



# IAS PARLIAMENT

*Information is a Blessing*

A Shankar IAS Academy Initiative

## TARGET 2018

### ENVIRONMENT II

***December 2017 to February 2018***

**Shankar IAS Academy™**

Door No 18, New Plot No 259 /109,  
AL Block, 4th Avenue, Shanthi Colony,  
Annanagar, Chennai - 600040.



**TARGET 2018**  
**ENVIRONMENT II**  
**INDEX**

<b>1. POLLUTION .....</b>	<b>4</b>	4.3	WSD SUMMIT 2018.....	16	
1.1	GARBAGE EMERGENCY .....	4	4.4	INTERNATIONAL CONFERENCE ON SUSTAINABLE BIOFUELS, ICSB 2018 .....	16
1.2	WASTE MANAGEMENT AND POLLUTION EXCHANGE PLATFORM.....	4	<b>5. ENVIRONMENTAL ORGANISATIONS AND FUNDS .....</b>	<b>16</b>	
1.3	ANTI- SMOG GUN .....	4	5.1	MANGALAJODI ECOTOURISM TRUST (MET) .....	16
1.4	METHANOL BLENDING WITH PETROL .....	4	5.2	INDIA-UN DEVELOPMENT PARTNERSHIP FUND .....	17
1.5	REDUCTION IN OZONE DEPLETION.....	4	5.3	UN BROADBAND COMMISSION FOR SUSTAINABLE DEVELOPMENT .....	17
1.6	NITROGEN POLLUTION .....	5	5.4	INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC) .....	17
1.7	INVISIBLE OIL SPILL .....	6	5.5	UN ENVIRONMENT MANAGEMENT GROUP (EMG) .....	17
1.8	PLASTIC POLLUTION .....	7	5.6	NAF FOR CLIMATE CHANGE.....	18
1.9	DUST MITIGATION PLAN.....	7	5.7	WETLANDS INTERNATIONAL.....	18
1.10	CONTROLLING POLLUTION OF RIVER SAL .....	7	<b>6. GOVERNMENT INTERVENTIONS.....</b>	<b>19</b>	
1.11	FIRE IN BELLANDUR LAKE .....	8	6.1	STATE OF FOREST REPORT (SFR 2017).....	19
1.12	STUBBLE BURNING.....	8	6.2	NATIONAL GREEN TRIBUNAL .....	20
<b>2. RENEWABLE ENERGY .....</b>	<b>9</b>	6.3	BLUE FLAG .....	20	
2.1	WORLD'S FIRST PHOTOVOLTAIC HIGHWAY .....	9	6.4	CGANGA.....	21
2.2	LEADERSHIP IN ENERGY & ENVIRONMENTAL DESIGN (LEED).....	9	6.5	BIRTH CONTROL PROJECT .....	21
2.3	HURDLES IN REALISING ROOF TOP SOLAR PLANTS.....	9	6.6	STAR-RATING FOR GARBAGE FREE CITIES .....	21
<b>3. CLIMATE CHANGE .....</b>	<b>10</b>	6.7	MORE POWER TO STATES TO GRANT EIA.....	21	
3.1	DAY ZERO .....	10	6.8	PROTECTION OF MAJULI ISLAND .....	22
3.2	NATIONAL CARBON MARKET .....	10	6.9	NATIONAL CLEAN AIR PROGRAMME.....	22
3.3	INDIA'S STATE ACTION PLAN ON CLIMATE CHANGE .....	11	6.10	ITEWS.....	23
3.4	CYCLONE OCKHI .....	11	6.11	AUTOMATED OCEAN POLLUTION OBSERVATION SYSTEM .....	23
3.5	SOILS TO SEQUESTER CARBON .....	13	6.12	DISASTER RESILIENT INFRASTRUCTURE .....	23
<b>4. CONVENTIONS, TREATIES AND CONFERENCES.....</b>	<b>14</b>	6.13	HIMALAYAN RESEARCH FELLOWSHIPS SCHEME .....	24	
4.1	INDIA & CITES.....	14			
4.2	MINMATA CONVENTION ON MERCURY.....	15			



6.14	FRATERNAL TIES WITH TREES.....	24	8.7	KAPRA LAKE AND WATER HYACINTH .....	34
6.15	ZERO BUDGET NATURAL FARMING .....	25	8.8	UP GRADATION IN IUCN LIST .....	34
6.16	CAMPA RULES.....	25	8.9	CHEETAHS UP LISTED FOR ENDANGERED.....	35
6.17	GREEN GOOD DEEDS CAMPAIGN .....	25	8.10	ANT SPECIES IN ANDAMAN .....	35
6.18	GOVERNMENT'S DECISION ON AAREY FOREST LANDS .....	26	8.11	NIGHT FROGS .....	35
6.19	PELICAN FESTIVAL.....	26	8.12	NEW GINGER SPECIES .....	35
6.20	NEW TECHNOLOGY FOR NAMAMI GANGE .....	26	8.13	HUMPBACK WHALE .....	35
<b>7. PROTECTED AREAS.....</b>		<b>27</b>	8.14	CHIRU GOAT .....	36
7.1	KEOLADEO NATIONAL PARK .....	27	8.15	NILGIRI MARTEN.....	36
7.2	NO DEVELOPMENT ZONE.....	27	8.16	NEW MOTH SPECIES IN ARUNACHAL PRADESH.....	37
7.3	NAYACHAR ISLANDS .....	28	8.17	WHITE -NAPED TIT BIRD .....	37
7.4	TIGER CENSUS.....	28	8.18	RED SANDERS .....	37
7.5	MUDUMALAI TIGER RESERVE .....	29	8.19	THE BIRDS AND THE COFFEE BEANS .....	38
7.6	NAGARJUNASAGAR-SRISAILAM TIGER RESERVE .....	29	8.20	NEW EEL SPECIES .....	38
7.7	SUNDERBANS MANGROVE FOREST .....	29	8.21	SHELL FISH REEF.....	38
7.8	ASSAM- WILDLIFE PROTECTION .....	30	8.22	FOREST OWLET .....	39
7.9	ERAVIKULUM NATIONAL PARK.....	30	8.23	RARE FISH SPECIES FROM AUSTRALIA .....	39
7.10	TUNGABADRA OTTER CONSERVATION RESERVE.....	31	8.24	ECHINDAS .....	40
7.11	GHODAZARI WILDLIFE SANCTUARY .....	31	8.25	ANTARCTIC KRILL.....	40
7.12	RHODENDRON PARK .....	31	8.26	NEW PLANT SPECIES – WEST BENGAL.....	40
7.13	HUMAN ANIMAL CONFLICT - HIGHWAY TIGER KILLINGS.....	32	8.27	RING TAILED LEMURS (LEMUR CATT) .....	40
<b>8. SPECIES IN NEWS .....</b>		<b>32</b>	8.28	SAVING GREAT INDIAN BUSTARDS.....	41
8.1	WHITE SPOTTED BUSH FROG.....	32	8.29	ASIAN WATERBIRD CENSUS .....	41
8.2	LIST OF INVASIVE ANIMAL SPECIES.....	32	<b>9. REPORTS AND INDICES .....</b>		<b>42</b>
8.3	WAKALEO SCHOUTENI.....	33	9.1	'GLOBAL E-WASTE MONITOR 2017' REPORT.....	42
8.4	MASS EXTINCTION SURVIVOR .....	33	9.2	ENVIRONMENTAL PERFORMANCE INDEX, 2018 .....	42
8.5	SCHALLER'S WOOD SCORPION .....	33			
8.6	NARCONDAM HORNBILL .....	34			



## TARGET 2018

### ENVIRONMENT II

#### 1. POLLUTION

##### 1.1 Garbage Emergency

Bali has declared a “garbage emergency” across a six-kilometer stretch of coast.

- Indonesia is the world’s second biggest contributor to marine debris after China.
- Indonesia is one of the nearly 40 countries that are part of the UN Environment’s Clean Seas campaign.
- The campaign aims to halt the tide of plastic trash polluting the oceans, boost recycling services, curb the use of plastic bags, launch cleanup campaigns and raise public awareness.
- As part of its commitment, the government has pledged to reduce marine plastic waste by 70% by 2025.

##### 1.2 Waste management and pollution exchange platform

India is set to launch its first waste management and pollution exchange and trading platform.

- London based leading provider of exchange technology will collaborate with the Centre for Ganga River Basin Management and Studies (CGanga) will to launch this Platform.
- It will address the waste management and pollution related problems in the Ganga river basin, which is a part of the Ganga clean-up initiative.
- The exchange solution will include technology to deliver market data, warehouse receipts, finance and trading, including auctions, quoting and continuous trading facilities.

##### 1.3 Anti- Smog Gun

Delhi government to tackle its air pollution problem has tested an Anti-Smog gun in Northern areas of Delhi.

- It is simply a Water mist cannon, which is connected to a water tank and mounted on a flatbed truck.
- It sprays atomized water in which liquid is broken up into smaller droplets up to 230 feet into the air.
- The droplets merge with dust particles replicating the effect of rain, as rain lowers levels of air pollution by bringing particulates in pollution down to the ground.

##### 1.4 Methanol blending with Petrol

Government will soon announce a policy which calls for 15 per cent blending of methanol in petrol to make it cheaper and also reduce pollution.

- Methanol is an important chemical used as fuel in vehicles.
- It is currently produced by ‘Methanol Synthesis’ process which is very expensive and energy intensive.
- It involves breaking down natural gas at high temperatures into hydrogen gas and carbon monoxide.
- It is also made from the destructive distillation (pyrolysis) of wood and is chiefly synthesized from carbon monoxide and hydrogen.
- It is also used to produce biodiesel via transesterification reaction.
- Its principal uses are in organic synthesis, as a fuel, solvent, and antifreeze.

##### 1.5 Reduction in Ozone Depletion

The scientists have observed for the first time that levels of ozone-destroying chlorine are declining, resulting in less ozone depletion.

- There has been an international ban on chlorine-containing human made chemicals called chlorofluorocarbons (CFCs).



- Measurement show that this has resulted in about 20% less ozone depletion during the Antarctic winter than there was in 2005.
- Stratospheric ozone protects life on the planet by absorbing potentially harmful ultraviolet radiation that can cause skin cancer and cataracts,
- CFCs are long-lived chemical compounds that eventually rise into the stratosphere.
- In the long months of polar winter, chemical reactions take place in Polar Stratospheric Clouds that could not take place anywhere else in the atmosphere.
- These reactions convert the inactive chlorine in CFCs into more active forms, especially chlorine gas (Cl<sub>2</sub>).
- When the sunlight returns to the South Pole in October, UV light rapidly breaks the bond between the two chlorine atoms, releasing free chlorine.
- Chlorine atoms go on to destroy ozone molecules, resulting in Antarctic ozone hole.
- The measurements are made by Microwave Limb Sounder (MLS) aboard the Aura satellite, which has been monitoring continuously since 2004.

### CFC

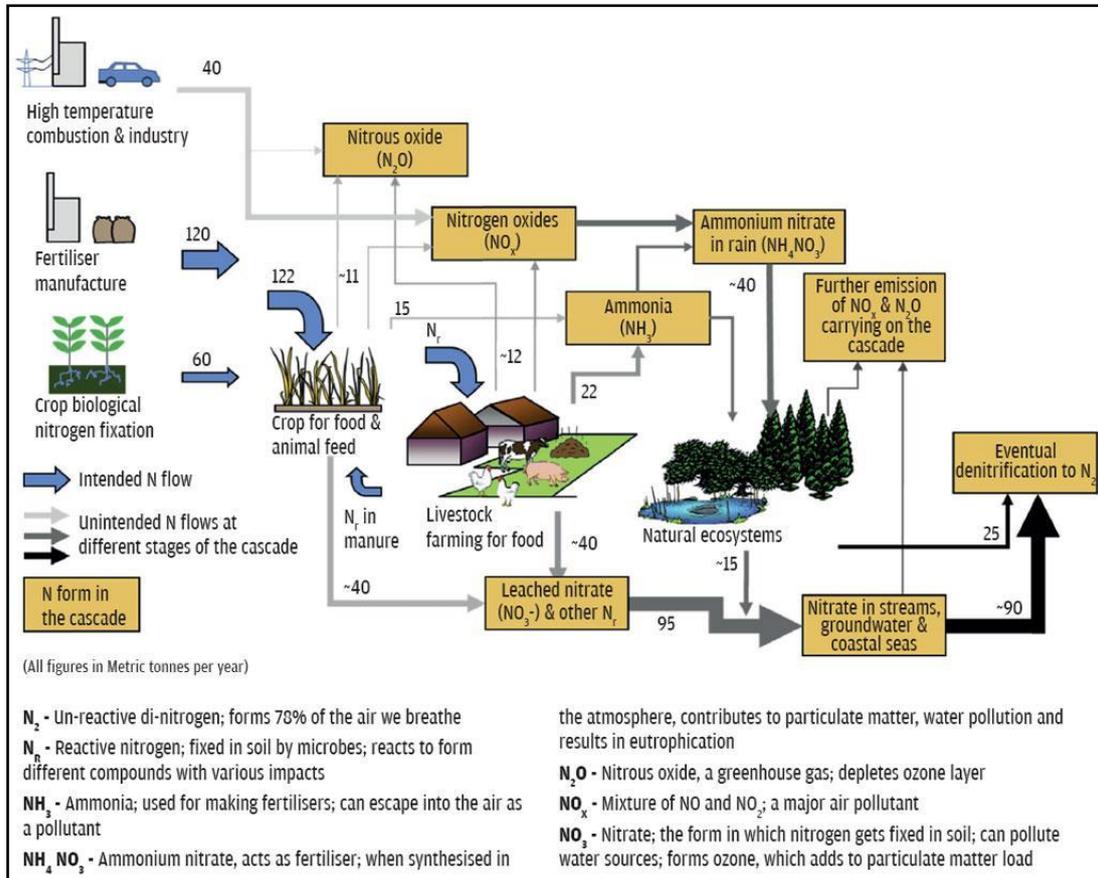
- Chlorofluorocarbons (CFCs) are long-lived man-made chemical compounds that eventually rise into the stratosphere.
- There they are broken apart by the Sun's ultraviolet radiation, releasing chlorine atoms that go on to destroy ozone molecules.
- The **Montreal Protocol** and its amendments have banned the use of ozone destroying chemicals and the rate of ozone depletion seems to have slowed.
- Scientists used data from the **Aura satellite** to determine how ozone and other chemicals have changed year to year.
- Aura is a NASA mission to study Earth's ozone, air quality, and climate and conduct research on the composition, chemistry, and dynamics of Earth's atmosphere.

## 1.6 Nitrogen Pollution

Indian Nitrogen Group has released "**The Indian Nitrogen Assessment**", India's first-ever such attempt to study nitrogen pollution.

- Society for Conservation of Nature (SCN), a coalition of more than 120 scientists setup a specialised group called the Indian Nitrogen Group (ING).
- The report takes into account nitrogen (N) being used for agricultural purposes and also its increasing emissions from the transport boom in the country.
- India has become the third country after the US and the EU to have assessed the environmental impact of nitrogen on their respective regions comprehensively.
- The Assessment shows that agriculture is the main source of nitrogen pollution in India followed by Sewage and organic solid wastes.
- Only 33 per cent of the nitrogen that is applied to rice and wheat through fertilisers is taken up by the plants in the form of nitrates (NO<sub>3</sub>). This is called **Nitrogen Use Efficiency or NUE**.
- The remaining 67 per cent remains in the soil and seeps into the surrounding environment causing a cascade of environmental and health impacts.
- It also found that nitrates not only affected surface water but also polluted groundwater sources.
- Nitrogen pollution also has an effect on soil health because of the **reduction of carbon content** of the soil over a long period of time which affects its health.
- Nitrogen in the form nitrous oxide (N<sub>2</sub>O) is also a greenhouse gas (GHG) and a fast rising contributor to global climate change.
- Fertilisers are the major emitters of N<sub>2</sub>O in India while vehicular pollution (55.53 Gigagram or Gg), industrial and domestic sewage (15.81 Gg) also contribute towards rise of N<sub>2</sub>O.

- **Vehicular pollution** is also a major contributor of NO<sub>x</sub>, accounting for 32 per cent of the total emissions in India, out of which 28 per cent is from road transport.
- The **poultry industry** in India emits Nitrogen to the tune of 0.415 Mt in 2016, which will increase to 1.089 Mt by 2030.



### 1.7 Invisible Oil Spill

The collision in the East China Sea that sank an Iranian tanker gave rise to an odd environmental disaster.

- It is the largest oil spill in the decades yet hasn't attracted the global attention as it happened in a remote location in the high sea and also due to the type of petroleum spill – **condensate**.
- Condensate is a toxic, liquid byproduct of natural gas production and does not clump into black globules that can be easily spotted.
- Absorbed into the water, it will remain toxic for a time; its exposure is extremely unhealthy to humans and potentially fatal.
- The East China Sea area produced five million tons of seafood of up to four dozen species for China including crab, squid, yellow croaker, mackerel and hair tail.
- The only real solution is to let it evaporate or dissolve.
- The condensate may find its way in to the rich Japanese Fisheries source.



### 1.8 Plastic Pollution

India will host the official global World Environment Day celebrations on June 5.

- The Theme of this year Environmental day will be “Beat Plastic Pollution”.
- The following are some insights into the plastic pollution in the country,
- The average production and consumption of plastic products between 2011-12 and 2015-16 at 707 million metric tons (MMT) per year.
- A report by Central Pollution Control Board in 2015 estimated that around 4,059 tons per day of plastic waste is generated from major cities.
- In 2015, the government had approved a scheme for “setting up of need-based plastic parks with requisite state-of-the-art infrastructure to assist the sector move up the value chain.
- Ockhi Cyclone resulted in agglomeration of plastic debris along the coasts of Maharashtra, Kerala, Karnataka, Goa and Gujarat.



### 1.9 Dust Mitigation Plan

The Environment Ministry has made it mandatory for companies seeking environment clearance to ensure that they put in place a dust mitigation plan.

- The requirements say that roads leading to or at construction sites must be paved and black-topped.
- There could be no soil excavation without adequate dust mitigation measures in place.
- No loose soil, sand, construction waste could be left uncovered.
- A water sprinkling system is mandatory, and the grinding and cutting of building materials in open area are prohibited.
- The standards were developed by the Central Pollution Control Board as part of the National Ambient Air Quality Standards (NAAQS).
- Road dust contributes to 56% of all PM10 pollution and 38% for PM2.5.
- Dust is a generic term for a vast mix of metals and non-metals — silicon, aluminium, titanium, manganese, copper, barium, antimony, selenium and zinc.

### 1.10 Controlling Pollution of River Sal

- The Centre sanctioned a new project to control pollution in River Sal at Navelim town in Goa.
- The project was sanctioned by the Ministry of Environment, Forest & Climate Change under the National River Conservation Plan.
- Under the project, around 32 kms of sewers will be laid and sewage treatment plant of 3 million litres per day (MLD) will be constructed.
- This will help in reduction of pollution load in the river and improvement in its water quality, besides improving the environment and sanitation in the town.





### 1.11 Fire in Bellandur Lake

Bellandur Lake in Bengaluru again saw a major fire. The lake exemplifies the larger woes that plague our urban clusters.

- Spread over 906 acres in south-eastern Bengaluru, Bellandur Lake is the city's largest lake with a catchment area of nearly 279 sq km.
- It is one of the 70 lakes that survived from the 272 lakes that existed in and around Bengaluru four decades ago.
- Until the Eighties, the lake was a vibrant ecosystem that nurtured a variety of birds, fish and insects, and a popular picnicking, boating and fishing site.
- The dramatic growth of Bengaluru over the last two decades has led to massive amounts of **domestic and industrial waste** flowing into the lake.
- **Encroachments** of over 90% of its catchment area by settlements, and the dumping of garbage on its shores, have throttled the flow of water into it.
- Often, **froth** spills over into the many busy roads that skirt its shores.
- Bellandur Lake's degradation is merely a pointer to the larger malice, which is the absence of any real accountability for the death of Bengaluru's lakes.
- Notably, "**Varthur Lake**", which is the second major lake in the city, is in an almost equally bad state.
- Also, the **Vrishabhavati River**, which was once a drinking water source for the city is now recognised only as an open sewer.
- Civic agencies failure to address the unplanned growth of the city has resulted in the unregulated flow of sewage and industrial pollutants into water bodies.
- **Solution** - Regulation of phosphorus levels in detergents is needed to avoid further frothing and disrupting methane formation (primary cause for fire).
- Mandating decentralised sewage treatment, and strictly enforcing "polluter pays principle" for industries dumping untreated waste is needed.
- Protection of the catchment area from further deterioration due to real estate projects, garbage dumping and encroachments also needs to be done.

### 1.12 Stubble Burning

*Paddy stubble burning is found to be a major contributor to Delhi's air pollution. Bans and fines are unlikely to be effective.*

- Stubble burning causes smoke and particulate pollution that can move over long distance.
- It also implies loss of nutrients in soil.
- One tonne of straw when burnt releases 3 kg of particulate matter, 60 kg of carbon monoxide, 1,460 kg of carbon dioxide, 199 kg of ash and 2 kg of sulphur dioxide.
- In Punjab alone, 15 million tonnes of paddy straw is burnt every year, generating 45 million tonnes of particulates.
- **Alternate uses of stubble** - Properly cut Stubble can be used to make bio-char or cellulosic ethanol, burn in a power plant or plant the next crop without tillage.

#### Reasons for stubble burning

- When manually harvested, the crops can be cut at the bottom and the stalks could be sent for other uses such as paper mills, animal bedding, etc.
- But manual harvesting has become very expensive as labourers charge around Rs 4,000/acre and take three to four days.
- So at present, paddy harvesting is done by combine harvester machine, which finishes it in half an hour and charges Rs 1,200/acre.
- But it leaves two thirds of the stalks on the ground.
- So stubble burning is the cheapest and quickest way to get their fields ready in time for the sowing of next crop.
- It kills weeds including those resistant to herbicides.
- It also kills slugs and other pests.



- Bio-char is a fine-grained, carbon-rich, porous product remaining after straw has been subjected to pyrolysis at low temperatures in an environment with little or no oxygen.
- Bio-char can improve water retention and increased soil surface area when used with other fertilisers.
- **Viable solution** - Incentives from power generators and ethanol manufactures to farmers bringing stubble will provide solution for this.
- Super SMS (straw management system) is an attachment that fits onto the combine harvesters for paddy, spreads residue evenly over the field.
- Initiatives should be taken to market biochar as a nutrient and private players should be involved for the infrastructures required.

## 2. RENEWABLE ENERGY

### 2.1 World's First Photovoltaic Highway

World's first **solar highway in Jinan**, the capital city of China's Shandong province was recently opened for testing.

- The new solar road consists of an insulating layer on the bottom, photovoltaic panels in the middle, and transparent concrete on top.
- It can generate 1 million kilowatt-hours of power in a year and saves the space for building solar farms and shorten the transmission distance.
- Last year, the world's first so-called **solar road** for cars and trucks opened in Normandy, **France**.
- Netherlands also opened a solar bike path with an estimated cost of \$3.7 million.
- A **solar bike path** in the **Netherlands** cost an estimated \$3.7 million to build.

### 2.2 Leadership in Energy & Environmental Design (LEED)

- It is the most widely used **green building rating system** in the world and is designed to help buildings achieve high performance in key areas of human and environmental health.
- It is launched by U.S Green Building Council in 2016.
- The top 10 in LEED list highlights countries outside of the US that are making significant strides in sustainable building design, construction and transformation.
- It evaluates performance of a city across five key areas of environmental and human health.
- It includes energy efficiency, indoor environmental quality, materials selection, sustainable site development and water savings.
- LEED for cities and LEED for communities track performance on energy use, waste management, water, transport and even quality of life in its respective levels.
- Washington, DC, was named the first LEED for Cities - **Platinum city** in the world last year.

**Performance Score  
and Certification  
Levels:**

- 40-49 is Certified
- 50-59 is Silver
- 60-79 is Gold
- 80-100 is Platinum

### 2.3 Hurdles in Realising Roof Top Solar Plants

Union government is working on a "rent a roof" policy to support its plan to generate 40 GW of solar power by 2022.

- **"Rent a roof" policy** - Under the policy, a developer will take rooftops on rent and will offer lease to each household, and then feed the solar power to the grid.



- This policy works under net-metering system, by which a consumer is only billed for the electricity consumed after deducting the power generated from one's solar rooftop panels that is supplied to the grid.
- Union government aims to give the discoms financial incentives for every MW of rooftop capacity created in their area of operation.
- However, to avail themselves of incentives, discoms should create the capacities through tariff-based competitive bidding.
- The proposed scheme seeks to shift the game from captive players to energy companies (independent power producers, or IPPs).
- **Hurdles** - Most of the discoms in India are State government-owned and are hesitant to take up such projects due to of their nature of self-protection from instant financial turmoil.
- These companies have refused to buy any surplus power from them.
- Therefore, factories and commercial establishments, like shopping malls, put up only as much rooftop solar capacity as would satisfy their demand, even if they have the space and wherewithal for more.
- As for individuals, rooftop solar has are not being attractive proposition as there is no clear government policy stand on installation and maintenance of roof top solar plants.
- There is also absence of policy direction on '**net metering**', which would allow owners of captive rooftop plants to sell surplus power to the grid.
- In a tariff-based competitive bidding scenario, individual and small producers will be at a disadvantage.
- Competitive bidding process would also culminate in a **Power Purchase Agreement (PPA)** and a PPA is not particularly appropriate for a sell-only-surplus situation.
- **PPA** - It is a contract between the one who generates electricity and one which is looking to purchase it.
- It defines all of the commercial terms for the sale of electricity between the two parties, including when the project will begin commercial operation, schedule for delivery of electricity, penalties for under delivery, payment terms, and termination.

### 3. CLIMATE CHANGE

#### 3.1 Day Zero

*Weekly reports on water levels in the dams that supply Cape Town capital of South Africa, terms "Day Zero"*

- It is the day when most taps could stop running and in South Africa it is expected to probably arrive in May 2018.
- The severity of the crisis, brought on by three years of poor rains and surging water demand.
- In a bid to curb water consumption, the city has banned residents from watering their gardens and washing their cars, shut most public swimming pools.

#### 3.2 National Carbon Market

*China has formally launched its national carbon market to tackle pollution and climate change.*

- Government has 3 ways to reduce carbon dioxide emissions such as setting emission limits, levying carbon taxes and facilitating a carbon market.
- A carbon market is a marketplace where carbon emissions can be traded. It allows governments to put a price on carbon emissions.
- Carbon markets can be implemented in many ways but the most popular is a **cap-and-trade scheme**.



- In the scheme, the government sets a **cap on a company's emissions** based on certain factors like the type of industry it belongs to and the ease with which the industry could feasibly reduce its emissions.
- If a company beats the government's targets, it can sell any additional "saved" carbon emissions on the market.
- Other companies that failed to hit reduction targets can buy those saved emissions to artificially reach their goals. This incentivizes polluters to pollute less.
- China's carbon market will at first only apply to emissions from power plants producing more than 26,000 tons of carbon dioxide per year.
- Carbon markets in the long term will help the government to lower the cap in emission level to raise the price of emissions and thus disincentivize polluters, without crippling the country's energy sector.
- **Carbon Markets in the world** - The European Union runs an emissions trading scheme (ETS) which covers emissions from electricity, industry, and aviation—covering about 40% of all emissions from the region.

### 3.3 India's State Action plan on Climate Change

- India's State Action Plan on Climate Change is implemented by Ministry of Environment, Forest and Climate change.
- It supports the integration of national climate change goals into sub national policies.
- India has committed to meet its current target of 33% reduction in emission intensity of the 2005 level by 2030, by generating 40% of its energy from renewables.
- States are important for the realization of this goal and they are considered as Sub national modules.
- The **Under2Coalition**, a MoU by sub national governments to reduce their greenhouse gas (GHG) emissions towards net-zero by 2050.
- It is generating a unique precedent for bold climate leadership, with its member states and regions surpassing 200 in number.
- Currently, Telangana and Chhattisgarh are signatories to this pact from India.

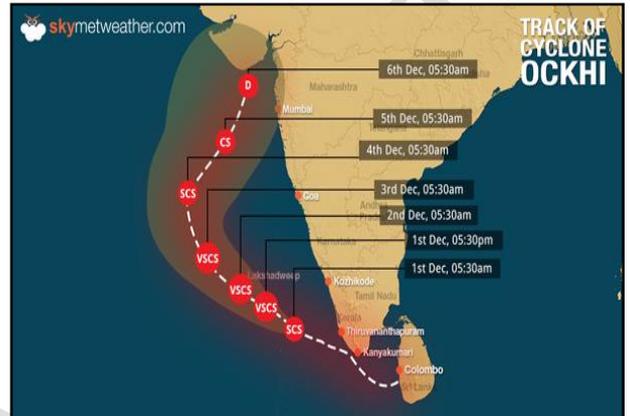
### 3.4 Cyclone Ockhi

*Cyclone Ockhi that struck the Kanyakumari district in Tamil Nadu and parts of Kerala has led to large-scale loss of lives and livelihood.*

- According to Indian Metrological Department, It was a 'very severe cyclonic storm'.
- Ockhi name is coined by Bangladesh, which means 'eye' in Bengali.
- The cyclone originated near the south-western coast of Sri Lanka.
- It arose in the Bay of Bengal over Sri Lanka and was expected to pass over Lakshadweep and then ease into the Arabian Sea, far away from India's west coast.
- But it followed a very unique trajectory by travelling along the coasts of Tamil Nadu, Kerala and Lakshadweep islands and ended up sharply swerving into parts of Maharashtra and Gujarat.
- It did not blow in very strongly because there it had not gained as much moisture from the Arabian Sea like it had over the Bay of Bengal and the Indian Ocean boundary.
- And though it wreaked havoc in Kerala and Tamil Nadu, and destroyed several beaches in Goa when it curved back to the land.
- The pathway of Ockhi resembles "**Re-curving Cyclone**".

## Re-curving Cyclone

- The cyclone ones that typically strike the Indian neighbourhood in the northern hemisphere rotate anticlockwise.
- Their normal behaviour is to derive strength from the moisture in waters such as the Bay of Bengal, move west, incline in a northerly direction and peter out into the sea or land, depending on their origin.
- On its way to diminish, if cyclone gets a sort of second wind by deflected right or eastwards is known as re-curving cyclone.
- This is due to air currents in the local atmosphere that push cold air from the poles towards the equator and interfere with cyclone formation.
- In the southern hemisphere, the cyclones spin clockwise and therefore also re-curve in the opposite direction.
- During the monsoon months, cyclones in the Western Pacific move westwards towards India and aid the associated rain-bearing systems over the country.
- However, in the years of a re-curve, they do not give as much of a push to the rain as they do in the good monsoon years.
- A challenge with re-curving cyclones is that it is hard for weather models to pick them early on as was the case with Ockhi.



## Bay of Bengal Vs Arabian Sea

- The relatively colder waters of Arabian Sea compared to Bay of Bengal, is not conducive to the formation and intensification of cyclones.
- Because, cyclone formation requires a warm ocean water of 26-27°C
- Additionally, the eastern coast of India receives cyclones that form not just in the Bay of Bengal but also those travelling from the Pacific Ocean, where the frequency of 'typhoons' is quite high.
- The cyclones over the Arabian Sea either originate over southeast Arabian Sea or remnants of cyclones from the Bay of Bengal that move across south peninsula.
- As the majority of Cyclones over the Bay of Bengal weaken over land after landfall, the frequency of migration into Arabian Sea is low.
- The western coast of India thus witnesses a less number of cyclones compared to Bay of Bengal.

## Stages of Cyclone Warning

- The cyclone warnings are issued to state government officials in four stages.
- The first stage warning known as "Pre Cyclone Watch" contains early warning about the development of a cyclonic disturbance.
- The second stage warning known as "Cyclone Alert" contains information on the location and intensity of the storm and coastal districts likely to experience adverse weather, advice to fishermen, general public, media and disaster managers.
- The third stage warning known as "Cyclone Warning" forecasts likely point and time of landfall.

### IMD's cyclone classification

- Super Cyclonic Storm (>222 km/h)
- Very Severe Cyclonic Storm (118-221 km/h)
- Severe Cyclonic Storm (88-117km/h)
- Cyclonic Storm (62-87 km/h)
- Deep Depression (52-61 km/h)
- Depression (<51 km/h)

- The fourth stage of warning known as "Post Landfall Outlook" forecasts expected time of landfall.

Stage of Warning	Time	Colour Code
Cyclone Alert	Issued at least 48 hrs in advance.	Yellow
Cyclone Warning	issued at least 24 hours in advance.	Orange
Post landfall out look	Issued at least 12 hours in advance	Red

### Naming of cyclone in Indian Ocean

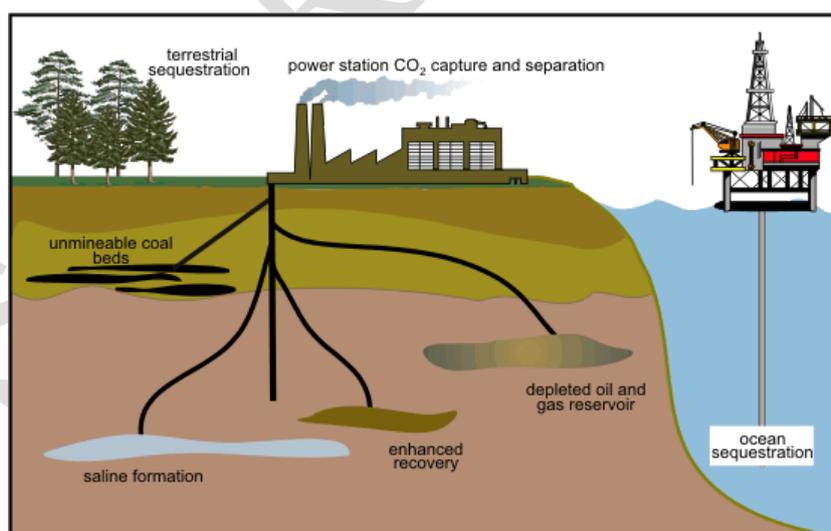
- World Meteorological Organisation (WMO) and the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) started the tropical cyclone naming system in 2000.
- Eight north Indian Ocean countries — Bangladesh, India, the Maldives, Myanmar, Oman, Pakistan, Sri Lanka and Thailand, gave eight names each which was combined into a list of 64 names.
- The next cyclone will be named by India and it will be called 'Sagar'.

### 3.5 Soils to Sequester Carbon

*The ability of soils to sequester carbon should be given a serious focus by policymakers in the context of climate change actions.*

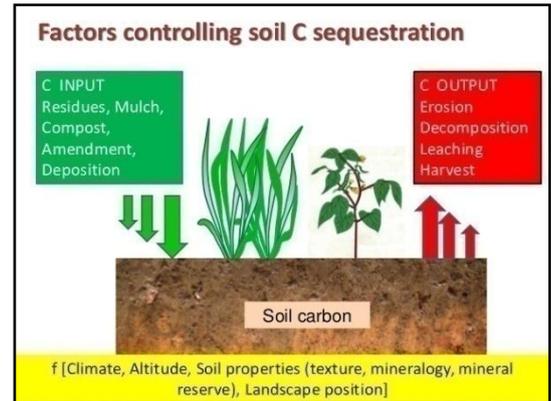
#### Carbon sequestration

- It is the process by which carbon dioxide is removed from the Earth's atmosphere and then stored in liquid or solid form.
- It could involve both natural and artificial processes to remove and store carbon.
- Significant carbon pools on earth are found in the earth's crust, oceans, atmosphere and land-based ecosystems.
- The prime purpose of artificially doing this is to mitigate or delay global warming and avoid extreme climate change.



- **SOC** - Soil organic carbon (SOC) comes from plants, animals, microbes, leaves and wood, mostly found in the first metre or so.
- Soils contain around 2,300 Gt (1 gigatonne = 1 billion tonnes) of organic carbon, making this the largest terrestrial carbon pool.
- There are many conditions and processes that determine changes to SOC content.
- These include temperature, rainfall, vegetation, soil management and land-use change.

- Thus, increasing Soil Organic Carbon involves adopting sustainable agricultural practices to keep these factors in balance.
- The approaches to increase SOC include:
  - i. reducing soil erosion
  - ii. no-till-farming
  - iii. use of cover crops
  - iv. nutrient management
  - v. applying manure and sludge
  - vi. water harvesting and conservation
  - vii. agroforestry practices, etc



- **Benefits** - Increasing SOC through various methods can **improve soil health**.
- It can contribute to agricultural yield, food security, water quality, and also reduce the need for chemicals.
- It helps address **carbon mitigation** and also improve conditions of fresh water, biodiversity, land use and nitrogen use.
- Moreover, carbon sequestration in soils has the potential **to offset GHG emissions** from fossil fuels by up to 15% annually.
- Utilising this option would thus offer the breathing time before other technologies can help transiting to a zero-carbon lifestyle.

## 4. CONVENTIONS, TREATIES AND CONFERENCES

### 4.1 India & CITES

India has been awarded with the Certificate of Commendation from CITES for its regional and global effort to combat illegal wildlife trade.

- India is the only recipient of this Certificate of Commendation at the 69<sup>th</sup> Standing Committee meeting of CITES at Geneva.
- The award was given to Wildlife Crime Control Bureau (WCCB).
- WCCB is statutory multi-disciplinary body under the Ministry of Environment and Forests, to combat organized wildlife crime in the country. It is headquartered in New Delhi.
- WCCB conducted and coordinated a species specific wildlife enforcement Operation, codenamed **Operation Save Kurma**.
- The operation aims to combat the proliferating illegal trade in live **turtles** and its parts from the country to destinations abroad.

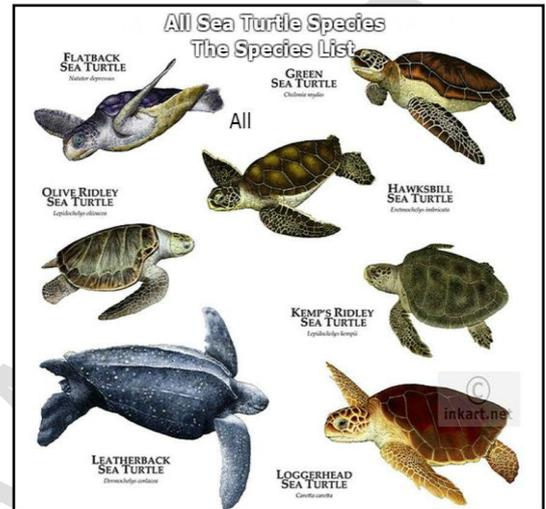
### CITES

- CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) is a multilateral treaty to protect endangered plants and animals.
- It is also known as the Washington Convention.
- Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten the survival of the species in the wild.
- It accords varying degrees of protection to more than 35,000 species of animals and plants.
- Participation is voluntary, and countries that have agreed to be bound by the Convention are known as Parties.

- Presently, 183 countries across the world are signatory to the Convention.
- Although CITES is legally binding on the Parties, it does not take the place of national laws.
- Rather it provides a framework respected by each Party, which must adopt their own domestic legislation to implement CITES at the national level.

### Sea Turtles in India

- There are five species of seas turtles in Indian waters – Leatherback, Loggerhead, Hawksbill, Green and Olive Ridley.
- IUCN Status of these turtles are
  - i. Hawksbill- Critically endangered
  - ii. Green turtle- Endangered
  - iii. Leatherback- Vulnerable
  - iv. Loggerhead- Vulnerable
  - v. Olive Ridley- Vulnerable
- Mostly these turtles are found in the eastern coast of the Country.
- Sea turtles are protected under the Indian Wildlife Protection Act of 1972, under the Schedule I Part II.
- Often turtle are confused with tortoises. The major difference between the tortoise and sea turtles is that tortoises dwell on land, while turtles live in the water for some or nearly all of the time.



### Significance of sea turtles

- Sea turtles, especially the leatherback, keep jellyfish under control.
- This in turn helps maintain healthy fish stocks in the oceans.
- The Green turtle feeds on sea grass beds.
- Turtle populations could improve seagrass ecosystem health by removing seagrass biomass and preventing sediment formation.
- By cropping the grass, they provide a nursery for numerous species of fish, shellfish and crustaceans.
- The Hawksbill feeds on sponges in the coral reef ecosystem and opens up crevices for other marine life to live in.
- Turtles are also transporters of nutrients and energy to coastal areas.
- Unhatched eggs, eggshells and fluids help foster decomposers and create much needed fertilizer in sandy beaches.

### 4.2 Minamata Convention on mercury

The Union Cabinet approved the proposal for ratification of Minamata Convention on Mercury.

- The Minamata Convention is a global treaty established to protect human health and the environment from the adverse effects of mercury.
- The Convention protects the most vulnerable from the harmful effects of mercury and also protects the developmental space of developing countries
- The objective of the convention's implementation to protect human health and environment from the anthropogenic emissions and releases of mercury and mercury compounds.



- It entered into force in August 2017 with ratification by over 50 countries.
- The first meeting of the Conference of the Parties to the Minamata Convention on Mercury (Mercury COP1) was held at Geneva, Switzerland.
- The report, 'Towards a pollution-free planet', was launched during the COP1.
- Global Environment Facility (GEF) is the financial mechanism for Minamata Convention.
- The Convention is named after the Japanese city Minamata, as the city went through a devastating incident of mercury poisoning.

#### **4.3 World Sustainable Development Summit 2018**

*World Sustainable Development Summit (WSDS 2018) was organized recently in New Delhi.*

- WSDS is the flagship forum of The Energy and Resources Institute (TERI).
- The theme of the 2018 Summit is 'Partnerships for a Resilient Planet'.
- The 'Greenovation Exhibition' at WSDS 2018 will showcase the latest technological advancements to meet Sustainable Development Goals.
- The summit seeks to bring together on a common platform, global leaders and thinkers in the fields of sustainable development, energy and environment sectors.
- The Energy and Resources Institute (TERI) is a leading think tank dedicated to conducting research for sustainable development of India and the Global South.
- TERI's key focus lies in promoting clean energy, water management, pollution management, sustainable agriculture and climate resilience.

#### **4.4 International Conference on Sustainable Biofuels, ICSB 2018**

- International Conference on Sustainable Biofuels is jointly being organized by Department of Biotechnology, Govt. of India on behalf of Mission Innovation and Biofuture Platform.
- Mission Innovation (MI) is a global initiative of 22 countries and the European Union to dramatically accelerate global clean energy innovation.
- The Sustainable Biofuel is one of the Seven Mission Innovation Challenges and India Co-leads this along with other countries Brazil, Canada and China.
- The event will bring together experts from Biofuels sector to take stock of current knowledge, share information and best practices, and build consensus on the actions most needed to move forward.
- A "New Delhi Declaration on Sustainable Biofuels" will be endorsed during this International Conference

### **5. ENVIRONMENTAL ORGANISATIONS AND FUNDS**

#### **5.1 Mangalajodi Ecotourism Trust (MET)**

*MET has won "Innovation in Tourism Enterprise" award given by United Nations World Tourism Organisation (UNWTO).*

- UNWTO Awards for Innovation in Tourism are given to innovative tourism initiatives which are both competitive and sustainable in their character.
- Mangalajodi is a village located on the northern banks of Chilika Lake in Odisha, hosting more than 3,00,000 birds in its wetland.
- It is one of the Indian subcontinent's largest wintering grounds for exotic migratory waterfowl.
- The poachers of Mangalajodi have turned protectors of the bird by the coordinated efforts of Ecotourism Trust.



- The trust was started in 2011 along with Royal Bank of Scotland Foundation India (RBS FI).
- It is community owned and managed wildlife conservation venture promoted by RBS FI and Indian Grameen Services.
- The relevance of the award is further amplified as UNGA recently adopted 2017 as the International Year of Sustainable Tourism.

## 5.2 India-UN Development Partnership Fund

*India has contributed an additional \$1 million to the India-UN Development Partnership Fund earmarked for South-South cooperation.*

- India has pledged a multi-year contribution of \$100 million to the fund established in June 2017.
- India has already provided \$6 million within the seven months since its launch.
- The fund focuses on the Least Developed Countries and Small Island Developing States and managed by the UN Office of South-South Cooperation (UNOSSC).
- The projects include climate resilience, maternal health, youth employment, agricultural development, and infrastructure.

## 5.3 UN broadband Commission for Sustainable Development

- International Telecommunication Union and UNESCO set up the Broadband Commission for Digital Development to step-up UN efforts to meet the Millennium Development Goals (MDGs).
- The Commission was established in May 2010 with the aim of boosting the importance of broadband on the international policy agenda.
- Following adoption of the UN's Sustainable Development Goals in 2015, the Commission was re-launched as the Broadband Commission for Sustainable Development.
- Its aim is to showcase and document the power of ICT and broadband-based technologies for sustainable development.
- The Commission has re-evaluated and launched new framework of Targets 2025 in support of "Connecting the Other Half" of the world's population.
- It publishes the "State of Broadband" annual report.

## 5.4 Intergovernmental Panel on Climate Change (IPCC)

- The IPCC is an international body for the assessment of climate change, it was established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO).
- The IPCC reviews and assesses the most recent scientific, technical and socio-economic information produced worldwide relevant to the understanding of climate change.
- It does not conduct any research nor does it monitor climate related data or parameters.

## 5.5 UN Environment Management Group (EMG)

- The EMG is a UN system-wide coordination body on environment and human settlements.
- Its members include the secretariats of the multilateral environmental agreements (MEAs) and other specialized agencies, programmes and organs of the UN.
- Representatives of intergovernmental bodies, civil society and international non-governmental organizations can be invited to contribute.
- The EMG works through technical meetings, Issue Management Groups and task forces.

## 5.6 National Adaptation fund for climate change

- The National Adaptation Fund for Climate Change (NAFCC) is a Central Sector Scheme.
- The overall aim of NAFCC is to support concrete adaptation activities which mitigate the adverse effects of climate change.
- National Bank for Agriculture and Rural Development (NABARD) is the National Implementing Entity (NIE).
- The Scheme has been designed to fulfill objectives of National Action Plan on Climate Change (NAPCC) and operationalize State Action Plans on Climate Change (SAPCC).

## 5.7 Wetlands International

- Wetlands International coordinates the International Water bird census of which Asian Water bird census is an integral part.
- It is a global not-for-profit organization dedicated to the conservation and restoration of wetlands.
- It is one of the International Partner Organizations of the Ramsar Convention.
- It was formerly known as International Waterfowl & Wetlands Research Bureau (IWRB) and their scope included the protection of wetland areas.

### Status of wetlands in India

- The National Wetland Atlas, prepared by the ISRO in 2011, found that India has over 2 lakh wetlands, most which aren't notified as such.
- They thus run the risk of being destroyed and many court cases across the country reflect the precarious existence of wetlands.
- The iconic East Kolkata Wetlands, which is also designated 'Ramsar wetland' of international importance, is being steadily eaten up by construction.
- Like in many cities, this wetland too is becoming a sewage canal, and a case has been filed with the National Green Tribunal (NGT).
- In Delhi-NCR, birdwatchers have filed a case to protect the Basai wetland, which is fed by sewage but continues to harbour almost 300 bird species.
- Similar cases were also filed to conserve Najafgarh jheel (a riverine wetland).
- Also, Sukhna Lake in Chandigarh, Deepor Beel in Guwahati, and the lakes in Nainital, are all choked by sewage, garbage and encroachment.
- Notably, the new "Wetland (Conservation and Management) Rules, 2017" has made matters worse as it denounces manmade water bodies as wetlands.
- The previous rules had stated that manmade water bodies like tanks and salt pans are also wetlands (these do support bird populations in reality).

States	Ramsar Wetland Sites
Andhra Pradesh	Kolleru
Assam	Deepor Beel
Gujarat	Nalsarovar Bird Sanctuary
Himachal Pradesh	Pong Dam
	Renuka
	Chandratal
Jammu & Kashmir	Wular
	Tso Moriri
	Hokera
	Mansar & Surinsar
Kerala	Ashtamudi
	Sasthamkotta
	Vembanad kol
Madhya Pradesh	Bhoj
Manipur	Loktak*
Orissa	Chilka
	Bhitarkanika
Punjab	Harike
	Kanjli
	Ropar
Rajasthan	Sambhar
	Keoladeo*
Tamil Nadu	Point Calimere
Tripura	Rudra Sagar
Uttar Pradesh	Upper Ganga
West Bengal	East Kolkatta wetland

\*Montreux Record Sites - Changes in ecological character due to technological developments



## Wetlands Day

- World Wetlands Day is celebrated every year on 2 February.
- It marks the date of the adoption of the Convention on Wetlands on in 1971, in the Iranian city of Ramsar.
- "Wetlands for a Sustainable Urban Future" was chosen as the theme for 2018.
- Wetlands play a vital role for cities and for the whole of humanity.
- They serve as a source of drinking water; they reduce flooding and the vegetation of wetlands filters domestic and industrial waste and improves water quality.

## 6. GOVERNMENT INTERVENTIONS

### 6.1 State of Forest Report (SFR 2017)

*Forest Survey of India recently published its 15<sup>th</sup> State of Forest Report (SFR 2017).*

- The Biennial report is published by Forest Survey of India (FSI), a premier institution under the Ministry of Environment and forest.
- The latest report states that, India posted a marginal 0.21% rise in the area under forest between 2015 and 2017.
- The document says that India has about 7, 08,273 square kilometers of forest, which is 21.53% of the geographic area of the country.
- Andhra Pradesh, Karnataka and Kerala topped the States that posted an increase in forest cover.
- India's northeast showed a decrease in the forest cover.
- Madhya Pradesh has the largest forest cover in the country in terms of area, followed by Arunachal Pradesh and Chhattisgarh.
- In terms of percentage of forest cover with respect to the total geographical area, Lakshadweep has the highest forest cover, followed by Mizoram and Andaman and Nicobar Island.
- The top five States where maximum forest cover has increased are Andhra Pradesh, Karnataka, Kerala, Odisha and Telangana.
- The survey, which has for the first time assessed water bodies, said that during last decade, the area under water bodies is increased by 2647 sq.km.
- The five States where forest cover has decreased most are Mizoram, Nagaland, Arunachal Pradesh, Tripura and Meghalaya.
- The main reasons for the decrease are shifting cultivation, other biotic pressures, rotational felling, diversion of forest lands for developmental activities, submergence of forest cover, agriculture expansion and natural disasters

#### Forest Survey of India

- Forest Survey of India (FSI) is an organisation under the Ministry of Environment & Forests.
- Its principal mandate is to conduct survey and assessment of forest resources in the country.
- The Forest Survey of India organize the training programmes to state sponsored forest personnel.
- FSI releases State of Forest Report biennially based on satellite imageries.
- According to the State of Forest Report, the definition of forest cover includes all lands more than 1 hectare in area with a tree canopy of more than 10 per cent, irrespective of land use, ownership, and legal status.



## 6.2 National Green Tribunal

Government has recently allowed the chairperson of NGT to constitute a single member benches in the tribunal.

- NGT was established in 2010 with its principal bench in Delhi.
- Its objective is to provide an effective and speedy disposal of cases pertaining to environment protection, conservation of forests and for seeking compensation for damages caused to people or property due to violation of environmental laws.
- The NGT has the power to hear all civil cases relating to environmental issues that are linked to the following laws -
  - i. The Water (Prevention and Control of Pollution) Act, 1974;
  - ii. The Forest (Conservation) Act, 1980;
  - iii. The Air (Prevention and Control of Pollution) Act, 1981;
  - iv. The Environment (Protection) Act, 1986;
  - v. The Public Liability Insurance Act, 1991;
  - vi. The Biological Diversity Act, 2002.
- There is a bar on civil court to take cases under these listed laws in Schedule 1 of NGT act.
- The NGT has not been vested with powers to hear any matter relating to the Wildlife (Protection) Act, 1972, the Indian Forest Act, 1927 and various laws enacted by States relating to forests, tree preservation etc.
- The NGT is not bound by the procedure laid down under the Code of Civil Procedure, 1908, but shall be guided by principles of natural justice.
- Current rules require that every Bench of the NGT consist of “two or more” members and made up of at least one judicial and one expert member.
- However, a recent notification from the Union Environment Ministry has relaxed this requirement.
- It has allowed the Chairperson of NGT to constitute single member benches.
- The notification was issued following the SC criticized the union government for not filling up vacancies in the NGT principal and zonal benches

## 6.3 Blue Flag

- The 'Blue Flag' is a certification by the Foundation for Environmental Education (FEE) that a beach, sustainable boating tourism operator, meets its stringent standards.
- Union Environment Ministry has launched a pilot project for beach clean-up and development and is also striving for the 'Blue Flag' certification for such identified beaches.
- Under the project, each state or UT has been asked to nominate a beach which will be funded through the ongoing Integrated Coastal Management Programme.

### FEE

- Foundation for Environmental Education is a non-governmental organization promoting sustainable development through environmental education.
- It was formed in 1981 and is headquartered in Copenhagen, Denmark.
- The Blue Flag was originally a symbol of an environmental awareness initiative in France in 1987.
- It was later adopted as a programme by FEE, followed by other initiatives like adoption of the Eco-Schools and Young Reporters for the Environment (YRE).



## 6.4 CGanga

*CGanga is the new think-tank formed under the aegis of NMCG (National Mission for Clean Ganga).*

- Its stated objective is to make India a world leader in river and water science.
- It is responsible for introducing new technologies, innovations and solutions into India.
- The Centre is headquartered at IIT Kanpur and represents leading science and technological institutes of the country.

## 6.5 Birth Control Project

*The Ministry of Environment and Forests has approved a 10-year research project for birth control methods to bring down the populations of **Asian elephants, Nilgais, wild pigs and rhesus macaques.***

- Dehradun-based Wildlife Institute of India (WII) is the nodal agency for the project.
- This will be the first time that birth control methods using contraceptives/sterilization vaccines are being considered in India on a large scale.
- The project is aimed specifically at these four species as their numbers have gone up resulting in crop damages and increased conflict in human habitations.
- The National Wildlife Action Plan (2017-31) calls for scientific management of wildlife populations and on land-use practices that mitigate human-wildlife conflict situations.
- Under the Wildlife Protection Act 1972 (WPA), when the population of some species becomes unmanageable, states request the Centre to declare them **vermin**, removing protections afforded by the WPA.
- In the past few years, monkeys, nilgais and boars have been declared vermins in some state, allowing state governments to cull them.
- However, such notifications are only valid for limited periods and for specified districts and are not a long term strategy.
- The case of the elephant is different from the other three species since Supreme Court has stayed contraception of elephants and the environment ministry would have to seek a nod from the SC.
- India hosts about 60% of the Asian elephant population, which is classified as **endangered in the IUCN Red list.**

## 6.6 Star-Rating for Garbage Free Cities

*Star Rating initiative for garbage free cities was launched by Swachh Bharat Mission- Urban.*

- It will be rating cities on a **7-star rating system** based on multiple cleanliness indicators for solid waste management and their compliance with the protocol conditions specified for each of the ratings.
- The most significant feature of the rating protocol is that it provides stakeholders with a **single metric** for multiple indicators to rate a city's cleanliness rather than separately evaluating multiple factors which contribute to a city's overall cleanliness and garbage free status.
- The city should be Open Defecation Free before it could be given rating of 3 star or above.
- While cities may self-declare themselves as 1-star, 2-star or 4-star, Mo Housing & Urban Affairs will carry out an additional verification through an independent third party to certify cities as 3-star, 5-star or 7-star.
- This star rating protocol was different from the Swachh Survekshan ranking survey, as the former would allow multiple cities to be awarded the same star rating whereas under Swachh Survekshan, only one city can be "Cleanest city".

## 6.7 More power to States to grant EIA

*Ministry of Environment, Forests and Climate Change issued a draft notification to amend the Environment Impact Assessment Notification (2006).*

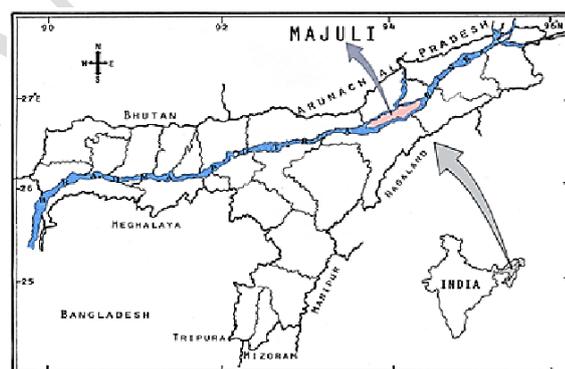
- The latest amendment **increases the ambit of state government authorities** to grant environmental clearances (ECs) to development projects.
- It particularly relates to mining projects involving non-coal minerals and minor minerals, as well as river valley/irrigation projects.

- It puts more mining projects under the ambit of State Environmental Impact Assessment Authorities (SEIAAs) and State Expert Appraisal Committees (SEACs) for clearance.
- **Changes in non-coal mining projects** - It allows the Central government to give EIA to only those non-coal mining projects requiring 100 or more hectares of land lease. Previously the projects size was 50 or more hectares.
- **Changes in Minor minerals projects** - For minor minerals, including sand mining, both for individual and cluster projects which require **25-100 hectares of land** should get **state clearances** and above 100 hectares of land should get central clearances.
- Projects with less than 5 hectares of land remains under the jurisdiction of district EIA authorities.
- **Changes in River valley/irrigation projects** – Projects involving Cultural Command Area (CCA) between 5,000 to 50,000 hectares requires state clearance and above 50,000 hectares requires Central clearances
- Projects involving CCA of less than 5,000 hectares would be classified under ‘**minor irrigation projects**’.

### 6.8 Protection of Majuli Island

*Ministry of Water Resources, River Development and Ganga Rejuvenation has introduced a new scheme for protection of Majuli Island in Assam from flood and erosion of river Brahmaputra.*

- Majuli is a riverine island on the Brahmaputra River in Assam.
- It is formed by the Brahmaputra river in the south and the Kherkutia Xuti, an anabranch of the Brahmaputra, joined by the Subansiri River in the north.
- It is said to be the largest inhabited River Island in the world.
- It was elevated from a subdivision to district in June last year.
- Thus it becomes the 1st island district of the country and considered to be a cultural heritage site in India.
- Majuli District with an area of 1245 sq km, includes main the Majuli Island, a large number of smaller islands and the Brahmaputra River upto its south bank touching Jorhat and Sibsagar Districts.
- Geomorphologically, the entire Majuli island is a part of the alluvial flood plains of the Brahmaputra river.
- It is formed of soil consisting mainly of silt deposits and lacking cohesion, making it susceptible to erosion, which has been a major problem since the huge earthquake of 1950.
- Water resources ministry entrusted **Brahmaputra Board** the task of ‘Protection of Majuli Island from Flood and Erosion’ in 2003, which began in 2004.
- In 2006, the Assam government enacted the Majuli Cultural Landscape Region Act, under which the **Majuli Cultural Landscape Management Authority**, a statutory body, was set up for protection and propagation of its heritage resources.
- The Assam government has been pressing for a UNESCO World Heritage Site tag for Majuli for more than two decades now.



### 6.9 National Clean Air Programme

*Ministry of Environment, Forest and Climate Change has formulated National Clean Air Programme (NCAP).*

- It is a medium term national level strategy to tackle the increasing air pollution problem across the country.



- The overall objective is to ensure a comprehensive management plan for prevention, control and abatement of air pollution.
- The NCAP focuses on collaborative and participatory approach covering all sources of pollution and coordination between relevant Central Ministries, State Governments, local bodies and other stakeholders.
- A separate component on 'Technology Assessment Cell' has been envisaged under NCAP to evaluate the technologies for prevention, control and abatement of air pollution.

#### 6.10 ITEWS

- Indian Tsunami Early Warning System (ITEWS) is established by Indian National Centre for Ocean Information Services (INCOIS), Hyderabad under Ministry of Earth Sciences.
- The ITEWS comprises a real-time network of seismic stations, tsunami buoys and tide gauges to detect tsunami genic earthquakes and to monitor tsunamis.
- It detects globally occurring earthquakes of 5 magnitude and above within 5-10 minutes of the event.
- The system is capable of displaying ticket messages related to tsunami events and triggering of a built-in siren alert system audible for up to 1 km.

#### 6.11 Automated Ocean Pollution Observation System

*Union government has planned to setup an automated ocean pollution observation system.*

- These systems will be installed in coastal areas of West Bengal, Goa, Mumbai, Kochi, Vishakhapatnam and Chennai.
- It will help keep a tab on ocean pollution levels apart and provides insights on how the marine system is changing.
- It is an initiative under National Centre for Ocean Information Services (INCOIS), an autonomous body under the Ministry of Earth Sciences.

#### 6.12 Disaster Resilient Infrastructure

*International Workshop on Disaster Resilient Infrastructure (IWDR) was organised by the National Disaster Management Authority (NDMA) in collaboration with United Nations Office for Disaster Risk Reduction (UNISDR).*

- The workshop brings together development banks, the United Nations, the private sector and academics to identify best practices in the infrastructure sector, as well as key issues in existing practices and ways to address them.
- **UNISDR** was established in 1999 as a dedicated secretariat to facilitate the implementation of the International Strategy for Disaster Reduction (ISDR).
- It is mandated by the UNGA to serve as the focal point in the United Nations system for the coordination of disaster reduction and to ensure synergies among UN system and regional organizations.
- UNISDR has five regional offices – in Asia (Bangkok), Africa (Nairobi), Europe (Brussels), Arab States (Cairo) and Americas and the Caribbean (Panama) and the UNISDR Headquarters in Geneva.
- It is an organisational unit of the UN Secretariat and is led by the UN Special Representative of the Secretary General for Disaster Risk Reduction (SRSG).
- The **Sendai Framework for Disaster Risk Reduction 2015-2030** is the successor instrument to the Hyogo Framework for Action (HFA) 2005-2015: Building the Resilience of Nations and Communities to Disasters.
- The Sendai Framework is the first major agreement of the post-2015 development agenda.



- It is a 15-year (2015-2030), **voluntary, non-binding agreement** which recognizes that the State has the primary role to reduce disaster risk but that responsibility should be shared with other stakeholders including local government, the private sector and other stakeholders.
- It identifies investing in Disaster Risk Reduction (DRR) for resilience and to build back better in reconstruction as priorities for action towards reducing disaster risk.
- **Goal 9 of the Sustainable Development Goals (SDGs)** recognizes disaster resilient infrastructure as a crucial driver of economic growth and development.

### **National Disaster Management Authority**

- GoI enacted the Disaster Management Act, which envisaged the creation of National Disaster Management Authority (NDMA), headed by the **Prime Minister**, and State Disaster Management Authorities (SDMAs) headed by respective Chief Ministers.
- The act envisaged a holistic and integrated approach to Disaster Management in India.
- NDMA, as the apex body, is mandated to
  - i. Lay down policies on disaster management;
  - ii. Approve the National Plan;
  - iii. Approve plans prepared by the Ministries or Departments of the Government of India in accordance with the National Plan;
  - iv. Recommend provision of funds for the purpose of mitigation;
  - v. Lay down broad policies and guidelines for the functioning of the National Institute of Disaster Management.

### **6.13 Himalayan Research Fellowships scheme**

*Union environment ministry has decided to start a 'Himalayan Research Fellowships scheme' to create a young pool of trained environmental managers, ecologists and socio-economists.*

- It will help generate information on physical, biological, managerial and human aspects of Himalayan environment and development.
- The scheme will be executed through various universities and Institutions working in the Indian Himalayan Region (IHR) and preference will be given to the Institutions from north-eastern states.
- The financial support will be provided under the **National Mission on Himalayan Studies (NMHS)**.
- Fellowships will be awarded for a maximum period of three years.
- Areas that are being focused on for research under the NMHS are,
  - i. Water resource management including rejuvenation of springs and catchments,
  - ii. Hydropower development,
  - iii. Assessment and prediction of water-induced hazards,
  - iv. Livelihood options including ecotourism opportunities,
  - v. Biodiversity management including recovery of threatened species and skill development.

### **6.14 Fraternal Ties with Trees**

*Recently the Government of Sikkim released a notification which allows a person to adopt or preserve them in remembrance of a departed relative.*

- It is a unique way of preserving trees by encouraging people to forge a relationship of brotherhood or sisterhood with trees through a **practice locally known as Mith/Mit or Mitini**.



- Through Sikkim Forest Tree (Amity & Reverence) Rules 2017, it allow any person to associate with trees standing on **private land or any public land** by entering into a Mith/Mit or Mitini relationship.
- The adopted tree is called as Smriti tree.
- The rules are in consonance with the age-old tradition of promoting amity between man and nature, particularly trees.
- It also prohibit felling or damage to any tree registered as adopted or smriti and any such violation shall be treated as a **forest offence**.

### 6.15 Zero Budget Natural Farming

*The Andhra Pradesh government has introduced an unique initiative “zero budget natural farming (ZBNF)” to improve farmers’ livelihood in the drought-prone Rayalaseema region.*

- Zero Budget Natural Farming (ZBNF) is a set of farming methods, and also a grassroots peasant movement, which has spread to various states in India.
- It has attained wide success in southern India, especially the southern Indian state of Karnataka where it first evolved.
- ‘Zero budget’ farming promises to end a reliance on loans and drastically cut production costs, ending the debt cycle for desperate farmers.
- The word ‘budget’ refers to credit and expenses, thus the phrase ‘Zero Budget’ means without using any credit, and without spending any money on purchased inputs.
- ‘Natural farming’ means farming with Nature and without chemicals.
- Intercropping is an important feature of ZBNF.

### 6.16 CAMPA Rules

- Compensatory and Afforestation Fund (CAF) Bill envisaged the creation of a permanent Compensatory Afforestation Fund Management and Planning Authority (CAMPA).
- CAMPA authority was envisaged as an independent body that would manage a corpus collected from industries that have used forest land for projects.
- These funds are meant to be used by states to implement agro-forestry in non-forest land to compensate for felled forest.
- In spite of Parliament signing CAMPA into law last year, it is yet to come into existence.
- It is because the “rules” governing the management of the fund weren’t finalised and several meetings had been held among states to fix these rules.
- Point of conflict between environment and finance ministry lies in “power to disburse the funds”.
- Environment ministry says that the power should be with the CAMPA, however the finance ministry says it should be routed through the Consolidated Fund of India (CFI).
- Currently funds collected under CAMPA directly go into the Public Account and from thereon to the states.
- Currently, states are able to access CAMPA funds through an “ad hoc” mechanism whereby the Centre disburses it on a needs-basis.
- The Supreme Court, in a 2009 order, had directed that an independent authority be charged with disbursing these funds, which paved the way for the Compensatory and Afforestation Fund (CAF) Bill.

### 6.17 Green Good Deeds Campaign

*The campaign is launched by the Union Ministry of Environment, Forest and climate change.*

- Its aim is to sensitize the people and students, in particular, about climate change and global warming.
- The Union minister for Environment and forest emphasized the crucial role of ‘Green Sainiks’ in the Green Good Deeds Campaign.
- The plan is to broad-base it with the involvement of teachers, students and other voluntary organizations.

### 6.18 Government's decision on Aarey forest lands

*Maharashtra government is firm in ceding the Aarey forest land for metro projects. This has aggravated distress among civil society as the forest area falls under eco sensitive zone.*

- **Aarey forest** is considered to be Mumbai's green lung which spreads over 1,300 hectare in the city's northern suburb.
- It is home to several species of birds, insects and leopards, and was once part of the adjoining Sanjay Gandhi National Park.
- This forest was once used to be over 3,000 acres in north Mumbai and has been reduced to around 1,300 acres.
- In 1949, 3,160 acres of land was handed over to Aarey Milk Colony, an autonomous body, and was declared a No-Development Zone.
- That changed in 2014, when the State government converted it into a Development Zone.
- Recently the Maharashtra government has decided to provide 3% (which will around 21 sq. kms) of this ecologically sensitive zone for a Metro car shed.
- There are also concerns related to tribals who stay in Aarey and their rehabilitation.



### 6.19 Pelican Festival

- The Andhra Pradesh government held its first Pelican Festival at the Atapaka Bird Sanctuary on Kolleru on the borders of Krishna and West Godavari districts.
- The sanctuary has been identified as the largest spot-billed pelican home in the world.
- Kolleru is one of the largest freshwater lakes in the country.
- Over 5,000 pelican birds from various countries reach Kolleru lake every year during winter by travelling over 3500 km.

### 6.20 New Technology for Namami Gange

*A new technology by the Water Technology Centre (WTC) of the Indian Agricultural Research Institute needs consideration for treating wastewater under Namami Gange project.*

- **New WTC technology** - It is a novel biological water purification technique that uses plants and micro-organisms to sequester impurities and decontaminate wastewater.
- The perennial plant used in this system is *Typha latifolia* which naturally absorbs pollutants.
- The plant boosts oxygen content of the watery medium around its roots to cleanse the dirty water.
- Besides, it also encourages proliferation of water decontaminating micro-organisms.
- And thus averts the need for using chemicals and aerators to improve water quality as is usually done in the conventional methods.

#### Advantages

- **Effective** - The system requires no chemicals, no energy, no skilled manpower and no inputs, barring seeding the plants.
- It removes even the metallic residues to the extent of 80 to 99%, something that the conventional methods are unable to do.



- **Economic** - The cost of refining the untreated sewage released into the Ganga would come down roughly by 8 times as against the conventional methods.
- It also generates revenue to make sewage treatment a profitable activity.
- The economic returns from the treatment plants can be enhanced further by incorporating fisheries into these ventures.
- Notably, planktons and zooplanktons, which serve as nutritious feed for fish, thrive well in the water ponds of these units.
- The fish output of such integrated sewage treatment enterprises is relatively high and of good quality, being free of toxic residues.
- Also, these units can be transformed into environment-friendly eco-parks, boosting tourism by attracting migratory birds.
- **Biomass** - Instead of producing sludge, the Typha-based treatment units produce biomass.
- This can further be converted into good quality particle boards or energy briquettes and pellets for use as clean fuel.
- The upper parts of Typha can be cut every 4 months or so for this purpose and the plant regenerates again.
- **Land** - The land requirement for setting up the WTC treatment units is comparatively far meagre than conventional plants.
- **Odour** - Unlike the normal sewage treatment plants, the WTC treatment units do not emit any unpleasant odour.
- This is because the decontamination process occurs under the soil surface without the use of chemicals which generate smelly gases.

## 7. PROTECTED AREAS

### 7.1 Keoladeo National Park

- It is Located in Bharatpur district, the eastern part of Rajasthan.
- The park is spread over nearly 30 sq.km which comprises many artificial and seasonal lagoons.
- Keoladeo attracts several migratory birds that make the region their breeding and wintering grounds.
- It is an UNESCO World Heritage and also a Ramsar site.
- The Siberian crane is one of the rare species that was spotted here till about the turn of the century.
- It habitat for nearly 365 species of birds, including raptors and waterfowls.
- Animal such as Jackals, Sambar, Nilgai, wild cats, hyenas, wild boar, porcupine and mongoose can be found in the region.

### 7.2 No Development Zone

- The River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016 provides that the bank of River Ganga, its tributaries or the active flood area of them shall be construction free zone.
- It also prohibits construction of any structure for residential or commercial or industrial or any other purposes.
- The National Green Tribunal has directed to identify and demarcate the flood plains of river Ganga from Haridwar to Unnao.
- Once the demarcation of flood plain is completed, 100 metres from the edge of the river would be designated as no development/construction zone.



- Further, Ministry of Environment Forests & Climate Change also circulated draft notification on “River Conservation Zones” in 2015 to all States.
- Ministry of Water Resources, River Development & Ganga Rejuvenation has taken up the matter with all the states. Only Uttarakhand, Rajasthan and Manipur have enacted the Legislation.

### 7.3 Nayachar Islands

- Nayachar is a newly emerged island with mangrove ecosystem in the middle estuary of the Hooghly River in West Bengal.
- This land mass was created in the Indian Sunderbans by river silt deposits, and remained largely submerged, rising occasionally above the water level.
- Till 1990 it was completely barren, with hardly any plant or animal species, at present there are 151 animal species on the island, making it a rare case in ecology.
- The natural succession of species on the island has been aided by the inundation of water during tides, and the soil brought from other places by fishermen.

### 7.4 Tiger Census

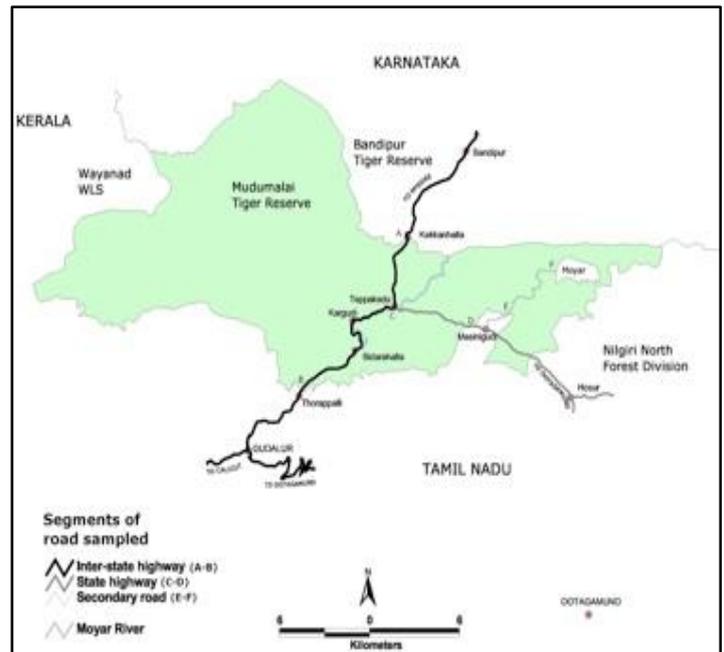
- India’s tiger census has been commissioned by the union environment ministry’s National Tiger Conservation Authority (NTCA).
- The census will see coordination with Bhutan, Nepal and Bangladesh in estimating the territorial spread of the animal in the subcontinent.
- The Wildlife Institute of India, a Union Environment Ministry-funded body, has been tasked with coordinating the tiger estimation exercise.
- Along with tigers, the survey also collects information on the prey population of deer and other animals.
- The techniques used to estimate tiger population are Pugmark Technique, camera trapping and DNA fingerprinting
- Between the borders of India and Nepal there are contiguous national parks such as –
  - i. Parsa National park and Chitwan National Park in Nepal are connected with Balmiki National Park
  - ii. Katarniaghat National Park in India is adjoined to Bardiya National Park
  - iii. Dudwa National Park (India) is connected to Shuklaphant National Park in Nepal.

### NTCA

- The National Tiger Conservation Authority is a statutory body under the Ministry of Environment, Forests and Climate Change.
- It was constituted under enabling provisions of the Wildlife (Protection) Act, 1972.
- The objectives of the NTCA are
  - i. Providing statutory authority to Project Tiger so that compliance of its directives becomes legal
  - ii. Fostering accountability of Center-State in management of Tiger Reserves
  - iii. Providing for an oversight by Parliament
  - iv. Addressing livelihood interests of local people in areas surrounding Tiger Reserves
- The main function of NTCA is to approve, co-ordinate, research and monitor tiger, co-predators, prey habitat, related ecological and socio-economic parameters and their evaluation.
- NTCA gave a statutory backing to Project Tiger.

### 7.5 Mudumalai Tiger Reserve

- Mudumalai Tiger Reserve (MTR) is situated at the tri-junction of Tamil Nadu, Karnataka and Kerala.
- The reserve straddles the Ooty -Mysore interstate national highway.
- It is contiguous with Wyanaad Wildlife Sanctuary on the west, Bandipur Tiger Reserve on the north.
- The Moyar river flows downstream into the Mudumalai Tiger Reserve and is the natural line of division between Mudumalai and Bandipur Sanctuary.
- The MTR also forms part of the Nilgiri Biosphere Reserve
- The Reserve has tall grasses, commonly referred to as “Elephant Grass”, Bamboos of the giant variety, valuable timber species like Teak, Rosewood.
- Fauna found in the region are Tiger, Elephant, Indian Gaur, Panther, Barking Deer, Malabar Giant Squirrel and Hyena etc.,
- Sathayamangalam, Kalakkad Mudunthurai and Anamalai are the other tiger reserves in the state of Tamil Nadu.



### 7.6 Nagarjunasagar-Srisailam Tiger Reserve

- The reserve is situated in the Nallamalais - an offshoot of Southern Eastern Ghats of Andhra Pradesh.
- River Krishna forms northern most boundary of the Tiger Reserve.
- The nomadic, shy, food gathering and hunting primitive tribe "Chenchus" of these hill ranges live in groups called gudems amidst forests of this sanctuary.
- The reserve primarily comprises of southern tropical dry mixed deciduous forest.
- The Nagarjuna sagar- Srisailam wildlife Sanctuary attained the Project Tiger status in 1983, then in 1992, it was renamed as Rajiv Gandhi Wildlife Sanctuary.
- Post bifurcation of the state, the northern part of the reserve in Telangana state which is called Amrabad Tiger reserve

### 7.7 Sunderbans Mangrove forest

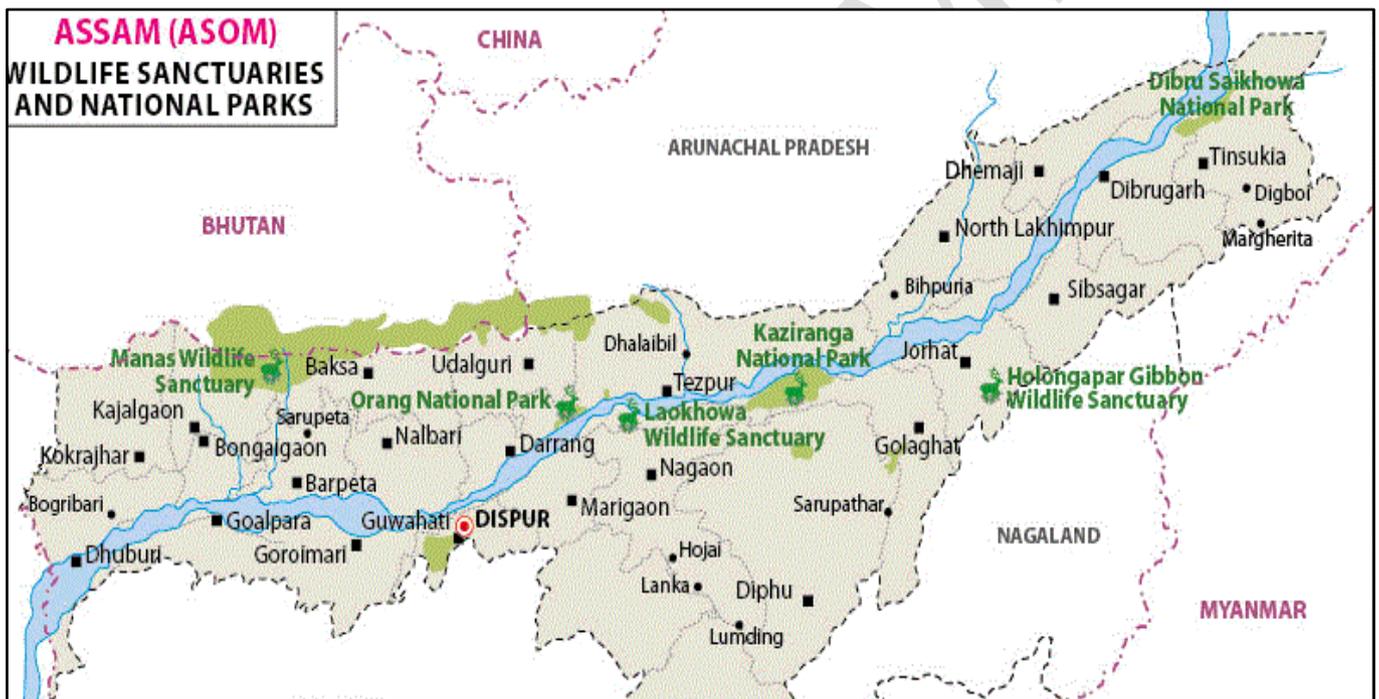
*'State of Art Report on Biodiversity in Indian Sundarbans' published by World Wide Fund for Nature, India, outlines the threats facing the ecosystem.*

- Unique mangrove ecosystem that hosts a sizeable tiger population is unable to expand due to developmental pressures and sea level rise.
- The Indian Sunderbans that comprise almost 43% of total mangrove cover.
- The threats are climate change, habitat degradation due to industrial pollution and human disturbance, fuel-wood collection.
- If the present rate of change prevails, the Sunderbans may disappear due to sea level rise.
- Its natural response to retreat further inland is blocked by geographical features and man-made obstructions.
- The population density of the Indian Sunderbans outside the Tiger Reserve area is 1,000 people per sq km.

- Rehabilitation of former mangrove areas and creation of new mangrove habitations through intensified afforestation program are the only way out.

### 7.8 Assam- Wildlife Protection

- In a major initiative for wildlife protection, the forest guards in Assam were given modern weapons to check poaching of rhinos, tigers and other wild animals.
- Also for the first time wildlife fast-track courts have been set up to exclusively deal with poaching and wildlife crimes.
- Assam has five national parks and 19 wildlife sanctuaries and is home to 91% of Indian rhinos.
- The five national parks in Assam are
  1. Kaziranga
  2. Manasa
  3. Nameri
  4. Rajiv Gandhi Orang
  5. Dibru Saikhowa



- Manas and Dibru saikhowa are the Biosphere reserve in the state.

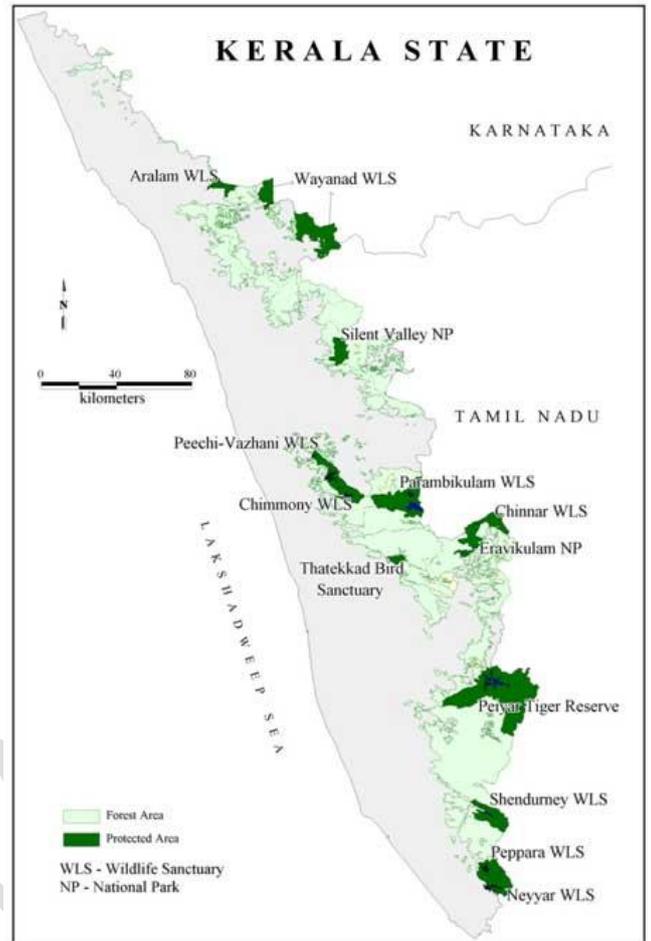
### 7.9 Eravikulam National Park

- Eravikulam National Park is located in the Kannan Devan Hills of the Southern Western Ghats in the Idukki District, Kerala State.
- In the local language, Eravikulam denotes streams and pools.
- The highest peak in peninsular India, Anamudi (2695 m), is situated in this park.
- Three major types of plant communities found in the park are: Grasslands, Shrub Land and Shola Forests.
- Neelakurunji, a plant endemic to the Western Ghats, blooms once every 12 years is found in this national park.

- It also is home to and the sanctuary of the Nilgiri tahr, an endangered goat species.
- The catchment area of three important rivers, Periyar, Chalakudy and Pambar is located in this area.
- The Muthuvans are the indigenous people, who have traditionally been associated with the management of the park.

#### 7.10 Tungabhadra Otter conservation reserve

- Karnataka declared first otter conservation reserve, 34 km along the Tungabhadra, in 2016.
- The Otter reserve stretches from from Mudlapura village to Kampli in Ballari district.
- The reserve also passes through Hampi, a UNESCO heritage site.
- The reserve houses a good number of smooth-clawed otter, Eurasian and smooth-coated otters, mahseer fish, fresh water crocodiles and giant soft shelled turtles.
- Smooth-coated otter is distributed throughout the country from the Himalayas and to the south in India.
- According to the International Union for Conservation of Nature (IUCN) Red List of Threatened Species, Smooth-coated species is vulnerable.
- The highest protection under Schedule 1 (small-clawed otter) and Schedule 2 (smooth-coated otter) of the Wildlife Protection Act, 1972 is provided for the otters.



#### 7.11 Ghodazari Wildlife Sanctuary

- The Maharashtra government has approved Ghodazari in Chandrapur district as a new wildlife sanctuary.
- The decision was taken by the Maharashtra State Board for Wildlife.
- The sanctuary is in the North East of Tadoba Tiger Reserve and will include 159 sq km of Brahmapuri forest.
- Ghodazari influences distribution of tiger occupancy in the Tadoba & Navegaon-Nagzira Tiger Reserve landscape.
- According to Wildlife protection act, the state government has the power to declare an area as Wildlife Sanctuary and as a National Park.
- It is done through notification and so no legislation is needed.
- At the same time, no alteration of the boundaries of a Wildlife Sanctuary/National Park shall be made except on a resolution passed by the Legislation of the State.

#### 7.12 Rhodendron Park

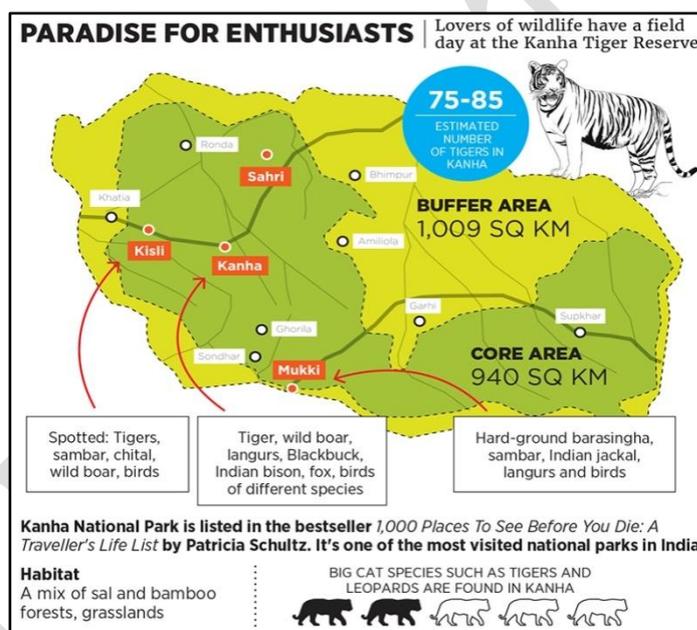
- Arunachal Pradesh government recently laid the foundation stone of a Rhodendron Park in Tawang district.
- Rhododendron, literally rose tree in Greek is a large genus of flowering plants.
- Found in varied habitats from subtropical forest to alpine shrubs, rhododendrons range from dwarf shrubs to large trees.
- North-Eastern States are home to 97% of the Rhododendron species and sub-species in the country.

- The cold, moist slopes and deep valleys of the eastern Himalayas form a conducive habitat for their growth.
- Arunachal Pradesh is home to the highest number with 119 taxa (74 species, 21 sub species and 24 varieties) of the Rhododendron.
- Indiscriminate felling and loss of habitat had made them vulnerable to extinction.
- The park would be partly funded under border area development programme (BADP).

### 7.13 Human Animal Conflict - Highway Tiger killings

*Bajirao, one of India's breeding tigers from the Bor reserve, was killed in a highway hit and run accident recently.*

- Bor Tiger Reserve is a wildlife sanctuary located in Wardha District of Maharashtra.
- Bor Tiger Reserve is one among the 'Satellite core area', which gives special focus on tiger protection.
- This incident highlights the absence of scientific advice to keep highways out of wildlife corridors.
- Recent study in **Kanha-Pench tiger reserve corridor** in Maharashtra also found that a national highway could block flow of genes between regions.
- **Possible measures** - The Centre and the National Highways Authority of India have been repeatedly advised to realign or modify sensitive roads.
- The National Tiger Conservation Authority should insist on modification of existing roads to provide under tunnel crossings for animals.
- Users can be asked to pay a small price for the protection of vital environmental features.
- This would ensure that tigers and other animals are not isolated, and can disperse strong genetic traits to other populations.
- Curbs could be imposed on traffic on existing roads passing through sanctuaries.
- There could also be speed restraints and limitations like allowing only escorted convoys, with a ban on private vehicular movement at night



## 8. SPECIES IN NEWS

### 8.1 White Spotted Bush Frog

- It is found only in the Western Ghats' Agastya Hills in Kerala and Tamil Nadu.
- It was rediscovered in 2011 after 125 years.
- It belongs to the category of tree frogs and breeds inside hollow bamboo stems.
- It is categorized as "Critically Endangered" in IUCN Red list.
- Male frogs watch over their eggs to guard them from cannibalizing by other male frogs.
- This is the first known instance of cannibalism among tree frogs of the Rhacophoridae family.

### 8.2 List of Invasive Animal Species

- Zoological survey of India has recently compiled the list of invasive animal species.
- These are species which pose a threat to the native biodiversity and human well-being.

- **Papaya Mealy Bug** - It belongs to Mexico and Central America.
- It is believed to have destroyed huge crops of papaya in Assam, West Bengal and Tamil Nadu.
- **Cotton Mealybug** - It is a native of North America but has severely affected cotton crops in the Deccan.
- **Amazon Sailfin catfish** – It is destroying fish populations in the wetlands of Kolkata.
- **African Apple Snail** – It is said to be most invasive among all alien fauna.
- It is a mollusk and was first reported in the Andaman and Nicobar Islands but today it is found all across the country.
- **Orange Cup-Coral** – It originated in the Indo-East Pacific.
- It has been reported in the Andaman and Nicobar Islands, the Gulf of Kutch, Kerala and Lakshadweep.

### Zoological Survey of India

- ZSI, a subordinate organization of the Ministry of Environment and Forests was established in 1916, headquartered at Kolkata.
- Its primary objective is Exploration, Survey, Inventorying and Monitoring of faunal diversity in various States, Ecosystems and Protected areas of India.
- It undertakes Environmental Impact Assessment (EIA) with special reference to ecology and wildlife and development of ENVIS and CITES Centers.
- It involves in the preparation of Red Data Book, Fauna of India and Fauna of States.

### 8.3 Wakaleo Schouteni

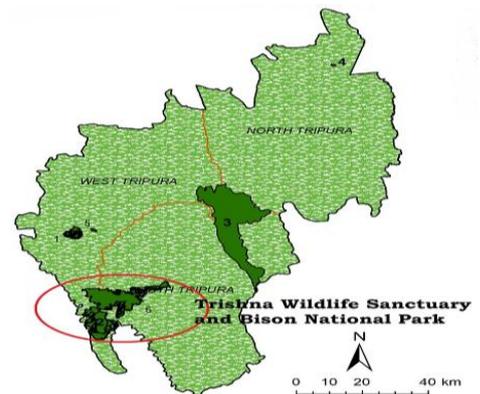
- It is a **new species of marsupial lion** discovered in Australia which has been extinct for at least 19 million years.
- It was a meat eating predator existing in the late Oligocene to early Miocene era (some 18 to 26 million years ago).
- It is named in honour of palaeo-artist Peter Schouten.
- With this new finding, it is believed that two different species of marsupial lions were present in Oligocene era.

### 8.4 Mass Extinction Survivor

- The fossil of an aquatic reptile – sauropterygian which survived the mass extinction has been found recently.
- The Triassic – Jurassic mass extinction has destroyed all aquatic species except this reptile clade.
- It is believed to have lived safe in the depths of the sea which enables it to survive.

### 8.5 Schaller's Wood Scorpion

- It is a new species recently identified from **Tripura**.
- They are found in low elevations in parts of Tripura, including **Trishna Wildlife Sanctuary** and Bison National Park.
- It is the 11<sup>th</sup> wood scorpion species from India.
- India is home to more than 125 species of scorpions. Nine of India's 11 wood scorpions are endemic to the country.
- Wood scorpions are also called dwarf scorpions as they are only about 3 cm long and live in small burrows on the ground, making them very difficult to spot.
- Scorpions belong to the class Arachnida (having 8 legs) and phylum Arthropoda (jointed legs).





- Trishna Wildlife Sanctuary and Bison National Park is well known for Indian Bison locally known as Gaur.
- It also supports of viable population of Holook Gibbon, Spectacled Langurs, slow loris, Pig Tailed Macaque.

### 8.6 Narcondam Hornbill

- The Narcondam hornbill (*Rhyticeros narcondami*) is a small, distinctive, dark hornbill, measuring 45 to 50 cm in length.
- They are monogamous, non-migratory resident birds showing sexual dimorphic.
- This species is endemic to the tiny (6.8 sq.kilometers) dormant volcanic island of Narcondam, forming part of the Andaman Islands, India.
- It is resident in fairly open mixed forest, which covers most of the island, from sea-level to the peak
- This hornbill is listed as “**Endangered**” in IUCN red list and CITES Appendix II.
- It is protected under the Wildlife Protection Act and Narcondam Island is a wildlife sanctuary, near Myanmar’s Coco Island.
- The Important Bird and Biodiversity Area (IBA) of these hornbill species in India is the Narcondam Island Wildlife Sanctuary.
- Its population appears to be stable despite some degree of hunting and habitat degradation.

### 8.7 Kapra Lake and Water Hyacinth

- Kapra Lake is located in north east part of Greater Hyderabad.
- The lake is polluted, choked by water hyacinth and acts as a breeding ground for mosquitoes.
- Water hyacinth is a free-floating perennial plant, native to South America.
- It can grow to a height of 3 feet with dark green leaves with flowers above the water and heavily branched, dark fibrous root system underneath.
- It is a very aggressive invader forming thick mats which can cause oxygen depletion in the waterbodies and kills the aquatic plants and fish.
- Submerged portion provide habitats for many micro and macro invertebrates.
- After aquatic plants die, their decomposition by bacteria and fungi provides food for many aquatic invertebrates.
- It has no known direct food value to wildlife and is considered a pest species.

### 8.8 Up gradation in IUCN list

*IUCN has recently upgraded the status of two kiwi birds from “Endangered” to “Vulnerable”.*

- The two species are the northern brown kiwi and the rowi kiwi.
- They are flightless birds found in New Zealand.
- The conservation of these species was taken care by the New Zealand government for the past 25 years under “Kiwi Recovery Plan”.
- It mainly involved predator (dogs, feral cats) control which is the biggest threat for the survival of kiwis.
- The plan also has community engagement and operation Nest Egg to improve the juvenile survival rates.
- Kiwis lay the largest egg in relation to their body size of any bird species.
- The upgrade in the status came after the steady increase in its population.

### 8.9 Cheetahs up listed for Endangered

- Populations of cheetahs in southern Africa have declined as farming and other human activities push deeper into the Cheetah range.
- This new assessment is 11 per cent lower than the IUCN's most recent population estimate in 2015.
- International team of scientists has called for up listing the cats' conservation status from "vulnerable" to "endangered" on the International Union for Conservation of Nature (IUCN) Red List.

### 8.10 Ant Species in Andaman

- Scientists have discovered the new species *Tetramorium krishnani* and *Tetramorium jarawa* in Havelock Island, a part of the Andaman archipelago.
- The ant species are endemic to the Andaman Islands.
- They dwell in leaf litter in the evergreen forests of the Island.
- The species are named in honour of late scientist K.S. Krishnan, and after the Jarawas, an indigenous people of the islands, who are inhabited the islands.



### 8.11 Night Frogs

- Frogs belongs to the genus *Nyctibatrachus* are commonly known as night frogs.
- They are found only in the Western Ghats mountain range.
- Scientists have recently discovered new night frog "Mewasinghi", belonging to *Nyctibatrachus* from Malabar Wildlife Sanctuary, Kozhikode.
- It is found in a small stream running along the Peruvannamuzhi dam.
- It is closely relative to Athirappilly night frog (found south of the Palakkad Gap in Thrissur and Idukki) and the Kempholey night frog (found in the northern Western Ghats of Kerala and Karnataka).



### 8.12 New Ginger Species

- Scientists have discovered two new species of Ginger in Manipur and Nagaland.
- They were found in easternmost districts bordering Myanmar.
- Both the plants are from the family of Zingiberaceae, to which the commonly found Ginger (*Zingiber officinale*) belongs.
- The species discovered in Nagaland, is an epiphytic plant and grows on tall trees.
- The species from Manipur was found growing in rock crevices, boulders and humus rich soil in the Shirui Hills.

### 8.13 Humpback Whale

- The humpback whale is one of the four species of baleen whales occurring in Indian waters.
- Characteristic baleen plates and paired blowholes help distinguish baleen whales from toothed whales.
- These whales strain huge volumes of ocean water through their baleen plates to capture food
- Humpback Whales migrate annually from the summer feeding grounds near the poles to warmer winter breeding waters closer to the Equator.

- They are found near coastlines, feeding on tiny shrimp-like krill, plankton, and small fish.
- The Arabian Sea humpback whales are the only sedentary whales in the world, feeding and breeding in the same area.
- Researchers from Environment Society of Oman have tagged a female humpback whale named as “Luban” to track its movement via satellite.
- It started its journey from Oman, heading towards east and reached off the coast of Goa after two months.
- Even though the IUCN Red List categorises humpback whale as of ‘least concern’, it recognised the distinct Arabian Sea population as ‘endangered’ in 2008.

#### 8.14 Chiru Goat

- Chiru goat is also known as the Tibetean antelope.
- It is native of China (Tibet, Xinjiang region) and India (North Eastern Ladakh region) and regionally extinct in Nepal.
- Its numbers and distribution have decreased sharply as a result of commercial hunting for the underfur for making of shawls.
- In India, it is killed for making of the famous Shahtoosh shawls, which is renowned for its quality from Srinagar.
- In 2017, it has been included in “Near Threatened” category by IUCN.
- The parliamentary standing committee on science & technology, environment & forests had recommended to the ministry of environment, to conserve and breed the Chiru goat, which can then be given to the shawl makers.
- The motive behind such recommendation is to provide a sustainable livelihood opportunity to the people of Jammu and Kashmir.
- However, Ministry of Environment has ruled out the possibility of conservation breeding citing that it may lead to decline in its population due to commercial poaching.

#### 8.15 Nilgiri Marten

- It is a vulnerable and little known carnivorous animal which is endemic to the Western Ghats.
- Nilgiri Marten looks like a civet or a mongoose and it most prefers higher altitudes.
- The present global population of the Nilgiri Marten is estimated below 1000.
- The animal is placed in schedule 2 of the part 2 of the Indian Wildlife (Protection) Act 1972.
- Recent studies shows that Nilgiri marten is thriving in the Pampadum Shola National Park located on the southern portion of Western Ghats.



#### Shola forests

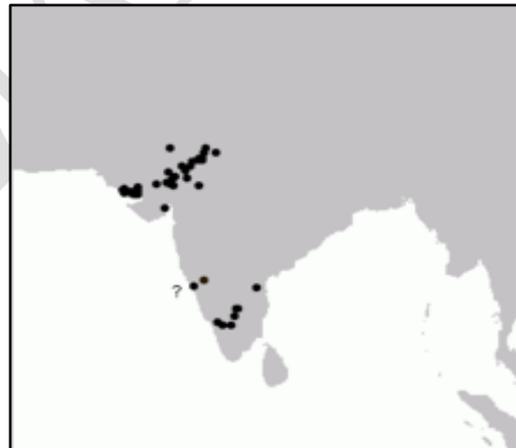
- 'Sholas' are patches of evergreen tropical and subtropical moist broadleaf forests.
- It is found in Southern India, particularly in the regions of Nilgiri, Palani Hills and Annamalai Hills.
- The Western Ghats and associated ranges in the states of Karnataka, Kerala and Tamil Nadu.
- The main varieties of Trees in this type of forest are Zenker, bishop wood, Indian mahogany, gular fig tree etc

### 8.16 New Moth Species in Arunachal Pradesh

- Researchers have discovered a new species of moth from the Talle Wildlife Sanctuary near ziro valley in Arunachal Pradesh.
- The new species, scientifically named *Elcysma Ziroensis*, be commonly called Apatani Glory, named after a local tribe called Apatani.
- This species has only been seen during autumn, notably in the month of September.
- It is a **univoltine species**, meaning it has only one brood of offspring in a year.
- Brood is the young of certain animals, especially a group of young birds or fowl hatched at one time by the same mother
- **Multivoltine species** are often short lived insects such as mosquitoes, which has multiple broods of offspring annually.

### 8.17 White -Naped Tit Bird

- White-naped tit was the centre of attention at the 21st Indian Birding Fair, Jaipur.
- White-Naped is a robust, strongly patterned, mainly black-and-white coloured bird with yellow in the flanks and sides of the breast
- The white-naped tit (*Machlolophus nuchalis*) is endemic to India where it is found in dry thorn scrub forest in two disjunct populations, in western India and southern India.



- International Union For conservation of nature (IUCN) classifies the bird as vulnerable.
- The Bird is considered vulnerable to extinction because of the scarcity of suitable habitats.

### 8.18 Red Sanders

- *Pterocarpus santalinus* (Red sanders) is a species of *Pterocarpus* with a common name red sandalwood, and saunders wood.
- It occurs in the Southern Tropical Dry Deciduous Forests.
- It is generally found at altitudes of 150 - 900 m.
- It prefers lateritic and gravelly soil and cannot tolerate water logging.
- It is endemic to the southern Eastern Ghats mountain range of South India.
- It is listed in the category of “Endangered” by the IUCN because of overexploitation for its timber in South India.
- It is also listed in the appendix II of the CITES.



- This tree is valued for the rich red color of its wood and it is highly in demand in China.
- The wood is not aromatic and it is not to be confused with the aromatic Santalum sandalwood trees that grow natively in South India.
- Red Sanders is said to be used in the making of oriental musical instruments like Shamisen, Koto and Erhu.

### 8.19 The birds and the coffee beans

- In India, coffee acreage has increased by 150% between 1990 and 2015.
- Though Arabica variety of coffee is more flavorful, the planters prefer the Robusta variety which is less resource intensive.
- Arabica is generally grown in shaded, low-intensity areas, while full sun monocultures are common for Robusta cultivation
- To test the differential impact of Robusta and Arabica coffee cultivation on the local ecology, researchers carried out a survey of bird species in the plantation areas.
- The survey points out that Robusta farms generally had the same abundances of bird species as Arabica farms.
- The reason behind it was the dense canopy, landscape-level forest cover and less use of pesticide.
- Arabica plantations were more avian species-rich, bird communities in the Robusta agro forests included many fruit-eating species.
- The survey results suggest that coffee cultivation in the Western Ghats has not been inimical to the ecosystem or the endemic avian population.

### 8.20 New Eel Species

- Eels are elongated fish, mostly predators belonging to the order Anguilliformes.
- They are found mostly at the bottom of rivers and seas.
- Across the world about 1,000 species of eels have been identified. In India, the number is around 125.
- Scientists have recently discovered three new species of eel along the northern Bay of Bengal coast.
- Gymnothorax pseudotile discovered at the Digha coast (West Bengal) of the Bay of Bengal.
- The other two species, Gymnothorax visakhaensis and Enchelycore propinqua, were discovered from the Visakhapatnam coast of the Bay of Bengal.

### 8.21 Shell Fish Reef

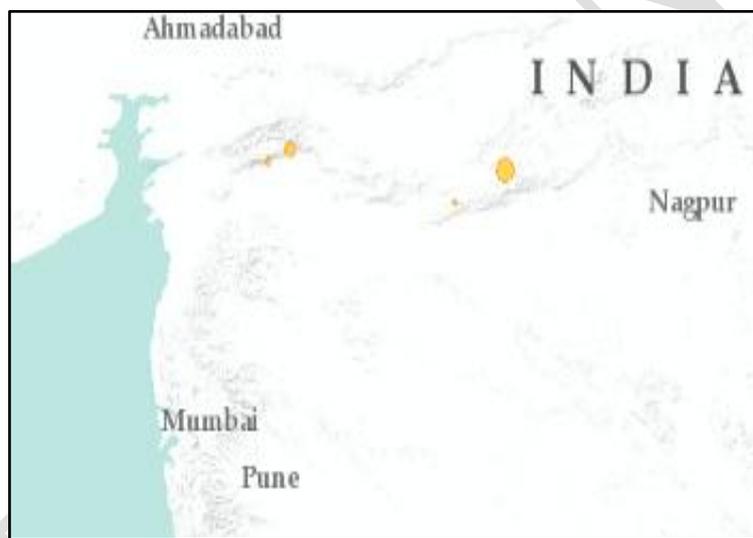
- Virtually all of Australia's shellfish reefs have disappeared, making them the country's most threatened ocean ecosystem.
- Shellfish reefs are made up of oysters and mussels.
- They accrete dead shell material such that the reef grows in size and mass over time.
- Just like coral reefs, they support the growth of important fish species whilst also helping to improve water quality and increase biodiversity.
- The shellfish reef plays a crucial role in water filtration, increased local fish production, bank stabilization and sustaining biodiversity.
- Shellfish reefs have declined by up 99% since British colonization.



- The reason behind the decline are
  - a. Early destruction of lime for mortar used in the construction of roads,
  - b. Overharvesting of shellfish for food and oysters,
  - c. Destructive fishing practices,
  - d. Introduction of non-native shellfish and
  - e. Habitat loss from coastal development.

### 8.22 Forest owllet

- The century old debate on forest owllet's genetic relationship with spotted owllet is resolved.
- The bird belongs to the same genus as spotted owllet (Athene).



- The *Heteroglaux blewetti* is endangered under IUCN classification.
- Also the bird is endemic to the central Indian forests.
- It is sedentary resident with recent sightings from fairly open dry deciduous forest dominated by teak.
- The species faces a number of threats such as forest loss and degradation as a result of illegal logging and human encroachment, forest fires and minor irrigation dams.
- The bird is included under CITES Appendix 1.

### 8.23 Rare Fish Species from Australia

- Scientists hauled up thousands of fish in an attempt to examine life at abyssal depths along Australia's vast coastline.
- Life at such depths is one of crushing pressures, no light, little food and freezing temperatures, with animals that call it home evolving unique ways to survive.
- As food is scarce, they are usually small and move slowly and others are jelly-like and spend their lives floating about.
- Some species have ferocious spines and fangs and lie in wait until food comes to them.
- Over 42,000 fish and invertebrates were caught, some of which are potentially new species.
- Scientists gathering in the Tasmanian capital Hobart to examine them which is a first in its nature.
- It is the first systematic attempt to examine life at abyssal zone depths anywhere along Australia's vast coastline.

### 8.24 Echindas

- Echidnas, also called spiny anteaters, are mammals
- Echidnas are one of the world's oldest surviving mammals.
- They are egg-laying mammals.
- It is listed as 'least concern' in IUCN classification.
- However, the short-beaked echidna found only in Australia and Papua Guinea is threatened.
- The main threats are land clearing and habitat loss ,traffic, feral cats and potentially the rapidly changing climate.



### 8.25 Antarctic Krill

- The krill population in the Antarctic is under threat, due to a combination of factors including industrial-scale fishing and climate change.
- Antarctic krill are one of the most abundant and successful animal species on Earth.
- The loss of krill could endanger the entire Antarctic ecosystems, with predators, especially penguins, in potential danger.
- Krill are essential feed for whales, penguins and seals.
- Modern trawlers that suck in large quantities of water at a time are a primary cause of their demise.
- Krill oil is a scientifically proven to be a super source of omega-3 fatty acids.
- Krill numbers have declined by as much as 80% since the 1970s.



### 8.26 New Plant species – West Bengal

- Scientists from the Botanical Survey of India have identified a new plant species from Buxa and Jaldapara National Parks in West Bengal.
- The plant is named after former President Abdul Kalam as *Drypetes kalamii*.
- It is a small shrub adding to the rich floral wealth of India.
- The newly described plant is unisexual in nature, which means they have separate male and female plants.
- The new species is found in wet, shaded areas of subtropical moist semi-evergreen forests, at a height ranging 50-100 meters.
- Being exclusive to these two parks, the plant is classified as critically endangered.



### 8.27 Ring tailed Lemurs (*Lemur catta*)

- Lemurs are primates found only on the African island of Madagascar and some tiny neighboring islands.
- Ring-tailed lemurs have powerful scent glands and use their unique odor as a communication tool and even as a kind of weapon.
- It is under the endangered category in the IUCN red list.
- It is listed on Appendix I of CITES.
- Ring tailed lemurs is hunted for food and frequently kept as a pet



### 8.28 Saving Great Indian Bustards

- A group of farmers at the Lala Sanctuary, also called Kutch Bustard Sanctuary, have decided not to use inorganic fertilizers and toxic pesticides so as to save the Great Indian Bustard (GIB), locally known as Ghorad.
- GIB is critically endangered and these birds feed on insects.
- When farmers use pesticides, GIB loses a major portion of its food — insects, locust, lizard among others — and the bird is forced to look for smaller insects in the grains, resulting in damage to the crops.



### 8.29 Asian Waterbird census

*Asian Waterbird Census (AWC) that surveys sites across 23 countries (including Australia) was recently conducted.*

- Asian Waterbird census is part of International Waterbird census of **Wetlands International**, South Asia.
- The trends highlight the dangers facing water birds and their habitats.
- India has the biggest species diversity among the regions sampled by AWC, tallying to a mean figure of 1.8 million water birds over 300 sites.
- Chilika Lake in Odisha alone supports a staggering half-a-million water birds.
- Most of these water birds are migratory and winter in India's wetlands.
- For instance, the bar-headed goose, breeds in Mongolia, Tibet and Kyrgyzstan and crosses the Himalayas and Hindu Kush to reach India.
- There has been a noticeable decline in several species visiting India over the years, which is concerning.
- The Oriental darter (long necked), which was once a common sight in many wetlands, numbered just 4,000 in the sites that got surveyed currently.
- The Indian skimmer (with a bright orange bill) — which can 'skim' over water to snap up fish, were counted to be just 300.
- Sarus crane, the world's tallest flying bird, often found in pairs or small groups, accounted for as little as just about 100 birds over several years.
- These are mainly because, the wetlands, which are cherished equally by local residents, and birdwatchers are in peril.



## 9. REPORTS AND INDICES

### 9.1 'Global E-waste Monitor 2017' Report

- The Global E-waste Monitor report is a joint effort of the International Telecommunication Union the United Nations University (UNU) and the International Solid Waste Association (ISWA),
- It provides up-to-date information on the amounts of e-waste generated and recycled, makes predictions until 2021, and provides information on the progress made in terms of e-waste legislation.
- The report has highlighted that electronic waste has risen 8% by weight in two years globally as incomes rise and prices fall.
- It cautioned that experts foresee a further 17% increase ( 52.2 million metric tonnes) of e-waste by 2021, making it the fastest growing part of the world's domestic waste stream.
- In 2016, e-waste was recorded at a staggering 44.7 million metric tonnes (mt), up 3.3 mt or 8% from 2014.
- According to the report, the highest per capita e-waste generators (at 17.3 kg per inhabitant) were Australia, New Zealand and the other the nations of Oceania, with only 6% formally collected and recycled.
- Europe (including Russia) is the second largest generator of e-waste per inhabitant with an average of 16.6 kg per inhabitant.
- Asia generates only about one third of America's e-waste per capita.
- In March 2016, India notified the E-Waste Management Rules which among other things include a provision for financial penalty for damage caused to ecology and any third party due to improper management of e-waste.

### The International Solid Waste Association (ISWA)

- It is a non-governmental, independent and non-profit association to promote and develop professional waste management worldwide.
- It has national Members, Company/Organisation Members, Individual Members, student Members and online Members.
- The National Members are non-profit, waste management associations representing the waste management industry in a particular country.
- National Members are the only memberships allowed to vote at the General Assembly and thus, they constitute the governing body of ISWA.
- Company/Organisation Members are public or private organisations and companies working in or associated with the field of waste management.

### 9.2 Environmental Performance Index, 2018

*India ranks 177 among 180 countries in the Environmental Performance Index 2018.*

- EPI is a biennial report by Yale and Columbia Universities along with the **World Economic Forum**.
- The report ranks 180 countries on 24 performance indicators.
- It is spread across 10 categories covering environmental health and ecosystem vitality.
- Switzerland leads the world in sustainability, followed by France, Denmark, Malta and Sweden in the recent EPI.
- India is among the bottom 5 countries on the index, at 177th place.
- This is a drop of 36 points from 141 in 2016.
- Emerging peer economies, Brazil and China, ranks 69 and 120, respectively.



- In the environmental health category, India is at the bottom of the list.
- And in terms of air quality it is placed third last.
- The overall drop is attributed to **poor performance in the environment health policy** and high pollution related deaths.
- Pollution from solid fuels, coal and crop residue burning, and emissions from motor vehicles are the major causes.
- Population growth, industrial production and automotive transportation continue to increasingly degrade the air quality.

### Government Measures

The government has set some ambitious targets for environmental protection in the recent years.

- It includes:
  - i. strict environmental standards for coal-fired power plants
  - ii. target to implement Bharat Stage VI emission norms from April 1, 2020
  - iii. efforts to produce and sell electric vehicles in the country by 2030
  - iv. revision of National Solar Mission, accelerating transition to renewable sources of power
  - v. accordingly, revising the target for setting up solar capacity from 20 GW to 100 GW by 2021-22
  - vi. assurance to clean up highly polluted Ganga by 2018
- **Shortfalls** - Unfortunately, there appears to be a big gap between policy goals and action.
- India seems to be moving in the right direction on solar targets.
- However, balancing it with other goals is seriously lacking.
- Evidently, the promise of implementing strict power plant emission norms by December 2017 has been relaxed.
- Annual electronic waste collection target for electronics manufacturers was set at 30% of the products sold in the market. However, this has now been relaxed to 10%.
- The automobile industry has stated that full conversion to electric vehicles was realistically possible only by 2047.
- This is in contrast to the government's targets.
- CAG, in a recent report, highlighted the lag in developing an action plan and poor fund utilisation in the clean-up of the Ganga.

\*\*\*\*\*