significant since wolves in Bengal are mostly found in the western parts bordering Chhattisgarh and Jharkhand.
- The Indian wolf is **a Schedule I animal in the Wildlife (Protection) Act 1972 of India**.
- It prefers to live in **scrub lands, grasslands and semi-arid pastoral/ agricultural landscape**.
- Less than 2,000 wolves are currently found in the forests of India.
- It is categorised as 'endangered' by the International Union for Conservation of Nature.
- Less than 2,000 wolves are there in the Indian forests.

18) GOLDMAN PRIZE

Why in news?

- Activist Prafulla Samantara is one of the six winners of the **Goldman Environmental Prize** for 2017.
- He is being honoured for his historic 12-year legal battle that affirmed the indigenous Dongria Kondhs' **land rights and protected the Niyamgiri Hills** from a massive, open-pit aluminium ore mine.

About Goldman Prize

- The annual prize awarded by the Goldman Environmental Foundation **honours grassroots environmentalists**, **who risk their lives to protect the environment** and empower those who have the most to lose from industrial projects that threaten their traditional livelihoods.
- Since 1990 when the awards were first instituted, six Indians — Medha Patkar, M.C. Mehta, Rasheeda Bi, Champaran Shukla, Ramesh Agrawal and Prafulla Samantara have won the prize.
- Apart from a medal and citation, winners receive a substantial cash award though the exact amount is not revealed.
- Reuters reported in 2014 that individuals won $175,000 (Rs.1.13 crore approx.) as prize money.
- The Goldman Environmental Prize recipients are **selected by an international jury from confidential nominations** submitted by a worldwide group of environmental organizations and individuals.
- The winners are **announced every April to coincide with Earth Day**.

ABOUT DONGRIA KONDHS:

- The Dongria Kondh in south-western Odisha is one of India's so-called **"particularly vulnerable tribal groups."**
- The Kondhas are believed to be from the Proto-Australoid ethnic group.
- Their native language is Kui, a Dravidian language written with the Odia script.
- They have a subsistence economy based on foraging, hunting & gathering but they now primarily depend on a subsistence agriculture i.e. shifting cultivation or slash and burn cultivation or Podu.
- The Dongria Kondh **call themselves Jharnia** meaning those who live by the Jharana (streams).
- Hundreds of perennial streams flow from Niyamgiri hill, and there are hundreds of Dongria villages by the streams. The Dongria are considered the protectors of these streams, hills and jungles by the people of the nearby plains.

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