



## **GNANADHARE ACADEMY**

#2 Sharada Arcade, Nagarbhavi Main Road Prashanth Nagar, Vijaynagar  
North Bangalore-560079, Mob:9513804777/9513809777

**GNANADHARE EDUCATIONAL TRUST ®**

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**ENVIRONMENT NOTES**

### Marijuana

- Marijuana is greenish-grey mixture of dried, shredded leaves, stems, seeds and flowers of Cannabis sativa – the hemp plant.
- Most people smoke marijuana, though it can also be used in other forms such as edibles, powders and oils.
- It used for controlling pain for medical issues, like cancer, nervous system diseases, glaucoma, migraines, etc and also used to treat nausea and improve appetites for people with HIV or other chronic illnesses.



### 'Blue Flag' tag

- The Chandrabhaga beach on the Konark coast of Odisha will be the first in Asia to get the Blue Flag certification —
- The tag given to environment-friendly and clean beaches, equipped with amenities of international standards for tourists.
- Twelve more beaches in the country are being developed by the Society for Integrated Coastal Management (SICOM), an Environment Ministry's body working for the management of coastal areas, in accordance with the Blue Flag standards.

### Blue Flag standards

- The standards were established by the Copenhagen-based Foundation for Environmental Education (FEE) in 1985.
- To achieve the Blue Flag standards, a beach had to strictly comply with 33 environment and tourism-related conditions it includes plastic-free and equipped with a waste management system.
- Clean water should be available for tourists, apart from international amenities. The beach should have facilities for studying the environmental impact around the area.



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### **Society for Integrated Coastal Management**

- Society of Integrated Coastal Management (SICOM) has been established under the aegis of Ministry of Environment, Forests and Climate change, Government of India.

### **The main objectives of SICOM are as follows:-**

- The main objective of the Centre is to promote research and development in the area of coastal management including addressing issues of coastal communities.
- To support implementation of Integrated Coastal Zone Management (ICZM) activities in India.
- To implement the World Bank assisted India ICZM Project
- To provide Research Development (R&D) and stakeholders participation in management of the Coastal areas in India.
- To undertake any additional work or function as may be assigned by Ministry of Environment, Forests and Climate Change from time to time in the area of Coastal Management and other related activities.

### **SICOM will be implementing the following four components, namely,**

- National Coastal Management Programme
- ICZM West Bengal
- ICZM Orissa
- ICZM Gujarat.

### **Taj Declaration to Beat Plastic Pollution adopted in Agra**

- A 'Taj Declaration to Beat Plastic Pollution' was adopted as part of which efforts would be made to make the 500-metre.



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### **Centre to start measuring 'green GDP' of States**

- The government will begin a five-year exercise to compute district-level data of the country's environmental wealth.
- The numbers will eventually be used to calculate every State's 'green' Gross Domestic Product (GDP).
- The metric will help with a range of policy decisions, such as compensation to be paid during land acquisition, calculation of funds required for climate mitigation, and so on.
- "This is the first time such a national environment survey is being undertaken,"
- A pilot project is set to begin this in 54 districts.
- Land will be demarcated into "grids" with about 15-20 grids per district. These will capture the diversity in the State's geography, farmland, wildlife, and emissions pattern, and will be used to compute a value
- The government has also launched a 'green skilling' programme under which youth, particularly school dropouts, would be trained in a range of 'green jobs'— as operators of scientific instruments used to measure environmental quality, as field staff in nature parks, and as tourist guides.

### **International Environment day: June 5th**

- India was global host nation for the 2018 World Environment Day with theme of 'Beat Plastic Pollution'.
- India generates over 25,000 tonnes of plastic waste every day.
- India declared that it would do away with all single-use plastics by 2022.
- In Delhi the Delegation of the European Union (EU) and embassies of the member states adopted a 'Green Pledge', under which the 28 EU member-states made a commitment to green their embassies.



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### **Nitrogen emissions going up: study**

- Nitrogen particles make up the largest fraction of PM<sub>2.5</sub>, the class of pollutants closely linked to cardiovascular and respiratory illness, says the first-ever quantitative assessment of nitrogen pollution in India.
- Make up largest fraction of PM<sub>2.5</sub>; fertilizers, agriculture and untreated sewage causing the rise.
- While the burning of crop residue is said to be a key contributor to winter smog in many parts of North India, it contributes over 240 million kg of nitrogen oxides (NO<sub>x</sub>: a generic term for the nitrogen oxides that are most relevant for air pollution, namely nitric oxide and nitrogen dioxide) and about 7 million kg of nitrous oxide (N<sub>2</sub>O) per year.
- Agriculture is the largest contributor to nitrogen emissions.
- Sources of Non-agricultural emissions are sewage and fossil-fuel burning — for power, transport and industry in the form of nitrogen oxides and nitrous oxide.
- Annual NO<sub>x</sub> emissions from coal, diesel and other fuel combustion sources are growing at 6.5% a year.
- Agricultural soils contributed to over 70% of N<sub>2</sub>O emissions from India in 2010, followed by waste water (12%) and residential and commercial activities (6%).
- Since 2002, N<sub>2</sub>O has replaced methane as the second largest Greenhouse Gas (GHG) from Indian agriculture.
- Chemical fertilizers (over 82% of it is urea) account for over 77% of all agricultural N<sub>2</sub>O emissions in India, while manure, compost and soon make up the rest.
- Cattle account for 80% of the ammonia production, though their annual growth rate is 1%, due to a stable population.
- India is globally the biggest source of ammonia emission; nearly double that of NO<sub>x</sub> emissions.
- But at the current rate of growth, NO<sub>x</sub> emissions will exceed ammonia emissions and touch 8.8 tonnes by 2055, the report says.
- The nutrient recovery/recycling from waste water for agriculture could cut down N<sub>2</sub>O emissions from sewage and waste water by up to 40%.

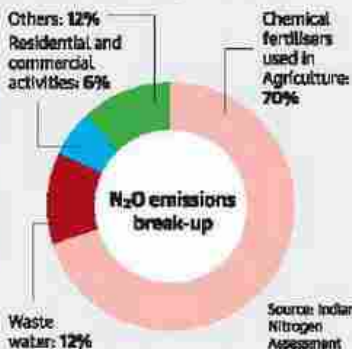
### Scare in the air

Highlights from the 'Indian Nitrogen Assessment', the first ever quantitative assessment of reactive nitrogen in the Indian environment



Burning of crop residue In most parts of North India is one of the main sources of nitrogen emissions. - AFP

Agricultural soils remain the largest contributor of nitrogen emissions



#### Menace of nitrogen oxides (NOx) pollution

• Indian NOx emissions grew from 52% between 1991-2001, to 69% between 2001-2011

• Burning of crop residue contributes over 240 million kg of NOx and 7 million kg of N<sub>2</sub>O per year

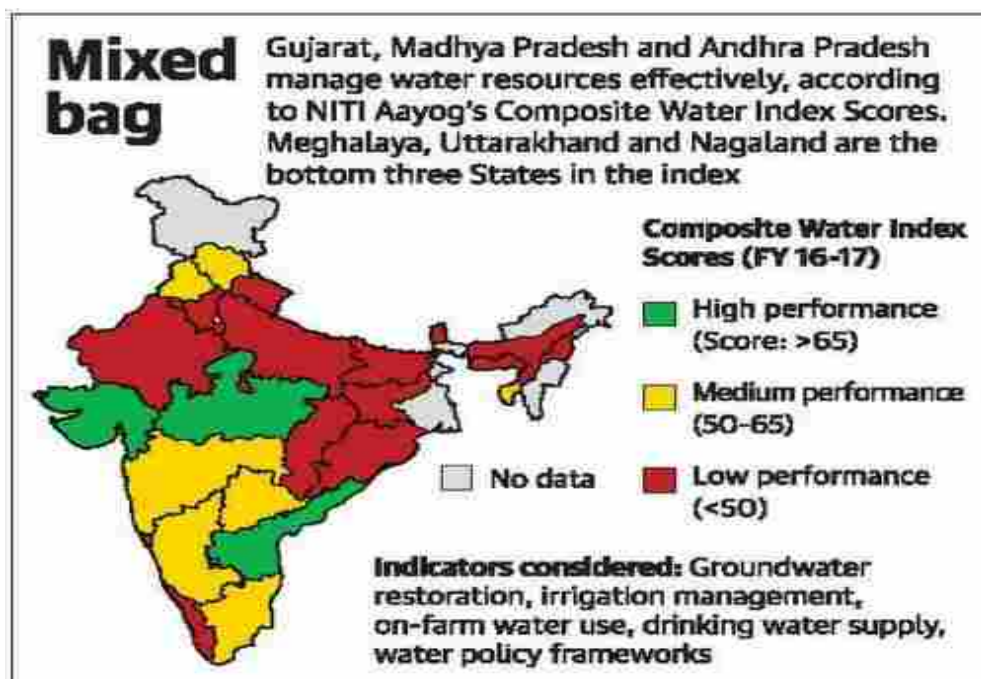
• NOx emissions from coal, diesel are growing at 6.5% per year currently

### Anthropocene era

- A new period in earth's history, when humans have begun to impact our environment at the global scale.



### India is facing its worst water crisis: NITI Aayog



- Envisioned as an annual exercise, the Composite Water Management Index (CWMI), to evaluate States, has been developed by the NITI Aayog and comprises 9 broad sectors with 28 different indicators covering various aspects of groundwater, restoration of water bodies, irrigation, farm practices, drinking water, policy and governance.

### Highlights of the report

- The NITI Aayog released the results of a study warning that India is facing its "worst" water crisis in history and that the demand for potable water will outstrip supply by 2030, if steps are not taken.
- Twenty-one cities, including Delhi, Bengaluru, Chennai and Hyderabad, will run out of groundwater by 2020
- If matters are to continue, there will be a 6% loss in the country's Gross Domestic Product by 2050



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- Critical groundwater resources, which accounted for 40% of the water supply, are being depleted at “unsustainable” rates and up to 70% of the supply is “contaminated,”
- The observations are part of a study that ranked 24 States on how well they managed their water. Gujarat, Andhra Pradesh and Madhya Pradesh took the top three spots, and Jharkhand, Bihar and Haryana came in last in the ‘Non-Himalayan States’ category. Himachal Pradesh — which is facing one of its worst water crises this year

### **Mihir Shah Committee**

- Committee on Restructuring the Central Water Commission and the Central Ground Water Board, chaired by Mihir Shah, has called for a user-centric approach to water management, especially in agriculture.
- It advocates decentralisation of irrigation commands, offering higher financial flows to well-performing States through a National Irrigation Management Fund.

### **States should protect all strays: AWBI**

- States will be held responsible for cattle, dogs and cats wandering on streets and officials will be held accountable for inflicting “cruelty” on them, according to a directive by the Animal Welfare Board of India (AWBI), constituted under the provisions of the Prevention of Cruelty to Animals (PCA) Act.
- If animals are wandering on the streets, it is not just the responsibility of cow shelters and animal welfare activists, State departments are also responsible. Else we will consider it an act of cruelty,
- The AWBI, however, does not have the right to prescribe punishments or fines for violations of the PCA Act but can pursue legal action.
- “It is also the responsibility of local bodies to save animals like stray cats, monkeys and stray dogs from cruelty and sufferings,”



### Costa Rica

- The Republic of Costa Rica is sandwiched between Panama and Nicaragua
- One of the first countries in the world to implement a green tax, which helped reverse deforestation and has actually managed to implement a ban on single-use plastics.
- The entire Costa Rican grid ran on renewable power for a record 300 days. Besides hydro, wind and solar, it is a world leader in geothermal energy.
- It plans to move from a staggering 98.6% renewable power base to 100% this year.
- By 2020 it will become carbon neutral, matching its greenhouse emissions with the carbon emissions it saves.
- Costa Rica would become the world's first 'zero carbon' economy in two decades, starting with the initial goal of eliminating fossil fuels from the transportation sector by 2021.



### Movin' On

- It's a global summit on sustainable mobility; a Michelin-sponsored think-fest held at Montreal

### Petroglyph site discovered in Kurnool

- The biggest petroglyph site excavated at Kandanthi village of Kurnool district in Andhra Pradesh.
- Petroglyphs are images created by removing part of a rock surface by incising, picking, carving, or abrading, as a form of rock art.





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### **The Gender Action Plan:**

- The United Nations Convention to Combat Desertification (UNCCD) recently created a new plan to support and enhance gender-responsive policy needs.
- The Gender Action Plan (GAP) that will increase and strengthen the participation and leadership of women at all levels of decision-making and local implementation of the UNCCD, including drought management as well as sand and dust storms and land degradation neutrality interventions, with the aim to reach gender parity by 2030.

### **International Decade for Action**

- The UN General Assembly has proclaimed the decade 2018-2028 as the International Decade for Action 'Water for Sustainable Development' to begin on World Water Day 22 March 2018 and ending on World Water Day, 22 March 2028.
- The draft resolution states amongst others that emphasis should be given to sustainable development and integrated management of water resources in order to reach the social, economic and environmental goals.
- It stresses the importance of implementing such programmes and projects and promoting partnerships as well as the involvement of different stakeholders in order to accomplish the 2030 Agenda for Sustainable Development.
- Republic of Tajikistan and United Nations are jointly organizing the high level global conference on "International Decade for Action: Water for Sustainable Development".
- "International Decade for Action: Water for Sustainable Development 2018-2028" being held in Dushanbe.
- The conference aims to promote national, regional and international action on integrated and sustainable water resources management worldwide.
- Sustainable development and integrated water resources management is 6th goal of SDG

### Ken-Betwa project

#### **Booster shot** Key aspects of the ₹18,000 crore Ken Betwa river interlink project



### India's first river interlinking project

- The project, which involves deforesting a portion of the Panna Tiger Reserve
- Clearance by the National Wildlife Board on the condition that the land lost would be made good by acquiring contiguous, revenue land. This is to ensure that wildlife corridors in the region aren't hit
- Phase 1 involves building a 77 m-tall and a 2 km-wide dam, the Dhaudhan dam, and a 230 km canal to transfer extra water from the Ken River for irrigating 3.64 lakh hectares in the Bundelkhand region of Uttar Pradesh and Madhya Pradesh.

### Zero Budget Natural Farming in Andhra Pradesh

- Andhra Pradesh has become the first State to implement a ZBNF policy.
- State would fully embrace Zero Budget Natural Farming (ZBNF), a chemical-free method that would cover all farmers by 2024.
- By 2021-22, the programme is to be implemented in every panchayat, with full coverage by 2024.

### Zero Budget Natural Farming (ZBNF)

- Subhash Palekar developed the ZBNF
- ZBNF is set of natural farming methods where cost of growing and harvesting plants is zero.
- It is a farming practice that believes in natural growth of crops without adding any fertilizers and pesticides or any other foreign elements. It is different from organic farming.
- The word Zero Budget refers to zero net cost of production of all crops. This means that farmers need not purchase fertilizers and pesticides in order to ensure the healthy growth of crops.
- The inputs used for seed treatments and other inoculations are locally available in form of cow dung and cow urine.
- It requires almost no monetary investment and envisages use of 'Jeevamrutha' and 'Beejamrutha'.
- The main aim of ZBNF is eliminate use of chemical pesticides and uses biological pesticides and promote of good agronomic practices.
- Farmers use earthworms, cow dung, urine, plants, human excreta and such biological fertilizers for crop protection.
- local materials to increase microbes; cover crops, straw and other organic matter to retain soil moisture and build humus; and soil aeration for favourable soil conditions. These methods are combined with natural insect management methods when required.
- It lowers cost of inputs of farmers and gives better capacity to increase the incomes. It also protects soil from degradation and helps in retaining soil fertility and is climate change resilient.







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### **Significance**

- In ZBNF, yields of various cash and food crops have been found to be significantly higher when compared with chemical farming.
- Input costs are near zero as no fertilizers and pesticides are used. Profits in most areas under ZBNF were from higher yield and lower inputs.
- Model ZBNF farms were able to withstand drought and flooding,

### **Difference with organic farming**

- In early 2016, Sikkim was declared India's first fully organic State. But organic agriculture often involves addition of large amounts of manure, vermin compost and other materials that are required in bulk and need to be purchased. These turn out to be expensive for most small farm holders.

### **Future Policy Gold Award**

- This award is given by UN Food and Agriculture Organisation (FAO) and co-organised by World Future Council (WFC) and IFOAM Organics International.
- The award is nicknamed the "Oscar for best policies".
- It recognises the world's best laws and policies promoting agroecology.
- Sikkim State has won the 2018 award for its achievement in becoming the world's first totally organic agriculture state.
- Sikkim beat out 51 other nominees from around the world for the award.
- Brazil, Denmark, Quito and Ecuador shared the Silver award.

### **World Future Council**

- It is an independent body with 50 eminent members from governmental bodies, civil society, business, science and the arts.
- It is registered as a charitable foundation and headquartered in Hamburg, Germany.
- It focuses on policy solutions that serve the interests of future generations.





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### **Kanha's tiger to Satkosia**

- T-2, a three-year-old tiger from the Kanha Tiger Reserve in Madhya Pradesh and introduced it to Odisha's Satkosia Tiger Reserve, marking the first ever inter-State re-introduction of tigers.
- Guidelines of the National Tiger Conservation Authority (NTCA), where the animal selected for relocation was in its 'transient age' and had not set its territory.

### **'i-Hariyali' app' to increase state's green cover**

- Punjab government has launched 'i-Hariyali' mobile application under 'Mission Tandarust Punjab' aimed at increasing the state's green cover.
- It will enable app users to order free plant saplings and help to save the environment from pollution.
- The app aims to inspire more and more people to plant maximum saplings during current monsoon season so as to save environment from pollution hazards.
- Using it, users can book sapling of their choice, a maximum of 25 per person, from nearby government nursery.

### **National Off-Shore Wind Policy:**

- The Ministry of New & Renewable Energy had notified National Off-Shore Wind Policy in October 2015.
- With this, the Ministry of New & Renewable Energy (MNRE) has been authorized as the Nodal Ministry for use of offshore areas within the Exclusive Economic Zone (EEZ) of the country and the National Institute of Wind Energy (NIWE) has been authorized as the Nodal Agency for development of offshore wind energy.
- Government has paved way for development of the offshore wind farms up to the seaward distance of 200 Nautical Miles (within its Exclusive Economic Zone) from the base line.

### **Why is in news?**

- Central government has set the target for offshore wind energy generation
- Medium target of 5 GW by 2022.
- Long term target of 30 GW by 2030

### **Maharashtra bans plastic**

- As per the notification, violators will be fined Rs 5,000 and Rs 10,000 for the first and second-time offense. A third-time offender will have to shell out Rs 25,000 and may also face imprisonment for a period of three months.
- The manufacture, usage, sale, transport, distribution, wholesale and retail sale and storage, import of plastic bags with or without handle, and disposable products made out of plastic and thermocol.



### **What all plastic products are covered under the ban?**

- Under the notification products manufactured from plastic and thermocol have been covered under the ban. As a result usage of plastic bags with a handle and without handle, disposable cups, and plates, spoons, forks, glasses and containers is prohibited in the state. Plastic packaging used to wrap and store the product is also included in the ban.
- Apart from this plastic straw, non-woven polypropylene bags, pouches and any other plastic used to store, package and transfer food items will no longer be permitted in the state. Besides, it has banned the use of plastic and thermocol for decoration purposes



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### **Plastic items excluded from the ban**

- Plastic used for packaging medicines and drugs
- Food grade virgin plastic used for packaging milk
- Compostable packaging bags used for horticulture and agriculture purposes
- Plastic bags used for exporting goods
- Plastic used at the manufacturing stage
- Plastic used for handling of solid waste

### **What is the fine if found using these plastic products?**

- As per the notification, violators will be fined Rs 5,000 and Rs 10,000 for the first and second-time offense. A third-time offender will have to shell out Rs 25,000 and may also face imprisonment for a period of three months.
- While the ban will be implemented within Maharashtra, passengers coming to the state from other parts of the country are also expected to maintain caution while disposing plastic at stations.
- The government has come up with 'Buy Back' policy where the stall owner is expected to offer money in return over the plastic bottle deposited by the user.

### **National Clean Air Programme (NCAP).**

- "The government has formulated National Clean Air Programme (NCAP) as a medium term national level strategy to tackle the increasing air pollution problem across the country in a comprehensive manner.
- The overall objective is to augment and evolve effective ambient air quality monitoring network across the country besides ensuring 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.
- In order to ensure use of new technologies to combat the rising challenge of air pollution in India, a separate component on 'Technology Assessment Cell' has been envisaged under NCAP to evaluate the technologies for prevention, control and abatement of air pollution.



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- The NCAP envisions setting up 1,000 manual air-quality-monitoring stations (a 45% increase from the present number) and 268 automatic stations (triple the current 84).
- It also plans to set up pollution-monitoring stations in rural areas.
- Under proposed NCAP, the MoEFCC will augment air quality monitoring network, identification of alternative technology for real-time monitoring, set up of 10 city super network, indoor air pollution monitoring and management and air pollution health impact studies
- The government, earlier this month, announced the National Clean Air Programme (NCAP). This is the first ever effort in the country to frame a national framework for air quality management with a time-bound reduction target.
- The programme will not be notified under the Environment Protection Act or any other Act to create a firm mandate with a strong legal back up for cities and regions to implement NCAP in a time bound manner for effective reduction.

### **Key features of the National Clean Air Programme (NCAP):**

- Achieve a national-level target of 20-30% reduction of PM2.5 and PM10 concentration by between 2017 and 2024.
- Central Pollution Control Board (CPCB) will execute this nation-wide programme in consonance with the section 162 (b) of the Air (Prevention and Control of Pollution) Act, 1986.
- The programme has been launched with an initial budget of ₹300 crore for the first two years.
- The plan includes 102 non-attainment cities, across 23 states and Union territories, which were identified by Central Pollution Control Board (CPCB) on the basis of their ambient air quality data between 2011 and 2015.
- Non-attainment cities are those which have been consistently showing poorer air quality than the National Ambient Air Quality Standards. These include Delhi, Varanasi, Bhopal, Kolkata, Noida, Muzaffarpur, and Mumbai.



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- As part of the programme, the Centre also plans to scale up the air quality monitoring network across India. At least 4,000 monitors are needed across the country, instead of the existing 101 real-time air quality (AQ) monitors, according to an analysis.
- The plan proposes a three-tier system, including real-time physical data collection, data archiving, and an action trigger system in all 102 cities, besides extensive plantation plans, research on clean-technologies, landscaping of major arterial roads, and stringent industrial standards.
- It also proposes state-level plans of e-mobility in the two-wheeler sector, rapid augmentation of charging infrastructure, stringent implementation of BS-VI norms, boosting public transportation system, and adoption of third-party audits for polluting industries.
- Various committees: The national plan has proposed setting up an apex committee under environment minister, a steering committee under-secretary (environment) and a monitoring committee under a joint secretary. There would be project monitoring committees at the state-level with scientists and trained personnel.

### **Prosopis juliflora or Karuvelam tree**

- The Karuvelam tree or prosopis juliflora as its known biologically, is a species native to West Africa and was brought to Tamil Nadu in 1960s as fuelwood.
- Slowly, these seeds started drifting into dams and rivers, causing problems. Apparently, the plant is such that no other species can co-exist with it, and it has already caused drying up of several water bodies in the state, adding to the woes of the water-starved state.







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- According to a report, Karuvelam tree absorbs more than four litres of water to obtain one kilogram of biomass. It cannot even shelter birds as it produces less oxygen and more carbon dioxide.
- If it does not have sufficient water it begins absorbing groundwater. And if there is no groundwater, it starts absorbing humidity from the surroundings. It can also turn the groundwater poisonous.
- The Madurai bench of the Madras high court has directed the Tamil Nadu government to remove these trees.

### **Decreasing 'greenness' in India's forests**

- Scientists at Hyderabad's National Remote Sensing Centre analysed NASA's MODIS satellite images of India's forests at eight-day intervals for 15 years (2001 to 2014) and assessed the persistent decreases in greenness.
- They found that the highest degradation is in moist deciduous forests (more than 20 lakh hectares), especially in the states of Chhatisgarh, Odisha, Maharashtra and Madhya Pradesh.
- Wet evergreen forests – including those in the Western Ghats and Eastern Himalayas – are also affected, with the major changes observed in Karnataka and Arunachal Pradesh, followed by Kerala and Meghalaya.
- Using statistical analyses, the team determined the 'spots' or areas where the decrease in seasonal greenness was high and spatially contiguous.
- West Bengal was a major hotspot of mangrove degradation. Arunachal Pradesh, Kerala, Karnataka and Meghalaya were hotspots of decreasing greenness of wet evergreen forests while Manipur, Tamil Nadu, Mizoram, Sikkim and Arunachal Pradesh showed degraded montane (high-elevation) wet forests.

### **Asian Ministerial Conference on Disaster Risk Reduction**

Asian Ministerial Conference on Disaster Risk Reduction 2018 (AMCDRR 2018) to be held in Ulaanbaatar, Mongolia

The theme of the AMCDRR 2018: 'Preventing Disaster Risk: Protecting Sustainable Development' reflects the essence of the Sendai Framework for

Disaster Risk Reduction 2015-2030. Development that does not take risk into account cannot be sustainable

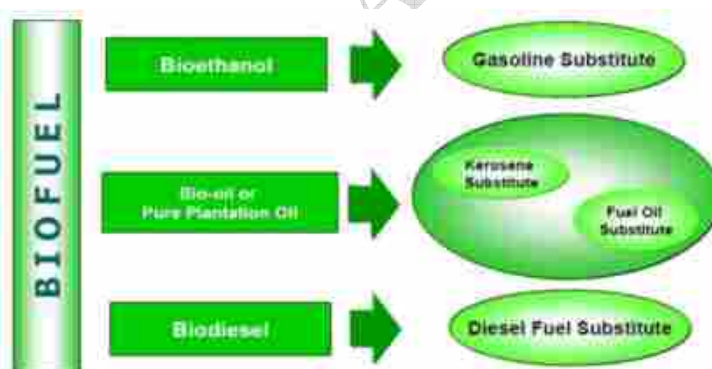
The theme of the AMCDRR 2018 is aligned with the theme of the 2018 High-level Political Forum on Sustainable Development that focuses on 'Transformation towards sustainable and resilient societies'

Disaster risk reduction is a key instrument to achieve the Sustainable Development Goals, as highlighted in the 2030 Agenda for Sustainable Development.

## **National Policy on Biofuels - 2018**

### **Salient Features:**

- The Policy categorises biofuels as "Basic Biofuels" viz. First Generation (1G) bioethanol & biodiesel and "Advanced Biofuels" - Second Generation (2G) ethanol, Municipal Solid Waste (MSW) to drop-in fuels, Third Generation (3G) biofuels, bio-CNG etc. to enable extension of appropriate financial and fiscal incentives under each category.
- The Policy expands the scope of raw material for ethanol production by allowing use of Sugarcane Juice, Sugar containing materials like Sugar Beet, Sweet Sorghum, Starch containing materials like Corn, Cassava, Damaged food grains like wheat, broken rice, Rotten Potatoes, unfit for human consumption for ethanol production.
- Farmers are at a risk of not getting appropriate price for their produce during the surplus production phase. Taking this into account, the Policy allows use of surplus food grains for production of ethanol for blending with petrol with the approval of National Biofuel Coordination Committee.
- With a thrust on Advanced Biofuels, the Policy indicates a viability gap funding scheme for 2G ethanol Bio refineries of Rs.5000 crore in 6 years in





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addition to additional tax incentives, higher purchase price as compared to 1G biofuels.

- The Policy encourages setting up of supply chain mechanisms for biodiesel production from non-edible oilseeds, Used Cooking Oil, short gestation crops.
- Roles and responsibilities of all the concerned Ministries/Departments with respect to biofuels has been captured in the Policy document to synergise efforts.

### **Expected Benefits:**

- *Reduce Import Dependency:* One crore lit of E10 saves Rs.28 crore of forex at current rates. The ethanol supply year 2017-18 is likely to see a supply of around 150 crore litres of ethanol which will result in savings of over Rs.4000 crore of forex.
- *Cleaner Environment:* One crore lit of E-10 saves around 20,000 ton of CO2 emissions. For the ethanol supply year 2017-18, there will be lesser emissions of CO2 to the tune of 30 lakh ton. By reducing crop burning & conversion of agricultural residues/waste to biofuels there will be further reduction in Green House Gas emissions.
- *Health benefits:* Prolonged reuse of Cooking Oil for preparing food, particularly in deep-frying is a potential health hazard and can lead to many diseases. Used Cooking Oil is a potential feedstock for biodiesel and its use for making biodiesel will prevent diversion of used cooking oil in the food industry.
- *MSW Management:* It is estimated that, annually 62 MMT of Municipal Solid Waste gets generated in India. There are technologies available which can convert waste/plastic, MSW to drop in fuels. One ton of such waste has the potential to provide around 20% of drop in fuels.
- *Infrastructural Investment in Rural Areas:* It is estimated that, one 100klpd bio refinery will require around Rs.800 crore capital investment. At present Oil Marketing Companies are in the process of setting up twelve 2G bio refineries with an investment of around Rs.10,000 crore. Further addition of 2G bio refineries across the Country will spur infrastructural investment in the rural areas.



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- Employment Generation: One 100klpd 2G bio refinery can contribute 1200 jobs in Plant Operations, Village Level Entrepreneurs and Supply Chain Management.
- *Additional Income to Farmers:* By adopting 2G technologies, agricultural residues/waste which otherwise are burnt by the farmers can be converted to ethanol and can fetch a price for these waste if a market is developed for the same. Also, farmers are at a risk of not getting appropriate price for their produce during the surplus production phase. Thus conversion of surplus grains and agricultural biomass can help in price stabilization.

### **Background:**

- In order to promote biofuels in the country, a National Policy on Biofuels was made by Ministry of New and Renewable Energy during the year 2009.
- Biofuels in India are of strategic importance as it augers well with the on-going initiatives of the Government such as Make in India, Swachh Bharat Abhiyan, Skill Development and offers great opportunity to integrate with the ambitious targets of doubling of Farmers Income, Import Reduction, Employment Generation, Waste to Wealth Creation.
- Biofuels programme in India has been largely impacted due to the sustained and quantum non-availability of domestic feedstock for biofuel production which needs to be addressed
- In 2003, the Ethanol Blended Petrol Programme (EBP) focussed on 5% blending of molasses-based ethanol with petrol. By 2008, it pushed for the blending target to be 10%.
- The National Biodiesel Mission proposed a two-phase strategy for biodiesel production from Jatropha seeds to achieve a 10% blending mandate with diesel by 2012.
- In 2009, the NPB proposed a revised target of 20% blending for ethanol and biodiesel by 2017. This is yet to be realised. Fuel blending with ethanol varies from 85% (E85) in Australia to vehicles run on 100% (E100) ethanol in Brazil, where the ethanol blending mandate is 27% (E27). In contrast, India has an abysmal 2-4% blending rate and is woefully short of the original target of 5% due to the inconsistent supply of domestically produced ethanol.



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### **Classification of Biofuels:**

- 1st generation biofuels are also called conventional biofuels. They are made from things like sugar, starch, or vegetable oil. Note that these are all food products. Any biofuel made from a feedstock that can also be consumed as a human food is considered a first generation biofuel.
- 2nd generation biofuels are produced from sustainable feedstock. The sustainability of a feedstock is defined by its availability, its impact on greenhouse gas emissions, its impact on land use, and by its potential to threaten the food supply. No second generation biofuel is also a food crop, though certain food products can become second generation fuels when they are no longer useful for consumption. Second generation biofuels are often called “advanced biofuels.”
- 3rd generation biofuels are biofuel derived from algae. These biofuels are given their own separate class because of their unique production mechanism and their potential to mitigate most of the drawbacks of 1st and 2nd generation biofuels.

### **Updates**

- Rajasthan has become the first State in the country to implement the national policy on biofuels unveiled by the Centre
- The policy lays emphasis on increasing production of oilseeds and establishes a Centre for Excellence in Udaipur to promote research in the fields of alternative fuels and energy resources.

### **NBWL adds 4 species in Recovery Programme for Critically Endangered Species**

- The standing committee of National Board for Wildlife (NBWL) has recently added four species- Northern River Terrapin, Clouded Leopard, Arabian Sea Humpback Whale and Red Panda into Centre’s Recovery Programme for Critically Endangered Species.
- They were added on the recommendation by Wildlife Division of Ministry of Environment and Forests and Climate Change (MoEFCC).





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### **Norther River Terrapin:**

- It is species of riverine turtle found in rivers that flow in Eastern India.
- It is hunted for its meat and carapace. It is native of Bangladesh, Cambodia, India, Indonesia and Malaysia.

### **Clouded Leopard:**

- It is found in Himalayan foothills. It is threatened due to habitat loss, poaching for its skin and is also as a live pet trade.
- The IUCN in its Red List assessment of 2016 has categorized Clouded Leopard as 'Vulnerable' and indicating declining trend in its population.

### **Arabian Sea Humpback Whale:**

- It is a species found in all of major oceans. This species migrates from the Oman coast through the Arabian Sea, along the Indian coasts till the Sri Lankan coast.
- Ship strikes, unforgiving fishing gear and seismic exploarations pose grave threat to it.

### **Red Panda:**

- It is closely associated with montane forests with dense bamboo-thicket. It is found Sikkim, West Bengal and Arunachal Pradesh. It is poached for its meat, and for use in medicines, and as a pet.
- The IUCN has categorized Red Panda as 'Endangered'.
- As per its Red List assessment of 2015, population of this species is decreasing.

### **Recovery Programme for Critically Endangered Species**

- The programme is one of the three components of centrally funded scheme, Integrated Development of Wildlife Habitats (IDWH).
- It was started in 2008-09. IDWH is meant for providing support to protected areas (national parks, wildlife sanctuaries, conservation reserves and community reserves except tiger reserves), protection of wildlife outside

protected areas and recovery programmes for saving critically endangered species and habitats.

- So far, 17 species were identified under this recovery programme.
- These are Snow Leopard, Bustard (including Floricans), Dolphin, Nilgiri Tahr, Hangul, Marine Turtles, Edible Nest Swiftlet, Dugongs, Asian Wild Buffalo, Nicobar Megapode, Manipur Brow-antlered Deer, Vultures, Malabar Civet, Indian Rhinoceros, Asiatic Lion, Swamp Deer and Jerdon's Courser

### **Arunachal stares at water scarcity**

- More than 200 rivers and streams across Arunachal Pradesh have dried up.
- The drying up of water bodies to rampant destruction of forests besides thinning glaciers in the Eastern Himalayas due to climate change.
- "The State's forest cover has decreased from 82% to 79% and catchment areas of many rivers are under threat because of jhum (slash-and-burn) cultivation and landslides
- Large-scale hunting of animals, too, has been a factor in the depletion of the State's natural resources
- Many communities hunt birds and animals for food and adornment of traditional headgear. Wild animals such as Asiatic black bear, leaf deer and Mishmi takin are considered delicacies.

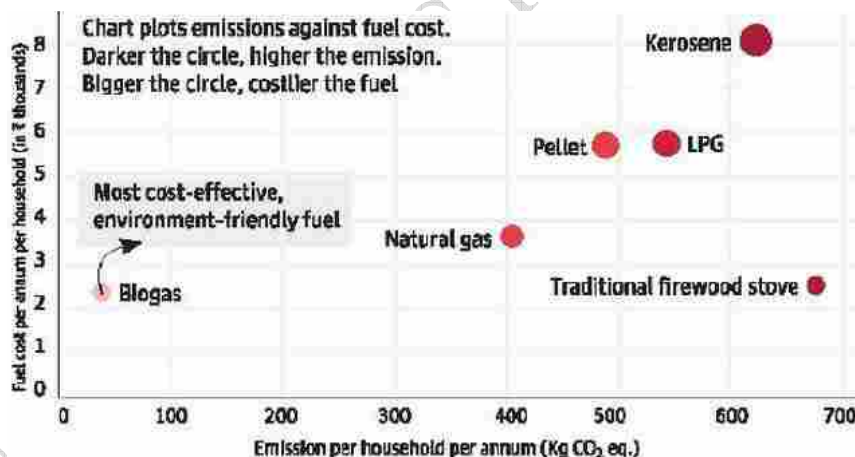
### **Nepal returns 'dancing bear' to India**

- The sloth bear, which was smuggled into Nepal in December 2017 for use as a 'dancing bear,' is being sent back to India.
- Sloth bears (*Melursus ursinus*), found only in the Indian subcontinent, were exploited as 'dancing bears' in India until the practice was banned in 1972. But it is not illegal in Nepal.



## A clean cooking strategy

- Among the various fuel options available (firewood, pellet, biogas, kerosene, liquefied petroleum gas or LPG, piped natural gas or PNG) biogas accounts for the lowest effective greenhouse gas emission; PNG and then LPG are next.
- An assessment of annual life cycle emissions of various fuels per household per annum is based on the estimation of life cycle emissions, feedstock processing, fuel processing, distribution and cook-stove use.
- Cooking fuels emit substantial amounts of toxic pollutants (respirable particles, carbon monoxide, oxides of nitrogen and sulphur, benzene, formaldehyde and polyaromatic compounds) which contribute to indoor air pollution
- Among the various options available for cooking fuel, firewood and pellet are the most polluting, LPG and kerosene are moderately cleaner, and biogas and natural gas are cleaner fuels for combustion.



<https://www.thehindu.com/todays-paper/tp-opinion/a-clean-cooking-strategy/article24394188.ece> (mains)

### **Mercenary conservation**

- Karnataka recently drafted Private Conservancy Rules in a bid to increase forest area through private land.
- Under the rules, anyone who has a minimum of 100 acres of land bordering a national park can convert it to a “Wildlife Private Conservancy”. Of this land, 5% can be used to construct buildings for ecotourism; the rest has to be kept for flora and fauna.

### **Nilgiri tahr:**

- Climate change threatening 60% of its habitat according to recent study published international journal Ecological Engineering, climate change is threatening the Nilgiri tahr.
- It is estimated that endangered wild goat could lose approximately 60% of its habitat, starting from 2030s. There are only around 2,500 Nilgiri Tahrs left in the wild and their population is small and isolated. It makes them vulnerable to local extinction.
- The study emphasises need for ecological restoration of Nilgiri tahrs. It also highlights demand for comprehensive species management plan.



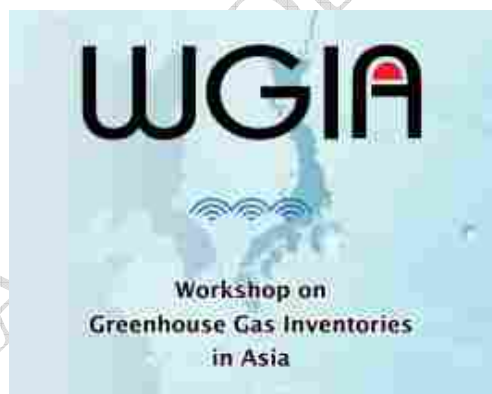
### **Facts on Nilgiri tahr**

- It is state animal of Tamil Nadu. It is endemic to Western Ghats from the Nilgiris to Kanyakumari.
- It is confined to a narrow belt of higher elevation (altitudes) of Shola Forests in Western Ghats (Mukurthi National Park)
- Endemic to the Nilgiri Hills and the southern portion of the Western Ghats in the states of Tamil Nadu and Kerala in Southern India.
- Protection Status: IUCN in its red data book has classified it as Endangered (number fewer than 2,500 mature individuals).

- Besides it is protected species under Schedule I of Wildlife (Protection) Act of 1972
- Threats: The population also faces several threats. Researchers point to the continuing spread of invasive species of flora, such as wattle and pine, and exotic weeds like scotch broom (*Cystisus scoparius*) and gorse, which end up diminishing grazing land.

### Workshop on Greenhouse Gas Inventories in Asia (WGIA)

- WGIA is an initiative of Government of Japan.
- It is to improve the quality of Greenhouse Gas Inventories of Asian countries by building capacities through training and exchange of experience.
- Members of WGIA - 15 countries including Brunei, Cambodia, China, India, Indonesia, Japan, Republic of Korea, Lao PDR, Malaysia, Mongolia, Myanmar, Philippines, Singapore, Thailand and Vietnam.
- India is hosting WGIA for the first time.
- Workshop has been organized by the Ministry of Environment, Government of Japan and is being hosted by Ministry of Environment, Forest and Climate Change (MoEFCC) in New Delhi.
- GHG inventory experts from member countries participated along with representatives from UNFCCC, IPCC, FAO and other specialized agencies



### National Green Tribunal

- Justice Adarsh Kumar Goel recently assumed charge as chairperson of the NGT.
- Justice Goel, who retired as a Supreme Court judge on July 6, has been appointed for five years.





- He is the third chairperson of the NGT since its inception in 2010.
- NGT was established in 2010 under NGT Act 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 -
  - The Water (Prevention and Control of Pollution) Act, 1974;
  - The Forest (Conservation) Act, 1980;
  - The Air (Prevention and Control of Pollution) Act, 1981;
  - The Environment (Protection) Act, 1986;
  - The Public Liability Insurance Act, 1991;
  - 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.

### **Koala bear**

- Recently, an international team of scientists has successfully sequenced the whole genome of Koala bear.
- It is a tree-dwelling marsupial of coastal eastern Australia.
- They have exceptional parental care and strange eating habits that they enjoy the leaves of eucalyptus that would be toxic or even fatal to most mammals.



- They are born after just 34-36 days of gestation without an immune system and spend almost six months developing in the pouch.
- It is listed as “Vulnerable” under IUCN’s Red Data Book.

### **Harriers decline as grasslands disappear**



- Harrier birds, a migratory raptor species that regularly visits vast swathes of India, are declining. This may foretell lurking dangers to the country's grasslands.
- Every winter, several species of harrier birds travel thousands of kilometres to escape frigid Central Asia for the grasslands of the subcontinent.
- The gravest concern is the loss of grasslands, either to urbanisation or to agriculture. In February-March, peak season for the arrival of the birds, farmlands are burnt or over-grazed.
- Excessive use of pesticides in farms in and around the roosting sites could also be a reason for the lowered population counts.
- In crops such as cotton, the use of pesticides kills grasshoppers, the harriers' primary prey, and could lead to mortality of the birds themselves as they are on the top of the food chain.
- Globally, of the 16 harrier species, only two are listed as endangered by the International Union for Conservation of Nature, even though most of them are declining.

### **Golden Jackel**

- Destruction of mangrove cover in the Bandar Reserve Forest is forcing the golden jackal out of its habitat.
- The conservation status of the animal is the 'least concern' and it preys on wild crab and fish.
- The Golden Jackal is widespread in North and north-east Africa, Arabian Peninsula, Eastern Europe and the entire Indian Subcontinent.
- In India, jackal populations achieve high densities in pastoral areas such as Kutch, Maharashtra, Rajasthan, and Haryana.
- It is present in all protected areas of India except for those in the high elevation regions of the Himalayas.
- The species is included in CITES Appendix III (in India).
- Jackals feature on Schedule III of the Wildlife Protection Act (1972) of India and are afforded the least legal protection (mainly to control trade of pelts and tails).



### **Tiger survey**

- The quadrennial survey will cover almost 4,00,000 sq km of tiger habitats in India.
- Designed by scientists at the Wildlife Institute of India (WII)
- Scientists study the number of times a specific tiger was captured on camera, as well as the number of times the cameras recaptured the same tiger again. This method, which also factors in the locations of the camera traps to estimate the population size, is known as 'spatially explicit capture recapture' (SECR).
- first time ever, India will be conducting the census along with the three other tiger-range countries — Nepal, Bhutan and Bangladesh.



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Representatives from these countries have completed their training in India.

- According to the WII and NTCA, India's tiger population has been observed to increase at a rate of around 5.8% per year since 2006.
- The estimation in 2014 pegged tiger numbers at 2,226. The same year, the news that global tiger numbers grew from 3,200 in 2010 to 3,890 in 2014 caused much cheer.

### **Index calibration**

- Once camera-trapping wraps up across the country, all the teams will compile their data and send it to the WII and the NTCA for scientific data analysis. Then, in a process known as index calibration
- M-STriPES, a mobile-based application, to collect data on the field.
- to obtain more precise estimates of the tiger numbers, the area in which a single pair of camera traps is deployed called a 'grid'

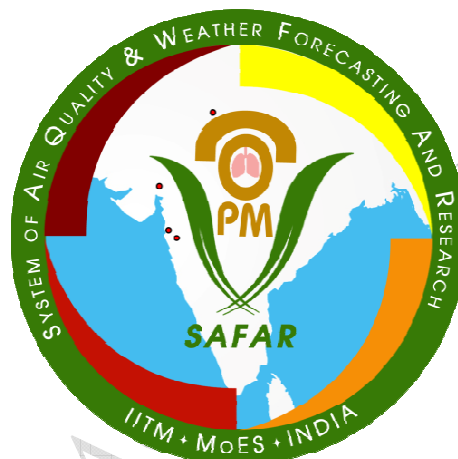
### **Pugmark census**

- The first method used to count India's tigers, the pugmark census, was already in use during the launch of Project Tiger in 1974.
- Once every four years, forest guards and watchers would walk across tiger habitats over two weeks, identify tiger pugmarks, and take their plaster casts.
- Based on the shape and other measurements, these pugmarks would be assigned to individual tigers to arrive at an absolute count (the left hind paw, specifically).



### System of Air Quality and Weather Forecasting (SAFAR)

- Union Environment Ministry has recently unveiled the most advanced System of Air Quality and Weather Forecasting (SAFAR) in New Delhi.
- The system, first of its kind in the country, was developed indigenously in by Indian Institute of Tropical Meteorology, Pune and operationalized by IMD.
- It will also measure sun's UV-Index, PM1 and Mercury in addition to monitoring and forecasting regular air quality.
- In addition to regular air quality parameters like PM2.5, PM10, Sulphur Dioxide, Ozone, Nitrogen Oxides, Carbon Monoxide, the system will also monitor the existence of Benzene, Toluene and Xylene.
- Based on UVI, skin advisories will be issued on display.



# SAFAR

### Dhole

- Wildlife scientists from Wildlife Institute of India (WII) have recently satellite- collared a dhole, the Indian wild dog, for the first time.
- The satellite transmitter will help to study the habits of the endangered species.
- Dhole is native to Bangladesh, Bhutan, Cambodia, China, India, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Nepal, and Thailand.
- It is included in CITES – Appendix II (2013) and are legally protected in the countries where they occur.
- It is listed as “Endangered” under IUCN red list of Threatened species.





### **Digital Knowledge on Bird Species**

- The study was carried out with intent to evaluate the “digital accessible knowledge” of bird species occurrences.
- They explored two sources - Global Biodiversity Information Facility and eBird.
- Global Biodiversity Information Facility (GBIF) is a network funded by the world’s governments focused on making scientific data on biodiversity available online.
- eBird is the world’s largest biodiversity-related citizen science project where users contribute information on bird sightings.

### **Karnataka the top State in renewable energy**

- With 27% of its power generation coming from renewable energy, Karnataka has emerged the leading State for renewable energy in India this year, pipping Tamil Nadu.

### **Pangolin**

- A special unit of the Odisha Police has launched a drive to bust an international syndicate that illegally trades pangolin.
- Pangolins are nocturnal mammals, often called “scaly anteaters,” are covered in tough, overlapping scales.
- These burrowing mammals eat ants and termites using an extraordinarily long tongue, and are able to quickly roll themselves up into a tight ball when threatened.
- There are eight different pangolin species can be found across Asia and sub-Saharan Africa.
- They are the most trafficked mammal in the world.
- They are listed as "Endangered" in IUCN red list of threatened species.



- The scales of the pangolin are sold raw or fried in Asia for as much as \$500 per kilogram for treating asthma and migraines.
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international intergovernmental agreement to ensure that international trade in specimens of wild animals and plants does not threaten their survival.
- TRAFFIC is the wildlife trade monitoring network, which is a non-governmental organization working globally on trade in wild animals and plants in the context of both biodiversity conservation and sustainable development.

### **Biological Invasions**

- Biological Invasions, an international journal dedicated to the patterns and processes by which organisms invade ecosystems they are not usually found in.
- As many as 471 plant species that are alien or exotic — not native to India — are 'naturalised
- At 332, Tamil Nadu has the highest number of naturalised exotics, followed by Kerala (290), while Lakshadweep has the least (17).
- Naturalised species reproduce naturally in the environments they colonise. Invasive species do this so prolifically that they alter the workings of the natural ecosystems they colonise or invade.
- A majority of these naturalised plants are herbs such as the invasive Siam weed *Chromolaena odorata*, native to south and Central America.

### **Invasive species**

- Alien species which migrate to a new geography from their native lands can be a huge risk to both agriculture and wildlife. They could be insects, trees, weeds or viruses.
- Many of them tend to die out in new environments. Some become naturalised, like a few eucalyptus species have in India. Naturalised aliens maintain their population and do not pose a great risk to biodiversity.



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- But a small percentage of aliens, like the fall armyworm, turn invasive, which means they spread uncontrollably. The absence of natural predators from their original homes allows them to disrupt ecosystems and cause massive economic losses.
- The first line of defence is a quarantine system, under which imports of grains and plants that can host such insects are inspected at shipping ports, airports and land border crossings. In India, this responsibility lies with the Directorate of Plant Protection, Quarantine & Storage, with its headquarters in Faridabad, Haryana.
- The alien species richness increased with isolation because of with increasing geographical isolation there was a decrease in the resistance of the resident species.
- In the absence of competitor species from the mainland, these [island] species do not need to sustain their defence mechanisms and can reallocate the energy into other characteristics that they benefit from. Hence, many island species lose their defence mechanisms or become less competitive.
- Alien species bring in traits that native species lack. "They [alien species] have advantages compared to native island species due to their evolutionary history and the fact that they have evolved in a context where competition for resources is stronger and where other threats are more prominent,"

### **World Network of Biosphere Reserves**

- The Khangchendzonga Biosphere Reserve in Sikkim has been included in the UNESCO designated World Network of Biosphere Reserves (WNBR).
- The decision was taken at the 30th Session of International Coordinating Council (ICC) of Man and Biosphere (MAB) Programme of UNESCO held at Palembang, Indonesia.
- It has become the 11th Biosphere Reserve from India to be included in WNBR.
- The core zone of Khangchendzonga National Park was designated a World Heritage Site in 2016 under the 'mixed' category.



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- The biosphere reserve is one of the highest ecosystems in the world, reaching elevations of 1, 220 metres above sea-level.

### **Biosphere Reserves**

- Biosphere Reserve is an international designation by UNESCO for representative parts of natural and cultural landscapes extending over large area of terrestrial or coastal/ marine ecosystems or a combination thereof.
- They are living examples of how human beings and nature can co-exist while respecting each other's needs.
- India is a signatory to the landscape approach supported by UNESCO's Man and Biosphere (MAB) programme.
- Biosphere Reserve Programme is being implemented by Government of India since 1986.
- The financial assistance under the programme is given in 90:10 ratio to the North Eastern Region States and 3 Himalayan states and in the ratio of 60:40 to other states.
- The State Government prepares the Management Action Plan which is approved and monitored by Central MAB Committee.

### **PARIVESH**

- Pro-Active and Responsive facilitation by Interactive, Virtuous and Environmental Single-window Hub was recently launched by the Prime Minister of India.
- It is a Single-Window Integrated Environmental Management System, launched on the occasion of World Biofuel Day.
- It has been designed, developed and hosted by the Ministry of Environment, Forest and Climate Change (MOEFCC), with technical support from National Informatics Centre, (NIC).
- It has been rolled out for online submission, monitoring and management of proposals seeking various types of environment clearances from Central, State and district-level authorities.



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- It enables project proponents, citizens to view, track and interact with scrutiny officers, generates online mail alerts to state functionaries in case of delays beyond stipulated time for processing of applications.

### **DNA Barcoding**

- Scientists from Delhi University (DU) and the Wildlife Institute of India has collected genetic data of frogs and analysed it using DNA barcoding.
- The researchers found that the ornate narrow-mouthed frog, thought to be widely-distributed in Asia, is seen only in peninsular India and Sri Lanka.
- The study reveals that the ornate narrow-mouthed frog is present only in Tamil Nadu, Kerala, Karnataka, Maharashtra and Andhra Pradesh.
- The study would enable IUCN to review the conservation status of this group of frogs across South Asia at the earliest opportunity.

### **India's first genetic bank for wildlife conservation**

- India has got its first scientific and most modern national wildlife genetic resource bank.
- It is located in Hyderabad at the Laboratory for the Conservation of Endangered Species (LaCONES), a research wing of the Centre for Cellular and Molecular Biology (CCMB).
- The state-of-the-art bank is equipped with sophisticated equipment to preserve the genetic resources that could be utilised to virtually resurrect an animal species in case it goes extinct.
- The bank that contains genetic resources of about 250 wildlife species.
- The Genetic Resource Bank will store genetic material of Indian species. It will also help in protecting India's biodiversity and environment.



### **Laboratory for the Conservation of Endangered Species (LaCONES)**

- The Laboratory for the Conservation of Endangered Species (LaCONES) is India's only facility for conservation of endangered species.
- It is a dedicated facility of CSIR's Centre for Cellular and Molecular Biology (CCMB) in Hyderabad.
- It was set up in 2007 with the support of Department of Biotechnology, Central Zoo Authority, Council of Scientific and Industrial Research (CSIR) and Govt. of Andhra Pradesh.
- It uses modern biotechnologies for conservation of endangered wildlife.
- It supports both in-situ habitat preservation and Ex-situ conservation through captive breeding in controlled environment to restock original wild populations.
- It is the only laboratory in India that has developed methods for collection and cryopreservation of semen and oocytes from wildlife and successfully reproducing endangered blackbuck, spotted deer and Nicobar pigeons.
- It has established Genetic Resource Bank for Indian wildlife and collected genetic resources from 23 species of Indian wild animals.

### **The Andamans' new colonisers**

- The Indian bull frog, a recent arrival from the mainland, is steadily occupying the islands' ecosystem and threatening the local economy.
- The bullfrog, found widely in mainland India and protected under Schedule IV of the Indian Wildlife Act 1972, is making the most of a free run that it's enjoying in the erstwhile penal colony.
- With an average life span of seven years, and time to sexual maturity of 10-12 months, their population can dramatically shoot up in a very short time, which is precisely what happened once they landed in the islands.



### **Colonisers among the natives**

- Bullfrogs are found all over mainland India, but it is in the unique ecosystem of the islands that it becomes a major threat.
- Unlike the mainland, resources on the islands are scarce for big animals, while natural calamities are more frequent.
- The wildlife here has evolved in a miniature setting: there are no large herbivores (the largest is the Andaman wild pig) or large carnivores.
- “Islands have fewer species, but their natures make them irreplaceable. They are found nowhere else in the world... This makes the entire food web in the islands very different from that of the mainland,”



### **Fall Armyworm**

- It is an invasive agricultural pest discovered in the Maize field in the State of Telangana.
- It was first reported in Karnataka by the Indian Council for Agricultural Research.
- It is a major maize pest in North America and it arrived in Africa in 2016.
- It has spread to Central and Western Africa in 2016 and has proved very hard to control.
- It prefers Maize, but can feed on 80 species of plants, including rice, sorghum, millet, sugarcane and cotton.
- It can be controlled with insecticides, through natural enemies or by inter-cropping.

### **BAULA' PROJECT AT DANGAMAL**

- 'Baula' is the Oriya term for Saltwater Crocodile. At Dangmal in Bhitarkanika sanctuary, salt-water crocodile eggs have been collected locally; and young crocodiles have been released in the creeks and the estuaries; and more than 2200 crocodiles have been released in phases since 1977.
- This operation has been reasonably successful and the crocodile population in the Bhitarkanika river system has gradually been built up. Above 50 released female Saltwater Crocodiles have laid eggs in the wild and bred successfully.
- The annual census conducted in the river systems of Bhitarkanika wildlife sanctuary in January 2004 indicated that there were 1308 Saltwater crocodiles and is on increasing trend.



### **Satkosia Wildlife Sanctuary**

- A two-year-old Royal Bengal tigress from Bandhavgarh National Park in Madhya Pradesh was released into the Satkosia Wildlife Sanctuary in Odisha's

### **Hilsa**

- It is the most priced variety of fish, originates in the coastal waters of Myanmar.
- It travels to the mouth of the Ganga in West Bengal, Padma and Meghna rivers in Bangladesh to lay eggs in fresh water during the monsoon.



- It is a sensitive species and its breeding ground is mostly concentrated at the confluence of river and oceanic waters.
- After breeding in freshwater, the fish makes its way to seawater by undertaking a return journey to the confluence points.
- It belongs to the family of Clupeidae.
- It is known as “King of Fish” due to its soft oily texture and mouth-watering flavour.

### **BNHS to open its first regional centre near Chilika Lake**

- The Bombay Natural History Society (BNHS), one of India’s premier avian research institutes, will start operating its first regional centre or avifauna observatory on the campus of Wetland Research and Training Centre near Chilika Lake (Asia’s largest brackish water lagoon), Odisha

### **Madhya Pradesh Government seeks revival of Cheetah Reintroduction Project**

- Madhya Pradesh forest department has written to National Tiger Conservation Authority (NTCA) to revive its Cheetah Reintroduction Project to reintroduce Cheetahs in Nauradehi sanctuary located in Sagar district of state. The ambitious project was conceived in 2009 but had hit roadblock for want of funds.
- Cheetah, fastest land animal was declared extinct in India in 1952.
- India’s last spotted Asiatic cheetah (*Acinonyx jubatus venaticus*) had died in Chhattisgarh in 1947.
- This species was hunted into extinction by British colonial officers and Indian royalty. According to earlier action plan, around 20 cheetahs were to be trans-located to Nauradehi from Namibia in Africa.
- Namibia Cheetah Conservation Fund had then showed its willingness to donate felines to India. However, State was not ready to finance plan contending that it was the Centre’s project.





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- In 2011, NTCA, a statutory body under Union Environment Ministry had committed Rs.50 crore to State for this project.
- Dehradun based Wildlife Institute of India (WII) also had prepared Rs. 260 crore Cheetah Reintroduction Project in 2012.
- It was estimated that Rs. 25 crore to Rs. 30 crore will be needed to build enclosure with huge boundary walls in area of 150 sq km for introduction and protection of Cheetahs in Nauradehi before releasing them in wild.
- Nauradehi sanctuary was found to be most suitable area for reintroduction of Cheetahs as its forests are not very dense to restrict fast movement of Cheetahs and also has abundant prey base.

### **Cheetah Re-introduction Project**

- The central government had set up an expert panel for reintroducing the cheetah in India. The panel recommended that the home of the fastest animal could be Kuno Palpur in Madhya Pradesh, Velavadar National Park in Gujarat and TalChapar sanctuary in Rajasthan.
- NTCA, a statutory body under Union Environment Ministry had committed Rs.50 crore to State for this project in the year 2011. Cheetah Re-introduction Project was conceived in the year 2012.

### **Facts about Cheetah**

- The cheetah, *Acinonyx jubatus*, is one of the oldest of the big cat species, with ancestors that can be traced back more than five million years to the Miocene era.
- The cheetah is also the world's fastest land mammal, an icon of nature. With great speed and dexterity, the cheetah is known for being an excellent hunter, its kills feeding many other animals in its ecosystem—ensuring that multiple species survive.
- The country's last spotted feline died in Chhattisgarh in 1947. Later, the cheetah — which is the fastest land animal — was declared extinct in India in 1952.



### **India's first interstate connected wind power project commissioned in Bhuj**

- 126 MW wind power capacity, part of India's first inter-state transmission system (ISTS) auction, was commissioned in Bhuj, Gujarat.
- It was part of India's first ISTS auction was conducted by state-run Solar Energy Corporation of India Ltd (SECI) in February 2017.



### **NTCA to take over Corbett Tiger Reserve**

- Pointing to an "alarming trend" of tiger deaths, the Uttarakhand High Court has asked if the National Tiger Conservation Authority (NTCA) could take over the management of the Corbett Tiger Reserve "as an interim measure".
- The court also asked the NTCA if the tigers could be relocated "to save them from poaching".

### **Non-Attainment Cities**

- Non-attainment cities are those cities marked by Central Pollution Control Board that have fallen short of the National Ambient Air Quality Standards (NAAQS) for PM 10 and NO2 over 5 years.
- There are 94 non-attainment cities in the country.
- These cities were asked as part of the National Clean Air Campaign (NCAP) to implement measures aimed at mitigating air pollution.
- The measures include control and mitigation measures related to vehicular emissions, re-suspension of road dust and other fugitive emissions, bio-mass, municipal solid waste burning, industrial pollution, and construction and demolition activities.
- The aim of pollution mitigation measures was to cut overall pollution in these cities by 35% in the next three years.



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### **National Ambient Air Quality Standards (NAAQS)**

- Air (Prevention and Control of Pollution) Act empowers Central Pollution Control Board to set standards for the quality of air.
- Current NAAQS were notified by CPCB in the year 2009.
- Pollutants covered under NAAQS are Sulphur Dioxide (SO<sub>2</sub>), Nitrogen Dioxide (NO<sub>2</sub>), Particulate Matter (PM 10, PM 2.5), Ozone (O<sub>3</sub>), Lead (Pb), Carbon Monoxide (CO), Ammonia (NH<sub>3</sub>), Benzene (C<sub>6</sub>H<sub>6</sub>), Benzo(a), Pyrene (BaP), Arsenic(As), Nickel (Ni).

### **National Air Quality Index**

- NAQI, launched by CPCB, is a number used to communicate to the public how polluted the air currently is or how polluted it is forecasted to become.
- The classifications of air quality are part of a 6 grade, colour coded taking into account 8 pollutant levels.
- These pollutants are:
  - Ground-level Ozone or O<sub>3</sub>
  - Particulate Matter (soot and dust) - PM 2.5 and PM 10
  - Carbon Monoxide or CO
  - Sulphur Dioxide or SO<sub>2</sub> and
  - Nitrogen Dioxide or NO<sub>2</sub>
  - Ammonia or NH<sub>3</sub>

### **India's National Redd+ Strategy**

- Complying with the UNFCCC decisions on REDD+, India has prepared its National REDD+ Strategy.
- The Strategy builds upon existing national circumstances which have been updated in line with India's National Action Plan on Climate Change, Green India Mission and India's Nationally Determined Contribution (NDC) to UNFCCC.

### **REDD+:**

- In simple terms, REDD+ means “Reducing Emissions from Deforestation and forest Degradation”, conservation of forest carbon stocks, sustainable management of forests, and enhancement of forest carbon stocks in developing countries.
- REDD+ is a mechanism developed by Parties to the United Nations Framework Convention on Climate Change (UNFCCC).
- It creates a financial value for the carbon stored in forests by offering incentives for developing countries to reduce emissions from forested lands and invest in low-carbon paths to sustainable development.
- Developing countries would receive results-based payments for results-based actions. REDD+ goes beyond simply deforestation and forest degradation and includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks.

### **3D Printed Reef**

- World's largest 3D-printed reef was installed in Maldives to help save corals.
- It was designed to resemble reef structures typically found in the Maldives.
- It aims to help coral reefs survive the ravages of climate change and warming waters.
- 3D printing technology offers a new way of saving the corals to fight with global warming, bleaching and environmental pollution.



### **Conservation of Western Ghats**

- The Western Ghats Ecological Expert Panel had earlier proposed “much larger areas for being included in the eco-sensitive zone” though the Kasturirangan-led High Level Working Group, also appointed by the MoEF to look into the WGEEP report, had reduced it.



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- The Ministry had accepted the Kasthurirangan report and issued the draft notifications on ecologically sensitive zones.

### **Gadgil Committee**

- It defined the boundaries of the Western Ghats for the purposes of ecological management.
- It proposed that this entire area be designated as ecologically sensitive area (ESA). Within this area, smaller regions were to be identified as ecologically sensitive zones (ESZ) I, II or III based on their existing condition and nature of threat.
- It proposed to divide the area into about 2,200 grids, of which 75 per cent would fall under ESZ I or II or under already existing protected areas such as wildlife sanctuaries or natural parks.
- The committee proposed a Western Ghats Ecology Authority to regulate these activities in the area.
- Ban on the cultivation of genetically modified in the entire area.
- Plastic bags to be phased out in three years.
- No new special economic zones or hill stations to be allowed.
- Ban on conversion of public lands to private lands, and on diversion of forest land for non-forest purposes in ESZ I and II.
- No new mining licences in ESZ I and II area.
- No new dams, thermal power plants or large-scale wind power projects in ESZ I.
- No new polluting industries in ESZ I and ESZ II areas.
- No new railway lines or major roads in ESZ I and II areas.
- Strict regulation of tourism.
- Cumulative impact assessment for all new projects like dams, mines, tourism, housing.



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### **Kasturirangan committee**






- None of the six concerned states agreed with the recommendations of the Gadgil Committee, which submitted its report in August 2011.
- In August 2012, then Environment Minister constituted a High-Level Working Group on Western Ghats under Kasturirangan to “examine” the Gadgil Committee report in a “holistic and multidisciplinary fashion in the light of responses received” from states, central ministries and others.
- Its report revealed that of the nearly 1,750 responses it had examined 81% were not in favour of the Gadgil recommendations. In particular, Kerala had objected to the proposed ban on sand mining and quarrying, restrictions on transport infrastructure and wind energy projects, embargos on hydroelectric projects, and inter-basin transfer of river waters, and also the complete ban on new polluting industries.
- A ban on mining, quarrying and sand mining.
- No new thermal power projects, but hydro power projects allowed with restrictions.
- A ban on new polluting industries.
- Building and construction projects up to 20,000 sq m were to be allowed but townships were to be banned.
- Forest diversion could be allowed with extra safeguards.



**DEFINITION:**



Eco.sensitive areas are **ecologically and economically important**, but vulnerable even to mild disturbances, and hence demand careful management. These areas are critical to the maintenance of productive and diverse plant and wildlife populations.

**FEATURES OF ECO SENSITIVE AREAS:**

-  Biologically and ecologically rich, valuable or unique
-  Largely irreplaceable if destroyed
-  High value to human societies
-  Maintains the ecological stability of the area
-  Conserves biological diversity

**CONTENTS OF ESA:**

- **Sacred forests protecting origins of rivers** (e.g. Bhimashankar in Pune District)
- **Important breeding habitats** (e.g. Kokkre – Bellur Pelicanry in Mandya District, Karnataka)

Source: wildtrails.in

## Maralal Camel Derby

The Maralal Camel Derby is an annual event, held midyear just outside of Maralal town.

This is Kenya's best known and most prestigious camel race, attracting both local and international competitors.



### **Indian Roofed Turtle**

- It is a species of turtle, protected under Schedule 1 of Wildlife Protection Act, 1972.
- It is found in India, Bangladesh, Nepal and Pakistan.
- In India, it is found in Ganges, Brahmaputra and Indus River drainages.
- It is listed on CITES Appendix I.
- It is listed as “Least Concern” in the IUCN list of threatened species.
- The protected area in Jalpaiguri is known for protecting this species.
- In addition to it, it is also found in Lota devi temple located on the basin of River Karala in Jalpaiguri.
- Society for Protecting Ophiofauna & Animal Rights (SPOAR), an NGO and the Wildlife Trust of India (WTI) has led an initiative to save the species from severe pollution in the river.
- They have installed the Kurma avatar (form of turtle) of Lord Vishnu on the outskirts of river to reduce pollution and to encompass the religious belief.



### **Integrated Development of Wildlife Habitats (IDWH)**

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

### **Bonnethead shark**

- It is the first known omnivorous shark species identified by scientists
- 60% of its diet consists of seagrass. The species graze upon seagrass, in addition to eating bony fish, crabs, snails and shrimp.
- The bonnethead shark is abundant in the shallow waters of the Western Atlantic North of American shore, and the Gulf of Mexico.
- Though small by shark standards, adult females — the larger of the sexes — can still reach an impressive five feet long.
- Lacking the kind of teeth best suited for mastication, the shark may rely on strong stomach acids to weaken the plants' cells so the enzymes can have their digestive effects.



### **International Whaling Commission**

- The 67th biennial meeting of International Whaling Commission (IWC) is going to be held in Brazil.
- IWC was set up for the proper conservation of whale stocks and orderly development of the whaling industry.
- Its objectives are
  - Setting out catch limits by species and area which may be zero as it the case for commercial whaling,
  - Designating specified areas as whale sanctuaries,
  - Protection of calves and females accompanied by calves,
  - Prescribe open and closed seasons and areas for whaling and restrictions on hunting methods.
- The headquarters of the IWC is in Impington, near Cambridge, England.
- Currently, 88 nations are members to this commission including India.



- In 1982 the IWC adopted a moratorium on commercial whaling, which is opposed by Japan, Russia, and other nations.
- It allows non-zero whaling quotas for aboriginal subsistence and member nations may issue 'Scientific Permits' to their citizens.
- In the upcoming meeting, Brazil is going to push for "Florianopolis Declaration".
- The declaration insists that commercial whaling is no longer a necessary economic activity and would allow the recovery of all whale population to pre-industrial whaling levels.

### **Snow leopard**

- They are listed as Vulnerable on the IUCN Red List of Threatened Species.
- They inhabit alpine and subalpine zones at elevations from 3,000 to 4,500 m (9,800 to 14,800 ft). In the northern range countries, they also occur at lower elevations.
- The snow leopard is the state animal of Uttarakhand and the National Heritage Animal of Pakistan.
- Their habitat extends through twelve countries: Afghanistan, Bhutan, China, India, Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Pakistan, Russia, Tajikistan, and Uzbekistan. China contains as much as 60% of all snow leopard habitat areas.
- In India, their geographical range encompasses a large part of the western Himalayas including the states of Jammu and Kashmir, Himachal Pradesh, Uttarakhand and Sikkim and Arunachal Pradesh in the eastern Himalayas.
- The snow leopard, like all big cats, is listed on Appendix I of the Convention on International Trade of Endangered Species (CITES), which makes trading of animal body parts (i.e., fur, bones and meat) illegal in signatory countries. It is also protected by several national laws in its range countries.
- Global Snow Leopard Forum, 2013: 12 countries encompassing the snow leopard's range (Afghanistan, Bhutan, China, India, Kazakhstan, Kyrgyz Republic, Mongolia, Nepal, Pakistan, Russia, Tajikistan, and Uzbekistan).





- Bishkek Declaration: To protect the species and its environment.
- Global Snow Leopard and Eco-system Protection Program: It is a joint initiative of range country governments, international agencies, civil society, and the private sector. Goal — secure the long-term survival of the snow leopard in its natural ecosystem.

### 'Pondicherry shark'

- Researchers recently spotted 'Pondicherry shark', an endangered species protected under the provisions of the Wildlife (Protection) Act, in the East Godavari River Estuarine Ecosystem region.
- Scientifically known as *Carcharhinus hemiodon*, it belongs to the Carcharhinidae family with a growth of 3.3 feet.
- Known as 'Pala Sora' in the local parlance, the Pondicherry Shark is on the verge of extinction even according to the conventional fishermen.
- The International Union for Conservation of Nature (IUCN) has listed the Pondicherry shark as Critically Endangered.
- The shark is among the 25 "most wanted lost" species that are the focus of Global Wildlife Conservation's "Search for Lost Species" initiative.



### Whale Sanctuary

- Whale Sanctuary was proposed in South Atlantic by 39 countries in International Whaling Commission.
- It was meant to provide haven for endangered marine mammals.
- The idea was proposed by Brazil in 2001 in IWC meeting.
- It was co-sponsored by Argentina,







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Gabon, South Africa and Uruguay.

- In the recently concluded session of IWC in Brazil, pro-whaling nations blocked the proposal of setting up of sanctuary.
- Pro-whaling nations include Japan and Russia.

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### **Nahargarh Biological Park**

- Rajasthan's first lion safari has been inaugurated at Nahargarh Biological Park.
- The park is located on Delhi-Jaipur National Highway in the Aravalli foothills, nearly 12 kilometers from state capital Jaipur.
- Lions in this park were brought from Junagarh, Gujarat under an exchange programme.
- The park will serve for breeding lions and also centre of attraction for tourists. It will provide new habitat to lions and also add tourism venue to the Pink City.



### **Chiller Star Labelling Programme**

- A Chiller is a machine that removes heat from a liquid via a vapor-compression cycle.
- Chillers are used extensively for space conditioning of buildings and for industrial process cooling applications.
- It is energy intensive system and contributes to more than 40% of total energy consumption in commercial buildings.
- Chiller Star labelling programme was recently launched by Bureau of Energy Efficiency (BEE).
- It envisages providing star rating to chillers in terms of its energy performance.
- Through this programme, it is estimated that more than 500 million units of electricity would be saved along with reduction of Greenhouse Gas emission (GHG) of 0.5 million-ton equivalent by 2019.



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### **Bureau of Energy Efficiency**

- Bureau of Energy Efficiency (BEE) was set up under the provisions of Energy Conservation Act, 2001.
- Its mission is to assist in developing policies with the primary objective of reducing energy intensity of the Indian Economy.
- Energy Conservation Act provides for regulatory and promotional functions of BEE.
- BEE is responsible for
- Create awareness and disseminate information on energy efficiency and conservation
- Promote innovative financing of energy efficiency projects
- Give financial assistance to institutions for promoting efficient use of energy and its conservation
- Prepare educational curriculum on efficient use of energy and its conservation
- Implement international co-operation programmes relating to efficient use of energy and its conservation.

### **CPCB report on river pollution**

- Increase in numbers: The number of polluted stretches of the country's rivers has increased to 351 from 302 two years ago, and the number of critically polluted stretches — where water quality indicators are the poorest — has gone up to 45 from 34.
- Several of the river's stretches — in Bihar and Uttar Pradesh — are actually far less polluted than many rivers in Maharashtra, Assam and Gujarat. These three States account for 117 of the 351 polluted river stretches.
- The most significant stretches of pollution highlighted by the CPCB assessment include the Mithi river — from Powai to Dharavi — with a BOD (Biochemical Oxygen Demand) of 250 mg/l; the Godavari — from Someshwar to Rahed — with a BOD of 5.0-80 mg/l; the Sabarmati — Kheroj to Vautha — with a BOD of 4.0-147 mg/l; and the Hindon — Saharanpur to Ghaziabad — with a BOD of 48-120 mg/l.



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### **Pacific Asia Travel Association gold awards:**

- Kerala Tourism has won two prestigious gold awards of Pacific Asia Travel Association (PATA) for its innovative marketing campaigns.
- These awards were won by Kerala Tourism's Yalla Kerala print campaign and Live Inspired Posters under PATA's Travel Advertisement Print and Travel Poster categories respectively.
- Both campaign and posters were developed and designed by Stark Communications which is advertising agency of Kerala Tourism.
- These awards are given by PATA and are sponsored by Macau Government Tourism Office (MGTO).
- The Awards are presented to outstanding entries in four principal categories: Marketing; Education and Training; Environment, and Heritage and Culture.
- These awards are presented every year in recognition of the achievements of 25 separate organisations and individuals.
- Khan al-Ahmar is in the 60% of the West Bank that is known as Area C and remains under full Israeli control. Area C is home to about 4,00,000 Israeli settlers and an estimated 1,50,000 to 2,00,000 Palestinians.
- Khan al-Ahmar is located a few dozen metres from a four-lane highway that runs east-west, effectively slicing the West Bank in half at a narrow waist and linking Jerusalem with the Jordan Valley.

### **Green Agriculture project**

- As four of the 35 biodiversity hotspots are located in India, it is biodiversity-rich.
- The Green Agriculture project implemented by the Indian government and the Food and Agricultural Organisation (FAO) takes a novel approach to support the NBAP and synergise biodiversity conservation, agriculture production and development.
- It is being implemented in five landscapes adjoining Protected Areas/Biosphere Reserves: Madhya Pradesh, Mizoram, Odisha, Rajasthan and Uttarakhand.



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- It envisages a transformation in Indian agriculture for global environmental benefits by addressing land degradation, climate change mitigation, sustainable forest management, and biodiversity conservation.
- The landscape approach will aim to restore traditional knowledge systems, such as the conservation of common property resources.
- Examples include the Orans of Rajasthan and the village safety and supply reserves in Mizoram. Traditional farming systems such as jhum encouraged crop diversity. However, climate change and shortened fallow cycles are undermining jhum cultivation sustainability. Participatory learning tools will encourage farmers to adopt more sustainable indigenous soil conservation.

### **India Cooling Action Plan (ICAP)**

- Union Environment Ministry has recently released India Cooling Action Plan (ICAP).
- ICAP addresses cooling requirement across sectors and lists out actions which can help reduce the cooling demand.
- India is the first country in world to develop such a document.
- Its goal is to provide sustainable cooling and thermal comfort for all while securing environmental and socio-economic benefits for the society.
- This will help in reducing both direct and indirect emissions.
- The interventions under the action plan includes,
  - Recognition of “cooling and related areas” as a thrust area
  - Reduction of cooling demand across sectors
  - Reduction of refrigerant demand
  - Training and certification of 100,000 servicing sector technicians by the year 2022-23, in synergy with Skill India Mission
  - Reduction of cooling energy requirements

### **Global Environment Facility**

- The Global Environment Facility was established on the eve of the 1992 Rio Earth Summit to help tackle our planet’s most pressing environmental problems.



- It is an international partnership of 183 countries, international institutions, civil society organizations and the private sector that addresses global environmental issues.
- GEF funds are available to developing countries and countries with economies in transition to meet the objectives of the international environmental conventions and agreements.
- The World Bank serves as the GEF Trustee, administering the GEF Trust Fund.
- It is a FINANCIAL MECHANISM for five major international environmental conventions:
  - The Minamata Convention on Mercury,
  - The Stockholm Convention on Persistent Organic Pollutants (POPs)
  - The United Nations Convention on Biological Diversity (UNCBD)
  - The United Nations Convention to Combat Desertification (UNCCD)
  - The United Nations Framework Convention on Climate Change (UNFCCC).

### **Why is in news?**

- The government along with United Nations body FAO has launched an agriculture project with \$33.5 million grant from Global Environment Facility (GEF) that seeks to bring transformative change in the farm sector through conservation of biodiversity and forest landscapes.

### **Neelakurinji plant**

- Neelakurinji is a tropical plant species. It is native to Shola forests in Western Ghats.
- It is also seen in Shevroys Hills in Eastern Ghats, Anamalai hills and Agali hills in Kerala and Sanduru hills in Karnataka.



- It grows at height of 30 to 60 cm on hills slopes at an altitude of 1300 to 2400 meters where there is no tree forest.
- The flowers of Neelakurinji are purple-blue in colour and blooms once in 12 years.
- The flower has no smell or any medicinal value. It is because of these flowers, Nilgiri hills in southern tip of Western Ghats are called Blue Mountains.
- It is rarest of rare plant species that grows in Western Ghats and does not grow in any other part of the world.
- It has been categorized as endangered species. In ancient Tamil literature, kurinji flowers symbolize love. Paliyan tribal people living in Tamil Nadu use this flower bloom as reference to calculate their age.
- Tamil Nadu government has announced Scheme for protection of exotic Neela kurinji (*Strobilanthus kunthianus*) plants that flower only once in 12 years.
- This scheme comes following complaints that these rare and ecologically unique flowers are being packaged and sold on the commercial basis.

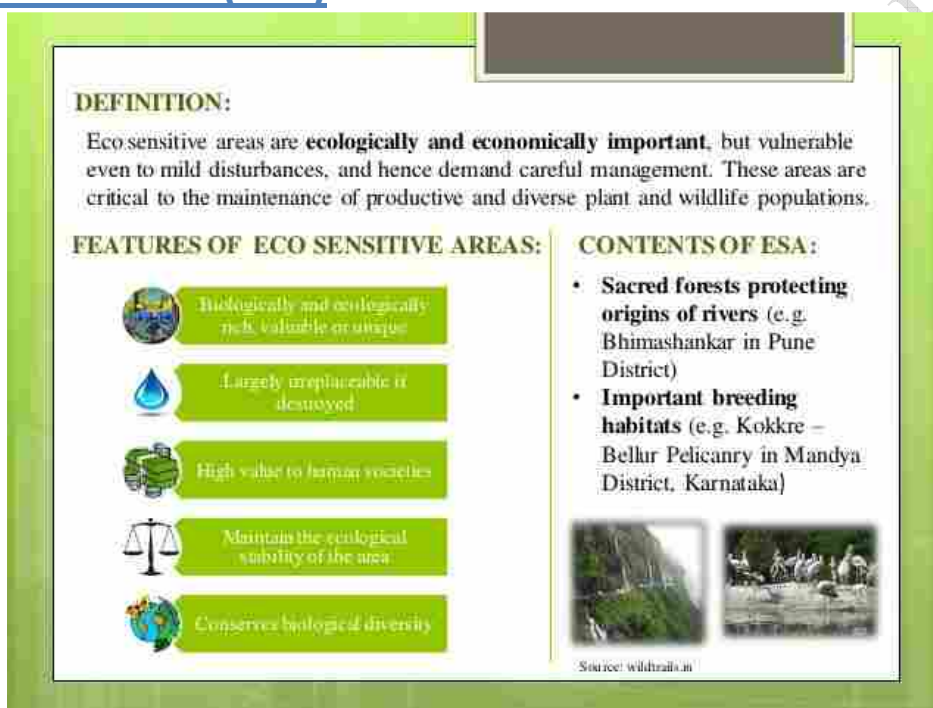
### **Hornbill Watch initiative**

- It is an interactive web interface that allows a person to report on hornbills anywhere in India.
- It was launched by Scientists from Nature Conservation Foundation and Conservation India.
- Hornbills play essential roles in forest ecosystems as dispersers of seeds of forest plants.
- There are nine hornbill species in India out of which four are found in the Western Ghats. They are,
  - Indian Grey Hornbill (endemic to India),
  - the Malabar Grey Hornbill (endemic to the Western Ghats),








- Malabar Pied Hornbill (endemic to India and Sri Lanka) and
- Widely distributed but endangered Great Hornbill.
- India also has one species that has one of the smallest ranges of any hornbill, the Narcondam Hornbill, found only on the island of Narcondam.
- The hornbills were reported from 70 protected areas in the country.

## Eco-sensitive area (ESA)




**DEFINITION:**  
Eco-sensitive areas are **ecologically and economically important**, but vulnerable even to mild disturbances, and hence demand careful management. These areas are critical to the maintenance of productive and diverse plant and wildlife populations.

**FEATURES OF ECO SENSITIVE AREAS:**

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-  Maintain the geological stability of the area
-  Conserve biological diversity

**CONTENTS OF ESA:**

- **Sacred forests protecting origins of rivers** (e.g. Bhimashankar in Pune District)
- **Important breeding habitats** (e.g. Kokkre – Bellur Pelicanry in Mandya District, Karnataka)



Source: wildtrail.in

- An ecologically sensitive area is one that is protected by the government given the sheer number of species, plants and animals endemic to the region. According to the Environment (Protection) Act, 1986, the government can prohibit industrial operations such as mining, sand quarrying and building thermal power plants in sensitive areas.
- The definition offered by the MoEF: “An ecological sensitive area is a bioclimatic unit (as demarcated by entire landscapes) in the Western Ghats wherein human impacts have locally caused irreversible changes in the structure of biological communities (as evident in number/ composition of species and their relative abundances) and their natural habitats.”



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- To categorise an area as ecologically sensitive, the government looks at topography, climate and rainfall, land use and land cover, roads and settlements, human population, biodiversity corridors and data of plants and animal species.

### **The Kasturirangan committee report:**

- The MoEF notification is based on findings of a High-Level Working Group, also known as the Kasturirangan committee. The government-appointed committee had said that the natural landscape of the Ghats constitutes only 41 per cent, or which 90 percent or 60,000 square kilometres were identified as ecologically sensitive.
- The committee suggested phasing out current mining projects within five years, or when mining leases were about to expire. It recommended that infrastructure and development projects be subject to environmental clearance, and that villages in ESA be involved in decision making regarding future projects.
- The notification was deemed too environmentally friendly by stakeholder states.

### **WAYU**

- It is a device developed by the National Environmental Engineering Research Institute (NEERI), Nagpur-based laboratory of the Council of Scientific and Industrial Research (CSIR).
- It is to address air pollution at high traffic zones, which have lot of buildings in the neighbourhood leading to restricted flow of air called "Street Canyon" effect.
- Working - A fan sucks air around the device and pollutants like dust and particulate matter are separate using three filters of different dimensions.
- The air is led into a specially designed chamber where carbon monoxide and hydrocarbons content in the air are oxidized.
- After oxidation, the pollutants will turn into less harmful carbon dioxide using activated carbon coated with titanium dioxide.
- The purified air is then ejected with force into the atmosphere so as to help dilute pollutant content in the outside air.



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### **Champions of the Earth**

- It is the UN's highest environmental honour.
- It was launched in the year 2005 by UNEP.
- It recognizes exemplary individuals and organisations whose actions created positive impact on environment.
- It recognizes laureates in the following categories,
  - Lifetime Achievement
  - Policy Leadership
  - Action and Inspiration
  - Entrepreneurial Vision
  - Science and Innovation
- In its 2018 edition, Indian Prime Minister and France President has been awarded under Policy Leadership category for their International Solar Alliance (ISA) initiative.
- Indian PM Modi has also been awarded for his pledge to eliminate single use plastic in India by 2022.
- Cochin International Airport has also been honored with the award for Entrepreneurial Vision, for its leadership in the use of sustainable energy.
- The awards will be presented during the Champions of the Earth Gala in New York City, on the sidelines of the 73rd UN General Assembly.

### **Report by Ramsar Convention**

- Ramsar convention adopted in the year 1971 that provides the framework for the conservation and wise use of wetlands and their resources.
- This intergovernmental treaty came into force in 1975.
- It has been ratified by most of the world's nations, including the U.S., China and India.
- It has designated more than 2,300 sites of international importance.
- The convention has recently issued its first-ever global report on the state of World's wetlands.
- The report is titled as "Global Wetland Outlook".
- The report found that around 35% of wetlands were lost between 1970 and 2015.





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- Wetlands include lakes, rivers, marshes and peatlands, as well as coastal and marine areas like lagoons, mangroves and coral reefs.
- In India, The Ministry of Environment, Forest and Climate Change is the nodal Ministry for wetlands conservation.
- Wetlands in India account for 4.7% of the total geographical area.

### **State Disaster Response Fund**

- Under the Disaster Management Act 2005, a financial mechanism has been set up by way of National Disaster Response Fund (NDRF) at national level and State Disaster Response Funds (SDRF) at state level.
- The funds are to meet the rescue and relief expenditure during any notified disaster.
- The funding for disaster relief is governed by the National Disaster Management Policy.
- As per the policy, the State governments have to provide disaster relief from their respective State Disaster Response Funds (SDRFs).
- Additional assistance will be provided from the National Disaster Response Fund (NDRF) only for a “calamity of severe nature”.
- SDRF has been constituted in each state in which the state had been, so far, contributing 75 per cent for general category states and 90 per cent for special category states of hilly regions.
- The Centre has announced to enhance its contribution to the (SDRF) from 75 per cent to 90 per cent for general category states with effect from April 1 this year.
- With the declaration, the contribution of all states to the SDRF fund would be only 10 per cent.
- The NDRF is funded through a National Calamity Contingent Duty levied under GST for selected goods and contribution from any person or institutions.



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### **India-United Nations Sustainable Development Framework (UNSDF)**

- India and United Nations will sign India-United Nations Sustainable Development Framework (UNSDF) for 2018-2022.
- The NITI Aayog is the national counterpart for the UN in India for the operationalization of the UNSDF.
- SDF 2018-2022 outlines the work of UN agencies in India, to support the achievement of key development outcomes that are aligned to the national priorities.
- The seven priority areas outlined in the UNSDF are,
  - Poverty and Urbanization;
  - Health, Water, and Sanitation;
  - Education and Employability;
  - Nutrition and Food Security;
  - Climate Change, Clean Energy, and Disaster Resilience;
  - Skilling, Entrepreneurship, and Job Creation; and
  - Gender Equality and Youth Development.

### **Kolkata launches first flood forecast system**

- The Kolkata Municipal Corporation, with the support of the Asian Development Bank, launched the country's first flood forecasting and early-warning system, which will provide real-time data on inundation, rainfall intensity, temperature, air quality and other climate-related data.
- This is expected to help policy-makers make informed decisions during disasters.

### **Common Risk Mitigation Mechanism**

- It is under the International Solar Alliance.
- It will be formally announced at the 24th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP 24) to be held in Poland in December.
- It has been taken over by the World Bank and it has mobilised \$1 million for preparatory work.



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- The objective of CRMM is de-risking and reducing the financial cost of renewable energy projects in ISA-member countries.
- It will act as a pooled insurance with limited liability.
- Banks and multi-lateral institutions can contribute to the fund for a marginal premium.

### **Climate Finance Leadership Initiative**

The Climate Finance Leadership initiative supports a global mobilisation of private capital in response to the challenge of climate change.

It works to fulfil the private financing objectives included in the landmark 2015 Paris Climate Change Agreement.

Paris agreement reaffirmed the goal of mobilizing at least \$100 billion per year by 2020 through a combination of public development finance and private foreign direct investment.

It will draw members from top international financial firms and corporations.

It focus on catalysing scaled-up investments in clean energy and climate resilience projects around the world, in both developed and emerging markets.

The initiative will have a one-year term culminating in a UN Climate Summit to be held in September 2019.

It will work closely with the government of France and will provide a first report to G7 Finance Ministers by July 2019.

### **Flood Forecast System**

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### **SATAT Initiative**

- It is an initiative by Ministry of Petroleum and Natural Gas.
- It is aimed at providing a Sustainable Alternative Towards Affordable Transportation (SATAT)
- It will promote the use of Compressed Bio-Gas (CBG) production plants and make available CBG in the market for use in automotive fuels.
- It will be launched in association with PSU oil marketing companies, which invites potential entrepreneurs to set up CBG plants.

### **Bio-gas**

- Is produced naturally through a process of anaerobic decomposition from waste / bio-mass sources like agriculture residue, cattle dung, sugarcane press mud, municipal solid waste, sewage treatment plant waste, etc.
- After purification, it is compressed and called CBG, which has pure methane content of over 95%.

### **Compressed Bio-Gas**

- Compressed Bio-Gas is exactly similar to the commercially available natural gas in its composition and energy potential. With calorific value (~52,000 KJ/kg) and other properties similar to CNG, Compressed Bio-Gas can be used as an alternative, renewable automotive fuel.
- Given the abundance of biomass in the country, Compressed Bio-Gas has the potential to replace CNG in automotive, industrial and commercial uses in the coming years.
- Compressed Bio-Gas can be produced from various bio-mass/waste sources, including agricultural residue, municipal solid waste, sugarcane press mud, distillery spent wash, cattle dung and sewage treatment plant waste.
- The other waste streams, i.e, rotten potatoes from cold storages, rotten vegetables, dairy plants, chicken/poultry litter, food waste, horticulture waste, forestry residues and treated organic waste from industrial effluent treatment plants (ETPs) can be used to generate biogas.
- Benefits of production of CBG on a commercial scale includes,

- Responsible waste management, reduction in carbon emissions and pollution
- Additional revenue source for farmers
- Boost to entrepreneurship, rural economy and employment
- Support to national commitments in achieving climate change goals
- Reduction in import of natural gas and crude oil
- Buffer against crude oil/gas price fluctuations

### **Green learning**

- Global Language Park ( bhasha van in Hindi) in Pune. It will be located on a one-acre plot on the premises of the Savitribai Phule Pune University (SPPU).

### **Assam to introduce methanol as cooking fuel**

- Public sector Assam Petrochemicals Limited is set to introduce – in a first in India – methanol as cleaner, cheaper alternative to liquefied petroleum gas.
- The pilot project involving 500 burners and stoves, each fuelled by a 1.2-litre canister of methanol



### **Adamant Algae**

Global warming may be affecting almost all species on Earth, but not the green algae Picochlorum. A new study published in Molecular Biology and Evolution has said that having survived in hostile and fluctuating conditions in the salt marshes and salt flats, these algae have a set of genes that may help it survive climate change.





### **Wildlife Crime Control Bureau (WCCB)**

- WCCB is statutory multi-disciplinary body under the Union Ministry of Environment, Forests and Climate Change (MoEFCC) to combat organized wildlife crime in the country.
- It was established in June 2007 by amending the Wildlife (Protection) Act (WLPA), 1972, a special Act to protect the wildlife and fauna in the country.
- It is headquartered in New Delhi and has five regional offices at Delhi, Mumbai, Kolkata, Chennai and Jabalpur; three sub-regional offices at Amritsar, Guwahati, and Cochin; and five border.
- Functions: Under Section 38 (Z) of WLPA, 1972, it is mandated to collect and collate intelligence related to organized wildlife crime and disseminate it to state and other enforcement agencies for immediate action.
- It assist foreign authorities and international organization concerned to facilitate co-ordination and universal action for wildlife crime control.
- It is tasked with capacity building of the wildlife crime enforcement agencies for scientific and professional investigation into wildlife crimes and assist states to ensure success in wildlife crimes prosecutions.
- It advises Union Government on issues relating to wildlife crimes having national and international ramifications, relevant policy and laws.
- It also assists and advises the Customs authorities in inspection of the consignments of flora & fauna as per the provisions of Wild Life Protection Act, CITES and EXIM Policy governing such an item.



### Black Spotted Turtles

- According to a recent report by TRAFFIC, India accounts for 29% of black spotted turtles seized from across seven countries in South Asia.
- Black spotted turtle or spotted pond turtle is a medium-sized freshwater turtle and native to South Asia.
- The species was once smuggled for its meat and is now sought after as an exotic pet.
- It is classified as Vulnerable by the IUCN (International Union for Conservation of Nature) Red List of threatened species.
- In India, the species is distributed across the north, northeast and a few parts of central India.
- The States are West Bengal, Assam, Bihar, Haryana, Uttar Pradesh and Uttarakhand, and parts of Madhya Pradesh, Punjab, Rajasthan and Meghalaya.
- According to TRAFFIC, in turtles seizure rate, India is followed by Thailand (19%) and Hong Kong (17%), Bangladesh (12%).



### TRAFFIC

- TRAFFIC, the wildlife trade monitoring network, is a leading non-governmental organisation working globally on trade in wild animals and plants.
- It is a strategic alliance of IUCN and World Wide Fund for Nature (WWF).
- Its mission is to ensure that trade in wild plants and animals is not a threat to the conservation of nature.
- It plays a vital role in tackling illegal wildlife trade through conducting research and analysis, advocacy and awareness work and by supporting remedial action against illegal wildlife trade.



- It is currently working in the following projects,
- ReTTA - Reducing trade threats to Africa's wild species and ecosystems through strengthened knowledge and action in Africa and beyond.
- Wildlife-TRAPS - Wildlife Trafficking Response, Assessment and Priority Setting.
- The Global Shark and Ray Initiative – It works to secure the future of our oceans through shark and ray conservation.

### **First Assembly of ISA**

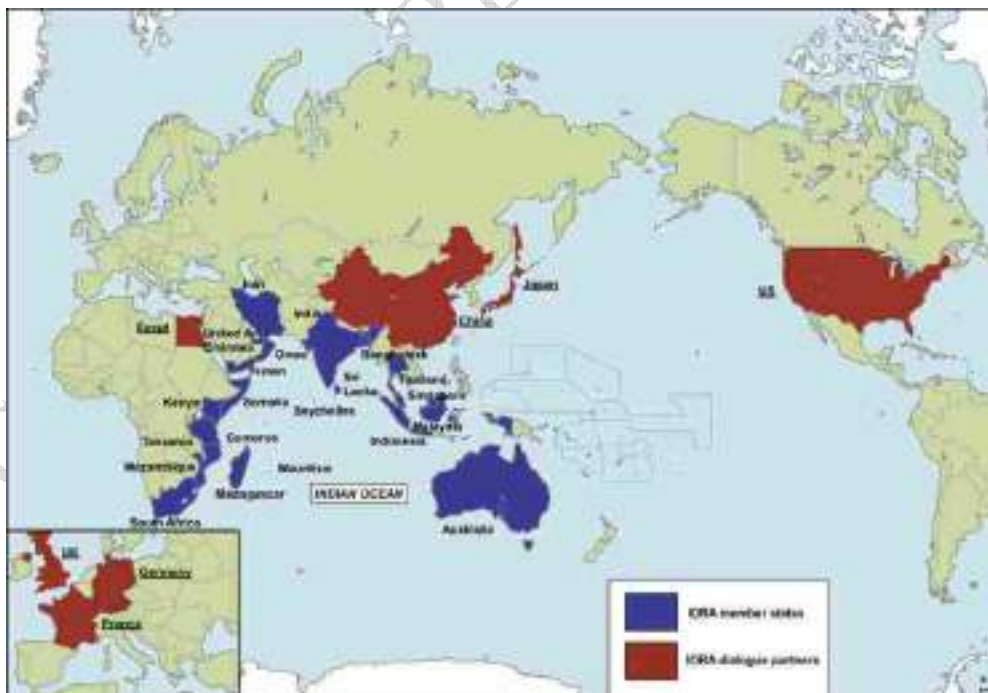
- The Ministry of New and Renewable Energy is organising the First Assembly of International Solar Alliance (ISA) in New Delhi.
- It will be inaugurated in the presence of Secretary General of United Nations.
- Ministers from countries which ratified ISA treaty framework will attend the assembly as members.
- Countries that have signed but are yet to ratify the ISA Treaty Framework will attend the Assembly as Observers.
- The assembly is the supreme decision making body of ISA.
- Initially, ISA envisaged 121 countries situated between the tropics of Cancer and Capricorn as its members.
- In the assembly, India will propose to make all United Nations members eligible for ISA membership.
- It will help induction of countries - Germany, Italy, Spain, Tunisia, Nepal and Afghanistan, which have shown interest in becoming ISA members.



### **International Solar Alliance (ISA)**

- ISA, an Indian initiative, was launched jointly by India and France on the sidelines of COP21 of UNFCCC held in Paris.
- It opened ISA Framework Agreement for signature in Marrakech, Morocco in 2016, on the side-lines of COP-22.
- After ratification by 15 countries, ISA became the first full-fledged treaty based international intergovernmental organization headquartered in India.
- Delhi Solar Agenda was adopted in the founding conference of ISA held in 2018.
- In the agenda, ISA member States have agreed to pursue an increased share of solar energy in the final energy consumption in respective national energy mix.
- The first assembly will lay the foundation of Delhi Solar Agenda.
- Till date, out of 121 prospective member countries that lie either fully or partially between the Tropics of Cancer and Capricorn, 68 countries have signed the Framework Agreement of the ISA.

### **IORA - Renewable Energy Ministerial Meeting**







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- The Indian Ocean Rim Association (IORA) was set up with the objective of strengthening regional cooperation and sustainable development within the Indian Ocean Region.
- The association comprises 21 Member States and 7 Dialogue Partners.
- India, Australia, Iran, Indonesia, Thailand, Malaysia, South Africa, Mozambique, Kenya, Sri Lanka, Tanzania, Bangladesh, Singapore, Mauritius, Madagascar, UAE, Yemen, Seychelles, Somalia, Comoros and Oman are members of IORA.
- Neither Pakistan nor Myanmar are member of IORA.
- The Coordinating Secretariat of IORA is located at Ebene, Mauritius.
- The apex body is the Council of (Foreign) Ministers (COM).
- The first Renewable Energy Ministerial Meeting was held in Abu Dhabi, UAE in the year 2014.
- India is going to host 2nd IORA Renewable Energy Ministerial meet in October, 2018.
- Ministers and delegates from all 21 member-countries are expected to participate.

### **Global Geoparks**

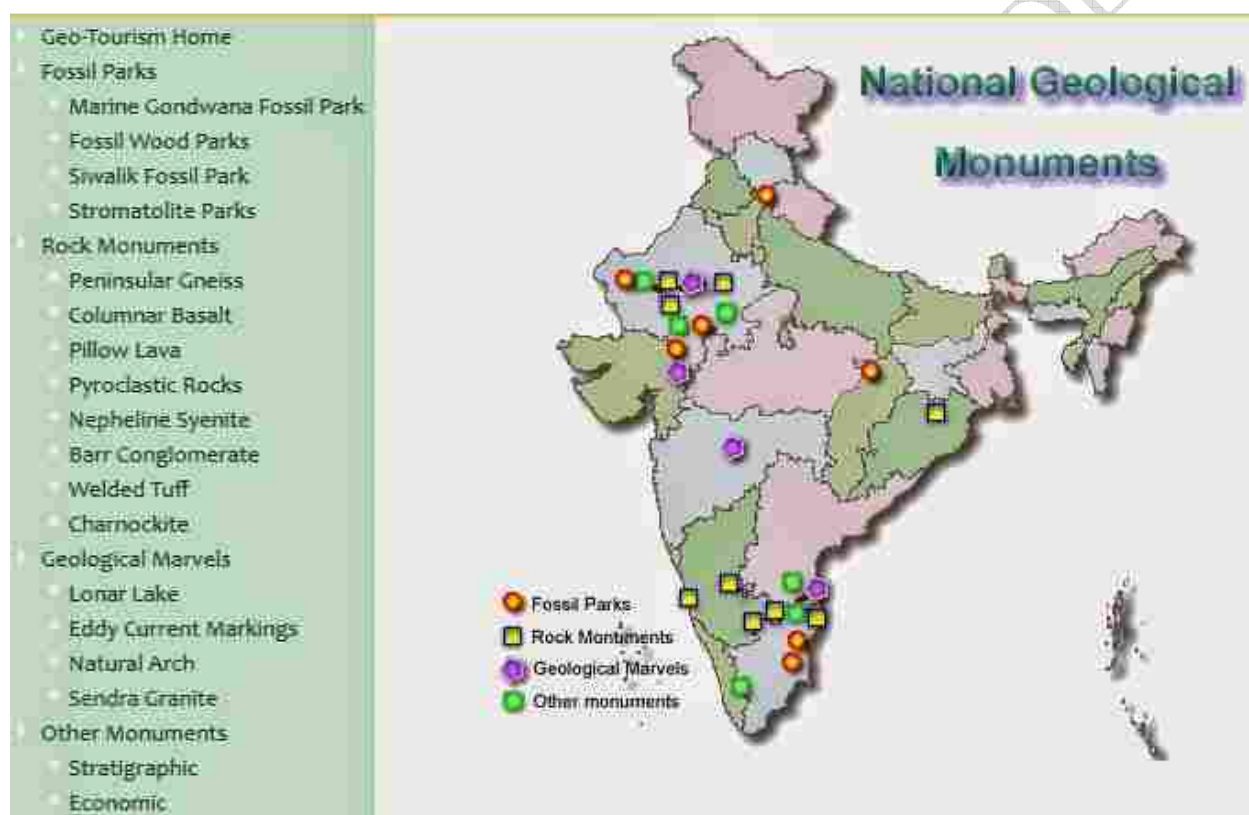
- Global Geoparks are single, unified geographical areas where sites and landscapes of international geological significance are present.
- It is a designation given by UNESCO.
- In 2004, 17 European and 8 Chinese geoparks came together at UNESCO headquarters in Paris to form the Global Geoparks Network (GGN).
- In 2015, the 195 Member States of UNESCO ratified the creation of a new label, the UNESCO Global Geoparks.
- The Geopark tag is akin to that of a 'World Heritage Site' for historical monuments that can bring famed geological features to the global stage.





- Global Geopark uses its geological heritage, in connection with all other aspects of the area's natural and cultural heritage, to enhance awareness and understanding of key issues facing society.
- At present, there are 140 UNESCO Global Geoparks in 38 countries. There is no site from India in the list.

### **Geological Sites in India**



- Geological Survey of India has nominated two sites in India for the first time for Global Geoparks status.
- The sites are Lonar Lake in Maharashtra and St. Mary's Island and Malpe beach in coastal Karnataka.
- Lonar Lake is an ancient circular lake created by a meteorite strike.
- It is the only known meteorite crater in basaltic rock and is world famous.
- It became a geo-heritage site in 1979.

- A meteorite estimated to weigh two-million-tonnes slammed into the Earth, creating a 1.83-km diameter crater where the lake formed.
- St. Mary's island is a unique phenomenon where a hexagonal mosaic of basaltic rocks is present.
- It was declared as a national geo-heritage site in 1975.
- It is estimated to be an 88-million-year-old formation that goes back to a time when Greater India broke away from Madagascar.



Hexagonal Columnar Basaltic Lava in St. Mary's Island

### **Global Geopark:**

- UNESCO Global Geoparks are single, unified geographical areas where sites and landscapes of international geological significance are managed with a holistic concept of protection, education and sustainable development.



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- Their bottom-up approach of combining conservation with sustainable development while involving local communities is becoming increasingly popular.
- At present, there are 140 UNESCO Global Geoparks in 38 countries.
- An aspiring Global Geopark must have a dedicated website, a corporate identity, comprehensive management plan, protection plans, finance, and partnerships for it to be accepted.

### **Once a UNESCO Global Geopark, always a UNESCO Global Geopark?**

- No, a UNESCO Global Geopark is given this designation for a period of four years after which the functioning and quality of each UNESCO Global Geopark is thoroughly re-examined during a revalidation process.
- As part of the revalidation process, the UNESCO Global Geopark under review has to prepare a progress report and a field mission will be undertaken by two evaluators to revalidate the quality of the UNESCO Global Geopark. If, on the basis of the field evaluation report, the UNESCO Global Geopark continues to fulfil the criteria the area will continue as a UNESCO Global Geopark for a further four-year period (so-called “green card”).
- If the area no longer fulfils the criteria, the management body will be informed to take appropriate steps within a two-year period (so-called “yellow card”). Should the UNESCO Global Geopark not fulfil the criteria within two years after receiving a “yellow card”, the area will lose its status as a UNESCO Global Geopark (so-called “red card”).

### **What is the Global Geoparks Network?**

- The Global Geoparks Network (GGN), of which membership is obligatory for UNESCO Global Geoparks, is a legally constituted not-for-profit organisation with an annual membership fee.
- The GGN was founded in 2004 and is a dynamic network where members are committed to work together and exchange ideas of best practise and



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join in common projects to raise the quality standards of all products and practises of a UNESCO Global Geopark.

- While the GGN as a whole comes together every two years, it functions through the operation of regional networks, such as the European Geoparks Network that meets twice a year to develop and promote joint activities.

### **Difference between UNESCO Global Geoparks, Biosphere Reserves and World Heritage Sites:**

- UNESCO Global Geoparks, together with the other two UNESCO site designations Biosphere Reserves and World Heritage Sites, give a complete picture of celebrating our heritage while at the same time conserving the world's cultural, biological and geological diversity, and promoting sustainable economic development.
- While Biosphere Reserves focus on the harmonised management of biological and cultural diversity and World Heritage Sites promote the conservation of natural and cultural sites of outstanding universal value, UNESCO Global Geoparks give international recognition for sites that promote the importance and significance of protecting the Earth's geodiversity through actively engaging with the local communities.
- In case an aspiring UNESCO Global Geopark includes a World Heritage Site or Biosphere Reserve, a clear justification and evidence has to be provided on how UNESCO Global Geopark status will add value by being both independently branded and in synergy with the other designations.

### **Key facts:**

- Lonar lake is an ancient circular lake created by a meteorite strike in Maharashtra. It is the only known meteorite crater in basaltic rock. Lonar crater became a geo-heritage site in 1979. It is relatively young geologically, at just 50,000 years old.
- Mary's Island, declared a national geo-heritage site in 1975, is estimated to be an 88-million-year-old formation that goes back to a time when Greater India broke away from Madagascar.



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### **Soil moisture map**

- With the rabi season around the corner, a countrywide forecast has been prepared. This forecast, following a joint exercise by IIT Gandhinagar and the India Meteorological Department (IMD), for the first time, provides a country-wide soil moisture forecast at seven and 30-day lead times.

### **How was it developed?**

- The experts used the 'Variable Infiltration Capacity' model to provide the soil moisture prediction.
- The product, termed 'Experimental Forecasts Land Surface Products', is available on the IMD website. It has been developed using the hydrological model that takes into consideration soil, vegetation, land use and land cover among other parameters.

### **Highlights of the findings:**

- In Bundelkhand, most farmers keep their land fallow or just grow some fodder crop during the kharif season since the rains are unpredictable and there could be extended dry spells after sowing. They then mainly cultivate the rabi crop using the soil moisture left behind by the monsoon rains.
- It is a similar trend in Bihar, in low lying areas of Seemanchal and Kosi belt, where no crop is grown during Kharif because of inundated lands. This means that if there is not enough rainfall in one or two months, these are regions which will demand heavy irrigation whether that comes from groundwater or surface water storage (reservoirs).
- Based on observed conditions at present, Gujarat, parts of Maharashtra, Chhattisgarh, Jharkhand, Tamil Nadu and parts of Andhra Pradesh are deficient in terms of soil moisture right now.
- Significance and the need for data on soil moisture:
- Soil moisture is crucial for agriculture since it directly affects crop growth and how much irrigation is required for the area. It is because crucial information needed for agriculture is not revealed only through rainfall data.





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- Soil moisture gives us more information on what is needed for crop growth in different parts of the country. Besides, timely soil moisture forecasts will help target interventions, in terms of seed varieties for better planning in agriculture.

### **RE-INVEST**

- RE-INVEST is a global platform to explore strategies for development and deployment of renewables.
- It showcases India's clean energy market and the Government's efforts to scale up capacity to meet the national energy demands in sustainable ways.
- Ministry of New and Renewable Energy is organising 2nd global RE-INVEST expo in Greater Noida, UP.
- It will build upon the success of RE-INVEST 2015.
- It provides an international forum to established players as well as new segments of investors and entrepreneurs to engage, ideate and innovate.

### **Marrakesh Treaty**

- European Union has recently ratified Marrakesh Treaty to ease access to reading material for print-disabled people.
- Marrakesh Treaty was adopted by United Nations - World Intellectual Property Organisation (WIPO).
- With the ratification of European Union, the treaty now expands to 70 countries.
- India was among the earliest to ratify the Marrakesh treaty in June 2014.
- The governments that are party to the Marrakesh treaty are obliged to adopt laws authorising the conversion of books into accessible formats such as braille, e-text, audio and large print by designated organisations.
- They are also allowed to exchange these alternative formats across national borders without clearance by copyright owners.



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### **Canine Distemper Virus (CDV)**

- Canine Distemper Virus (CDV) was found in some of the 23 Asiatic lions which died in Gujarat's Gir forest
- According to officials, a deadly combination of Canine Distemper Virus and Protozoal infection is responsible for the death of at least 11 of 23 lions in the Gir sanctuary.
- The government has launched massive operations to ensure that the infection does not spread to other big cats in their only abode in Asia.
- The CDV whose outbreak had wiped out 30 per cent population of lions in Serengeti forest areas in East Africa in 1990s.
- Canine distemper is a contagious viral disease that affects a wide variety of animal species, including dogs, coyotes, foxes, pandas and wolves. It attacks the respiratory, gastrointestinal and nervous systems of animals.
- CDV didn't cause deaths but it affects immunity of infected lions after which the lions cannot survive if they have any small diseases.
- The genetic sequence of the virus was compared to available CDV sequences and it was found to be related to the East African strains.
- "Lions with CDV can be infected by Protozoa infection which is spread by ticks. Presence of both of these causes death.
- As per the IUCN (International Union for Conservation of Nature) guidelines, a place has to be identified first.
- Forest department had launched a screening operation in Dalkhaniya range of Gir sanctuary to identify sick lions
- According to a 2015 census, Gir is home to 523 lions, including 109 male, 201 female, 73 sub-adults and 140 cubs
- Being cattle-herders, the animals which the Maldharis reared also acted as a source of food for the lions.
- Subsequent studies at three potential sites within the historic range of the Asiatic lion identified Kuno-Palpur sanctuary in Madhya Pradesh to be the most suitable for reintroducing the species.

### **What is Canine Distemper?**

- This is a viral disease that is frequent in dogs, foxes, wolves, big cats and even primates. It is caused by a single-stranded RNA virus of the family Paramyxoviridae (the family of viruses causing measles, mumps and bronchiolitis in humans). It infects the spinal cord and brain and also the respiratory and gastrointestinal tracts. The virus is believed to have a 50% fatality rate in dogs.
- In 1994, the CDV was responsible for an epidemic in the Serengeti region of Africa, where 1,000 lions died in three weeks. Its prevalence in India has not been studied and only a few reports are available regarding its detection in wild carnivores.

### **Asiatic Lions**

- There are only 700 Asiatic lions in the wild, and they only live in the Gir Forest area, India.
- At present Gir National Park and Wildlife Sanctuary in Gujarat is the only abode of the Asiatic lion.
- It is listed in Schedule I of Wildlife (Protection) Act 1972, in Appendix I of CITES and as Endangered on IUCN Red List.
- The asiatic lions in Gir Sanctuary, has recently been succumbed to the deadly infection of canine distemper virus (CDV) and tick-borne babesiosis.
- Canine Distemper Virus is a contagious and serious disease that attacks the respiratory, gastrointestinal and nervous systems of species of cats and dogs family.
- Babesiosis is caused by a parasite that infects red blood cells and transmitted by ticks.
- Machli, the tigress from Ranthambhore in Rajasthan. Known as the world's most photographed tigress, she lived for 20 years before her death in 2016. This is because she was treated medically, and often fed artificially.

### **Methanol as an alternative fuel:**

- Methanol is a promising fuel as it is clean, cheaper than fossil fuels and a good substitute for heavy fuels. India imports methanol from Saudi Arabia and Iran at present. Across the world, methanol is emerging as a clean, sustainable transportation fuel of the future.

### **Why Methanol?**

- Methanol can be used as an energy producing fuel, transportation fuel and cooking fuel, cutting down India's oil import bill by an estimated 20% over the next few years. Unlike CNG, using methanol as a transportation fuel would require minimal alteration in the vehicles.
- Methanol is a clean-burning fuel that produces fewer smog-causing emissions — such as sulphur oxides (SO<sub>x</sub>), nitrogen oxides (NO<sub>x</sub>) and particulate matter — and can improve air quality and related human health issues.
- Methanol is most commonly produced on a commercial scale from natural gas. It can also be produced from renewable sources such as biomass and recycled carbon dioxide.
- As a high-octane vehicle fuel, methanol offers excellent acceleration and power. It also improves vehicle efficiency.

### **Methanol as an enduring solution to human energy needs?**

- Methanol has the potential to be an enduring solution to human energy needs is because the belched out CO<sub>2</sub> (greenhouse gas emission) both from using Methanol and while producing Methanol can be tapped back to produce Methanol.
- Thereby a seamless loop of CO<sub>2</sub> sequestration cycle is created to perpetually burn fuels without polluting the environment at all. CO<sub>2</sub> from steel plants, Thermal Power plants, Cement Plants etc. can be tapped in large quantities to produce Methanol.

### **Way ahead:**

- The Concept of “Methanol Economy” is being actively pursued by China, Italy, Sweden, Israel, US, Australia, Japan and many other European countries. 10% of fuel in China in transport Sector is Methanol.
- Methanol Economy, if adopted by India can be one of the best ways to mitigate the Environmental hazards of a growing economy. NITI Aayog is preparing a road map for a full-scale implementation in the near future.

### **National Dolphin Research Centre (NDRC)**

- National Dolphin Research Centre (NDRC) will be set up on the banks of the Ganga River in Patna University campus in Patna, capital of Bihar. It will India's and Asia's first Dolphin research centre.
- The announcement for the centre was made on the occasion of Dolphin day (October 5), observed in Bihar for protection and conservation of Gangetic river dolphin to create awareness to save endangered species.
- NDRC will play important role in strengthening conservation efforts and research to save endangered mammal whose population is decreasing. Bihar is home to around half of the country's estimated 3,000 dolphin population.



### **Ghost nets**

- Ghost nets are classified under Abandoned, Lost or otherwise Discarded Fishing Gear (ALDFG), which includes lines, traps, hooks, dredges and buoys.
- Ghost nets can kill marine wildlife, including vulnerable species, and destroy the benthic ecosystems that exist at the lowest level of





a body of water. The problem has been worsening with the global expansion in fishing operations, and the availability of more durable gear.

- High quality synthetic nets can last in the oceans for centuries, and lead to micro-plastic ingestion by aquatic life.

### Eurasian otter

- Eurasian otter — one of the least-known of India's three otter species — in the Western Ghats.
- Small-clawed and the smooth-coated otter (the commonly sighted otter species in south India)
- The Eurasian otter has been recorded historically from the Western Ghats (Coorg in Karnataka and Tamil Nadu's Nilgiri and Palani hill ranges, according to zoologist R.I. Pocock in 1941)
- Otter is a carnivorous mammal and there are 7 subspecies found in 3 continents - Europe, Asia and Africa.
- The Eurasian otter found in all the 3 continents is considered to be "Near Threatened" in IUCN Red List.
- It lives in a wide variety of aquatic habitats, including highland and lowland lakes, rivers, streams, marshes, swamp forests and coastal areas independent of their size, origin or latitude.
- Eurasian otter is the one of the least-known of India's 3 otter species (Eurasian, smooth-coated & small-clawed otters) in Western Ghats.
- It has been recorded historically from the Western Ghats - Coorg in Karnataka and Tamil Nadu's Nilgiri and Palani hill ranges.
- Though its range is wide, it is not as frequently sighted as other two otters in India.
- All 3 species of otters in India are protected under the Wildlife Protection Act and are listed in CITES Appendices.
- Eurasian Otter - CITES Appendix I; WPA Schedule II
- Smooth Coated Otter - CITES Appendix II; WPA Schedule II





## **GNANADHARE ACADEMY**

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- Clawless Otter - CITES Appendix II; WPA Schedule I
- The Eastern Ghats spread across Odisha, Andhra Pradesh, Karnataka and Tamil Nadu

### **Wildlife Trust of India (WTI)**

- Wildlife Trust of India (WTI) is a leading Indian nature conservation organisation committed to the service of nature. Its mission is to conserve wildlife and its habitat and to work for the welfare of individual wild animals, in partnership with communities and governments.
- WTI's team of 150 dedicated professionals work towards achieving its vision of a secure natural heritage of India, in six priority landscapes, knit holistically together by nine key strategies or Big Ideas.



### **Objectives:**

- To provide at least 500 short term, focused and innovative aid at times of emergencies and conservation issues so as to nip problems in the bud and provide game changing solutions to age old problems.
- To combat key wildlife crime using trade control, litigation and capacity building techniques that demonstrably reduce poaching or trade in at least a dozen species or habitats.
- Reduce the dependence of at least a dozen local communities on wildlife or their habitats through ecologically appropriate livelihoods and people's participation in conservation.
- To recover populations of at least six threatened species or sub-species by lowering their national or global status of threat through direct conservation action.
- To improve the existing functionality of six selected Protected Areas (PAs) and restore their ecological integrity.



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- To increase the welfare of individual displaced animals while enhancing conservation and pioneering science based rehabilitation and wildlife health across India, and in doing so to save at least 5000 lives in the decade.
- Demonstrate seven innovative and replicable models of Human Wildlife Conflict reduction to catalyse appropriate changes in policy.
- To create a positive and measurable change in people's perceptions to improve the conservation and welfare of wildlife in India with at least a dozen planned campaigns.
- To secure critical habitats outside the traditional PA system, especially habitat linkages, wetlands, grasslands, community reserves, Important Bird Areas and sacred groves, thereby increasing the effective protected area of India by 1%.

### **Environment Pollution Control Authority (EPCA)**

- EPCA is Supreme Court mandated body tasked with taking various measures to tackle air pollution in the National Capital Region. It was notified in 1998 by Environment Ministry under Environment Protection Act, 1986.
- Its mandate is to protect and improve quality of environment and prevent and control environmental pollution in National Capital Region. It is also mandated to enforce Graded Response Action Plan (GRAP) in NCR as per the pollution levels.
- In November 2017, EPCA had enforced several measures, including ban on brick kilns, closure of Badarpur thermal power plant, hot mix plants and stone crushers, and construction activities in NCR.

### **Intergovernmental Panel on Climate Change (IPCC)**

- United Nations Intergovernmental Panel on Climate Change (IPCC) has released special report on global warming in Incheon, South Korea.
- The report includes contributions from 91 authors and review editors from 40 countries. It will be key scientific input in upcoming Katowice Climate Change Conference in Poland in December 2018.



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### **Key Points from report**

- It clearly shows how half degree of warming makes big difference, adversely impacting global population and overall ecosystem through intense heat waves, melting of Arctic, sea level rise, erratic rainfall, reduction of farm yield and vanishing of living species.
- It is possible to meet new warming target, provided nations together take rapid and far reaching transitions over next 10 to 20 years in energy, industry, land use, buildings, transport and cities to cut emissions and reach net zero around 2050 — 25 years earlier than planned under earlier 2-degree goal.
- It lists four pathways to curb global warming and through which the 1.5 degree target can be achieved. In each of pathways, global average temperature is projected to overshoot 1.5 degrees Celsius target by some amount before returning to that level before the end of this century.
- Each of these pathways is also dependent on some amount of Carbon Dioxide Removal (CDR), a reference to physical removal of stock of CO<sub>2</sub> from atmosphere to reduce its concentrations.
- Varying amounts between 100 to 1000 gigatons (billion tonnes) of CO<sub>2</sub> needs to be removed from atmosphere in these four pathways.
- It refers to climate models that project robust differences in regional climate characteristics between present-day and global warming of 1.5 degrees Celsius and between 1.5 and 2 degrees Celsius.
- These differences include increase in mean temperatures in both land and ocean regions, hot extremes in most inhabited regions, heavy precipitation in several regions and probability of drought and precipitation deficits in some regions.
- It said that to cap the rise in global average temperature over pre-industrial levels at 1.5°C, a 45% reduction in emissions over 2010 levels must be made by 2030.



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### **Intergovernmental Panel on Climate Change (IPCC)**

- IPCC is the leading international body for the assessment of climate change. It was established in 1988 by the United Nations Environment Programme (UNEP) and World Meteorological Organization (WMO).
- It is headquartered in Geneva, Switzerland.
- Currently 195 countries are its members. It comprises a group of several hundred scientists of different nationality who assess climate change science.
- Every 5 or 6 years, IPCC comes out with comprehensive periodic reports on Climate Change called Assessment Reports (AR).
- Functions: IPCC neither monitors climate related parameters or data nor does it conduct any research work.
- It merely assesses the most recent scientific, socio-economic and technical information produced worldwide relevant to the understanding of climate change.
- Awards: IPCC's 4th AR had helped them to win Nobel Peace Prize in 2007. During this time R.K. Pachauri was its Chairman.

### **Singphan Wildlife Sanctuary**

- Singphan wildlife sanctuary has been declared as a Elephant reserve by the Government of Nagaland.
- With the approval of Government of India, it becomes the 30th Elephant reserve in the country.
- The reserve lies in the North-western part of the State of Nagaland.
- The declaration will boost the elephant conservation in the country especially north eastern region.





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### **National Environment Survey (NES)**

India's first ever National Environment Survey (NES) will be launched in January, 2019 to map environment data of 55 districts across 24 states and 3 Union Territories.

The NES will rank all districts on their environmental performance and document their best green practices based on various environmental parameters.

The first NES will be carried out by Ministry of Environment, Forests and Climate Change (MoEFCC) through Environmental Information System (ENVIS) and its hubs and resource partners across the country.

It will be done through grid-based approach, using grids measuring 9×9 km to collect comprehensive data on various environmental parameters.

The parameters include air, water, soil quality; solid, hazardous and e-waste; emission inventory; forest & wildlife; flora & fauna; wetlands, lakes, rivers and other water bodies. It will also assess carbon sequestration potential of all the districts across the country.

### **Significance:**

The green data from this survey will provide important tool in hands of policy-makers for decision making at all levels – district, state and national.

The survey will fully map and create emission inventory, provide valuation of ecosystem services and collate research in the field of environment. Initially the survey will be focusing on 55 districts and later will be scaled up to all districts in the country.

The skilled manpower required for the survey will be provided from persons skilled and trained under MoEFCC's Green Skill Development Programme.

### **Forest Fire Management**

- Ministry of Environment and Forests and Climate Change (MoEFCC) and World Bank Report have jointly released report on Strengthening Forest Fire Management in the Country.
- The report discusses policies on forest fire prevention and management (FFPM) at national, state and local levels.
- It also underscores need for comprehensive national policy and guidelines. It provides recommendations on five broad themes – policy, institutions and capacity, technology, community engagement and data and information.
- It has analysed patterns and trends of forest fires in India and looks at national and international best practices in FFPM.



### **Key Points from report**

- Forest fires are leading cause of forest degradation in India. Forest fires occur every year in almost every state in India and some districts have been found to be more vulnerable than others.
- In fact, just 20 districts (mostly located in Northeast India) account for over 40% of all forest fires detected between 2003 and 2016. Similarly, top-20 districts (mainly in Central India) account for about 48% of total fire-affected area, while having just 12% of the country's forest cover in the year 2000 and 7% of its land area.

### **Reasons for forest fire:**

- Like in other parts of the world, people are main driver of fires in India and forest fires are distributed close to people and infrastructure. But over longer term, shifts in climate caused by anthropogenic global warming may further alter India's forest landscape and fire regime



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### **Relation with Monsoon:**

- India's monsoons are largely responsible for seasonal nature of forest fires in the country. Forest fires peak during dry months of March or April before arrival of monsoon.
- The fire season mainly occurs during the four-month period between February 15 and May 15. However it has not clear how
- drying of monsoon due to reduced contrast in land-sea temperatures (which has weakened engine that drives monsoon) has affected intensity or frequency of forest fires.
- Region distribution: Forest fires in Northeast are concentrated in smaller area that is subject to repeat burning.
- The peak fire season is most concentrated (shortest) in Northeast and Northern state of Bihar. Fires in other regions, particularly districts in Central and Southern India are more expansive.
- Districts experiencing widespread and frequent forest fires include areas of dry and moist deciduous forest in order lands of
- Chhattisgarh, Maharashtra, and Telangana that are affected by fire on nearly annual basis.
- Ecological value of Forests: According to scientists from National Remote Sensing Centre (NRSC), fires affecting forests have significant ecological value. Between 2006 and 2015, NRSC scientists forest fires were detected in just under half (281 of 614) of protected areas in India. In 2014, fires burned about 8.6 % of forest cover in protected areas

### **Sendai Framework:**

- The "Sendai Framework for Disaster Risk Reduction 2015-2030" was adopted during the Third UN World Conference on Disaster Risk Reduction held in Sendai, Japan in March, 2015.
- It is the first major agreement of the post-2015 development agenda, with seven targets and four priorities for action.
- It was endorsed by the UN General Assembly following the 2015 Third UN World Conference on Disaster Risk Reduction (WCDRR).
- The Framework is for 15-year. It is a voluntary and 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.

- The new Framework is the successor instrument to the Hyogo Framework for Action (HFA) 2005-2015: Building the Resilience of Nations and Communities to Disasters.



### **Graded Action plan:**

- Emergency protocols under the Graded Response Action Plan which involve a series of measures on basis of the Air Quality Index are set to be implemented. When the mark is between moderate and poor category, the burning of garbage will be stopped and pollution control regulations will be enforced.
- If the air quality drops to very poor category, additional measures will be taken including stopping of diesel gensets, enhancing parking fees and increasing frequency of metro and buses.
- For severe and very severe category air quality, additional measures would include frequent mechanised cleaning of roads and sprinkling of water, stopping entry of trucks, stopping construction activities and appointment of task force to take decisions like shutting of schools.

### **Environment Pollution Control Authority (EPCA):**

- EPCA was constituted with the objective of 'protecting and improving' the quality of the environment and 'controlling environmental pollution' in the National Capital Region. The EPCA also assists the apex court in various environment-related matters in the region.
- EPCA is Supreme Court mandated body tasked with taking various measures to tackle air pollution in the National Capital Region. It was notified in 1998 by Environment Ministry under Environment Protection Act, 1986.

### **Composition:**

- Besides the chairman, the EPCA has 14 members, some of whom are the environment secretary of the National Capital Territory of Delhi (NCT), chairperson of the New Delhi Municipal Council, transport commissioner of the NCT, the commissioners of various municipal corporations of Delhi and professors at IIT Delhi and Jawaharlal Nehru University.

### **Functions:**

- To protect and improve quality of environment and prevent and control environmental pollution in National Capital Region.
- To enforce Graded Response Action Plan (GRAP) in NCR as per the pollution levels.

### **Mount Etna:**

- Why in News? The southeast flank of Mount Etna in Sicily is sliding towards the sea at a rate of several centimetres a year.
- What's causing this? It's likely caused by gravity pulling on Etna's lower underwater slopes, far from the summit.
- Concerns: The kind of stress that this movement creates inside volcanoes can cause devastating landslides. This means Etna is more susceptible to catastrophic collapse than had previously been realised.







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### **About Mt. Etna:**

- Mount Etna is the largest active volcano in Europe and one of the world's most frequently erupting volcanoes. It is also the volcano with the longest record of continuous eruption.
- Located near the east coast of the island of Sicily in Italy, Mount Etna is 10,900 feet (3,329 meters) tall with a base circumference of about 93 miles (150 kilometers).
- The mountain's largest feature is the Valle del Bove (Valley of the Ox), a large horseshoe-shaped caldera on the eastern slope.
- Etna sits on the active fault between the African plate and the Ionian microplate, which are both being subducted together beneath the Eurasian plate.
- In June 2013, it was added to the list of UNESCO World Heritage Sites.
- Due to its history of recent activity and nearby population, Mount Etna has been designated a Decade Volcano by the United Nations.

### **Cheetah Reintroduction Project**

- Cheetah was declared extinct in India in the year 1952.
- Wildlife Institute of India started this ambitious Cheetah Reintroduction Project in 2009.
- The project focused on relocating cheetah from Namibia in Africa to Nauradehi sanctuary in Madhya Pradesh.
- This project had hit a roadblock for want of funds.
- The Madhya Pradesh forest department has written to the National Tiger Conservation Authority to revive the plan to reintroduce cheetahs in the State's Nauradehi sanctuary.
- The sanctuary was found to be the most suitable area for the cheetahs as its forests are not very dense to restrict the fast movement and the prey base is also in abundance.
- It is the largest wildlife sanctuary in Madhya Pradesh, extending across the river basins of Narmada and Ganga.

### **Air Quality Early Warning System**

- The System is designed to predict extreme air pollution events and give alerts to take necessary steps as per Graded Response Action Plan (GRAP) of the Government of India.
- The air pollution system has been developed jointly by the scientists at Indian Institute of Tropical Meteorology (IITM), Pune, India Meteorological Department and National Centre for Medium Range Weather Forecasting (NCMRWF).
- The system will help in proactively forewarning, 3-4 days in advance, any large scale air pollution events which may occur over the Delhi region.
- The warning system consists of a) real time observations of air quality over Delhi region and details about natural aerosols like dust (from dust storms) and particulate matter using different satellite data sets b) Predictions of air pollutants from two different air quality prediction systems based on state-of-the-art atmospheric chemistry transport models and c) Warning Messages and Alerts and Bulletins.

### **India's first railway station inside tunnel to come up in Himachal Pradesh:**

- For the first time in India, a railway station will be built inside a tunnel at a height of 3,000 metres, on the strategic Bilaspur-Manali-Leh line close to the China-India border.
- The station will be at a height of around 3,000 metres and will be inside a 27-km-long tunnel.
- Keylong is the administrative centre of Lahaul and Spiti district, 26 km north of Manali and 120 km from the India-Tibet border.



- Ghost gear: Any fishing equipment that has been lost discarded or abandoned in water bodies.

### **Baishui Glacier**

- The glacier is in China and it is one of the world's fastest melting glaciers.
- It is located in the Third Pole of the Earth, a region in Central Asia with the world's third largest store of ice after Antarctica and Greenland.
- Third Pole glaciers are vital to billions of people from Vietnam to Afghanistan.
- Asia's 10 largest rivers, including the Yangtze, Yellow, Mekong, and Ganges are fed by seasonal melting third pole glaciers.
- The melting of this glacier attracts large number of tourists.
- Scientists have already warned that the effects of glacier melting on water resources are gradually becoming increasingly serious for China.



### **Third Pole**

- Scientists conducting research in the third pole area have warned of disturbing global warming trends, and how, if they continue, they could affect the lives of 1.3 billion people. The glacier has lost 60% of its mass and shrunk 250 m since 1982.
- The Hindu Kush-Himalayan region spans an area of more than 4.3 million square kilometres in Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan.
- The region stores more snow and ice than anywhere else in the world outside the polar regions, giving its name: 'The Third Pole'.
- The Third Pole contains the world's highest mountains, including all 14 peaks above 8,000 metres, is the source of 10 major rivers, and forms a formidable global ecological buffer.



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- The Third Pole Environment (TPE): TPE, an international research program, was launched in 2009 and focuses on the Tibetan Plateau and surrounding mountain ranges.

### **Green Climate Fund**

- Green Climate Fund has approved more than \$1 billion in new investments after a meeting held recently in Bahrain.
- The meeting approved 19 new projects, including a programme to protect freshwater resources in Bahrain. Environmentalists had argued the Gulf nation should pay for the project itself using money it made from its vast reserves of oil and gas.
- The GCF was set up in 2010 under the UNFCCC's financial mechanism to channel funding from developed countries to developing countries to allow them to mitigate climate change and also adapt to disruptions arising from a changing climate. It was central to the Paris climate agreement signed in 2015, that the world's largest historical emitter.
- The Green Climate Fund will support projects, programmes, policies and other activities in developing country Parties using thematic funding windows.
- It is intended to be the centrepiece of efforts to raise Climate Finance of \$100 billion a year by 2020.
- The Fund will promote the paradigm shift towards low-emission and climate-resilient development pathways by providing support to developing countries to limit or reduce their greenhouse gas emissions and to adapt to the impacts of climate change, taking into account the needs of those developing countries particularly vulnerable to the adverse effects of climate change.
- The Fund will strive to maximize the impact of its funding for adaptation and mitigation, and seek a balance between the two, while promoting environmental, social, economic and development co-benefits and taking a gender-sensitive approach.



**GREEN  
CLIMATE  
FUND**

- The Fund is governed and supervised by a Board that will have full responsibility for funding decisions and that receives the guidance of the COP. The Fund is accountable to, and functions under the guidance of, the COP.

### **Why in news?**

- UN-backed fund Green Climate Fund (GCF) has approved US \$43.4 million for enhancing climate resilience for millions of people living in India's coastal communities as part of its efforts to combat extreme impacts of climate change. The grant is part of more than US \$1 billion approved by 21st meeting of GCF Board held in Bahrain's capital Manama for 19 new projects to help developing countries tackle climate change

### **Harit Diwali-Swasth Diwali campaign**

- Union Ministry of Environment, Forests and Climate Change (MoEFCC) has launched Harit Diwali-Swasth Diwali campaign. MOEFCC has merged this year's campaign with "Green Good Deed" movement that has been initiated as social mobilization for conservation and protection of environment.
- Aim: To reduce adverse environmental conditions especially pollution in the country after post Diwali celebrations due to excessive bursting of crackers which contributes significantly to air and noise pollution.
- This campaign was initiated in 2017-18 to enlighten children about harmful fire crackers and motivate them to celebrate Diwali in environment-friendly manner and not to buy fire crackers, instead buy gift, food items, or sweets for poor and underprivileged children living in their locality.
- Under this campaign, the MoEFCC will undertake various activities for creating awareness among various stakeholders and encourage people to participate in combating air pollution. This campaign was extremely





successful and the air quality had not deteriorated post Diwali in 2017 unlike what was experienced in 2016.

### **Background:**

- Air pollution is a serious health issue in the country especially in the northern parts during winter seasons. It is attributed to dust, burning of crops in certain states, burning of garbage construction and prevailing climatic conditions.
- This air pollution has serious impacts on the health of children aged people and people suffering from respiratory ailments. Diwali which is a festival of lights falls during the same period. As a matter of practice people have been celebrating Diwali by bursting crackers.
- Crackers contains combustible chemicals that include potassium chlorate powdered aluminum, magnesium, salts of barium, copper, sodium, lithium, strontium etc. and emits smoke on combustion of these chemicals along with sound. This smoke and sound has health impacts on children, aged people and also animal and birds. Apart from these compounds large amount of waste is also generated after bursting of crackers.

### **International Conference on Status and Protection of Coral Reefs (STAPCOR – 2018)**

- The International Conference on Status and Protection of Coral Reefs (STAPCOR – 2018) is being held at Bangaram coral Island of Territory of Lakshadweep.
- It was jointly organized by Department of Environment and Forest, Union Territory of Lakshadweep Administration with the technical support of Zoological Survey of India (ZSI) and in association with Ministry of Environment, Forest and Climate Change (MoEFCC), International Union for Conservation of





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Nature (IUCN), Environmental Information System (ENVIS) in consonance with declaration of year 2018 as 3rd decadal International year of Reefs.

### **What is STAPCOR?**

- The effect of climate change and global warming along with El-Nino on the corals has led to heavy bleaching internationally during the year 1998. This led to the foundation of STAPCOR with a decision to have a international conference in every 10 years to review the status and progress of coral reefs all over the world.

### **The goals of the 3rd IYOR – 2018 are to:**

- Strengthen awareness about ecological, economic, social and cultural value of coral reefs and associated ecosystems.
- Improve understanding of the critical threats to reefs and generate both practical and innovative solutions to reduce these threats.
- Generate urgent action to develop and implement effective management strategies for conservation and sustainable use of these ecosystems.

### **Background:**

- The first IYOR was designated in 1997 in response to the increasing threats on coral reefs and associated ecosystems. The hope was to increase awareness of the value of and threats to coral reefs, and to promote conservation, research and management efforts on a global scale.

### **What are Corals?**

- Corals are invertebrates belonging to a large group of colourful and fascinating animals called Cnidarians. Other animals in this group include jellyfish and sea anemones. Each individual coral animal is called a polyp, and most live in groups of hundreds to thousands of genetically identical polyps that form a 'colony'. The colony is created by a process called budding, where the original polyp literally grows copies of itself.

### **Hard and Soft Corals:**

- Corals are generally classified as either “hard” or “soft”. There are around 800 known species of hard coral, also known as ‘reef building’ or scleractinian corals. Soft corals, or octocorals, which include seas fans, sea feathers and sea whips, don’t have the rock-like calcareous skeleton, instead they grow wood-like cores for support and fleshy rinds for protection.



- Soft corals also live in colonies, that often resemble brightly coloured plants or trees, and are easy to tell apart from hard corals as their polyps have tentacles that occur in multiples of 8, and have a distinctive feathery appearance. Soft corals are found in oceans from the equator to the north and south poles, generally in caves or on ledges. Here, they hang down in order to capture food floating by in the currents.

### **What are coral reefs?**

- Coral reefs have evolved on earth over the past 200 to 300 million years, and have developed a unique and highly evolved form of symbiosis. Coral polyps have developed this relationship with tiny single-celled algae known as zooxanthellae. Inside the tissues of each coral polyp live these zooxanthellae, sharing space and nutrients.
- This symbiosis between plant and animal also contributes to the brilliant colors of coral that can be seen while diving on a reef. It is the importance of light that drives corals to compete for space on the sea floor, and so constantly pushes the limits of their physiological tolerances in a competitive environment among so many different species. However, it also makes corals highly susceptible to environmental stress.

### **SC order on firecrackers**

- The SC on refused to impose a nationwide blanket ban on the manufacture and sale of firecrackers. In its verdict, the court said only “green firecrackers” would be allowed to be sold in Delhi/NCR. It also set time slots for bursting firecrackers during festivities.
- Ruling out a blanket ban on firecrackers in Delhi-National Capital Region, the Supreme Court has permitted the sale of “green crackers”.
- Online sale of crackers has been banned. Sale of joined firecrackers, popularly called laris, is also prohibited.



### **What are green crackers?**

- Green crackers are “reduced emission crackers”. According to the Council of Scientific and Industrial Research, firecrackers that cause 30-35% lower emission of particulate matter (PM10 and PM2.5) and 35-40% lower emission of sulphur dioxide (SO<sub>2</sub>) and nitrogen oxide are categorized as “green crackers”. The products have low content of aluminium. Use of barium salt and ash as a drying agent is banned for such crackers. The clinical composition of fireworks will be reviewed by the Petroleum and Explosives Safety Organisation, which would submit its report within two weeks.



### **How does bursting of firecrackers impact the environment?**

- Bursting of firecrackers leads to a spike in pollution, as the air quality dips to “very poor” levels. There is a significant rise in the levels of PM10 and PM2.5, known to cause or aggravate health hazards such as asthma, coughing, bronchitis, nervous system breakdown and cognitive impairment. Aluminium in firecrackers may cause skin problems, while barium salts emit poisonous gases causing respiratory problems. Noise pollution due to firecrackers has also been a key concern.

### **Chemical composition:**

- Firecrackers are essentially made up of four components: Oxidisers, fuel, colouring agents and binder, according to a report filed before the Supreme Court by the Central Pollution Control Board (CPCB) on the "Known Health Impacts From Bursting Firecrackers Caused Due To Their Chemical Composition".
- The oxidiser is usually a perchlorate salt. It serves the function of releasing the oxygen required for the explosion.
- When the firework is set off, most of the perchlorate present becomes harmless compound. However, the remnants enter the soil and water, and when ingested by humans, it gets absorbed in the thyroid gland and interferes with the thyroid hormone. This eventually leads to problems in metabolism and mental development.
- The fuel in the firecracker is generally charcoal which sustains the fire. Burning this results in the release of a large amount of air pollutants, particularly sulphur dioxide, carbon dioxide, carbon monoxide (CO) and particulate matter into the atmosphere. These get lodged in people's lungs, and there's an immediate danger for those with asthma or chemical sensitivities.



### **Then, there are the colouring agents.**

- According to the CPCB report, these are the chemical compounds which give firecrackers their colours. Aluminium compounds produce brilliant whites; barium nitrate produces greens, and the addition of copper results in blue light. Each of these come with their health effects.
- Aluminium causes contact dermatitis and bio-accumulation. It also causes bronchoconstriction in susceptible individuals. Copper compounds can cause cancer. Antimony sulphide produces toxic smoke and is a carcinogen. Barium nitrate can cause an irritated respiratory tract in addition to possible radioactive fallout. Barium chromate was also found to be toxic to living cells and genes in the human lung cells.

The CPCB report also lists out other compounds released by firecrackers which cause health problems. Lead dioxide/nitrates/chlorides are poisonous. Mercury can cause bioaccumulation. Potassium nitrate is a carcinogenic which causes toxic dust. Ozone is a highly reactive gas and has been noted to result in small changes in airway resistance and repeated exposure to it is associated with increased asthma-related symptoms. Strontium compounds are toxic and can replace calcium in the body. Nitric oxide and nitrogen dioxide are highly toxic if inhaled.

### **Mammals of India (MaOI)**

- MaOI is a part of Biodiversity Atlas (India project), which is an initiative of National Centre for Biological Sciences.
- It is an online, peer-reviewed, freely-accessible portal.
- It provides an opportunity to any person to upload geotagged photographic observations about mammals with information on habitat age of the observed individual.
- These observations will be reviewed by subject experts and uploaded on the website.



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### **Citizen- Science repository of Indian mammals**

- Scientists and researchers from the National Centre for Biological Sciences (NCBS) in Bangalore have come up with a new citizen-science repository on Indian mammals, called Mammals of India (MaOI). MaOI is a part of the Biodiversity Atlas (India project).
- The initiative aims to develop individual species pages for all Indian mammals with information on identification, variation, distribution, breeding and non-breeding ecology and species conservation.
- Now one can contribute to the cause of science by sharing the picture of the animal on a specific website, providing the location of spotting. This will make more information available about lesser known mammals of the country.
- These photographic records will help researchers in having distribution map of mammals in the country. The photographs will not only help gather information on the distribution of the various species but also interactions between different species of mammals, like predation and mutualism.
- MaOI is a part of Biodiversity Atlas (India project), which is an initiative of National Centre for Biological Sciences.
- It is an online, peer- reviewed, freely-accessible portal.
- It provides an opportunity to any person to upload geo-tagged photographic observations about mammals with information on habitat age of the observed individual.
- These observations will be reviewed by subject experts and uploaded on the website.

### **Facts:**

- As per current estimates, 426 species of mammals are found in India; of them 47 species are endemic to the Indian subcontinent. Along with well-known species, the mammals of 100 species of rats and 126 species of bats and 24 species of whales of dolphins.



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### **Mammals of India (MaOI)**

- Mammals of India (MaOI) is a new model of repository on Indian mammals by the Scientists and Researchers from the National Centers for Biological Sciences (NCBS), Bangalore. It is a citizen-scientific repository initiated in September 2018. It is a first such repository of Mammals in India.

### **Special Features Of MaOI**

- It is an online, freely –accessible portal whose aim is to develop individual pages for all Indian mammals covering all related information about their distribution, breeding, variation, identification and conservation .
- The website [mammalsofindia.org](http://mammalsofindia.org) provides a facility to the citizen to upload photographic observations about mammals. 768 images, of 161 species of mammals, have been uploaded by October 25, 2018.
- The photographs of rare species such as Red Serow from Manipur, Lynx a species of wild cat from Jammu and Kashmir, Asian Golden Cat from West Kameng district of Arunachal Pradesh and Binturong, also known as bear cat, from East Kameng district of Arunachal Pradesh have been uploaded on this portal.
- This is an exclusive portal for mammals in India which will help in having a good distribution map of mammals all around the country.
- MaOI is an initiative under Biodiversity Atlas project. The Biodiversity Atlas is a species-based bioinformatics platform.
- India is a mega-diversity country with only 2.4% of the world's land area but accounts for 7-8% of all global species. There are about 426 species of mammals known from India, which is about 8.86% of the world species.
- Citizen Science Projects in Conservation Of Indian Biodiversity Citizen science projects are changing the scenario of collection of scientific information about biodiversity.
- These projects enable participants to make direct contribution to collection and research on information related to environmental issues. Citizens are the unpaid contributors in collecting information related to bio-diversity.



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### **Fall Armyworm**

- The Indian Council for Agricultural Research (ICAR) has sounded the alarm after the invasive agricultural pest Fall Armyworm (*Spodoptera frugiperda*) was discovered in Karnataka.
- A major maize pest in North America, the Fall Armyworm arrived in Africa in 2016. Since then, it has threatened the continent's maize crop, a staple which feeds 300 million people.
- The Karnataka finding is the first report of the pest in Asia. The discovery is more worrisome because the pest feeds on around 100 different crops, such as vegetables, rice, and sugarcane. Its discovery in Karnataka means its spread to the rest of the country, as well as neighbouring countries, could be just a matter of time
- Initially, they suspected it was the Northern Armyworm, or *Mythimna separata*, a common local pest. But when they examined the moth, they were able to identify it as the Fall Armyworm through its distinctive genitalia. Further confirmation came through DNA barcoding at Bengaluru's Indian Institute of Horticultural Research.
- The first line of defence against the Fall Armyworm will be insecticides like lambda-cyhalothrin.
- Its efficacy is currently being studied in field trials. Also, the researchers have found some natural predators such as coccinellid beetles that can aid biological control.
- A fungal species called *Nomuraea rileyi* also infects the Fall Armyworm. But these natural enemies may not be as effective as insecticides

### **Unwelcome visitor**

The Fall Armyworm (FAW) is native to the Americas



- sugarcane and cotton
- India's tropical climate could allow the pest to thrive
- It can be controlled with insecticides, through natural enemies, or by inter-cropping

**The pest munching on maize in Zimbabwe**

- FAW arrived in Africa in 2016. Since then, it has spread to 44 African countries
- It prefers maize, but can feed on 80 species of plants, including rice, sorghum, millet,

Source: FAO

### India home to two new gecko species

- The spot-necked day gecko and the Anaimudi day gecko, both very distinctly-patterned lizards found only in the higher reaches of the Agasthyamalai and Anamalai hill ranges in the Western Ghats, are the latest additions to India's reptile fauna.





### **NDRF aid only for severe calamities**

What are the classifications of disasters, and how does this affect funding?

- According to the National Disaster Management Policy, the State governments have to provide disaster relief from their respective State Disaster Response Funds (SDRFs), and only for a “calamity of severe nature”, will additional assistance be provided from the National Disaster Response Fund (NDRF).
- There is, however, no provision in the law or rules for the government to designate a disaster as a “national calamity”.
- Minister of State for Home Kiren Rijiju informed Parliament recently that the guidelines of the NDRF and the SDRFs did not contemplate declaring a disaster a national calamity.



### **How are the NDRF and the SDRFs funded?**

- The NDRF is funded through a National Calamity Contingent Duty levied on pan masala, chewing tobacco and cigarettes, and with budgetary provisions as and when needed. A provision exists to encourage any person or institution to make a contribution to the NDRF. However, this source of funding has not been tapped so far, according to the government.
- The 14th Finance Commission recommended changes to this structure once the cess was discontinued or subsumed within the Goods and Services Tax. However, the government, instead, decided to continue with the National Calamity Contingent Duty even in the GST regime.
- The SDRF corpus is contributed by the Union government and the respective State governments in a 75:25 ratio for general category States and 90:10 for Special Category States.
- The allocation of the SDRF for each State is done by the Finance Commission, and the Centre contributes its specified share each financial year. The Central share of SDRF is released in two equal instalments, in June and then in December.

### **What has been the trend in budgetary allocations to the NDRF and SDRFs?**

- The Union government has maintained a steady flow of funds to the NDRF each year, ranging from Rs. 5,690 crore in 2015-16 to a budgeted amount of Rs. 2,500 crore for the current financial year. In addition, the Centre has also been contributing to the SDRFs every year, amounting to Rs. 8,374.95 crore in 2016-17 and Rs. 7,281.76 crore in 2017-18.
- How have NDRF funds been allocated to States in the recent past?
- In 2017-18, up to December 27, 2017, the Union government released NDRF funds to nine States — Arunachal Pradesh, Bihar, Himachal Pradesh, Karnataka, Kerala, Nagaland, Rajasthan, Tamil Nadu, and Telangana — over and above its contributions to their respective SDRFs. The recipient of the highest amount was Karnataka, which got Rs. 913 crore that year.
- Over the four years till December 27, 2017, the Centre has released the most cumulative funds to Maharashtra (Rs. 5,244.69 crore), Karnataka (Rs. 5,122.45 crore), Uttar Pradesh (Rs. 4,949.04 crore), Tamil Nadu (Rs. 3,115.31 crore), and Madhya Pradesh (Rs. 1,958.93 crore).
- For specific calamities, the Centre released Rs. 1,365.67 crore for the Chennai floods of 2015 and Rs. 218.76 crore after Cyclone Vardah in 2016. Andhra Pradesh received Rs. 400 crore and Rs. 230 crore after Hudud ravaged Visakhapatnam

### **2016 National Disaster Management Plan (NDMP)**

- The Government of India does not issue any appeal for foreign assistance in the wake of a disaster. However, if the national government of another country voluntarily offers assistance as a goodwill gesture in solidarity with the disaster victims, the Central Government may accept the offer.” It says the Home Ministry is required to coordinate with the External Affairs Ministry, primarily responsible for reviewing foreign offers of assistance and channelising these.
- For multilateral assistance, the 2016 NDMP guidelines say, “An offer of assistance from UN agencies, India will accept the offer only if the government considers it necessary, based on various factors. If accepted, Govt will issue directions to the respective Ministry or State Government to coordinate with the concerned UN agency.
- Any financial assistance offered by UN financial institutions involving foreign exchange will require the approval of the Department of Economic Affairs. India will allow UN agencies and international NGOs already operating in the country at the time of the disaster event to continue their humanitarian assistance to people in the affected area in coordination with the relevant Central Ministries/Departments and the State Government as per applicable norms and protocols.”



### **What is the Compensatory Afforestation Fund (CAF)?**

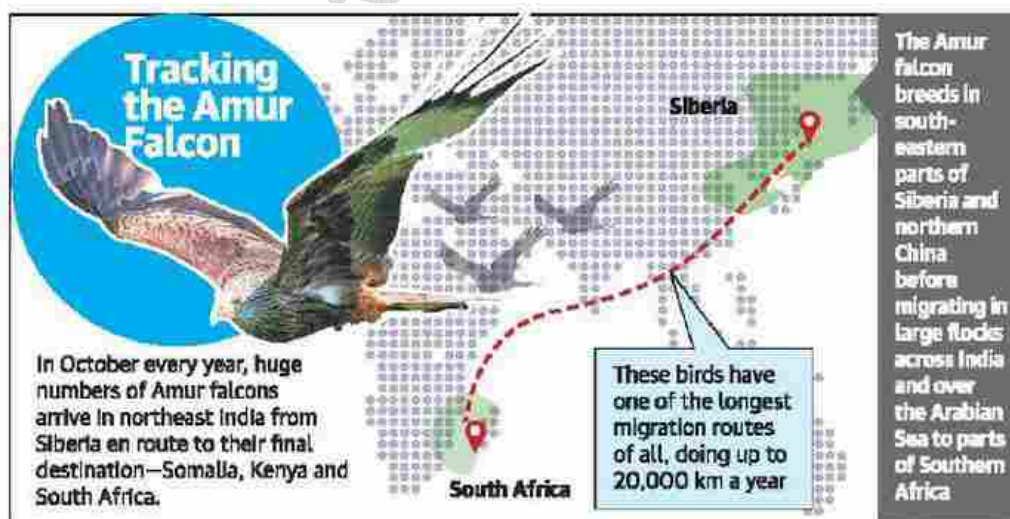
- The CAF is a nationally constituted authority that presides over a corpus of ₹66,000 crore. This is money paid by developers who have razed forest land for their construction projects, and the idea is that such land destroyed needs to be made good by regenerating forest elsewhere on non-forest land.

- The amount to be paid depends on the economic value of the goods and services that the razed forest would have provided. These include timber, bamboo, firewood, carbon sequestration, soil conservation, water recharge, and seed dispersal. Industrialists pay this money and this is eventually transferred to the States concerned to carry out afforestation.
- Until now, a Compensatory Afforestation Fund Management and Planning Authority was in charge of the funds. However a new Act, the CAF Act 2016, that came into being after over a decade since it was devised, now establishes an independent authority to execute the fund. However, it was not until August that the rules governing the management of the fund were finalised. And this has stoked controversy.

## **Sterlite protest in Tuticorin**

- Emissions of sulphur dioxide were found, Copper Anode production
- Copper smelters are very polluting industries. They lead to the release of sulphur dioxide and dust particles in the air.
- In addition to this, a plant such as this will require a lot of surface water and resources, which should go for agriculture. Drinking water supply will be depleted.

Siberian visitors freeze Assam-Meghalaya border dispute





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- Umru village on the Assam-Meghalaya border lacks a road but that doesn't stop its famous winter visitors — a flock of Amur falcons, the world's longest travelling raptors.
- Doyang Lake near Pangti village in Nagaland's Wokha district is better known as a stopover for the Amur falcons during their annual migration from their breeding grounds in Mongolia and northern China to warmer South Africa, a flock has been seen since 2010 in Umru.
- Umru is in Block II, one of 12 disputed areas along the Assam-Meghalaya border, since Meghalaya was carved out of Assam in 1972.
- Assam claims the village is under Baithalangso Assembly constituency of East Karbi Anlong district while Meghalaya asserts it is under Mawhati Assembly constituency of its Ri-Bhoi district.
- The village welcomes the falcons in mid-October, uniting to ensure a safe stay for the birds. Both communities have made common cause in protection of the Amur falcons and have fixed a fine of Rs. 25,000 for anyone caught ensnaring or killing the birds.
- The Tyrso Valley Wildlife Protection Society is an NGO formed by the villagers of the eponymous Meghalaya village adjoining Umru. The group has been organising the Amur Falcon Festival since 2015 to celebrate the "birds that have this back-of-beyond area famous".
- The festival is scheduled on November 7-8, a fortnight before the birds are expected to soar for the next destination on their migration.
- Wildlife officials in Nagaland also point out that the migratory birds used to roost in very large numbers in the Changtongya Community Conservation Reserve but moved on to Pangti and Yaongyimchen, a lesser roosting site.
- Both Gorkha and Khasi tribal communities have made common cause in protection of the Amur falcons and have fixed a fine of Rs.25,000 for anyone caught ensnaring or killing the birds.





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### **ZSI survey on Moths**

- Zoological Survey of India (ZSI) has recently conducted a study on moths.
- It revealed that moth insects are acting as pollinators to a number of flowering plants in the Himalayan ecosystem.
- The insect order Lepidoptera comprises the butterflies, moths, and skippers.
- They can be distinguished from all other insects by their two pairs of scale-covered wings and are renowned for their sense of smell.
- For most Lepidoptera species, the vast majority of the life cycle is spent in the larval stage.
- Butterflies and moths have numerous physical and behavioral differences. Eg. moths are nocturnal and butterflies are diurnal.
- Role of pollinators – They are essential for the genetic exchange among flowering plants and the biodiversity among plants.
- About 90% of the world's flowering plants are pollinated by animals.
- Usually bees, wasps and butterflies are considered as prominent pollinators.
- Almost two-thirds of common large moth species have declined over the last 40 years in some parts of world.
- One of main reasons for the decline is light pollution (an increase in artificial light in moth habitats).

### **AQI in Delhi**

- Air Quality Index is a number used to communicate to the public how polluted the air currently is or how polluted it is forecasted to become.
- As AQI increases, an increasingly large percentage of the population is likely to experience increasingly adverse health effects.
- The AQI is most commonly used by Central Pollution Control Board (CPCB) to describe ground-level ozone levels.
- According to CPCB report, AQI score in Delhi for the season reached poor and severe category recently.
- The city registered an average AQI of 366, which falls in the 'very poor' category, based on the reading of 32 monitoring stations.



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- Accordingly, CPCB has issued health advisories and recommended stringent measures from November 1 to 10 forecasting further deterioration in air quality ahead of Diwali.
- AQI takes in to account 8 pollutants and prepare a 6 grade colour code to reveal the severity of pollutants in air quality.
- These pollutants are:
  - Ground-level Ozone or O<sub>3</sub>
  - Particulate Matter (soot and dust) - PM 5 and PM 10
  - Carbon Monoxide or CO
  - Sulphur Dioxide or SO<sub>2</sub> and
  - Nitrogen Dioxide or NO<sub>2</sub>
  - Lead or Pb
  - Ammonia or NH<sub>3</sub>
- Sikkim beat 51 other nominations from across the globe to receive an UN award on Oct. 16, 2018, for becoming the world's first 100% organic state. Sikkim Chief Minister Pawan Kumar Chamling received the UN Food and Agriculture Organisation's (FAO) Future Policy Gold Award for paving the way for the rest of the world. Sikkim was recognised for its farming policies which have helped over 66,000 farmers and boosted tourism. It got rid of chemical fertilizers and pesticides and began using natural alternatives instead.
- The Ocean Cleanup, an ambitious project spearheaded by a young Dutch inventor, Boyan Slat, was launched in September, with the deployment of its first device - System 001. The system began to target plastic in the Great Pacific Garbage Patch, which is a large collection of marine debris in the North Pacific. The Ocean Cleanup aims to launch 60 such systems subsequently in the world's oceans, to collect and remove the larger debris before it breaks down into microplastic.

### **WHO's First Global Conference on Air Pollution and Health**

- The first Global Conference on Air Pollution and Health will be held at WHO Headquarters in Geneva.
- Organizers: The conference is being held in collaboration with UN Environment, World Meteorological Organization (WMO), the Secretariat of the UN Framework Convention on Climate Change (UNFCCC), the Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants (CCAC) and the United Nations Economic Commission for Europe (UNECE).
- Participants will include Ministers of Health and Environment and other national government representatives; representatives of intergovernmental agencies, health professionals, other sectors (e.g. transport, energy, etc.), as well as from research, academia and civil society.
- The conference responds to a World Health Assembly mandate to combat one of the world's most significant causes of premature death, causing some 7 million deaths annually. Air pollution in most cities exceeds recommended WHO Air Quality levels and household air pollution is a leading killer in poor rural and urban homes. Up to 1/3 of deaths from stroke, lung cancer and heart disease are due to air pollution.

### **WHO's First Global Conference on Air Pollution and Health**



### **CSIR develops Less Polluting Firecrackers**

- CSIR develops Less Polluting Firecrackers named – safe water releaser (SWAS), safe minimal aluminium (SAFAL) and safe thermite cracker (STAR).
- These crackers have unique property of releasing water vapour and /or air as dust suppressant and diluent for gaseous emissions and matching performance in sound with conventional crackers.





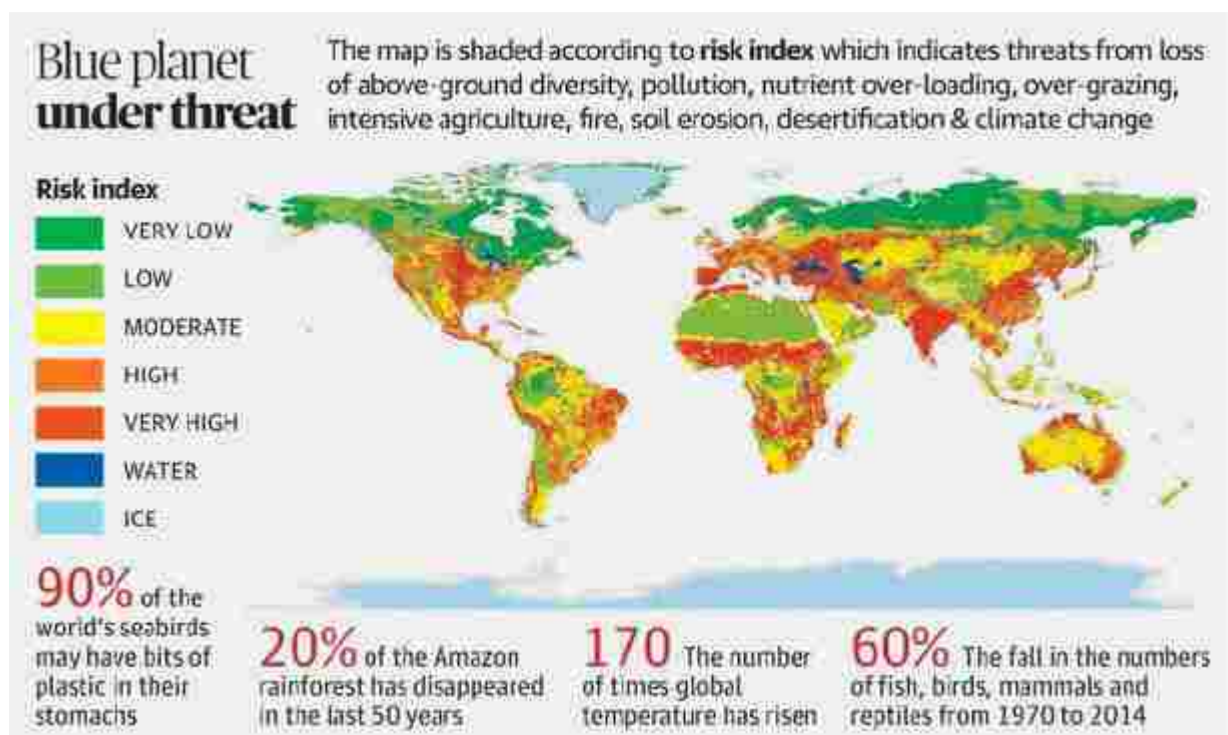
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- SWAS crackers eliminates usage of ( $\text{KNO}_3$ ) Potassium nitrate and Sulphur with consequent reduction in particulate matter (30-35%)  $\text{SO}_2$  and  $\text{NO}_x$ . It has matching sound intensity with commercial crackers in the range of 105-110 dBA. SWAS has been tested for shelf life upto 3 weeks with consistent performance.
- STAR eliminates usage of  $\text{KNO}_3$  and S with consequent reduction in particulate matter (35-40%),  $\text{SO}_2$  and  $\text{NO}_x$ . It has matching sound intensity with commercial crackers in the range of 105-110 dBA.
- SAFAL has minimal usage of aluminium (only in flash powder for initiation) with consequent significant reduction in particulate matter (35-40 %) compared to commercial crackers. It has matching sound intensity with commercial crackers in the range of 110-115 dBA.

### **Global Soil Biodiversity Atlas**

- The Atlas is prepared by World Wide Fund for Nature.
- It indicates risk index which takes in to account, threats from loss of above-ground diversity, pollution and nutrient over-loading, over-grazing, intensive agriculture, fire, soil erosion, desertification and climate change.
- The two key drivers of biodiversity loss were the over exploitation of natural resources and agriculture.
- The risk index shows India among countries whose soil biodiversity faces the highest level of risk.
- The report highlighted that, while India's per capita ecological footprint was less than 1.75 hectares/person (which is in the lowest band, among countries surveyed) its high population made it vulnerable to an ecological crisis.
- The other countries which are placed along with India - Pakistan, China, several countries in Africa and Europe, and most of North America.
- The findings under this are part of the bi-annual Living Planet Report 2018.



## Dal-Nageen Lake

- J&K administration has appointed an official for conducting a comprehensive bathymetric survey (study of underwater depth of lake or ocean floors) of the Dal-Nageen lake.
- The Nageen lake in Srinagar is a deep blue water offshoot of the Dal lake that is interconnected by a thin causeway.
- The lake is located to the east of the city of Srinagar, at the foothill of the Zabarwan Mountain.
- The Nageen lake is surrounded by a large number of willow and poplar trees. Hence, it has been referred as a "nageena", which means "the jewel in the ring".







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### **Living Planet Report 2018**

- The bi-annual Living Planet Report 2018 has been released by the World Wide Fund for Nature. The Report tracked more than 4,000 species of mammals, birds, fish, reptiles and amphibians.
- Global wildlife population shrank by 60% between 1970 and 2014.
- Declines are worst in the tropics, according to the data, as South and Central America saw an 89% decrease. Also, freshwater species saw an 83% drop, threatened by factors including overfishing, pollution and climate change.
- The report estimates that only a quarter of the world's land is untouched by humans, who are increasing food production and use of natural resources.
- Since 1960, the global ecological footprint has increased by more than 190%. Globally, the extent of wetlands was estimated to have declined by 87% since 1970.
- The two key drivers of biodiversity loss were the over exploitation of natural resources and agriculture.

### **Threat to soil biodiversity and pollinators:**

- A key aspect of this year's report is the threat to soil biodiversity and pollinators.
- Soil biodiversity encompasses the presence of micro-organisms, micro-fauna (nematodes and tardigrades for example), and macro-fauna (ants, termites and earthworms).
- The report notes that India's soil biodiversity is in grave peril. The WWF's 'risk index' for the globe — indicating threats from loss of above-ground diversity, pollution and nutrient over-loading, over-grazing, intensive agriculture, fire, soil erosion, desertification and climate change — shows India among countries whose soil biodiversity faces the highest level of risk.



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### **What needs to be done?**

- To address these challenges, the WWF suggests three necessary steps: “clearly specifying a goal for biodiversity recovery; developing a set of measurable and relevant indicators of progress; and agreeing on a suite of actions that can collectively achieve the goal in the required time frame.”
- The WWF has called for an international treaty, modelled on the Paris climate agreement, to be drafted to protect wildlife and reverse human impacts on nature.

According to recently released Global Soil Biodiversity Atlas prepared by World Wide Fund for Nature (WWF), India among nations that face grave danger to soil biodiversity. The atlas was released as part of WWF's bi-annual Living Planet Report (LPR) 2018. The key aspect of this year's report was threat to soil biodiversity and pollinators, the two key drivers of biodiversity. These two key drivers loss were due to over exploitation of natural resources and agriculture.

#### Highlights of report

Soil Biodiversity: It encompasses presence of micro-organisms, micro-fauna (nematodes and tardigrades for example), and macro-fauna (ants, termites and earthworms).

Millions of microbial and animal species live and make up soils, from bacteria and fungi to mites, beetles and earthworms. Soil biodiversity, thus is total community from genes to species, and varies depending on environment.

The immense diversity in soil allows for great variety of ecosystem services that benefit species that inhabit it, the species that use it and its surrounding environment.

WWF's 'risk index' for globe: It indicated threats from loss of above-ground diversity, pollution and nutrient over-loading, over-grazing, intensive agriculture, fire, soil erosion, desertification and climate change.

India was coloured red on atlas and is among countries whose soil biodiversity faces the highest level of risk. Other countries in this category include Pakistan, China, several countries in Africa and Europe, and most of North America.



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### **Odisha Coastal Disaster Alert System**

- Odisha Government has launched an automatic public address system to warn citizens about cyclone and tsunami, floods.

### **Key features**

- This is the first of its kind technology in field of Early Warning Dissemination System (EWDS) in India.
- The EWDS of Odisha government has been implemented under the assistance of World Bank with a cost of around 82 crores.
- Around 122 towers have been installed along the 480 km long coastline of the odisha state to produce sound and sirens during emergency situations.
- Sound producing from the towers can be heard in communities within a radius of 1.5 km.
- The button will be pressed from the state emergency centre in Bhubaneswar during an emergency situation.
- Six coastal districts named Balasore, Bhadrak, Jagatsinghpur, Kendrapara, Puri and Ganjam have been covered under the system.
- It's a part of the last-mile connectivity programme under the National Cyclone Risk Mitigation Project an aimed at protecting people from the cyclone effects.
- The system will prove to be boon for the fisherman of the state.

### **Odisha and disasters**

- Odisha is vulnerable to many disasters. The state is prone to tropical cyclones, Storm surges and tsunamis.
- A large part of the state comes under Earthquake Risk Zone-II. The super-cyclone of 1999 which claimed 10,000 lives in Odisha. In 2013, Cyclone Phailin hit the Indian coasts. Cyclone Hudhud hit Odisha in 2014. Recently cyclone Titli hit odisha coast in 2018.
- Sundari, the tigress, which reportedly killed a man in Satkosia Tiger Reserve, Odisha.

### **National Action Plan for Conservation of Migratory Birds**

- Union government has come out with a 5-year national action plan to conserve habitats of migratory birds.
- It specifically covers species which take long distances from Siberia in Russia to make the country their temporary home during winter.
- The action plan is brought out by Union Environment Ministry which spans 2018-2023.
- It is meant for coordinated actions among states for securing and enhancing population of migratory birds in India within their range across the Central Asian Flyway (CAF).
- A flyway is a geographical region within which a single or a group of migratory species completes its annual cycle – breeding, moulting, staging and non-breeding.
- CAF is one of the 9 flyways in the world.
- CAF covers northernmost breeding ground in Siberia to the southernmost non-breeding grounds in west and south Asia, the Maldives and the British Indian Ocean Territory.



### **International Solar Alliance**

- Botswana has recently announced its decision to join International Solar Alliance.
- The International Solar Alliance is an alliance of more than 120 countries, most of them being sunshine countries, which come either completely or partly between the Tropic of Cancer and the Tropic of Capricorn.
- It aims to channel \$300 billion in 10 years to promote renewable energy projects under a global mega fund for clean energy.
- The framework pact was initiated by the Indian and French governments at the climate change summit held at Paris in 2015.
- It opened ISA Framework Agreement for signature in Marrakech, Morocco in 2016, on the side-lines of COP-22.



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- After ratification by 15 countries, ISA became the first full-fledged treaty based international intergovernmental organization headquartered in India.
- Till date, out of 121 prospective member countries that lie either fully or partially between the Tropics of Cancer and Capricorn, 68 countries have signed the Framework Agreement of the ISA.
- In the first assembly of ISA, a resolution was passed for amending the framework agreement to open ISA membership to all countries that are members of United Nations.

### **Country in news - Botswana**

- It is the country in the centre of Southern Africa.
- The country is named after its dominant ethnic group the "Tswana".
- It is bounded by Namibia to the west and north, Zambia and Zimbabwe to the northeast, and South Africa to the southeast and south.
- The Zambezi River, Chobe River border in the north and Molpo River (part of the Orange River system) in the south.
- The Limpopo River and its tributaries borders east.
- The country is characterized by rocky hill ranges and Kalahari desertic region.





### **SECURE Himalaya**

- The SECURE Himalaya project was launched by the union government in association with the United Nations Development Programme (UNDP).
- It is a six-year project to ensure conservation of locally and globally significant biodiversity, land and forest resources in the high Himalayan ecosystem spread over four states in India.
- The SECURE - securing livelihoods, conservation, sustainable use and restoration of high range Himalayan ecosystems is meant for specific landscapes.
- It includes Changthang (Jammu and Kashmir), Lahaul - Pangi and Kinnaur (Himachal Pradesh), Gangotri - Govind and Darma - Byans Valley in Pithoragarh (Uttarakhand) and Kanchenjunga - Upper Teesta Valley (Sikkim).



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- UNDP has recently launched a competition for tagline and illustration with the theme “Protecting Wildlife, Preserving Landscapes and Empowering Communities in the High altitude Himalaya”.

### **UNDP**

- UNDP, is an UN organization formed in 1965, is to help countries eliminate poverty and achieve sustainable human development.
- Sustainable human development is an approach to economic growth that emphasizes improving the quality of life of all citizens while conserving the environment and natural resources for future generations.
- The status of UNDP is that of an executive board within the United Nations General Assembly.
- It is working to strengthen new frameworks for development, disaster risk reduction and climate change.
- UNDP also encourages the protection of human rights and the empowerment of women in all of its programmes.
- The UNDP Human Development Report Office also publishes an annual Human Development Report (since 1990) to measure and analyze developmental progress.
- In addition to a global Report, UNDP also publishes regional, national, and local Human Development Reports.

### **461 elephants electrocuted in country in 8 years since 2009**

- A closer look at the data reveals that States in the eastern and northeastern region of the country have accounted for most of these deaths — in Odisha, 90 elephants died of electrocution; 70 elephants died of electrocution in Assam; 48 elephants in West Bengal; and 23 elephants in Chhattisgarh.
- Karnataka, which has the highest population of elephants, has recorded the highest casualties by electrocution, numbering 106. While 17 elephants died in Kerala, in Tamil Nadu, the number of deaths in the same period was 50.

- According to the all-India synchronised census of elephants in 2017, their population was 27,312. The States with the highest elephant population are Karnataka (6,049), followed by Assam (5,719) and Kerala (3,054).
- Representatives of the Wildlife Trust of India (WTI), who along with the MOEFCC's Project Elephant had come out with a publication on the right of passage in 101 elephant corridors of the country in 2017, stressed on the need for greater surveillance and protection of elephant corridors.

### Big dry

- Parts of New South Wales (NSW) - a state declared to be 100% in drought
- Farming regions in NSW and Queensland have been bone dry for months - years in some cases - meaning there is no quick fix to end the drought. So what would it take?



- The drought has fuelled conflict between native animals and farmers fervently trying to save every last blade of grass and feed for their livestock

### **Owls this Diwali**

- TRAFFIC, the wildlife trade monitoring network, has issued an advisory to enforcement agencies calling for increased efforts to help curb trafficking and sacrifice of owls. The advisory follows TRAFFIC's investigations into illegal owl trade in India, published in the report 'Imperilled Custodians of the Night'.



### **What does report says about?**

- The report stated that owls are used and traded for a wide variety of purposes, including black magic, street performances, taxidermy, private aviaries/ zoos, food, folk medicines and capturing other birds.
- Occult practitioners drive consumer demand by touting use of owl parts for purposes ranging from curing various illnesses to fighting the effects of evil spirits.
- The birds are poached for their bones, talons, skull, feathers, meat and blood, which are then used as talismans, for black magic and in traditional medicine. Owls, especially those with "ears" (tufts), are thought to possess the "greatest magical powers" and Diwali is claimed to be the most auspicious time for sacrificing an owl.
- Of 30 species of owls found in India, 15 are traded illegally. The spotted owl ( *Athene brama* ), barn owl ( *Tyto alba* ) and rock eagle-owl ( *Bubo bengalensis* ) are the most commonly recorded species in the illegal trade.
- Since sacrifice of owls begins with the onset of Dussehra and continues till Diwali, poachers involved in bird trade are most active during this season. This is one of the most important times for enforcement agencies to remain alert and increase vigilance."



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- Owls are protected under the Wildlife Protection Act, which prohibits hunting, trade or any other form of utilisation of the species or their body parts. Their international trade is restricted under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

### **Tyto alba Tyto alba Common Barn-owl**

- IUCN status Least Concerned
- Habitat: Artificial/Aquatic & Marine, Artificial/Terrestrial, Wetlands (inland), Shrubland, Savanna, Grassland, Caves and Subterranean Habitats (non-aquatic)

### **Air Quality Index (AQI) & SAFAR**

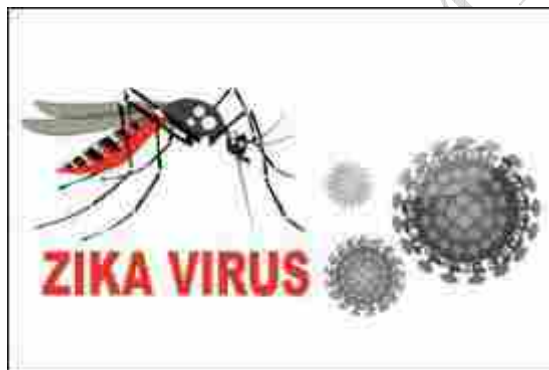
- Air Quality Index (AQI) or Air Pollution Index (API) or Pollutant Standard Index (PSI) is an index used by governments / Government agencies to characterize the quality of the air at a given location using the concentration of one or more pollutants as measure of severity of pollution. It's a public information tool that helps protect public health on a daily basis from the negative effects of air pollution.
- The Air Quality Index is a scale designed to help public understand what the air quality around them means to their health. In addition, Emission inventory or criteria pollutants are an important component of the forecasting model.
- In India, in the latter half of 2010, the "System of Air Quality Forecasting and Research (SAFAR) was dedicated to the nation at the Jawaharlal Nehru Stadium on the occasion of CWG New Delhi 2010.
- This system has been developed indigenously.
- It encompasses 11 Air Quality Monitoring Stations, 34 Automatic weather stations in NCR along with GPS observations and Doppler Weather radar.
- This is for the first time that India had a system for air quality forecasting and New Delhi became the first city in the country to be able to provide, 24 hour advance forecast for criteria pollutants namely Ozone, Oxides of Nitrogen, Carbon Monoxide, Particulate Matters <2.5µm (PM2.5), Particulate Matters < 10µm (PM10), Benzene, Toluene, Xylene, and Black carbon.



- SAFAR system for the air quality has been developed by the Indian institute of Tropical Meteorology (IITM), Pune and weather information and forecasting is done by India Meteorological Department (IMD).

### **Zika strain**

- Zika virus disease is an emerging disease currently being reported by 86 countries worldwide. Symptoms are similar to other viral infections such as dengue, and include fever, skin rashes, conjunctivitis, muscle and joint pain, malaise, and headache.
- In India, the first outbreak was reported in Ahmedabad in January/February 2017 and second outbreak in July, 2017 from Krishnagiri district in Tamil Nadu. Both these outbreaks were successfully contained through intensive surveillance and vector management.
- The disease continues to be on disease surveillance radars of the Union Health Ministry although it is no longer a Public Health Emergency of International Concern according to a WHO notification of November 18, 2016.



### **Palau becomes first country to ban sunscreen to save coral reefs**

- The Western Pacific nation of Palau has become the first country to ban many kinds of sunscreen, in a move to protect its coral reefs from chemicals that scientists say cause significant damage.
- Under the ban, which will take effect in 2020, “reef-toxic” sunscreen — defined as containing one of 10 prohibited chemicals
- Damage to coral reefs worldwide from climate change has been widely reported, but scientists say there is growing evidence that chemicals from sunscreen, which washes off swimmers or enters the ocean through sewer systems, also causes grave harm.



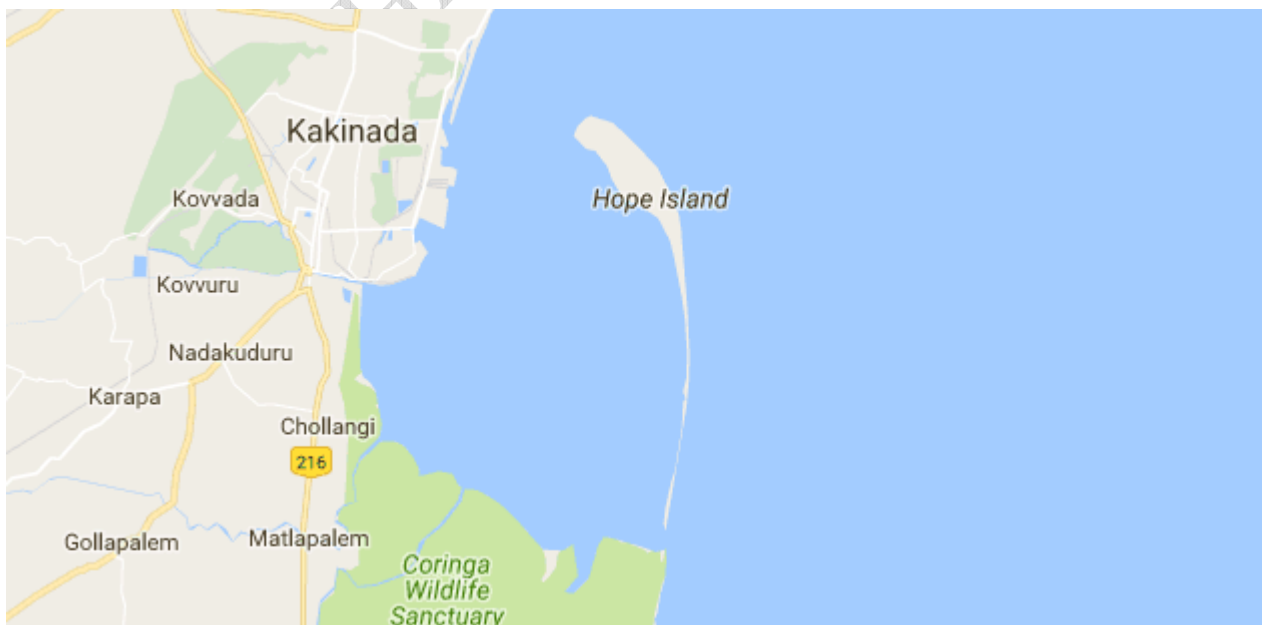
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- a 2017 report that found sunscreen products to be “widespread” in Jellyfish Lake, one of the country’s UNESCO World Heritage sites.
- Studies have shown that chemicals in sunscreen can cause localized coral bleaching and can disrupt the reproduction of fish by interfering with their hormonal systems.
- A 2015 study found that oxybenzone in sunscreen stunts coral growth and is toxic for the algae that live within reefs.

### **Hope Island**

- Greater Flamingoes have recently been spotted on the Coast of Hope Island after a long period.
- Hope Island is a part of the Coringa Wildlife Sanctuary, off the coast of Kakinada, Andhra Pradesh.
- It is relatively a young island, formed from the sediment outflow carried by the waters of the Koringa River, a distributary of the Godavari.
- It acts as natural barrier for storm surges and provides tranquility to the ships anchored in Kakinada Bay which makes Kakinada Port one of the safest natural ports in the Eastern Coast of India.
- The northern tip of the island is called "Godavari Point", which overlooks the entry point into the Kakinada Bay and the Kakinada harbour.
- Tigress Avni was shot dead at Ralegaon forest Yavatmal in Maharashtra



### **Green building**

- The assessment comes from Green Rating for Integrated Habitat Assessment (GRIHA) Council, a not-for-profit society jointly set up by The Energy and Resources Institute (TERI) and the Ministry of New and Renewable Energy to promote green buildings in India.
- Green buildings are structures that are designed to utilise less resources than conventional buildings.
- Buildings account for up to 40% of the total energy consumption in India
- Objectives include minimising water demand and promoting recycling, besides air pollution control measures. "Green buildings are much more healthy entities in terms of designing but the air that is going to come inside would be something that is present outside but to a certain extent you could minimise or reduce the damage through a green building.
- A green building can reduce the interference from outside pollutants



### **SDG Global Media Compact**

- Global media compact was introduced in the last session of UN general assembly in collaboration with UN foundation.
- It is an initiative marking a new drive to advance awareness of the Sustainable Development Goals (SDGs).
- The Compact seeks to inspire media and entertainment companies around the world to leverage their resources and creative talent to advance the Goals.
- It is inclusive and aims to embrace media companies from all regions and all platforms.
- The 17 Sustainable Development Goals were adopted by world leaders at the historic Sustainable Development Summit in September 2015.



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### **Earth's ozone layer is finally healing**

- The ozone layer is finally beginning to heal from all the damage caused by aerosol sprays and other manmade chemicals, a new United Nations report has revealed.
- The protective shield in Earth's atmosphere had been thinning out before scientists raised the alarm about the impact of chlorofluorocarbons (CFCs) in the 1980s.
- As a result of bans introduced by global governments, the upper ozone layer above the Northern Hemisphere should be completely restored in the 2030s.
- A gaping hole in the ozone over the Antarctic won't disappear until later – sometime in the 2060s, according to a scientific assessment released on Monday at a conference in Quito, Ecuador. The ozone layer in the Southern Hemisphere should be repaired by mid-century.
- The biggest cause of the depletion was the presence of various ozone-depleting substances (ODS) such as chlorofluorocarbons (CFCs) and halons, which constitute CFC-11 emissions, and were ultimately banned in 2010. Between then and now, efforts to replace these chemicals with less harmful ones such as hydrofluorocarbons (HFCs) have begun to pay off. India and China are big users of HFCs due to their population. They are coolants used in refrigerators and air conditioners.

### **Montreal Protocol**

- The Montreal Protocol on Substances that Deplete the Ozone Layer has been recognized as the most successful international environment treaty in history.
- It is the only environmental treaty which enjoys universal ratification of 197 UN member countries.
- The protocol has been amended by Kigali Agreement which was signed by the member countries in its 28th Conference of Parties (CoP).
- Kigali agreement aims to phase out Hydro fluorocarbons (HFCs), a family of potent greenhouse gases by the late 2040s.
- The protocol and its amendments have banned the use of ozone destroying chemicals and the rate of ozone depletion seems to have slowed.



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- Its implementation has not only led to the phase-out of around 98% of ozone depleting chemicals, but also averted more than 135 billion tonnes of carbon dioxide equivalent emissions.
- The beauty of treaties such as this one is that the onus of compliance remains on the country while the environmental effects remain global, pushing countries to do their best .
- Finalised in 1987, the Montreal Protocol has been hailed as the one of the most successful and effective environmental treaties ever negotiated and implemented, aimed solely at preventing the depletion of the ozone layer and protecting humans from the ultraviolet rays of the sun. The treaty also gives developing and underdeveloped signatory countries a buffer period to completely stop the use of HFCs, which do not directly affect ozone depletion but are global warmers.

### **Advanced Motor Fuels Technology Collaboration Programme**

- The programme is under the International Energy Agency.
- It is an international platform for co-operation among countries to promote cleaner and more energy efficient fuels & vehicle technologies.
- The programme provides an opportunity for fuel analysis, identifying new/ alternate fuels for deployment in transport sector and allied R&D activities for reduction in emissions in fuel intensive sectors.
- Union Cabinet has recently approved India's membership in this programme.
- The aim of joining this by Ministry of Petroleum and Natural Gas is
  - To facilitate the market introduction of Advanced motor fuels/ Alternate fuels
  - To bring down emissions and achieve higher fuel efficiency in transport sector.
- India is the 16th member of the programme and other members are USA, China, Japan, Canada, Chile, Israel, Germany, Austria, Sweden, Finland, Denmark, Spain, Republic of Korea, Switzerland and Thailand.



### **Sundari**

- Sundari, the tigress captured following a few incidents of mauling in Odisha's Satkosia Tiger Reserve, may not be shifted to the Nandankanan Zoological Park as the Central Zoo Authority has advised against transfer of animals from the wild

### **GI tag for Erode Turmeric**

- The Geographical Indications Registry has accepted the application seeking a GI tag for 'Erode Turmeric'.
- A GI tag is a sign used on products that have a specific geographical origin and possess qualities or a reputation by virtue of their geographical association. The tag conveys an assurance of quality and distinctiveness which is essentially attributable to the geographical origin of the product. The owner of the GI tag has exclusive rights over the product.
- Erode Turmeric is the traditional cultivar of India, traditionally grown in the Erode area of production comprising of entire Erode district, Annur and Thondamuthur (near Perur) Taluks of Coimbatore District and Kangayam Taluk, of present Tirupur district.
- Erode Turmeric comes under the genus *Curcuma longa* Linn and belongs to family Zingiberaceae. According to the documents, Erode Turmeric requires a hot and moist climate for cultivation.
- "It is mostly grown under irrigated conditions as the annual rainfall received is low. Kalingarayan canal and LBP (Lower Bhavani Project) canal are the major sources of irrigation besides tanks and wells. Erode turmeric thrives best on loamy soils or alluvial soils.
- Ganga Gram is a concept to transform the villages on the bank of river Ganga into ideal villages with emphasis on Open Defecation Free, Solid and Liquid Waste Management, Water Conservation, Ground Water Recharge,





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modern crematorium, tree plantation, organic and medicinal plants. After declaration of all 4465 Ganga Bank villages as ODF, the Ministry of Drinking Water and Sanitation is working in the direction of sustaining the ODF status of this area.

### **Advanced Motor Fuels Technology Collaboration Programme**

- The Union Cabinet has been apprised of India joining as Member of Advanced Motor Fuels Technology Collaboration Programme (AMF TCP) under International Energy Agency (IEA).
- The primary goal of joining AMF TCP by India to bring down emissions and achieve higher fuel efficiency in transport sector.

### **What is Advanced Motor Fuels Technology Collaboration Programme?**

- AMF TCP is an international platform under the framework of International Energy Agency (IEA) for co-operation among countries to promote cleaner and more energy efficient fuels & vehicle technologies.
- The activities of AMF TCP are deployment and dissemination of Advanced Motor Fuels. It looks upon the transport fuel issues in a systemic way taking into account the production, distribution and end use related aspects.
- AMF TCP also provides an opportunity for fuel analysis, identifying new/alternate fuels for deployment in transport sector and allied R&D activities for reduction in emissions in fuel intensive sectors.

### **India and Other Members:**

- Ministry of Petroleum & Natural Gas has joined AMF TCP as its 16th member in May, 2018. The other member Countries of AMF TCP are USA, China, Japan, Canada, Chile, Israel, Germany, Austria, Sweden, Finland, Denmark, Spain, Republic of Korea, Switzerland and Thailand.

## Benefits for India:

- India's association with AMF TCP will help in furthering its efforts in identification & deployment of suitable fuels for transport sector for higher efficiency and lesser emissions.
- The benefits of participation in AMF TCP are shared costs and pooled technical resources.
- The duplication of efforts is avoided and national Research and Development capabilities are strengthened.
- There is an information exchange about best practices, network of researchers and linking research with practical implementation.
- After becoming member, India will initiate R&D in other areas of its interest in advanced biofuels and other motor fuels in view of their crucial role in substituting fossil fuel imports.

## T.N. lost 41% shoreline to erosion, says study

### Shore under attack

Tamil Nadu's coastline is under threat, finds a report by the National Centre for Coastal Research

- 41% of Tamil Nadu's shoreline lost to erosion in the past 26 years
- Of the 991.47 km of shoreline taken up for assessment, nearly 407.05 km has been lost to erosion. Of this, nearly 15 km of shoreline has suffered a high degree of erosion
- Coastline in Kancheepuram, Villupuram, Thiruvananthapuram and Kanniyakumari districts under threat
- Some of the erosion hotspots are Thiruvottiyur, Kasikovilkuppam, Chinnakuppam, Periyakuppam, Nadukuppam and Oyalikuppam in Chennai, Bommiyarpalayam, Chinnamudalayar Chavadi, Periyamudalayar Chavadi, Pettodai and Periyakuppam near Puducherry, Tiruchendur, Colachel and Kovalam
- Sand accretion along shoreline noticed at places including Marina beach, between Ennore port and Kosasthalaiyar river, Vedaranyam and Muttam in Kanniyakumari district

- Of the coastline running to 40.97 km in Tiruvallur district, nearly 14 km is facing erosion and 9 km of shoreline has sand accretion
- Of Chennai 24.87 km coastline, 3.08 km faces erosion
- In Kancheepuram, 50 km of the 84.41 km of coastline faces erosion

#### SOLUTIONS PROPOSED BY NCCR

- Hard structures (seawalls, groynes, offshore breakwaters)
- Soft solutions (beach nourishment)
- Mixed solutions (beach nourishment and groynes/offshore breakwaters/reefs)



SOURCE: NATIONAL CENTRE FOR COASTAL RESEARCH

- In the past two decades, Tamil Nadu has reportedly lost 41% of its shoreline to erosion. As an effort to protect the coastline, National Centre for Coastal Research is preparing a report to identify vulnerable areas and propose solutions to suit site conditions.
- Based on a national assessment of shoreline changes and a status report for 1990-2016 prepared by the NCCR, the Centre and the National Institute of Ocean Technology are in the process of identifying erosion hotspots and executing short-term strategies for immediate protection.
- At present, sea walls and groynes, a collection of boulders laid perpendicular to the coastline, are the major artificial structures put in place for protecting the shoreline.
- According to the report released recently, ports development, construction of dams in the rivers that block supply of sediments to coastline are some of the reasons for erosion apart from the natural causes such as sea-level rise and storms.
- The Centre has completed projects in Puducherry and Kadalur Periyakuppam near Puducherry wherein beach nourishment by adding sediments and submerged reefs were implemented to reclaim the shoreline.
- Submerged dykes using geosynthetic tubes to a height of 2.5 metres was another solution to arrest sea erosion. These would be laid nearly 150 metres into the sea.
- The intensity of the waves is expected to be reduced with this technology.

### **Is Point Calimere Wildlife Sanctuary safe for migratory birds?**

- The water quality at the Point Calimere Wildlife Sanctuary might be unsafe for avifauna to feed and breed, notes a study that examined different pollution indicators in water.
- The wildlife sanctuary located in







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Nagapattinam district of Tamil Nadu spreads across an area of 30 sq.km and comprises sandy coastal, saline swamps and thorn scrub forests around the backwater.

- Though it is a protected area and a Ramsar site, chemical companies and small-scale shrimp farms around the wetland have started to pose a threat to the biodiversity and ecosystem of the sanctuary.
- High acidic or high alkaline water can affect the metabolic and developmental activities of wild animals and birds.
- Microbial indicators such as coliform bacteria were also found to be very high at all the five sites. The faecal waste of the birds contains a high level of microbial load besides nitrogen, and this can significantly alter the nutrients in the water. Previous studies have shown that drinking the contaminated water can lead to deformities in birds. Coliform infections in the birds have also been reported to cause a change in their natural behaviour and even affect their long distance migration.
- “There are also high chances for the prevalence of antibiotic resistance among the coliform bacteria

### **Groundwater depletion**

- The Indo-Gangetic Plain, northwestern, central and western parts of India account for most intensive groundwater-based irrigation. And among these regions, western India and the Indo-Gangetic Plain have more than 90% of the area irrigated using groundwater.
- While districts with significant decrease in groundwater are located in the Indo-Gangetic Plain, northwest, and central (Maharashtra) regions, a few districts in Punjab show substantial decline in groundwater table. With depletion occurring at a rate of 91 cm per year, Punjab has been witnessing a steep decline in groundwater table since 1996. “In northwestern India, the amount of groundwater extracted exceeds the total recharge leading to groundwater depletion.
- The study published in June this year found that groundwater recharge has declined between 1996 and 2016 in northwest and northcentral India due a reduction in low-intensity rainfall. Low-intensity rainfall during the monsoon is responsible for groundwater recharge in northwest and



northcentral India. The study also found that carbon dioxide emission from pumping groundwater and release of carbon dioxide into the atmosphere from the soil when groundwater is depleted is less than 2-7% of the total carbon dioxide emissions in India.

- Tensiometers to visually monitor soil moisture conditions in rice fields and irrigate the crops only when required

### **Point Calimere Sanctuary**

- It is the only Ramsar site in the State of Tamil Nadu.
- It is a mix of salt swamps, mangroves, backwaters, mudflats, grasslands and tropical dry evergreen forest.
- It is a haven for migratory birds and resident species.
- Chemical companies and small-scale shrimp farms around the wetland have started to pose a threat to the biodiversity and ecosystem of the sanctuary.
- Atmospheric temperature, pH and salinity exceeded the permissible limits for ecologically sensitive zones.
- The presence of salt pans around the sanctuary leads to increase in salinity of the waters.
- Previous studies show that, high acidic or high alkaline water can affect the metabolic and developmental activities of wild animals and birds.
- Coliform microbial infection in the birds have also been reported which can cause a change in their natural behaviour and even affect their long-distance migration.

### **Why in News?**

- Point Calimere Wildlife Sanctuary in Vedaranyam Range has been closed for a week in view of water-logging caused by a heavy spell of rainfall. A study notes that the water quality at the Point Calimere Wildlife Sanctuary might be unsafe for avifauna to feed and breed.



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### **Energy Efficiency Revolving Fund**

- Asian Development Bank (ADB) and Energy Efficiency Services (EESL) signed a USD 13 million grant to set up Energy Efficiency Revolving Fund.
- The fund is to be administered by ADB.
- It aims to expand and sustain investments in the energy efficiency market in India, build market diversification, and scale up existing technologies.
- Global Environment Facility (GEF) will provide the additional financing for the ongoing projects under this fund.
- Additional grants from GEF will be used by EESL for making investments in new and emerging technologies.
- EESL is under the administration of Ministry of Power and is working towards mainstreaming energy efficiency.

### **Global Cooling Innovation Summit**

- The first Global Cooling Innovation Summit was held in New Delhi.
- It was jointly organised by Department of Science and Technology along with Alliance for An Energy-Efficient Economy (AEEE), Rocky Mountain Institute, Conservation X Labs and CEPT University.
- The two-day summit was first-of-its-kind solutions-focused event organised to explore concrete means and pathways to address climate threat that comes from the growing demand from room air conditioners.
- It witnessed participation from distinguished speakers from around world, including innovators, philanthropists, venture capitalists, and other industry leaders.
- The launch Global Cooling Prize was also announced on the sidelines of this summit. It will be international competition to incentivise development of residential cooling technology that will have five times less climate impact in comparison to standard Room Air Conditioning (RAC) units sold currently.
- The hunting party failed to tranquilise Avni, as the rules required, and shot at it fatally.
- Out of 553 tiger deaths from 2012 to 2017, 22.1% were due to poaching, 15.4% were seizures, and 62.4% were attributed to natural causes

- India has 50 tiger reserves

### India's first specialized hospital for elephants opened in Mathura

- India's first specialized hospital for elephants was formally opened Churmura village in Mathura district of Uttar Pradesh. It is promoted by Wildlife SOS which had established first elephant conservation and care centre in 2010 and is currently looking after 20 elephants requiring specialised treatment
- The unique medical centre offers wireless digital X-ray, dental X-ray, laser treatment, thermal imaging, ultrasonography, hydrotherapy and quarantine facilities. The hospital is located close to elephant conservation and care centre. It is designed to treat injured, sick or geriatric elephants. It is equipped with medical hoist for lifting elephants. It also has elephant restraining device with dedicated indoor treatment enclosure for long duration medical procedures. It also has observation deck that allows veterinary students and interns to observe elephants' behaviour.



### Wildlife SOS (WSOS)

- It is conservation non-profit organisation. It was established in 1995 with primary objective of rescuing and rehabilitating wildlife in distress in country and preserving India's natural heritage.
- It is currently one of the largest Wildlife Organisations in South Asia. WSOS is also known for their efforts at rescue and rehabilitation of sloth bears and more recently elephants.



- It also runs active projects focused on mitigation of human wildlife conflict with regard to species. In addition, its work is also targeted at biodiversity and habitat conservation, awareness workshops and anti-poaching operations, as well as rehabilitation of communities dependent on performing or working animals for their livelihood

### Project maps butterfly migration in south India

- The Ferns Naturalists' Society (FNS), Wayanad, Travancore Natural History Society (TNHS), and the Malabar Natural History Society (MNHS) are joining hands to launch a citizen science project to map the migratory path of butterflies in South India in a first such initiative in the country.
- Usually migration starts during October-November with the onset of the northeast monsoon, from the plains to the ghats, and during April-May, just before the advent of the southwest monsoon, from the ghats to the plains.



- A recent study reveals that mainly four species of milkweed butterflies are involved in the migration, including Dakhn Dark Blue Tiger, Oriental Blue Tiger, Double-branded Black Crow and Indian Common Crow. The migration takes place across the plains of south India to the southern part of the Western Ghats.
- Migrant butterflies initially remain in reproductive diapause for a few weeks after reaching the Western Ghats. They breed in the mountain ranges and their progeny migrates to the eastern plains and Eastern Ghats area.

- The butterflies leave the Western Ghats just before the onset of the southwest monsoon and return after the monsoon. Thus, they avoid the cold weather and heavy rain in the southern Western Ghats.
- Butterfly migration is one of the least studied natural phenomena in the country.

### **Flood opened the gates to invasive plants**

- Floods and landslips that caused widespread havoc all over Kerala in August have also unleashed several alien invasive species of plants into the State's water bodies, posing a threat to native biodiversity and the aquatic environment, scientists have reported.
- An on-going survey of the Kerala Forest Research Institute (KFRI), Peechi, on the impact of the extreme climatic events in the State, has revealed that this might lead to invasive biota being introduced afresh, or being reintroduced in places where the control of their populations was once achieved.
- The study found that physical routes and paths formed due to landslides and the overflow of rivers had paved the way for the establishment of primary colonies of invasive species like Nila grass ( *Mimosa diplotricha* ), mikania ( *Mikania micrantha* ), lantana ( *Lantana camara* ) and Siam weed ( *Chromolaena odorata* ).
- The spread of the invasive species could threaten cultivable land and wildlife habitats alike. The survey revealed that invasive species like the water hyacinth ( *Eichhornia crassipes* ) and giant salvinia ( *Salvinia molesta* ), present in the backwaters of the Kuttanad region, had started colonising





paddy fields, cultivated lands and other isolated water bodies in nearby areas.

- In Thrissur district's Kole wetlands, notified under the Ramsar Convention, invasive plants, especially grass species, such as matamat ( *Rhynchospora corymbosa* ), desho grass ( *Pennisetum pedicellatum* ), giant salvinia and water hyacinth were reportedly establishing a beach-head, using available soil resources. This may lead to the conversion of marshy wetlands into dry land.
- In many areas of Thrissur, Palakkad, Wayanad and Idukki districts, seeds of invasive species from mountainous areas have spread to new spaces formed by landslips. Hardy invasive species can grow very fast in landslip-affected areas by using available nutrients, while native species cannot adapt to such conditions. Later, this area will be a seed source for many invasive species.
- In rubber plantations, cover crops (species grown mainly to prevent soil erosion) like mucuna ( *Mucuna bracteata* ), a nitrogen-regulating plant, are more likely to establish themselves in the new areas and subsequently spread into the forests through the corridors created by landslips. This could affect the soil and destroy the microhabitat of that area.
- Elimination of invasive plants is a Herculean task but their spread can be tackled with the active participation of the public." The Forest Department is conducting a survey to identify the area and density of the spread of invasive species in the Wayanad Wildlife Sanctuary.

### **Rare bird sighted in Kerala's Chinnar sanctuary**

- The sighting of a rare bird species in the Chinnar Wildlife Sanctuary has sparked much interest among ornithologists since its presence was noticed on the eastern side of the Western Ghats for the first time.
- The Sri Lankan Frogmouth, belonging to the *Batrachostomus moniliger* species, which was sighted at the sanctuary is usually confined to its habitation in the western side of the Western Ghats forests.
- It is a relative of Nightjar, a crepuscular and nocturnal bird breeding in Europe and temperate Asia. Its preferred habitat is a dry and open area with some small trees or bushes.
- The main feature is that it lays only one egg a year after the mating season in April-May. The nest is made using moss or leaves of soft plants and the bark of the trees. The male bird destroys the nest and flies away with the new born bird.
- Ornithologists say that the bird has a unique habitat in Sri Lanka and is also believed to be present in the Thattekad bird sanctuary. It is also found in Karnataka, Goa, and Maharashtra.



### **Parambikulam Tiger Reserve**

- The survey, initiated jointly by the Department of Forest and Wildlife, Parambikulam Tiger Conservation Foundation, and the Wayanad-based Ferns Naturalists Society, was held between November 9 and 12.
- The major species spotted during the four-day initiative include Small Palm Bob,



Silverstreak Blue, Orange-tail Awl, and Red-disc Bushbrown. Among them, Orange-tail Awl gets active only during early morning hours and late in the evening.

- One of the biggest surprises of the survey is the spotting of Red-disc Bushbrown, a high-altitude species endemic to Western Ghats. We found them in an area of Nelliampathy region at an altitude of 1,320 m.
- Budha Peacock or Budha Mayoore, which was recently declared as State butterfly of Kerala, was found in abundance in some areas of the forest. The survey had also recorded over 100 butterfly host plants in the reserve.

## Eco-sensitive zones

- The National Green Tribunal (NGT) has asked the Ministry of Environment, Forests and Climate Change (MoEF&CC) to consider declaring all elephant corridors in the country as eco-sensitive zones.
- NGT has given two week time to the Ministry to look into the issue and to proceed in the matter for declaration of such areas as eco sensitive zones.

### ECO-SENSITIVE ZONES

#### States with most no. of proposals

States	Number of Proposals
Madhya Pradesh	35
Himachal Pradesh	31
Maharashtra	31
Karnataka	29
Tamil Nadu	29

#### Notified proposals

Sikkim	8
Gujarat	6
Goa	6
Odisha	2
Haryana	1
Jharkhand	1
Karnataka	1
Andhra Pradesh	1

## Background:

- The observations came while the green panel was hearing a plea that highlighted the increasing number of unnatural elephant deaths taking place in the state. The petition said, "Owing to the increased denudation and loss of their forest habitats, elephants have come increasingly into conflicts with humans and faced deliberate retaliatory killings and accidents at railway crossings, high tension power lines, power fences and trenches."

### **What are Eco-sensitive zones?**

- The Environment Protection Act, 1986 does not mention the word “Eco-sensitive Zones”.
- The section 3(2)(v) of the Act, says that Central Government can restrict areas in which any industries, operations or processes or class of industries, operations or processes shall not be carried out or shall be carried out subject to certain safeguards.
- Besides the section 5 (1) of this act says that central government can prohibit or restrict the location of industries and carrying on certain operations or processes on the basis of considerations like the biological diversity of an area, maximum allowable limits of concentration of pollutants for an area, environmentally compatible land use, and proximity to protected areas.
- The above two clauses have been effectively used by the government to declare Eco-Sensitive Zones or Ecologically Fragile Areas (EFA). The same criteria have been used by the government to declare No Development Zones.

### **Criteria:**

- The MoEF (Ministry of Environment & Forests) has approved a comprehensive set of guidelines laying down parameters and criteria for declaring ESAs. A committee constituted by MoEF put this together.
- The guidelines lay out the criteria based on which areas can be declared as ESAs. These include Species Based (Endemism, Rarity etc), Ecosystem Based (sacred groves, frontier forests etc) and Geomorphologic feature based (uninhabited islands, origins of rivers etc).

### **Amur Falcon**

- Amur falcons are known to breed in southeast Russia and northern China.
- These birds migrate west through India and across the Arabian Sea to southern Africa where they spend their winters, making a round-trip of at least 20,000 km every year,



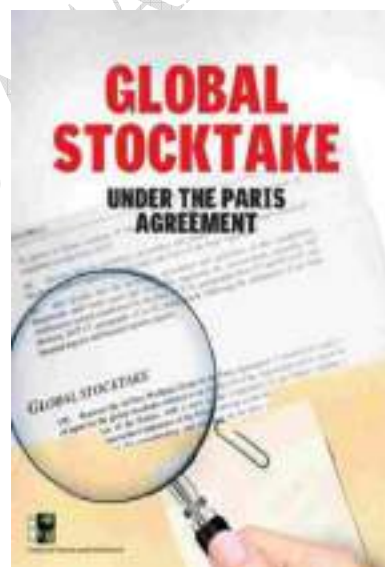


travelling between their breeding and wintering grounds.

- This arduous journey includes a non-stop flight over the Arabian Sea after passing across India.
- The resilient falcons arrive in large numbers, during October in Nagaland and a few other places in northeastern India.
- The Amur falcon is protected under the Indian Wildlife Protection Act, 1972.

### **Global Stocktake (GST)**

- GST refers to proposed five-yearly-review of the impact of climate change action undertaken by countries.
- Under the Paris Agreement, each country has to present a climate action plan every five years.
- Under the Paris Agreement, the first global stocktake will happen in 2023. It will help world to determine whether it needs to do more and how much more. India is demanded for 10-year period for GST, while EU and some others demanded five-year cycle.
- India argues that five years is too short a time to assess whether the actions were having the desired impacts.



### **BASIC nations push for 'climate finance'**

- At that meeting, countries had agreed to take steps to limit global warming to 2C below pre-industrial levels.
- A key aspect to make this possible is climate finance, but countries so far aren't agreed on what constitutes climate finance: do investments made by private companies in developed countries in new green technology count? Does improving efficiency in a thermal plant count?





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### **Point Calimere sanctuary**

- Point Calimere Wildlife and Bird Sanctuary (PCWBS) is a protected area in Tamil Nadu, South India along the Palk Strait where it meets the Bay of Bengal at Point Calimere.
- The sanctuary was created in 1967 for conservation of the near threatened blackbuck antelope, an endemic mammal species of India.
- It is famous for large congregations of waterbirds, especially greater flamingos.

### **A virtual climate summit**

- The Virtual Climate Summit is the brainchild of Marshall Islands President Hilda Heine, whose lowlying Pacific island nation will drown beneath rising seas if global warming continues unabated.
- It will consist of a rolling, 24-hour livestream that will begin in the Marshalls' capital Majuro, and then include addresses from leaders and panel discussions before delivering a declaration.
- The virtual summit's main aim is to encourage the international community to keep global warming to 1.5 degrees Celsius above pre-industrial levels.

### **"Atmosphere & Climate Research-Modelling Observing Systems & Services (ACROSS)" scheme**

- The Cabinet Committee has approved continuation of the nine sub-schemes of the umbrella scheme "Atmosphere & Climate Research-Modelling Observing Systems & Services (ACROSS)" during 2017-2020.
- ACROSS scheme pertains to the atmospheric science programs of the Ministry of Earth Sciences (MoES).
- It addresses different aspects of weather and climate services, which includes warnings for cyclone, storm surges, heat waves, thunderstorms etc.
- Each of these aspects is incorporated as nine sub-schemes under the umbrella scheme "ACROSS" and is implemented in an integrated.

- The ACROSS scheme consists of nine sub-programmes which are multi-disciplinary and multi institutional in nature and will be implemented in an integrated manner.
- As the objective of the ACROSS scheme is to provide a reliable weather and climate forecast for betterment of society, the scheme will aim at improving skill of weather and climate forecast through sustained observations, intensive R & D.
- The scheme will provide improved weather, climate and ocean forecast and services, thereby ensuring transfer of commensurate benefits to the various services.
- It will also provide a sizable number of scientific and technical staff along with requisite administrative support, thereby generating employment.
- To ensure last-mile connectivity of the weather based services to the end - user, a large number of agencies like the Krishi Vigyana Kendras of ICAR, Universities and local municipalities are roped in thus generating employment opportunities to many people.

### **India gets UN Environment award**

- United Nation Environment has awarded Wildlife Crime Control Bureau (WCCB), Ministry of Environment, Forest and Climate Change, Government of India with Asia Environment Enforcement Awards, 2018 for excellent work done by the Bureau in combating transboundary environmental crime.
- WCCB has been conferred this award in Innovation category.





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### **Why WCCB has been chosen?**

- WCCB has adopted innovative enforcement techniques that have dramatically increased enforcement of transboundary environmental crimes in India.
- Notably it has developed an online Wildlife Crime Database Management System to get real time data in order to help analyse trends in crime and devise effective measures to prevent and detect wildlife crimes across India.
- In order to involve the public in the fight against wildlife crime, WCCB has also developed a scheme to enroll willing persons as WCCB Volunteers.

### **About Asia Environmental Enforcement Award:**

- The Asia Environment Enforcement Awards publicly recognize and celebrate excellence in enforcement by government officials and institutions/teams combating transboundary environmental crime in Asia.
- The awards are given to outstanding individuals and/or government organizations/teams that demonstrate excellence and leadership in enforcement of national laws to combat transboundary environmental crime in one of the following eligibility criteria areas: collaboration; impact; innovation; integrity and gender leadership.

### **Wildlife Crime Control Bureau:**

- Wildlife Crime Control Bureau is a statutory multi-disciplinary body established by the Government of India under the MoEFCC, to combat organized wildlife crime in the country.
- Under Section 38 (Z) of the Wild Life (Protection) Act, 1972, it is mandated:
- To collect and collate intelligence related to organized wildlife crime activities.
- To disseminate the same to State and other



enforcement agencies for immediate action so as to apprehend the criminals.

- To establish a centralized wildlife crime data bank.
- Co-ordinate actions by various agencies in connection with the enforcement of the provisions of the Act.
- Assist foreign authorities and international organization concerned to facilitate co-ordination and universal action for wildlife crime control.
- It also assists and advises the Customs authorities in inspection of the consignments of flora & fauna as per the provisions of Wild Life Protection Act, CITES and EXIM Policy governing such an item.

### **Natural Gas:**

- Natural gas is superior fuel as compared with coal and other liquid fuels, as it is environment friendly, safer and cheaper fuel. It can be supplied through pipelines and hence, there is no need to store cylinders in kitchen and thus saves space.
- It is environment friendly fuel and its usage as domestic kitchen fuel, as fuel for transport sector as well as fuel for industries and commercial units can play a significant role in reducing carbon emission.
- It is 60% cheaper compared with petrol and around 45% cheaper when compared with Diesel.



### **Implementation Process**

- Around 96 cities and districts in different parts of the country were covered for development of CGD networks till September 2018. As per commitment made by various entities in 9th bidding round, around 2 crore PNG (Domestic) connections and 4600 CNG stations are expected to be installed across the country in next 8 years.
- Various pre-project activities for this GAs already have commenced and efforts are being made to commence the physical works at the site.



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- To further boost expansion of PNG/CNG network in India, Petroleum and Natural Gas Regulatory Board (PNGRB) has launched 9th CGD bidding round in April, 2018 for 86 Gas covering 174 districts in 22 States/UTs

### **Greenhouse Gas Bulletin**

- The WMO is the weather agency of the United Nations, and publishes its Greenhouse Gas Bulletin each year, this year's report covers data for 2017.
- In a statement, the WMO said that there is no sign of a reversal in the trend of rising levels of greenhouse gases in the atmosphere, which is driving long-term climate change, sea level rise, ocean acidification and more extreme weather.
- Carbon dioxide: Concentrations of the gas reached 405.5 parts per million in 2017, 146% of the pre-industrial era (before 1750). The increase in carbon dioxide from 2016 to 2017 was about the same as the average growth rate over the last decade. It was smaller than the record leap observed from 2015 to 2016 (from 401.1 ppm to 403.3 ppm) under the influence of a strong El Niño event; there was no El Niño in 2017.
- Methane: Atmospheric methane reached a new high of about 1859 parts per billion in 2017 and is now 257% of the pre-industrial level. Its rate of increase was about equal that observed over the past decade.
- Nitrous Oxide: Its atmospheric concentration in 2017 was 329.9 parts per billion. This is 122% of pre-industrial levels.
- CFC-11: The GreenHouse Gas Bulletin has a special section devoted to CFC-11 (trichlorofluoromethane). This is a potent greenhouse gas and a stratospheric ozone depleting substance regulated under the Montreal Protocol. Since 2012, its rate of decline has slowed to roughly two-thirds of its rate of decline during the preceding decade.
- The most likely cause of this slowing is increased emissions associated with production of CFC-11 in eastern Asia, the bulletin says.





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- To disseminate the same to State and other enforcement agencies for immediate action so as to apprehend the criminals.
- To establish a centralized wildlife crime data bank.
- Co-ordinate actions by various agencies in connection with the enforcement of the provisions of the Act.
- Apart from these functions WCCB also assists and advise the Customs authorities in inspection of the consignments of flora & fauna as per the provisions of Wild Life Protection Act, CITES and EXIM Policy governing such an item.
- Recently WCCB has received United Nation's Environment award
- As part of the exercise, first the male tiger was brought to Satkosia from the Kanha Tiger Reserve, and within 10 days, a female tiger was brought from the Bandhavgarh Tiger Reserve. Within days of the tigers being brought to Satkosia, villagers living on the fringes of the reserve started protesting.

### **ZSI report on Andaman & Nicobar Islands fauna**

- A recent publication by the Zoological Survey of India (ZSI) titled Faunal Diversity of Biogeographic Zones: Islands of India has for the first time come up with a database of all faunal species found on the Andaman and Nicobar Islands, putting the number at 11,009.
- The documentation proves that the islands, comprising only 0.25% of India's geographical area, are home to more than 10% of the country's fauna species. It has 11,009 species.
- Endemic species: The Narcondam hornbill, its habitat restricted to a lone island; the Nicobar megapode, a bird that builds nests on the ground; the

Nicobar treeshrew, a small mole-like mammal; the Long-tailed Nicobar macaque, and the Andaman day gecko, are among the 1,067 endemic faunal species found only on the Andaman and Nicobar Islands and nowhere else.

- Among birds, endemism is quite high, with 36 among 344 species of birds found only on the islands. Many of these bird species are placed in the IUCN Red List of threatened species under the Wildlife Protection Act (WPA).
- Endemic reptiles: Eight species of amphibians and 23 species of reptiles are endemic to the islands, and thus are at high risk of being threatened.
- Marine faunal diversity: Includes coral reefs and its associated fauna. In all, 555 species of scleractinian corals (hard or stony corals) are found in the island ecosystem, all which are placed under Schedule I of the WPA. Similarly, all species of gorgonian (sea fans) and calcerous sponge are listed under different schedules of the WPA.
- Concerns: The publication cautions that tourism, illegal construction and mining are posing a threat to the islands' biodiversity, which is already vulnerable to volatile climatic factors. Some of the species in A&N Islands are restricted to a very small area and thus more vulnerable to any anthropogenic threat. Any stress can have a long-lasting impact on the islands' biodiversity, devastating the population size of any endemic fauna, followed by extinction within a limited span of time.
- Vulnerable species: Of the ten species of marine fauna found on the islands, the dugong/sea cow, and the Indo-Pacific humpback dolphin, are both classified as Vulnerable under the IUCN (International Union for Conservation of Nature) Red List of Threatened Species. Among the 46 terrestrial mammalian species found, three species have been categorised as Critically Endangered — Andaman shrew (*Crocidura andamanensis*), Jenkin's shrew (*C. jenkinsi*) and Nicobar shrew (*C. nicobarica*). Five species are listed as Endangered, nine species as Vulnerable, and one species as Near Threatened, according to the IUCN.

### **New species of shark identified in Indian Ocean:**

- A new species of a deep sea shark- the Pygmy false catshark, has been found in the northern Indian Ocean, the first such discovery in India since 2011 when the Mangalore houndshark was identified.
- The Pygmy false catshark is currently known only from deep waters (200-1000m depth) and has a length of about 65cm. It is dark brown without any prominent patterns.
- The new species was found off the southwestern coast of India and north of Sri Lanka.
- Its scientific name is *Planonasus indicus* – from ‘planus’ meaning flat and ‘nusus’ meaning nose.
- The new species was first observed was on April 26, 2008, when it was caught in fishing nets in Kochi, Kerala.





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### **Dudhwa Tiger Reserve**

- It is protected area in Uttar Pradesh that stretches mainly across the Lakhimpur Kheri and Bahraich districts.
- It comprises Dudhwa National Park, Kishanpur Wildlife Sanctuary and Katarniaghat Wildlife Sanctuary.
- It covers area of 1,284.3 km<sup>2</sup> and includes three large forest fragments. It shares north-eastern boundary with Nepal, which is defined to large extent by Mohana River.
- The area is vast Terai alluvial floodplain traversed by numerous rivers and streams flowing in south-easterly direction.
- It ranges in altitude from 110 to 185 m. Apart from tigers (estimated 106–118), it is also home to swamp deer, sambar deer, barking deer, spotted deer, hog deer, Indian rhinoceros, sloth bear, ratel, jackal, civets, jungle cat, fishing cat, etc.
- It is home to one of finest forests in India, some of these trees are more than 150 years old and over 70 ft tall.
- Dudhwa Tiger Reserve (DTR) and Sashastra Seema Bal have joined hands to provide security to Dudhwa forests and its rich wildlife. It was part consensus reached among all security agencies including SSB, central and local intelligence officers, customs and excise officials, Special Tiger Protection Force and DTR's field staff to discuss issues involving safety of Dudhwa forests and its wildlife.

### **Virtual Climate Summit**

- It is an innovative climate summit which is an entirely online event to be a carbon neutral event.
- It is the world's first ever political global meeting to be held in online.
- Its focus is on to renew political momentum in tackling climate change.
- It was announced in the Global Environment Facility (GEF) assembly recently held in Vietnam.
- It is the brainchild of Marshall Islands President who insisted upon such summit in the GEF assembly.
- The summit is convened by the Republic of the Marshall Islands (RMI) in its capacity as the Climate Vulnerable Forum (CVF) chair.

- Its main aim is to encourage the international community to keep global warming to 1.5 degrees Celsius above pre-industrial levels.

### **Climate Vulnerable Forum**

- The climate vulnerable forum is an international partnership of countries highly vulnerable to a warming planet.
- The Forum serves as a South-South cooperation platform for participating governments to act together to deal with global climate change.
- It brings together climate vulnerable developing countries from across Africa, Asia, the Caribbean, Latin America and the Pacific.
- The forum held its first meeting in Maldives in the year 2009.
- CVF High-level meeting was last convened during the UNFCCC Climate Change Conference in Paris (COP21).
- The Manila-Paris Declaration and the 2016-2018 Roadmap of the CVF, adopted at this meeting, spell out the CVF's planned efforts during this time period.
- The forum has a rotating chairmanship that has been held by Maldives, Kiribati, Bangladesh, Costa Rica and Philippines, Ethiopia and currently held by Republic of Marshall.



### **Inclusive Wealth Report 2018**

- Inclusive wealth index, as part of the Inclusive Wealth Report 2018 has been released by the UN Environment and partners.
- The Inclusive Wealth Report (IWR) is a biennial effort led by the UN Environment to evaluate the capacities and performance of the nations around the world to measure sustainability of economy and wellbeing of their people.
- The inclusive wealth index is a tool assessing a nation's ability to look after its wealth in a way that is sustainable and safeguards its future generations.



While GDP measures the size of a country's economy, inclusive wealth index focuses on stocks of manufactured, human and natural capital.

- The Index provides important insights into long-term economic growth and human well-being. The Index measures the wealth of nations through a comprehensive analysis of a country's productive base and the country's wealth in terms of progress, well-being and long-term sustainability.

### **Hog Deer**

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



### Siberian unicorns

- Genetic analyses have shown that the Siberian unicorn was the last surviving member of a unique family of rhinos.
- Siberian unicorn are giant, shaggy Ice Age rhinoceros, and they are extraordinary single horn.
- Weighing up to 3.5 tonnes with a single enormous horn, the Siberian unicorn roamed the steppe of Russia, Kazakhstan, Mongolia, and Northern China.
- The Siberian unicorn was a very close relative of the extinct woolly rhino and living Sumatran rhino.



### Country's first owl festival in Pune:

- The Indian Owl Festival, the country's first owl fest, is being held at Pingori village in Purandar taluka of Pune.
- The two-day festival, organised by Ela Foundation, an NGO working towards nature education and conservation, will give information on owl conservation.
- It is a first-of-its-kind festival in the country that is being organised with the intention of creating awareness about owl as a bird and debunking numerous superstitions associated with it.
- Indian Owl is protected under the Wildlife (Protection) Act of India.



- Threat: Of the 262 species of owls that are found in the world, 75 feature in the red data book — meaning they are threatened. Major causes behind this are superstitions and habitat loss — both are man-made. They are “highly prized and in demand for black magic purposes”.

### **Conference of Parties (COP)**

- COP is the supreme decision-making body of United Nations Framework Convention on Climate Change (UNFCCC). All States that are Parties to UNFCCC are represented at COP.
- At COP, all parties review implementation of Convention and take decisions necessary to promote the effective implementation of Convention

### **Why in news?**

- The 24th meeting of Conference of Parties (COP-24) to United Nations Framework Convention on Climate Change (UNFCCC) began at Katowice, Poland. COP-24 is expected to finalise guidelines for implementation of Paris Agreement adopted in 2016.

### **Tx2 programme**

- It was launched by World Wildlife Foundation (WWF) at the 2010 St Petersburg Tiger Summit held in Russia.
- Under it, 13 tiger range countries had agreed to double the world tiger population by 2022, which is the year of tiger in Chinese calendar. These 13 countries are Bangladesh, Bhutan, Cambodia, China, India, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, Russia, Thailand and Vietnam.
- It aims at driving political momentum to ensure tigers remain top priority for world leaders, professionalise wildlife protection by training rangers, developing conservation standards (CA|TS) and technology (SMART) to achieve zero poaching, tackle illegal wildlife trade through partnership with





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TRAFFIC, focus efforts in key tiger landscapes and ensure there is space for both tigers and people in future.

- Nepal become first country in the world to double its tiger population in a decade as part of World Wildlife Foundation's (WWF) 'Tx2' programme which aims to double number of tigers in the world all over the world by 2022.
- There are now estimated 235 wild tigers in Nepal in comparison to an estimated 121 back in 2009. This trend is against global trend where number of tigers in many countries is witnessing a decline.

### **Parambikulam**

- Sprawled over 285 sq km, the Parambikulam Wildlife Sanctuary is nestled in the Nelliampathy-Anaimalai region of the Western Ghats. It has found a place in the list of the world's 34 biodiversity hotspots

### **Kalakad Mundanthurai**

- KMTR, spread over Tirunelveli and Kanyakumari districts, is part of the inter-state Agasthyamalai Biosphere Reserve. The International Union for Conservation of Nature (IUCN) considers the core of KMTR as one of the five centres of biodiversity and endemism in India.
- It is also a UNESCO World Heritage Site. Before their merger, Kalakad was known for its Lion Tailed Macaque population and Mundanthurai for its tigers.

### **On the table, a climate 'rulebook'**

- The two-week year-end annual meeting, informally called COP24 (short for the 24th Conference of the Parties to the UN Framework Convention on Climate Change), is being organised this time in Katowice, an important city in southern Poland's coal belt.
- The main task on the hands of negotiators gathered in Katowice would be to finalise the "rulebook" for the implementation of the Paris Agreement that was clinched at a similar meeting in 2015, and came into effect the following year after the required number of countries had ratified it.





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- Two years ago, at the COP22 meeting in Marrakech, countries had set themselves a 2018 deadline for the completion of the “rulebook”.
- A recent special report by the Intergovernmental Panel on Climate Change (IPCC) on the pathways to the 1.5° target is an important item on the agenda for discussions in Katowice.
- That report was presented last month. It said that to attain the 1.5°C target, the world needs to bring down its greenhouse gas emissions to about half of its 2010 levels by 2030, and to net zero by about 2050. Net-zero is achieved when total emissions is balanced by the amount of absorption of carbon dioxide through natural sinks like forests, or removal of carbon dioxide from the atmosphere through technological interventions.
- Right now, the countries are aiming to reduce global emissions only by 20%, from 2010 levels, by the year 2030, and achieve a net-zero emission level by the year 2075.
- This year, countries have been carrying out another stock-taking exercise, named “Talanoa Dialogue” by Fiji, the host and president of last year’s conference, to reflect a traditional form of community conversation in that country.
- Framing the rulebook means agreeing on such things as common standards to measure emissions, processes for monitoring, reporting and verification (‘MRV’ in climate jargon) of the various actions being taken by individual countries, and guidelines and institutions to facilitate diffusion of appropriate technologies to countries and regions that need them.
- The Paris Agreement makes it incumbent upon developed countries to communicate every two years, in advance, “indicative quantitative and qualitative information” on the money they would provide to the developing countries. It also makes it mandatory to provide “transparent and consistent information” every two years on money finally delivered.
- What is more, the term “mobilise” means that developed countries actually have to provide only a fraction of the \$100 billion from their own resources. Every dollar that they actually provide “mobilises” some money, often more than a dollar, from the host country, either in the form of government collaboration or as private investment. But the entire money is





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said to have been “mobilised” by the developed countries.

### **Katowice Commitment**

- Five Europe-based multinational banks pledged to employ cash lying with them to nudge clients away from polluting businesses. The banks, led by Amsterdam-based ING, issued a statement on The Katowice Commitment on the sidelines of the COP24 summit.
- The Katowice Commitment is “Co-created”, “Impact-driven”, “Engagement-focused”, “Sector-specific”, “Forward-looking”, and “Science-based”.
- Delegates representing nearly 200 countries are taking part in COP24, or the Katowice Climate Change Conference that began earlier this week as the UN’s follow-up to the 2015 Paris Climate Agreement.
- At Katowice, Indian negotiators put forth legitimate concerns on the likely social impact of the new rules that will operationalise the Paris Agreement in 2020.

### **Electro-mobility partnership**

- Recognising that the transport sector is already responsible for 14% of global greenhouse gas emissions, and in view of the projected challenges from rapid urbanisation around the world, progressive globalisation, and increased movement of people and freight, the Polish presidency of COP24 on Wednesday proposed a policy push towards electro-mobility and zero-emission transport.
- Poland and the UK jointly presented Driving Change Together — Katowice Partnership for Electromobility, “one of the concrete dimensions of implementation of the Paris Agreement and fulfilment of the Global Climate Action objectives”. The Declaration has been signed by 40 countries including, besides Poland and the UK, China, Japan, Indonesia, Mexico, France, and Germany. India is not among the signatory countries. Thirteen international and nongovernmental organisations, including the World Bank and The Climate Group, are also among the signatories. The Partnership was established in the main Plenary Hall.

- The Declaration endorsed several steps to accelerate the transition to low emission vehicles, including “driving demand through consumer initiatives” and “collaborating internationally to promote the deployment of ZEVs (zero-emission vehicles) on a global scale”, and to enable the growth of the market by “building a smart infrastructure network, planning for the cities of the future today, embedding zero-emission infrastructure into the fabric of our urban and rural communities”, and “driving up air quality standards in our towns and cities”.
- It underlined support to “zero-emission R&D, investing to improve and develop new zero emission technologies”, and the promotion of a “sustainable, circular economy to drive down emissions over the long term”

### Talanoa Dialogue

- Talanoa is a traditional approach used in Fiji and other Pacific islands to engage in an inclusive, participatory and transparent dialogue to resolve differences without putting any blame on any one.
- As per COP23 decision, it has been structured around three questions to arrive at answers with consensus: Where are we? Where do we want to go? How do we get there?
- The dialogue will be conducted in a manner that promotes enhanced ambition.
- It will help parties to UNFCCC review their actions and discuss way forward in terms of raising ambitions before 2020.
- It will consider efforts of Parties on mitigation action and financial and technical support, as appropriate, as one of its elements, in the pre-2020 period under 1997 Kyoto Protocol.
- The Talanoa Dialogue is a process designed to help countries implement and enhance their Nationally Determined Contributions by 2020. The Dialogue was mandated by the Parties to the United Nations Framework Convention for Climate Change to take stock of the collective global efforts



to reduce the emissions of greenhouse gases, in line with the goals of the Paris Agreement, which is to limit the rise in average global temperature to 2°C above pre-industrial levels, and to pursue efforts to limit the increase to 1.5°C.

- The Talanoa Dialogue was launched at COP 23 under the Presidency of the Republic of Fiji, and is a year-long process that will culminate in political discussions at COP 24 in Katowice, Poland, where political leaders will be expected to signal their commitment to increasing the ambition of their NDCs.
- The Talanoa Dialogue represents an opening up of the UN Climate Negotiations because non-state actors are able to actively participate and submit their ideas for how national governments can improve their emission reduction targets.
- The Talanoa Dialogue is based on the Pacific concept of “talanoa” - storytelling that leads to consensus-building and decision-making. The process is designed to allow for participants to share their stories in an open and inclusive environment, devoid of blame, in the hopes that others can learn and benefit from their ideas and experiences.

### **Pulicat Lake**

- Pulicat Lagoon is the second largest brackish water lagoon in India, after Chilika Lake.
- The Lagoon is one the three important wetlands to attract North-East Monsoon rain clouds during October to December season to Tamil Nadu.
- The lagoon comprises the following regions, which adds up 759 km<sup>2</sup> according to Andhra Pradesh Forest Department\*: 1) Pulicat Lake (Tamil Nadu-TN & Andhra Pradesh-AP) 2) Marshy/Wetland Land Region (AP) 3) Venadu Reserve Forest (AP) 4) Pernadu Reserve Forest (AP) The lagoon was cut across in the middle the





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Sriharikota Link Road, which divided the water body into lake and marshy land. The lake encompasses the Pulicat Lake Bird Sanctuary.

- The barrier island of Sriharikota separates the lake from the Bay of Bengal and is home to the Satish Dhawan Space Centre. Major part of the lake comes under Nellore district of Andhra Pradesh.
- The lagoon is aligned parallel to the coast line with its western and eastern parts covered with sand ridges.
- Two rivers which feed the lagoon are the Arani River at the southern tip and the Kalangi River from the northwest, in addition to some smaller streams.
- The Buckingham Canal, a navigation channel, is part of the lagoon on its western side. The lagoon's water exchange with the Bay of Bengal is through an inlet channel at the north end of Sriharikota and out flow channel of about 200 metres (660 ft) width at its southern end, both of which carry flows only during the rainy season.

### **US \$200 billion in climate action investment for 2021-25**

- World Bank has unveiled US \$200 billion in climate action investment for 2021 to 2025 to fight impact of climate change. The move coincides with Conference of Parties-24 (COP24) United Nations Climate Summit in Katowice, Poland.
- The breakdown of US \$200 billion will comprise approximately 100 billion in direct finance from World Bank.
- Around one-third of remaining funding will come from two World Bank Group agencies, the International Finance Corporation (IFC) and Multilateral Investment Guarantee Agency (MIGA) and rest will be private capital mobilised by the World Bank Group.
- This US \$200 billion in climate action investment, amounts to World Bank's doubling of its current five-year funding.
- It also represents significantly ramped up ambition of World Bank to tackle climate change and sends an important signal to the wider global community to do the same. This amount is also double of World Bank's earlier commitment for its current five-year funding.

- But it did not say whether the money would be provided in the form of loans or grants.
- AS NEGOTIATORS began their work to stitch together the mechanisms to implement the landmark 2015 Paris Agreement, the Indian government urged developed country parties to increase the “scope”, “scale” and “speed” of money (climate finance) that they are mandated to provide to the developing nations to facilitate actions to fight climate change.

### **Green Climate Fund**

- The GCF was set up in 2010 under the UNFCCC’s financial mechanism to channel funding from developed countries to developing countries to allow them to mitigate climate change and also adapt to disruptions arising from a changing climate.
- The Green Climate Fund will support projects, programmes, policies and other activities in developing country Parties using thematic funding windows.
- It is intended to be the centrepiece of efforts to raise Climate Finance of \$100 billion a year by 2020.
- The Fund will promote the paradigm shift towards low-emission and climate-resilient development pathways by providing support to developing countries to limit or reduce their greenhouse gas emissions and to adapt to the impacts of climate change, taking into account the needs of those developing countries particularly vulnerable to the adverse effects of climate change.
- The Fund will strive to maximize the impact of its funding for adaptation and mitigation, and seek a balance between the two, while promoting environmental, social, economic and development co-benefits and taking a gender-sensitive approach.



**GREEN  
CLIMATE  
FUND**





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### **Who will govern the Fund?**

- The Fund is governed and supervised by a Board that will have full responsibility for funding decisions and that receives the guidance of the Conference of Parties (COP). The Fund is accountable to, and functions under the guidance of, the COP.

### **INDC**

- In 2015, India listed a series of specific actions it would take to fight climate change in the Paris Agreement.
- It would reduce its emissions intensity (or emissions per unit of GDP) by 33 to 35 per cent by the year 2030 compared to the 2005 baseline.
- It would ensure that at least 40 per cent of its total electricity in the year 2030 would be generated through renewable sources of energy and that would create between 2.5 to three billion tones of additional carbon sinks through extensive afforestation.

### **Extreme weather events killed over 70,000 people in India**

- Just in 2017 alone, 2,736 people in India died in extreme weather events like floods, excessive rain or cyclones, the report by Germanwatch, an independent development organisation.
- During this period, India faced super cyclone in Odisha, several other cyclones, floods, landslides and extreme rain and heat-wave events.
- Deaths caused by natural calamities like earthquakes, tsunamis or volcanoes are not included in the data because these are not caused by climate change.
- The report put India 14th on the list of countries at maximum risk to climate change, based on how it had been impacted events in the last two decades.
- Puerto Rico, Honduras and Myanmar, all of which have faced the brunt of several cyclonic events, and lost many more lives as a proportion to their total population, were classified to be at maximum risk.

### **Global Carbon Project:**

- The Global Carbon Project was formed in 2001 to help the international science community to establish a common, mutually agreed knowledge base that supports policy debate and action to slow the rate of increase of greenhouse gases in the atmosphere.
- It is a Global Research Project of Future Earth and a research partner of the World Climate Research Programme. It was formed to work with the international science community to establish a common and mutually agreed knowledge base to support policy debate and action to slow down and ultimately stop the increase of greenhouse gases in the atmosphere.
- The Global Carbon Project works collaboratively with the International Geosphere-Biosphere Programme, the World Climate Programme, and the International Human Dimensions Programme on Global Environmental Change and Diversitas, under the Earth System Science Partnership.



### **Global carbon emissions**

- Global carbon emissions are set to hit an all-time high of 37.1 billion tonnes of CO<sub>2</sub> in 2018, according to researchers at the University of East Anglia (UEA) and the Global Carbon Project.
- India, the third-highest contributor, is projected to see emissions rise by 6.3% from 2017. The 2.7% projected global rise in 2018 has been driven by appreciable growth in coal use for the second year in a row, and sustained growth in oil and gas use.
- The 10 biggest emitters in 2018 are China, U.S., India, Russia, Japan, Germany, Iran, Saudi Arabia, South Korea, and Canada. The EU as a region of countries ranks third. China's emissions accounted for 27% of the global total, having grown an estimated 4.7% in 2018 and reaching a new all-time high.



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- Emissions in the U.S., which has withdrawn from its commitment to the Paris Agreement, account for 15% of the global total, and look set to have grown about 2.5% in 2018 after several years of decline.
- Limiting global warming to the 2015 Paris Agreement goal of keeping the global temperature increase this century to well below 2°C, would need carbon dioxide emissions to decline by 50% by 2030 and reach net zero by about 2050.
- Though coal use contributed to the rise in 2018 from last year, it still remains below its historical high in 2013 but may exceed that if current growth continues.
- Last year, India's CO<sub>2</sub> emissions had grown by 3.7 per cent, much lower than the average of about 6 per cent for the last 10 years, and this report had then said that it could have been partially attributable to demonetisation and GST.
- This year's growth in emissions has been attributed to the strong economic growth. "India's economy continues to grow strongly, with the first two quarters of 2018 averaging eight per cent. While installations of renewables are strong, coal consumption continues to increase as mining outputs grow to supply existing power stations that have been operating well short of supply," the report notes.
- India's growth in emissions is all the more noticeable considering the large deployment of renewable energy that has been happening and the fact that emissions intensity of GDP, or the emissions per unit of GDP, has been going down consistently over the last decade.
- The report says that growth in global CO<sub>2</sub> emissions could put the Paris Agreement goal of keeping the global rise in temperatures to within 2 degree Celsius of pre-industrial times "in jeopardy".

- “According to IPCC (Inter-governmental Panel on Climate Change), to limit warming well below 2 degree Celsius, CO2 emissions should decline by about 20 per cent by 2030 and reach net zero around 2075; to limit warming below 1.5 degree Celsius, CO2 emissions should decline by 50 per cent by 2030 and reach net zero by around 2050.

## EMISSIONS AT A GLANCE

	2018		2017	
	*Actual Emissions	Year-on-year % growth	*Actual Emissions	Year-on-Year % growth
India	2.62	6.3	2.46	3.7
China	10.3	4.7	9.83	1.3
US	5.4	2.5	5.26	-0.9
European Union	3.52	-0.7	3.54	1.1
World	37.12	2.7	36.15	1.3

\*(in billion tonnes of CO2)

### Ministry of New and Renewable Energy conferred Skoch Award for National Significance.

- Ministry of New and Renewable Energy has been conferred the Skoch Award for National Significance.
- The award has been conferred considering its purpose and critical role played in installing about 73 GW renewable energy capacities in the country.
- With 21 per cent of total installed capacity, within the year renewable energy grossed one billion units of electricity in the country.



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### **India's ranking:**

- India ranks fourth in the world in wind energy capacity, and
- India ranks fifth in solar & total energy capacity installed in the world.
- India had played a critical role in setting up of international solar alliance.

### **Skoch Group**

- It is a think tank dealing with socio-economic issues with a focus on inclusive growth since 1997.
- It has instituted India's highest independent civilian honours in the field of governance, finance, technology, economics and social sector.



### **Skoch Award 2018 who can nominate?**

- Central government
- State government
- Local body
- Municipality
- City/District administration
- State Owned Enterprises/Undertakings
- SKOCH Award celebrates excellence of governance delivery by domain departments. This includes having sufficient familiarity, capacity and knowledge about the functionality of their systems, processes and outcomes.

### **Raising crops in arsenic contaminated soil**

- An Indian scientist in the U.K. is working on a way to grow crops in arsenic-contaminated soil.
- To stop the cancer-causing arsenic entry into the food chain, it is essential to develop safe crops, through restricting the translocation of arsenic to edible part. In our current project, we are trying to manipulate cytokinin hormone in rice plants through genetic engineering and we expect to increase the roots detoxification capacity of the transgenic rice.





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### **India State-Level Disease Burden Initiative**

- It is the first comprehensive estimates of reduction in life expectancy associated with air pollution in each State, published by the India State-Level Disease Burden Initiative, a venture of the Indian Council of Medical Research (ICMR), the Public Health Foundation of India (PHFI) and the Institute for Health Metrics and Evaluation (IHME), in collaboration with the Ministry of Health and Family Welfare, along with experts and stakeholders associated with over 100 Indian institutions.
- The key findings from the paper include the fact that 12.4 lakh deaths in India in 2017 were due to air pollution, which included 6.7 lakh deaths due to outdoor particulate matter air pollution and 4.8 lakh deaths due to household air pollution.
- Over half of the deaths due to air pollution were in persons less than 70 years of age. In 2017, 77% population of India was exposed to ambient particulate matter PM2.5 above the recommended limit by the National Ambient Air Quality Standards. The report states that the highest PM2.5 exposure level was in Delhi, followed by the other north Indian States of Uttar Pradesh, Bihar and Haryana.
- This comprehensive effort over several years has for the first time produced what we believe are robust estimates of the health impact of outdoor and household air pollution in every State of India.
- The average life expectancy in India would have been 1.7 years higher if the air pollution level were less than the minimal level causing health loss, with the highest increases in the northern States of Rajasthan (2.5 years), Uttar Pradesh (2.2 years) and Haryana (2.1 years).

### **Sun in a box**

- MIT scientists have designed a system that could store renewable energy, such as solar and wind power, and deliver it back into an electric grid on demand.
- The system, described in the journal Energy and Environmental Science may be designed to power a small city not just when the sun is up or the wind is high, but around the clock.



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- The new design stores heat generated by excess electricity from solar or wind power in large tanks of white-hot molten silicon, and then converts the light from the glowing metal back into electricity when it's needed.
- The researchers from Massachusetts Institute of Technology (MIT) in the U.S. estimate that such a system would be vastly more affordable than lithium-ion batteries, which have been proposed as a viable, though expensive, method to store renewable energy.
- They also estimate that the system would cost about half as much as pumped hydroelectric storage – the cheapest form of grid-scale energy storage to date.
- Unlike conventional solar plants that use solar panels to convert light directly into electricity, concentrated solar power requires vast fields of huge mirrors that concentrate sunlight onto a central tower, where the light is converted into heat that is eventually turned into electricity.
- Concentrated solar plants store solar heat in large tanks filled with molten salt, which is heated to high temperatures of about 538 degrees Celsius.
- When electricity is needed, the hot salt is pumped through a heat exchanger, which transfers the salt's heat into steam. A turbine then turns that steam into electricity.
- The researchers have outlined their concept for a new renewable energy storage system, which they call TEGS-MPV, or Thermal Energy Grid Storage-Multi-Junction Photovoltaic.
- Instead of using fields of mirrors and a central tower to concentrate heat, they propose converting electricity generated by any renewable source, such as sunlight or wind, into thermal energy, via a process by which an electric current passes through a heating element.
- The system could be paired with existing renewable energy systems, such as solar cells, to capture excess electricity during the day and store it for later use.
- The system would consist of a large, heavily insulated, 10-metre-wide tank made from graphite and filled with liquid silicon, kept at a "cold" temperature of almost 1927 degrees Celsius.

<p><b>Posing a threat?</b> A draft assessment by Canada's public health department says talcum powder is harmful to the lungs and can cause ovarian cancer.</p>		<p>and scarring of the lung tissue"</p>	<p>• The American Academy of Pediatrics has warned against the use of baby powder due to the risk of serious respiratory problems</p>
<p><b>WHAT IS TALC?</b> Talc, or talcum, is a clay mineral consisting of hydrated magnesium silicate.</p> <p><b>WHAT ARE ITS USES?</b> • It is widely used in cosmetics, paints and ceramics • Talcum powder is among the most widely known talc-based self-care products</p>		<p><b>WHAT ARE THE RISKS?</b> • Breathing in products containing talc "can lead to coughing, difficulty in breathing, decreased lung function,</p>	<p>• Using products containing talc in the genital area "may cause ovarian cancer"</p> <p>• It says that the International Agency for Research on Cancer has classified perineal use of talc-based body powder as "possibly carcinogenic to humans" on the basis of limited evidence in humans.</p>

### Drugs discharged into the Yamuna toxic to aquatic life

- At this site, ibuprofen and paracetamol were found at a high concentration of 1.49 and 1.08 microgram per litre respectively. Previous studies have shown that even small concentration of ibuprofen could cause an antagonistic effect on aquatic organisms. Studies have also shown that ibuprofen exposure could increase cyanobacterial growth in the water.
- Caffeine was found in high concentration in most of the sites. Caffeine is used as a stimulant in medicine; residue from beverages and other food products may be a contributor.
- Even prescription drugs such as carbamazepine were found in the samples with the highest level at 1.35 microgram per litre. After studying the hazard quotient, the researchers say that though the individual levels were small and cannot cause acute toxicity to the marine life, the mixture of compounds can cause chronic toxicity.

### **Regulatory Indicators for Sustainable Energy (RISE) 2018**

- World Bank has released its report — Regulatory Indicators for Sustainable Energy (RISE) 2018 — charting global progress on sustainable energy policies.
- The report was released on the sidelines of the 24th Conference of the Parties to the UN Framework Convention on Climate Change (COP24).

### **World bank's RISE**

- World Bank has released its report Regulatory Indicators for Sustainable Energy (RISE) 2018, charting global progress on sustainable energy policies.
- The report was released on the sidelines of the 24th Conference of the Parties to the UN Framework Convention on Climate Change (COP24).
- The report stated that among the four SDG7 target areas renewable energy, energy efficiency, electricity access and access to clean cooking, the last one continued to be the most overlooked and underfunded by policymakers.



### **'Eco-sensitive zones'**

- The court took the initiative after its amicus curiae informed the court that the State governments have taken no effort to protect the area around these sanctuaries and parks.

### **What are Eco-sensitive zones?**

- The Environment Protection Act, 1986 does not mention the word "Eco-sensitive Zones".



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- The section 3(2)(v) of the Act, says that Central Government can restrict areas in which any industries, operations or processes shall not be carried out or shall be carried out subject to certain safeguards
- Besides the section 5 (1) of this act says that central government can prohibit or restrict the location of industries and carrying on certain operations or processes on the basis of considerations like the biological diversity of an area, maximum allowable limits of concentration of pollutants for an area, environmentally compatible land use, and proximity to protected areas.
- The above two clauses have been effectively used by the government to declare Eco-Sensitive Zones or Ecologically Fragile Areas (EFA). The same criteria have been used by the government to declare No Development Zones.

### **Criteria:**

- The MoEF (Ministry of Environment & Forests) has approved a comprehensive set of guidelines laying down parameters and criteria for declaring ESAs. A committee constituted by MoEF put this together.
- The guidelines lay out the criteria based on which areas can be declared as ESAs. These include Species Based (Endemism, Rarity etc), Ecosystem Based (sacred groves, frontier forests etc) and Geomorphologic feature based (uninhabited islands, origins of rivers etc).

### **UN 'Momentum for Change' climate action award**

- Momentum for Change is an initiative spearheaded by the UN Climate Change secretariat to shine a light on the enormous groundswell of activities underway across the globe that are moving the world toward a highly resilient, low-carbon future. Momentum for Change recognizes innovative and transformative solutions that address both climate change and wider economic, social and environmental challenges.





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### **SC directs Centre to declare 10 km area around national parks as eco-sensitive**

- A Bench led by Justice Madan B. Lokur took the initiative after its amicus curiae informed the court that the State governments have taken no effort to protect the area around these sanctuaries and parks. The court recorded that the issue has been pending for the past 12 years.
  - The parks and sanctuaries are the Pobitora sanctuary in Assam;
  - Hemis and Kishtewar national parks, Changthang, Hokersar, Trikuta sanctuaries in Jammu and Kashmir;
  - Jogimatti, Thimlapura and Yadahalli Chinkara sanctuaries in Karnataka;
  - Deolgaon Rehekuri and Thane Creek Flamingo sanctuaries and the Malvan marine sanctuary in Maharashtra;
  - Siroi National Park and Khongjaingamba Ching sanctuary in Manipur;
  - Baghmara Pitcher Plant sanctuary in Meghalaya;
  - Fakim and Puliebadze and Rangapahar sanctuaries in Nagaland;
  - Dr. Bhimrao Ambedkar bird sanctuary and Pilibhit sanctuary in Uttar Pradesh and
  - The Jorepokhri sanctuary in West Bengal.
- The court ordered the Centre to make the declaration “at the earliest”. Any plea for modification by the States concerned should be made to the Environment Ministry in two weeks.

### **Outcome of COP 24**

- The 24th Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP 24) was held in Katowice, Poland on 02nd– 15th December 2018.
- It focused on 3 key issues such as
  - Finalization of guidelines/ rules for the implementation of Paris Agreement,
  - The conclusion of 2018 Facilitative Talanoa Dialogue and
  - The stocktake of Pre-2020 actions implementation and ambition.



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- The guidance on adaptation recognizes the principle including equity and Common but Differentiated Responsibilities and Respective Capabilities (CBDR-RC).
- Parties have also agreed to initiate the work on setting up the new collective finance goals post-2020 from the floor of USD 100 billion.
- The guidance on Nationally Determined Contributions provides for Parties to submit different types of contributions including adaptation.
- The outcome on Talanoa dialogue also recalls the commitment of developed country Parties to a goal of mobilizing jointly USD 100 billion per year by 2020.
- The participating nations agreed on the rules to implement the Paris Agreement that will come into effect in 2020. The rules are regarding how the member nations will measure the carbon-emissions and report on their emissions-cutting efforts. This 'rulebook' can be called as the detailed "operating manual" of the 2015 Paris Agreement.
- The members of the conference did not agree to "welcome" the Intergovernmental Panel on Climate Change (IPCC) report on 1.5°C. The US, Saudi Arabia, Russia and Kuwait refused to "welcome" the IPCC report.
- The parties to the conference agreed to record the pledges in a public registry, as per the existing interim portal. The public registry will continue to include a search function, although many attempts have been made to get it deleted.
- It was also agreed among the members that future pledges should cover a "common timeframe" from 2031. The number of years for the timeframe will be decided later.

### **Task Force to protect Wildlife**

- India, Nepal and Bhutan are considering having a joint taskforce to protect wildlife across the Kanchenjunga Landscape, a trans-boundary region spread across Nepal, India and Bhutan.
- It will allow free movement of wildlife across political boundaries and checking smuggling of wildlife across the landscape.

- The landscape stretches along the southern side of Mount Kanchenjunga covers Nepal (21%), Bhutan (23%) and India (56%).

### **Great Indian Bustard**

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



### **Carbon credits**

- Carbon credits used to be earned by industries in developing countries by making verifiable reductions in their emissions. These credits could then be traded, for money, to countries which wanted them to fulfill their emission reduction targets under the Kyoto Protocol.
- Much of the credits accumulated by countries like Brazil, India and China in the last few years, however, have remained unused in the absence of

demand. Brazil had been arguing that these be allowed to be traded in a similar market mechanism that is sought to be created under Paris Agreement, which will replace Kyoto Protocol in 2020.

### **What was agreed at COP24?**

- Countries settled on most of the tricky elements of the “rulebook” for putting the 2015 Paris agreement into practice. This includes how governments will measure, report on and verify their emissions-cutting efforts, a key element because it ensures all countries are held to proper standards and will find it harder to wriggle out of their commitments. This global deal is meant for climate actions by all the countries across the globe post-2020.

### **What it contains?**

- The Katowice package includes guidelines that will operationalize the transparency framework. It sets out how countries will provide information about their Nationally Determined Contributions (NDCs) that describe their domestic climate actions. This information includes mitigation and adaptation measures as well as details of financial support for climate action in developing countries.
- Besides transparency framework, the Katowice package also includes guidelines that relate to the process for establishing new targets on finance from 2025 onwards to follow-on from the current target of mobilizing \$100 billion per year from 2020 to support developing countries.
- It also includes how to conduct the Global Stocktake (GST) of the effectiveness of climate action in 2023 and how to assess progress on the development and transfer of technology.

### **Significance of the rulebook:**

- The global rules are important to ensure that each tonne of emissions released into the atmosphere is accounted for. In this way, progress towards the emission limitation goals of the Paris Agreement can be

accurately measured. Currently, climate actions of rich nations for pre-2020 period are being guided by the Kyoto Protocol.

### **Why did it take so long?**

- There was a row over carbon credits, which are awarded to countries for their emissions-cutting efforts and their carbon sinks, such as forests, which absorb carbon. These credits count towards countries' emissions-cutting targets. Brazil, which hopes to benefit from its large rainforest cover, insisted on a new form of wording that critics said would allow double counting of credits, undermining the integrity of the system. This issue has been put off until next year.

### **What wasn't agreed?**

- Largely absent from these talks, which had a technical focus, was the key question of how countries will step up their targets on cutting emissions. On current targets, the world is set for 3C of warming from pre-industrial levels, which scientists say would be disastrous, resulting in droughts, floods, sea level rises and the decline of agricultural productivity.

### **When will that be agreed?**

- The key deadline is 2020, when countries must show they have met targets set a decade ago for cutting their emissions, and when they must affirm new, much tougher targets.

### **What does the science say?**

- The Intergovernmental Panel on Climate Change (IPCC), the global body of the world's leading climate scientists, warned two months ago that allowing warming to reach 1.5C above pre-industrial levels would have grave consequences, including the die-off of coral reefs and devastation of many species.





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### **How long have we got?**

- If we extrapolate from the IPCC's findings, the world has little more than a decade to bring emissions under control and halve them, which would help to stabilise the climate.

### **Are we getting there?**

- After years in which the world's carbon emissions appeared to be stabilising, they are on the rise again. Coal use continues and oil is still the engine of much of the world's economy. Clean energy is coming on-stream at a faster rate than many predicted, and the costs of it have come down rapidly, but its adoption needs to be speeded up.
- Infrastructure, such as energy generation plants, transport networks and buildings, is a central issue: infrastructure built now to rely on high-carbon energy effectively locks in high emissions for decades to come. Some people are also saying we need to invest in projects to remove carbon from the atmosphere.

### **What happens next?**

- The UN will meet again next year in Chile to thrash out the final elements of the Paris rulebook and begin work on future emissions targets. But the crunch conference will come in 2020, when countries must meet the deadline for their current emissions commitments and produce new targets for 2030 and beyond that go further towards meeting scientific advice.
- That conference may be held in the UK or Italy, both of which have bid to be hosts. The UK's intention in offering to host is to signal it will retain its role on the world stage after Brexit. The event may also provide a welcome change from wranglings over Brexit and intractable trade deals.

### **Stock-taking exercise for 2023**

- The exercise, called a global stock-take, is meant to assess whether the combined climate actions of all countries was adequate to realise the long-term goal of keeping global average temperatures below 2 degree Celsius

of pre-industrial times, or whether it needed to be scaled up. The rulebook, which was finalised in Katowice, specifies the manner in which the stocktake would be carried out.

### **How did the Paris Rulebook address the key areas?**

- Market mechanism: The concept allows a country to fund green projects in another country and get credits. Countries earn carbon credits for emission reductions in excess of requirement and these credits can then be traded for money.
- Climate finance: Developed countries are required to provide climate finance to developing countries to help deal with climate change, and submit an account of this. The rulebook spells out how financial flows should be accounted for.
- Technology development and transfer: It deals with rules of developing and transferring technologies to support national action on climate change.
- Global stocktake calls for periodic review and improvement of each country's commitment and action for fighting climate change.

### **WHAT did the latest IPCC recommend?**

- In October 2018, the Special Report on Global Warming of 1.5 degrees C was released by the Intergovernmental Panel on Climate Change (IPCC). It urged nations to limit global warming to 1.5 degrees C rather than the previously agreed cap of 2 degrees C to prevent catastrophic effects of climate change.

### **WHERE is next?**

- The U.N. will meet again in 2019 in Chile to finalise the final elements of the rulebook and begin work on future emissions targets. But 2020 is when the key conference will happen, wherein countries must meet the deadline for their current emissions commitments and produce new targets for 2030.

### **NDCs feature at international climate conferences, including in Katowice. What are these contributions?**

- Heard very often in the context of the just-concluded climate change conference in Katowice (Poland), NDCs or nationally determined contributions is an expression that refers to the climate actions that every country needs to take under the Paris Agreement.
- The phrase “nationally determined” emphasises the fact that countries themselves decide what actions to take, unlike the scenario in the previous agreement, the Kyoto Protocol, in which a few countries were assigned specific targets. And “contributions”, because each country’s actions is only a small part of the global effort against climate change.
- Countries are free to decide for themselves what actions they can take to help in the global fight against climate change, in line with their resources and capacities. So, richer and developed countries are expected, but not compelled, to take much stronger action than others.
- The climate actions included in its NDC by any country cannot be questioned by others, either on grounds of strength, or on grounds of adequacy in the global effort. But its progress can be reviewed.
- Currently, many countries have proposed NDCs that run until 2025, while others, including India, have proposed NDCs that go on until 2030. Countries are supposed to update their NDCs after those timelines, if not earlier, with fresh and stronger NDCs.
- India has made three main promises in its NDC — that it will reduce its emission intensity, or the emission per unit of GDP by 33% to 35% by 2030 compared to 2005 levels, that it will ensure that at least 40% of its electricity in 2030 will come from non-fossil fuel sources, and that it will create 2.5 to 3 billion tonnes of additional carbon sink through forests.

### **Asiatic Lion Conservation Project**

- The “Asiatic Lion Conservation Project” has been launched by the Ministry of Environment, Forest and Climate Change (MoEFCC).



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- The main objective of this project is to work for the conservation of the world's last ranging free Asiatic Lion population and the ecosystem associated with it.
- The total budget of the "Asiatic Lion Conservation Project" for 3 years stands at about Rs. 9784 lakh.
- The project will be funded under the 'Development of Wildlife Habitat (CSS-DWH)' scheme which is a Centrally Sponsored Scheme.
- The cost will be borne in the 60:40 ratio by the Central and State government.
- Key aspects of the conservation project include undertaking "habitat improvement" measures, making more sources of water available, creating a wildlife crime cell, and a task force for the Greater Gir region. 'Greater Gir' that includes, other than the existing Gir National Park, sanctuaries in Girnar, Pania and Mitiyala.
- It would also involve having in place a GPS-based tracking system, which would look at surveillance tracking, animal and vehicle tracking. There would also be an automated sensor grid that would have magnetic sensors, movement sensors and infra-red heat sensors.
- A key outcome of the project is to have a dedicated veterinary institute, lion ambulances and back-up stocks of vaccines that may be required.

### **Relocation of lions:**

- The Kuno-Palpur Wildlife Sanctuary in Madhya Pradesh was identified to be the most suitable for reintroducing the species, according to a Supreme Court-appointed technical expert committee, but there has been no progress on the proposal.
- There is a committee of experts from both States examining the suitability of Madhya Pradesh as a potential lion reserve.
- The SC in April 2013 had ordered the translocation of some lions from Gujarat to Madhya Pradesh within six months, but this hasn't happened. This was ordered after several recommendations by expert groups, including the Wildlife Institute of India.



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- It emphasised that the long-term survival of the lion as a species was best served if they could be present outside Gujarat, too, so that they are protected against, say, a forest fire, a disease, or calamities.

### **About Asiatic Lion**

- Asiatic Lions are listed as 'Endangered' under the IUCN Red List.
- Its population is restricted to the state of Gujarat in India.
- With serious conservation efforts of the State and the Union Government, the population of Asiatic lions have increased to over 500 which used to be around 50 by late 1890s.
- As per the 2015 census, there were a total of 523 Asiatic Lions in Gir Protected Area Network
- The Gir Protected Area Network of Gujarat includes Gir National Park, Gir Sanctuary, Pania Sanctuary, Mitiyala Sanctuary and adjoining forests. It has an area of 1648.79 sq. km.
- The main activities under the 'Asiatic Lion Conservation Project' include habitat improvement of the Lions, controlling of diseases among the population, scientific interventions and adequate veterinary care. It will be supplemented with sufficient eco-development works ensuring a stable and viable Lion population in India.

### **Timberlines**

- The cold climes on high-altitude mountain tops make it usually difficult for trees to grow above the timberline (the last canopy forests on the mountains). Though global warming is changing this in many of the world's high mountains and causing timberlines to move upward, the eastern Himalaya may be an exception, find scientists. The zone of uppermost canopy forests here is unlikely to shift upwards but will get denser.
- Timberlines, the uppermost limit of canopy forests that gradually gives way to the treeline (beyond which trees do not grow) are limited by climate: factors including low temperatures and high winds on mountain tops prevent woody tree growth higher up. Timberlines, therefore, serve as indicators of climate change.



- Among the 20 woody tree species they recorded here, the Bhutan fir *Abies densa*, the woolly rhododendron *Rhododendron lanatum* and the small-leaf rowan *Sorbus microphylla* dominated the vegetation.
- Environmental factors such as elevation slope and humus played a role in this species composition. The density of trees in the timberline ecotone was significantly higher than that of its western Himalayan counterparts

### **Kaziranga**

- 113-year-old Kaziranga, also a tiger reserve and UNESCO World Heritage Site since 1985, has shifted from the 'big four' — rhino, elephant, Bengal tiger and Asiatic water buffalo.
- Though the rhino prefers grasslands, it can be called a wetland animal because it needs to wallow and depends on submerged vegetation in shallow water bodies.
- A good avifauna reflects on the health of the ecosystem, and the population trend will help us know whether or not the conditions have deteriorated.



## Tsunami in Indonesia

- Anak Krakatau Volcano in the middle of the Java and Sumatra islands in the Sunda Strait erupted and triggered underwater landslides.
- This has led to Volcano triggered Tsunami in the region.
- Also called the angry "Child of Krakatoa", it emerged around 1928 in the caldera of Krakatoa, a volcanic island that violently erupted in 1883.
- It has become a small volcanic island with subsequent lava flows at an altitude of 1000 feet above sea level.
- The island is part of the Ujung Kulon National Park, listed in UNESCO's World Heritage site.
- Since its birth, it has been in a state of semi-continuous eruptive activity.
- Indonesia has nearly 130 active volcanoes, forming part of the Pacific "Ring of Fire".
- Indonesia's proximity to the junction of 3 continental plates makes it particularly vulnerable to earthquakes and eruptions.





## **GNANADHARE ACADEMY**

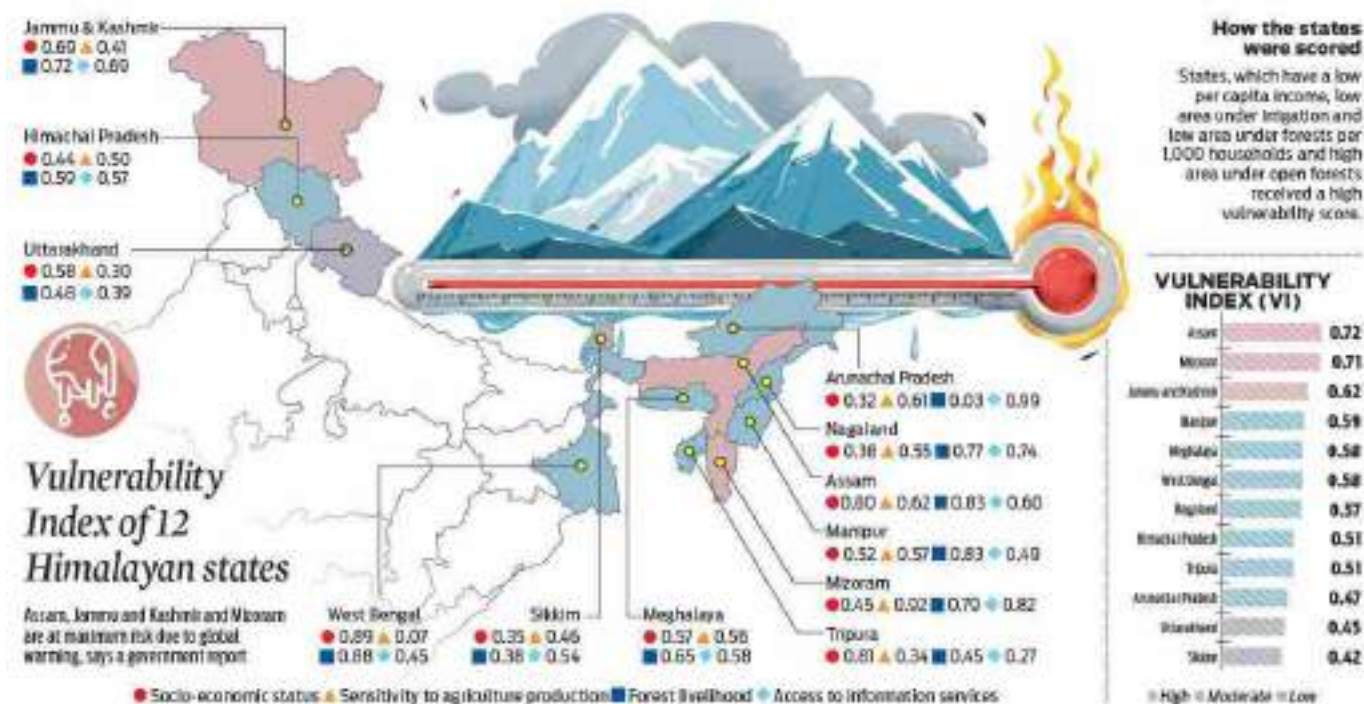
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- According to the International Tsunami Information Centre, Tsunamis triggered by volcanic eruptions are relatively rare, caused by the sudden displacement of water or "slope failure".
- Unlike earthquake triggered Tsunami, which trigger alert systems, Volcano triggered give little time to give warning.
- The tsunami was caused by "an undersea landslide resulting from volcanic activity on Anak Krakatau" and was exacerbated by abnormally high tide because of the full moon. Instability of the slope of an active volcano can create a rock slide that moves a large volume of water, creating local tsunami waves that can be very powerful. This is like suddenly dropping a bag of sand in a tub filled with water.
- Anak Krakatau is the island that emerged from the area once occupied by Krakatau, which was destroyed in 1883. It first appeared in 1927 and has been growing ever since. Neighbouring Malaysia and Australia both said they were ready to provide assistance if needed.

### **Chennai Andaman Nicobar Island (CANI) Cable System**

- CANI is a proposed project to provide high speed internet to the Andaman and Nicobar Islands in order to augment their communication infrastructure.
- It is a 2,200-km-long optical fibre system with a speed of 100 Gigabit per second.
- It will connect the Indian mainland from Chennai with the 8 islands of UT.
- They are Port Blair, Little Andaman (Hut Ba), Car Nicobar, Kamorta, Great Nicobar (Campbell Bay), Havelock, Long and Rangat.
- Under the proposal, the sub-marine cable system will be laid on the sea bed and the total route length will be 2,199.66 km.
- It is set to provide a fillip to defence communication infrastructure in the islands and improve communication during natural disasters.
- At present, telecom connectivity between the mainland and the islands is through satellites with limited bandwidth capacity.

## Climate Vulnerability Repor



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



- Sikkim is the least vulnerable state.

### **As mercury dips wheat production likely to snowball**

- A dip in the maximum and minimum temperatures in the country's key wheat producing States of Punjab and Haryana will boost the wheat crop output in the on-going winter (rabi) season.
- The current weather condition is conducive to the wheat crop. The dip in mercury will boost the growth of shoots, which will consequently increase the yield of the crop. Wheat is a temperature-sensitive crop and needs cold conditions to thrive. The lower temperature accompanied with sunlight will help in photosynthesis and eventually its growth.
- Days, the low temperature would help the soil to retain moisture, which otherwise in the absence of rain would adversely affect the quality of crop.

### **Bahuda rookery:**

- The Odisha forest department is all set to add another olive ridley mass nesting site to its wildlife map- at Bahuda rookery. Around 3-km stretch of the beach from Sunapur to Anantpur at Bahuda rookery is being developed as a possible olive ridley mass nesting site.
- Location: The Bahuda rookery is located around 20 km to the south of Rushikulya rookery coast, a major mass nesting site of olive ridleys on the Indian coastline.

### **Key facts:**

- Also known as the Pacific ridley sea turtle, Olive turtles are a medium-sized species of sea turtle found in warm and tropical waters, primarily in the Pacific and Indian Oceans.
- They are best known for their behavior of synchronized nesting in mass numbers.
- The Convention on Migratory Species and the Inter-American Convention for the Protection and Conservation of Sea Turtles have also provided olive ridleys with protection, leading to increased conservation and management for this marine turtle.



- It is included in vulnerable category by the IUCN Red list.

### **Dal lake:**

- Also known as the summer capital of Jammu and Kashmir, Dal Lake, which is the second largest in the state, is integral to tourism and recreation in Kashmir and is named the “Jewel in the crown of Kashmir” or “Srinagar’s Jewel”. The lake is also an important source for commercial operations in fishing and water plant harvesting.
- The lake is part of a natural wetland, including its floating gardens the floating gardens, known as “Rad” in Kashmiri, blossom with lotus flowers during July and August.
- The lake is located in the Zabarwan mountain valley, in the foothills of the Shankracharya hills, which surrounds it on three sides.
- The lake has four main interconnected basins namely, Hazratbal, Bod dal, Gagribal and Nagin.



### **River Dolphin s go missing in Sunderbans as water salinity rises**

- Rise in salinity in the water system that makes the Indian Sunderbans has resulted in a decrease in population of the Ganges River Dolphins in the region.
- A recent study covering 100 km of rivers and channels around the Sunderbans has revealed that the national aquatic animal is no longer sighted in the central and eastern parts of the archipelago.



- Only in the western part of Sunderbans, where the salinity is lower, could researchers find some evidence of the species.
- The rise in sea level, triggered by climate change, is one of the reasons for the increase in salinity of waters of rivers and channels. "Hydrological modifications like water diversion and commission of large barrages upstream have had a great impact on the salinity profile of the rivers downstream in the Sunderbans.
- Classified as endangered by the IUCN Red List, the species was once found in tributaries of the Ganga in West Bengal. Researchers and experts said the sighting of the dolphin has dipped over the years in the 534-km stretch from Farakka Barrage to Sunderbans.

## Needed, Breathing Space

The study indicates that the encounter rate of dolphins was consistent in less saline waters (<1 part per thousand) and in moderate salinity (1-10 ppt), which occurs close to the estuarine mouth of the Ganges



**Missing in action:** The Ganges River Dolphin seen in a section of the Hooghly in West Bengal. ■ R. CHAKRABORTY

### Boat-based surveys in selected water channels in Sunderbans to sight the mammals

Section	River channel	Survey length (km)	Sighting	Salinity range
Western	Hooghly	38	Yes	<1.0-19 ppt
	Muriganga	14	Yes	<1.0-19 ppt
Central	Matla	15	No	9.0-24.6 ppt
Eastern	Gomor	17	No	5.0-24 pp
	Bidya	12.3	No	5.0-24 pp



Average salinity in the Sunderbans

■ MIN. ■ MAX.





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### **Biennial Update Report (BUR)**

- Union Cabinet has approved Submission of India's second Biennial Update Report (BUR) to the United Nations Framework Convention on Climate Change (UNFCCC).
- The biennial update report aims to provide an update to India's first biennial report to the United Nation's body on climate change.
- The report contains five major components including
  - National circumstances.
  - National greenhouse gas inventory.
  - Mitigation actions,
  - Finance.
  - Technology and capacity building needs.
- The report has been prepared based on a range of studies conducted at the national level.
- The submission of India's second BUR would fulfil the obligation of India to furnish information regarding implementation of the convention, being a party. The scope of the BUR is to provide an update to India's first BUR to the UNFCCC.

### **Key findings:**

- Out of the total emissions, energy sector accounted for 73%, IPPU 8%, agriculture 16% and waste sector 3%. About 12% of the emissions were offset by the carbon sink action of forestland, cropland and settlements.

### **INDC- India's proposed targets:**

- Reduce emissions intensity of its GDP by 33 to 35% by 2030 from 2005 level.
- Achieve about 40% electric power installed capacity from non-fossil fuel based energy resources by 2030 with help of transfer of technology and low cost international finance.
- Create an additional carbon sink of 2.5 to 3 billion tonnes of CO<sub>2</sub> equivalent through additional forest and tree cover by 2030.

### Himalayan Griffon Vultures

- Himalayan Griffon Vultures is the largest of the genus Gyps.
- It has been listed as “Near Threatened” under IUCN Red list of threatened species and under Appendix II in CITES.
- Its habitat is mainly terrestrial such as Rocky areas (eg. inland cliffs, mountain peaks) and Grassland.
- It is distributed from western China, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Afghanistan and Pakistan, east through the Himalayan mountain range in India, Nepal and Bhutan, to central China and Mongolia.
- It has become an almost annual, but rare, winter visitor to Thailand, Myanmar, Bangladesh, Cambodia and Thai-Malay Peninsula.
- The species population appears to be stable in Dehradun District, Uttarakhand.
- The current population trend is stable, but it is suspected that it may undergo population decline over the next 3 generations.
- It is mainly because of the impacts of diclofenac use in livestock.
- The species was recently sighted at the famous vulture habitat Penchikalpet forest range in Telangana.
- The significance of the sighting, the experts opined that Pala Rapu can become a winter migration destination for the birds from the north.



### REDD+

- A new study by Delhi-based non-profit Centre for Science and Environment (CSE) has revealed that Reducing Emissions from Deforestation and Forest Degradation (REDD+), the programme initiated by the United Nations in 2005 to mitigate climate change through enhanced forest management in developing countries, has largely failed to achieve its objectives.



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### **Highlights of the study:**

- Large-scale finance for REDD+ has been a major issue as carbon markets have not materialised and international funding commitments for REDD+ have been much lower than expected.
- “REDD+ implementation costs have been high and benefits for local communities from REDD+ projects have been minimal.
- There is need to rethink the REDD+ mechanism based on these experiences and the findings emerging from new research on the potential of forests to mitigate climate change.

### **India's REDD+ strategy:**

- Complying with the UNFCCC decisions on REDD+, India has prepared its National REDD+ Strategy. The Strategy builds upon existing national circumstances which have been updated in line with India's National Action Plan on Climate Change, Green India Mission and India's Nationally Determined Contribution (NDC) to UNFCCC.
- The strategy report has been prepared by Indian Council of Forestry Research & Education (ICFRE), Dehradun.

### **About REDD+:**

- In simple terms, REDD+ means “Reducing Emissions from Deforestation and forest Degradation”, conservation of forest carbon stocks, sustainable management of forests, and enhancement of forest carbon stocks in developing countries.
- REDD+ is a mechanism developed by Parties to the United Nations Framework Convention on Climate Change (UNFCCC).
- It creates a financial value for the carbon stored in forests by offering incentives for developing countries to reduce emissions from forested lands and invest in low-carbon paths to sustainable development.
- Developing countries would receive results-based payments for results-based actions. REDD+ goes beyond simply deforestation and forest degradation and includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks.



### **Convention on Biological Diversity (CBD) report:**

- India recently submitted its Sixth National Report to the Convention on Biological Diversity (CBD).
- India is among the first five countries in the world, the first in Asia and the first among the biodiversity-rich megadiverse countries to have submitted the report.



### **Highlights of the report:**

- The report provides an update of progress in achievement of 12 National Biodiversity Targets (NBT) developed under the convention process in line with the 20 global Aichi biodiversity targets.
- The report highlights that while India has exceeded/ overachieved two NBTs, it is on track to achieve eight NBTs and with respect to two remaining NBTs, the country is striving to meet the targets by the stipulated time of 2020.
- According to the report, India has exceeded the terrestrial component of 17% of Aichi target 11, and 20% of corresponding NBT relating to areas under biodiversity management.
- Also, India has been investing a huge amount on biodiversity directly or indirectly through several development schemes of the central and state governments, to the tune of Rs 70,000 crores per annum as against the estimated annual requirement of nearly Rs 1,09,000 crore.

### **Convention on Biological Diversity (CBD)**

- At the 1992 Earth Summit in Rio de Janeiro, world leaders agreed on a comprehensive strategy for “sustainable development” — meeting our needs while ensuring that we leave a healthy and viable world for future generations. One of the key agreements adopted at Rio was the Convention on Biological Diversity.



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- The Convention on Biological Diversity is the international legal instrument for “the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources” that has been ratified by 196 nations.

### **The 12 National Biodiversity targets of India are:**

- By 2020, a significant proportion of the country’s population, especially the youth, is aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.
- By 2020, values of biodiversity are integrated into national and state planning processes, development programmes and poverty alleviation strategies.
- Strategies for reducing the rate of degradation, fragmentation and loss of all natural habitats are finalized and actions put in place by 2020 for environmental amelioration and human well-being.
- By 2020, invasive alien species and pathways are identified and strategies to manage them developed so that populations of prioritized invasive alien species are managed.
- By 2020, measures are adopted for sustainable management of agriculture, forestry and fisheries.
- Ecologically representative areas under terrestrial and inland water, and also coastal and marine zones, especially those of particular importance for species, biodiversity and ecosystem services, are conserved effectively and equitably, based on protected area designation and management and other area-based conservation measures and are integrated into the wider landscapes and seascapes, covering over 20% of the geographic area of the country, by 2020.
- By 2020, genetic diversity of cultivated plants, farm livestock, and their wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.



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- By 2020, ecosystem services, especially those relating to water, human health, livelihoods and well-being, are enumerated and measures to safeguard them are identified, taking into account the needs of women and local communities, particularly the poor and vulnerable sections.
- By 2015, Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization as per the Nagoya Protocol are operational, consistent with national legislation.
- By 2020, an effective, participatory and updated national biodiversity action plan is made operational at different levels of governance.
- By 2020, national initiatives using communities' traditional knowledge relating to biodiversity are strengthened, with the view to protecting this knowledge in accordance with national legislation and international obligations.
- By 2020, opportunities to increase the availability of financial, human and technical resources to facilitate effective implementation of the Strategic Plan for Biodiversity 2011-2020 and the national targets are identified and the Strategy for Resource Mobilization is adopted.

### **What are Aichi Targets?**

- The 'Aichi Targets' were adopted by the Convention on Biological Diversity (CBD) at its Nagoya conference. It is a short term plan provides a set of 20 ambitious yet achievable targets, collectively known as the Aichi Targets. They can be divided into:
- Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society.
- Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use.
- Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity.
- Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services.
- Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building.

### **Cinereous Vulture**

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



### **Parliamentary committee on Western Ghats**

- The committee has observed that despite three draft notifications issued over four years for earmarking ESA, the six States could not be brought on board for action. Resultantly, over 56,000 square km of ESA could not be earmarked as ‘no-go’ zones for polluting activities and deforestation, and large-scale deforestation, mining, and construction are continuing unabated, hurting the ecology of the Western Ghats.”
- “Insensitivity towards ecology of the Western Ghats is making the six States vulnerable to floods and landslides,”
- The panel has urged the Ministry of Environment, Forest and Climate Change to constitute a committee to address the issues and grievances of local people.



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- “The committee is of the view that implementation of the recommendations of the Kasturirangan report is only possible with active support of local population. It also requires consultation with the State government at micro level to achieve the objectives of saving the Western Ghats,”

### **Invasion of Shola Grasslands**

- Shola forest-grassland ecosystem is characterised by patches of forest of stunted evergreen shola trees in the valleys and grasslands on hill slopes.
- They are spread across the Western Ghats of Tamilnadu and Karnataka.
- Over four decades, almost one-fourth of the grasslands in the high-altitudes of the ecosystem was lost.
- The exotic invasive trees like pine, acacia and eucalyptus that were earlier used for afforestation in these areas are the primary reason behind it.
- Broadly, these grasslands in Tamil Nadu showed the highest rates of invasion than in Karnataka.
- Though the practice has been ceased in 1996, the exotics still invade these ecosystems.
- But the shola forests in the valleys have remained “relatively unchanged” over these years.
- The Anamalai-Munnar areas have also remained stable during this time.
- The satellite images they accessed reveal that 60% of the shola-grassland landscape has changed; almost 40% (516 km<sup>2</sup>) of native high-elevation grasslands have disappeared.
- Most of this loss occurred on the mountain tops of the Nilgiri, Palani and Anamalai hill ranges, which comprise more than half of the Ghat’s shola-grassland ecosystems, primarily due to the expansion of exotic trees (pine, acacia and eucalyptus).
- Shola-grassland ecosystems in Tamil Nadu showed the highest rates of invasion.



### **GEF assisted Green – Ag Project to transform Indian Agriculture**

- The Government has launched the “Green – Ag: Transforming Indian Agriculture for global environmental benefits and the conservation of critical biodiversity and forest landscapes” in association with Global Environment Facility (GEF).
- The project would be implemented in collaboration with the Food and Agriculture Organisation (FAO) in high conservation-value landscapes of five States namely,
  - Madhya Pradesh: Chambal Landscape,
  - Mizoram: Dampa Landscape,
  - Odisha: Similipal Landscape,
  - Rajasthan: Desert National Park Landscape and
  - Uttarakhand: Corbett-Rajaji Landscape.
- The Green-Ag project seeks to integrate biodiversity, climate change and sustainable land management objectives and practices into Indian agriculture.
- The project aims to catalyze a transformative change of India’s agricultural sector to support the achievement of national and global environmental benefits and conservation of critical biodiversity and forest landscapes.
- The project supports harmonization between India’s agricultural and environmental sector priorities and investments to realise the national and global environmental benefits without compromising on India’s ability to strengthen rural livelihoods and meet its food and nutrition security.

### **Climate Change Performance Index (CCPI)**

- Morocco has been named the second best performing country after Sweden in the Climate Change Performance Index (CCPI).
- The North African country significantly increased the share of renewables over the past five years and increased new renewable energy capacity.





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- Sweden is in top position, followed by Morocco and Lithuania in the CCPI 2019.
- The bottom five in the list is Saudi Arabia, U.S., Iran, South Korea and Taiwan. With the connection of the world's largest solar plant to the grid, Morocco is on track for achieving its target of 42% installed renewable energy capacities by 2020.
- In CCPI 2019 no country performed well enough to reach the ranking very good, meaning that no country has yet made it to one of the top three places in the rankings.

### **The Climate Change Performance Index (CCPI)**

- It is an annual publication by German watch and Climate Action Network Europe.
- It evaluates and compares the climate protection performance of 56 countries and the EU, which are together responsible for more than 90 percent of global greenhouse gas (GHG) emissions.
- 80 % of the evaluation is based on objective indicators of emissions trend and emissions level.
- 20 % of the index results are built upon national and international climate policy assessments by more than 200 experts from the respective countries.
- The CCPI ranking is qualified in relative terms (better–worse) rather than absolute terms.
- The Climate Change Performance Index (CCPI) is an instrument covering 58 countries and supposed to enhance transparency in international climate politics.
- Its aim is to encourage political and social pressure on those countries which have, up to now, failed to take ambitious actions on climate protection as well as to highlight countries with best-practice climate policies.



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### **Highlights of the report:**

- Only few countries have started working towards limiting global warming below 2°C or even at 1.5°C.
- Globally, Sweden is in top position, followed by Morocco and Lithuania in the CCPI 2019.
- The bottoms five in the list are Saudi Arabia, U.S., Iran, South Korea and Taiwan.
- India ranks 11th in this year's CCPI, improving its standing by three places compared to the previous edition.

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global environmental benefits without compromising on India's ability to strengthen rural livelihoods and meet its food and nutrition security.

### **About GEF:**

- The Global Environment Facility was established on the eve of the 1992 Rio Earth Summit to help tackle our planet's most pressing environmental problems.
- It is an international partnership of 183 countries, international institutions, civil society organizations and the private sector that addresses global environmental issues.
- GEF funds are available to developing countries and countries with economies in transition to meet the objectives of the international environmental conventions and agreements.
- The World Bank serves as the GEF Trustee, administering the GEF Trust Fund.

### **Action against Industries Polluting Ganga River**

- Government of India has launched the Namami Gange Programme in May 2015, with the total budgetary outlay of Rs. 20,000 crore for the period from 2014-2015 till 31 December 2020 to accomplish the twin objectives of effective abatement of pollution, conservation and rejuvenation of National River Ganga and its tributaries.
- Namami Gange Programme – is an umbrella programme which integrates previous and currently ongoing initiatives by enhancing efficiency, extracting synergies and supplementing them with more comprehensive & better coordinated interventions.





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- Government of India is supplementing the efforts of the state governments in addressing the pollution of river Ganga by providing financial assistance to the states.
- 961 Grossly Polluting Industries (GPIs) have been identified on main stem of river Ganga.
- Cleaning of the river is a continuous process and efforts are being made to complete the projects by the year 2020 for creating adequate Sewage Treatment Capacity.

### **Background:**

- Each day, more than 500 million liters of wastewater from industrial sources are dumped directly into Ganga. In many places, this wastewater entering the rivers is completely raw, completely untreated.

### **Main Pillars of the Namami Gange Programme are:**

- Sewerage Treatment Infrastructure
- River-Surface Cleaning
- Afforestation
- Industrial Effluent Monitoring
- River-Front Development
- Bio-Diversity
- Public Awareness
- Ganga Gram

### **Its implementation has been divided into:**

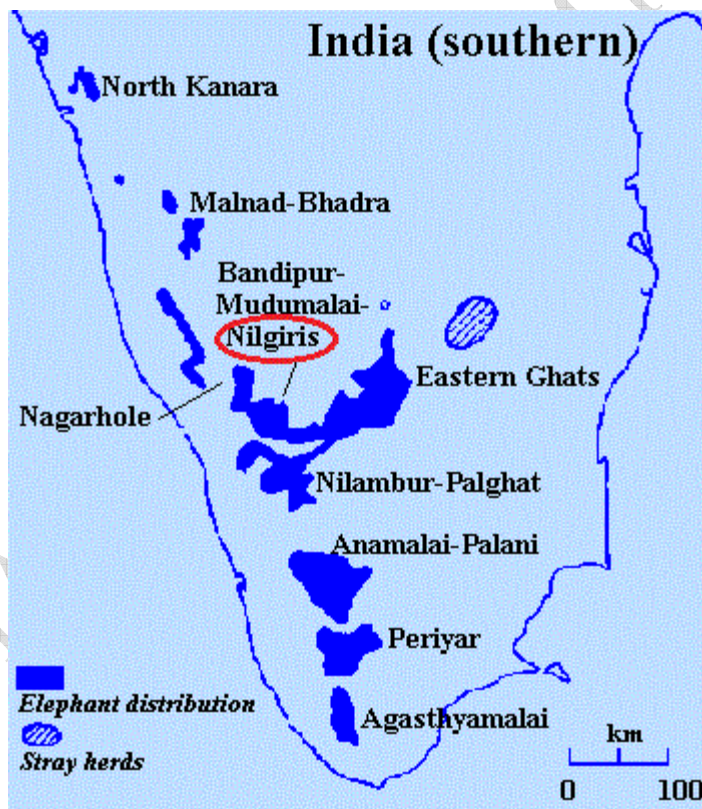
- Entry-Level Activities (for immediate visible impact),
- Medium-Term Activities (to be implemented within 5 years of time frame) and
- Long-Term Activities (to be implemented within 10 years).
- National Mission for Clean Ganga, endeavors to deploy best available knowledge and resources across the world for Ganga rejuvenation. Clean Ganga has been a perennial attraction for many international countries that have expertise in river rejuvenation.



- Countries like Australia, United Kingdom, Germany, Finland, Israel, etc. have shown interest in collaborating with India for Ganga Rejuvenation.

### Agasthyarkoodam

- Agasthyarkoodam or Agathyamala is the second highest peak in Kerala.
- It is a 1868m tall mountain within the Neyyar Wildlife Sanctuary in Thiruvananthapuram district.
- It lies on the border between Kerala and Tamilnadu.
- It has long been known as a bird watcher's paradise.
- It is also known for its remarkable flora and fauna, especially certain rare medicinal herbs which have been discovered here.
- The various vegetations found in this area are moist deciduous forests, semi evergreen forests, grasslands and evergreen forests.
- Over 2000 species including lichens, orchids, mosses and ferns have been recorded in the area.
- The peak was named after the sage Agastya and is a popular pilgrim site.
- Sage Agasthya is one of the seven maharishis (Saptarishis) in Hindu puranas
- A shrine dedicated to him is located in the hilltop.
- The original inhabitants of these hills are a tribe known as "Kanis"





## Neyyar Wildlife Sanctuary

- ## Firecracker ban on Galapagos Islands



- Galapagos Islands are an archipelago of volcanic islands distributed on either side of the equator in the Pacific Ocean.
- It is a World Heritage Site that comes under the jurisdiction of Ecuador.
- The islands are known for their large number of endemic species and were studied by Charles Darwin
- Ecosystems are very sensitive in the islands and its fauna that is so unique that they are easily affected by even fireworks.
- .Animals have suffered from elevated heart rates, nervous stress and anxiety, which have “notably” changed their behaviour and affected the survival of species
- So the local government has recently banned fireworks on the Islands to protect the its unique fauna
- Those fireworks that produce light but no noise have been excluded from the ban.
- It is also to avoid any potential deterioration in air quality or pollution of water sources.

### CITES — Washington Convention

- India has proposed to remove rosewood (*Dalbergia sissoo*) from Appendix II of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), a multilateral treaty to protect endangered plants and animals.
- The species is currently part of Appendix II of CITES that has species not necessarily threatened with extinction, but in which trade must be controlled to avoid utilisation incompatible with their survival. But, India doesn't want that for rosewood.



### **Why India wants rosewood removed from the list?**

- The species grows at a very fast rate and has the capacity to become naturalised outside its native range, even it is invasive in some parts of the world.
- The regulation of trade in the species is not necessary to avoid it becoming eligible for inclusion in Appendix I in the near future and the harvest of specimens from the wild is not reducing the wild population to a level at which its survival might be threatened by continued harvesting or other influences.

### **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES):**

- It is an International agreement to regulate worldwide commercial trade in wild animal and plant species. It also restricts trade in items made from such plants and animals, such as food, clothing, medicine, and souvenirs
- It was signed on March 3, 1973 (Hence world wildlife day is celebrated on march 3).
- It is administered by the United Nations Environment Programme (UNEP).
- Secretariat — Geneva (Switzerland).
- CITES is legally binding on state parties to the convention, which are obliged to adopt their own domestic legislation to implement its goals.

### **Classifications:**

- It classifies plants and animals according to three categories, or appendices, based on how threatened. They are.
- Appendix I: It lists species that are in danger of extinction. It prohibits commercial trade of these plants and animals except in extraordinary situations for scientific or educational reasons.
- Appendix II species: They are those that are not threatened with extinction but that might suffer a serious decline in number if trade is not restricted. Their trade is regulated by permit.



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- Appendix III species: They are protected in at least one country that is a CITES member states and that has petitioned others for help in controlling international trade in that species.

### **National Clean Air Programme**

- The government has announced the National Clean Air Programme (NCAP). This is the first ever effort in the country to frame a national framework for air quality management with a time-bound reduction target.
- The programme will not be notified under the Environment Protection Act or any other Act to create a firm mandate with a strong legal back up for cities and regions to implement NCAP in a time bound manner for effective reduction.

### **Key features of the National Clean Air Programme (NCAP):**

- Achieve a national-level target of 20-30% reduction of PM2.5 and PM10 concentration by between 2017 and 2024.
- Central Pollution Control Board (CPCB) will execute this nation-wide programme in consonance with the section 162 (b) of the Air (Prevention and Control of Pollution) Act, 1986.
- The programme has been launched with an initial budget of 300 crore for the first two years.



- The plan includes 102 non-attainment cities, across 23 states and Union territories, which were identified by Central Pollution Control Board (CPCB) on the basis of their ambient air quality data between 2011 and 2015.
- Non-attainment cities are those which have been consistently showing poorer air quality than the National Ambient Air Quality Standards. These include Delhi, Varanasi, Bhopal, Kolkata, Noida, Muzaffarpur, and Mumbai.
- As part of the programme, the Centre also plans to scale up the air quality monitoring network across India. At least 4,000 monitors are needed across the country, instead of the existing 101 real-time air quality (AQ) monitors, according to an analysis.
- The plan proposes a three-tier system, including real-time physical data collection, data archiving, and an action trigger system in all 102 cities, besides extensive plantation plans, research on clean-technologies, landscaping of major arterial roads, and stringent industrial standards.
- It also proposes state-level plans of e-mobility in the two-wheeler sector, rapid augmentation of charging infrastructure, stringent implementation of





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BS-VI norms, boosting public transportation system, and adoption of third-party audits for polluting industries.

- Various committees: The national plan has proposed setting up an apex committee under environment minister, a steering committee under-secretary (environment) and a monitoring committee under a joint secretary. There would be project monitoring committees at the state-level with scientists and trained personnel.

### **The target**

- NCAP takes into account available international experiences and national studies. It notes that internationally, actions have been “city-specific” rather than country-oriented, and cites examples such as Beijing and Seoul that saw 35%-40% PM2.5 reduction in five years.
- However effective this might have been abroad, reductions by similar levels might leave Indian cities still heavily polluted. Delhi’s very severe pollution levels are four times the permissible limits now, and a 30% reduction by 2024 would still leave it very dangerous for health.

### **Selection of cities**

- From the Central Pollution Control Board’s list of polluted cities, 102 were identified based on National Ambient Air Quality Monitoring Programme data for 2011-2015. “PM10 has been found to be exceeding in 94 cities consecutively for five years and NO2 is exceeding the limits in five cities. PM2.5 data since 2015 indicates 16 cities as non-attainment cities,” the NCAP states.
- It also selects from the top 10 cities from the World Health Organisation’s April 2018 database, which had ranked 14 Indian cities among the top 15 most polluted cities in the world.

### **Implementation**

- In broad terms, NCAP talks of a “collaborative, multi-scale and cross-sectoral coordination” between central ministries, state governments, and local bodies. “The CPCB shall, in consonance with the Air (Prevention and



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Control of Pollution) Act, 1981, and in particular with the provision of Section 16(2)(b) of the Act, execute the nation-wide programme for the prevention, control, and abatement of air pollution within the framework of the NCAP," it states.

- NCAP will be "institutionalised" by respective ministries and will be organised through inter-sectoral groups that will also include the Ministry of Finance, Ministry of Health, NITI Aayog, and experts from various fields.
- While some of the strategies are not new to India, NCAP appears to be targeting effective implementation. For example, it talks of "congestion management" at traffic junctions by the traffic police, solid waste management by municipal corporations, and stringent industrial standards put in place by concerned ministries.

### **Source apportionment studies**

- NCAP identifies particulate matter as a "major challenge" that is found to exceed limits across the country and in urban areas of the Indo-Gangetic plain. "While there are some variations due to differences in methodologies and the year of estimation, however, there is broad convergence of the estimates," it states.
- Identified as major pollutants are vehicles, industries, rampant construction, biomass burning, diesel gensets, and commercial and domestic use of fuel, among other things.
- From the studies highlighted, it is evident that more data are available for Delhi-NCR compared to other parts of the country. In fact, NCAP states: "It is to be noted that in Delhi and NCR, the initiatives started in 1992 with the creation of the EPCA, and thus has a definite edge over other non-attainment cities."
- Further, "current knowledge on the urban sources provide a basis to initiate action in the different sectors, though city-specific source apportionment studies is needed to refine air quality management plans for the city."



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### **Mitigation measures**

- NCAP details seven mitigation actions. It calls for stringent enforcement through a web-based, three-tier mechanism that will review, monitor, assess and inspect to avoid any form of non-compliance. "The experience indicates lack of regular monitoring and inspection as the major reason for non-compliance."
- Trained manpower and regular inspection drive will be ensured for stringent implementation purpose."
- It calls for an "extensive plantation drive" at pollution hotspots and execution; however, it is not made clear how much air pollution this will seek to reduce. In some instances, NCAP elaborates on schemes already in place — for instance, in handling road dust and construction, where mechanical sweepers have often been suggested as a solution.
- For power sector emissions, it refers to emission standards set by the Ministry of Environment and Forests for Thermal Power Plants in December 2015 to be implemented within a two-year period; it notes that this has since been extended to December 2022.
- For agricultural stubble burning, it highlights the initiatives already in place by way of the central assistance of Rs 1,151 crore for in situ management of crop residue and provides for general action points to be explored.

### **City-specific plans**

- NCAP calls for a "city action plan" that needs to be "guided by a comprehensive science-based approach" involving source apportionment studies. Source activities and meteorological settings are the other important factors that may influence the air pollution levels. It is, therefore, proposed to select candidate cities and towns considering the above-mentioned factors," it states. It advises that state capitals and cities with a million-plus population be taken up on priority.



### **Lake Urmia**

- Iran is witnessing revival of Lake Urmia which is one of the worst ecological disasters of recent decades.
- The lake is a saltwater lake.
- It is situated in the mountains of northwest Iran and is fed by 13 rivers
- In precise the lake is located in the west of the southern portion of the Caspian Sea.
- It is designated as a site of international importance under the UN Convention on Wetlands.
- According to the UN Environment Program, the lake has been shrinking since 1995, due to a combination of prolonged drought, over-farming and dams.
- The shrinking has threatened the habitat of shrimp, flamingos, deers and wild sheep and caused salt storms that pollute nearby cities and farms.
- Finally a coordinated effort to save the lake in 2013—with a joint program between Iran and the UN Development Program funded by the Japanese government was in force.



### **Asian Waterbird Census (AWC):**

- A waterbird survey conducted in the Upper Kuttanad region of Kerala has recorded 16,767 birds of 47 continental and local species. The survey, conducted as part of the annual Asian Waterbird Census, has spotted three





new species — Greater flamingo, Grey-headed lapwing, and Blue-cheeked bee-eater.

- Asian Waterbird Census is an annual event in which thousands of volunteers across Asia and Australasia count waterbirds in the wetlands of their country. This event happens every January. This event is coordinated by wetlands International and forms part of global waterbird monitoring programme called the International Waterbird Census (IWC).
- Asian Waterbird Census (AWC) was started in the year 1987. Its main focus is to monitor the status of waterbirds and the wetlands. AWC also aims to create public awareness on various issues concerning wetlands and waterbird conservation. Each year the census is carried out as a voluntary activity.
- In India, the AWC is annually coordinated by the Bombay Natural history Society (BNHS) and Wetlands International.

### **What are waterbirds?**

- According to Wetlands International (WI), waterbirds are defined as species of birds that are ecologically dependent on wetlands. These birds are considered to be an important health indicator of wetlands of a region.

### **Crocodile Census**

- Recent Crocodile Census conducted by Odisha.

### **Findings:**

- The population of the saltwater or estuarine crocodile (*Crocodylus porosus*) has increased in the water bodies of Odisha's Bhitarkanika National Park and its nearby areas in Kendrapara district.
- 1,742 individuals have been recorded in this year's annual reptile census.



- The increase in population was primarily due to the far-sighted measures of the government.

### **Background**

- There are three species of crocodilians—saltwater, Mugger and Gharial.

### **Mugger:**

- The mugger crocodile, also called the Indian crocodile, or marsh crocodile, is found throughout the Indian subcontinent.
- It is listed as vulnerable by IUCN.
- The mugger is mainly a freshwater species, and found in lakes, rivers and marshes.

### **Gharial:**

- The Gharial or fish eating crocodile is native to the Indian subcontinent.
- It is listed as a Critically Endangered by IUCN.
- Small released populations are present and increasing in the rivers of the National Chambal Sanctuary, Katarniaghat Wildlife Sanctuary, Son River Sanctuary and the rainforest biome of Mahanadi in Satkosia Gorge Sanctuary, Orissa.



### **Saltwater Crocodile:**

- It is the largest of all living reptiles. It listed as least concern by IUCN. It is found throughout the east coast of India.

### **Crocodile conservation programmes in India:**

- The Gharial and Saltwater crocodile conservation programme was first implemented in Odisha in early 1975 and subsequently the Mugger conservation programme was initiated, since Odisha is having distinction for existence of all the three species of Indian crocodilians. The funds and technical support for the project came from UNDP/ FAO through the Government of India.
- 'Baula' Project at Dangamal: 'Baula' is the Oriya term for Saltwater Crocodile. Dangmal is in Bhitarkanika sanctuary.
- Mugger Project at Ramatirtha: The Ramatirtha center, in Odisha, is meant for Mugger crocodiles.
- Gharial Project at Tikarpada, Odisha.
- Captive Breeding of Crocodiles at Nandankanan, Odisha.

### **Turtle Festival in Puri**

- First Odisha Turtle Festival was held recently in Puri to create awareness and promote ideas on conservation of olive ridley turtles.
- Organised by Cox & Kings Foundation in association with Humane Society International/India and Action for Protection of Wild Animals (APOWA).
- Odisha has half of the world's Olive Ridley turtle population and 90% of India's turtle population lives in the state. Despite that no actions have been taken for their conservation. Therefore, the government should develop some infrastructure near the turtle nesting sites at Devi and Rusikulya rivers, the two major nesting grounds.



### **Facts**

- There are five species in Indian waters — Leatherback (Vulnerable), Loggerhead (Endangered), Hawksbill (Critically Endangered), Green (Endangered) and Olive Ridley.

- In India, sea turtles are protected under the Indian Wildlife Protection Act of 1972.
- The Olive ridley turtles are the smallest and most abundant of all sea turtles found in the world, inhabiting warm waters of the Pacific, Atlantic and Indian oceans.
- The Olive ridley is the most numerous among the sea turtles found in India and is well known for its arribadas, or annual mass nestings when thousands of turtles migrate to the breeding ground to nest simultaneously.
- Recognized as Vulnerable by the IUCN Red list.
- International trade in these turtles and their products is banned under CITES Appendix I.
- 'Operation Kachhapa': Conservation of the Olive Ridley Sea Turtle was launched by the Wildlife Protection Society of India in collaboration with the Orissa State Forest Department and the Wildlife Society of Orissa and other local NGOs.
- To reduce accidental killing in India, the Orissa government has made it mandatory for trawls to use Turtle Excluder Devices (TEDs), a net specially designed with an exit cover which allows the turtles to escape while retaining the catch.

### **Hawaiian tree snail is the first extinction of 2019:**

- George, the last known *Achatinella apexfulva*- a Hawaiian tree snail, died on New Year's Day 2019, making his species the first to be declared officially extinct in 2019.





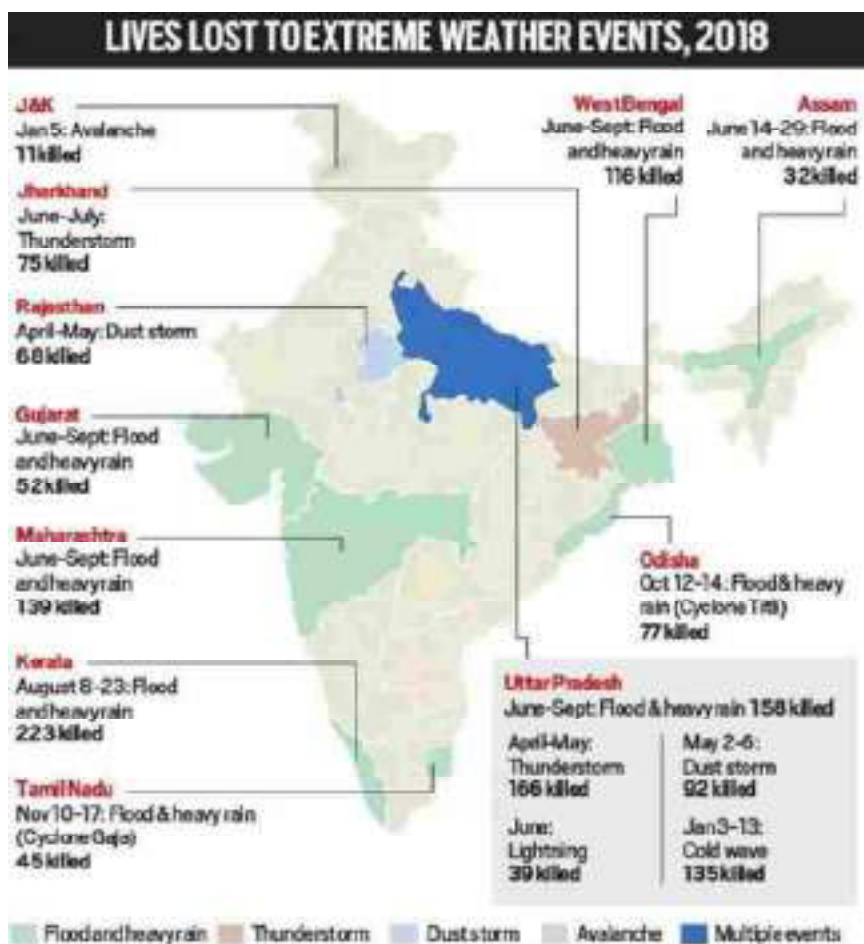
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### **India warming: what trends show?**

- The India Meteorological Department (IMD) said 2018 was the sixth warmest year on record, with the average temperature over India being “significantly above normal”.
- The five warmest years on record (nationwide records began in 1901) were, in order: 2016 (+0.720°C above the 1981-2010 average), 2009 (+0.560°C), 2017 (+0.550°C), 2010 (+0.540°C), 2015 (+0.420°C).
- The IMD said that 11 of the 15 warmest years were during the recent past fifteen years (2004-18).
- The trends of recent years are part of the “global warming” trend. “The rate of increase of temperatures over India is almost similar to the global average.
- During 2018, the IMD said the annual mean surface air temperature averaged over the country was +0.410°C above the 1981-2010 average. However, this was “substantially lower” than the highest warming observed over India in 2016, which was +0.720°C.
- “The 20 warmest years on record have been in the past 22 years, with the top four in the past four years.”





- Source: IMD, graphic adapted from a tweet by M Rajeevan, Secretary, Ministry of Earth Sciences
- The IMD that the winter and pre-monsoon seasons, with an anomaly of  $+0.590^{\circ}\text{C}$  and  $+0.550^{\circ}\text{C}$  respectively, “mainly contributed to this warming” seen in 2018.
- “Mean temperature during the monsoon and post-monsoon seasons (with anomaly of  $+0.260^{\circ}\text{C}$ , and  $+0.310^{\circ}\text{C}$  respectively) were also above normal. Temperatures are increasing during both day and night time.
- Heat waves are increasing in frequency as well as magnitude.” As a consequence, “extreme rainfall and rainstorms which can cause floods are increasing. Dry spell duration is also increasing.
- According to the IMD, the country-averaged season mean temperatures were also “above average” during all four seasons with winter (January-February,  $+0.590^{\circ}\text{C}$ ) being the fifth warmest since 1901.



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- The pre-monsoon season (March-May,  $+0.550^{\circ}\text{C}$ ) was the seventh warmest ever since 1901.
- Uttar Pradesh was the most adversely affected state during the year which reported near 600 deaths due to cold waves, thunderstorm, dust storm, lightning and floods.

### **Monsoon rainfall trends**

- While the rainfall over India as a whole during the southwest monsoon season of June to September was near normal — 90.6% of Long Period (1951-2000) Average — the northeast monsoon season rainfall was substantially below normal (56% of LPA), the IMD said. The latter was the sixth lowest since 1901.
- “The seasonal rainfall during the northeast monsoon season over the core region of the south peninsula (comprising five subdivisions viz. Coastal Andhra Pradesh, Rayalaseema, Tamil Nadu & Puducherry, South Interior Karnataka and Kerala), was also below average (66% of LPA).
- Out of these five subdivisions, one subdivision, Kerala, received normal rainfall; the other four subdivisions received deficient rainfall.

### **Bwindi Impenetrable National Park**

- Situated in the south-west part of Uganda and bordering the Democratic Republic of Congo, the Bwindi Impenetrable National Park spans more than 320 sq.km.
- The forests in the Park are believed to be the remaining areas of what was once a very large forest region covering vast areas of western Uganda, Rwanda, Burundi and eastern parts of the Democratic Republic of Congo.
- Declared a UNESCO World Heritage Site in 1994, the Park thrives primarily on community support and eco-tourism. However, it is threatened by development activities, habitat loss and hunting of gorillas and chimpanzees.

### **Mountain gorilla facts**

- Found only in three countries today - Rwanda, Uganda and the Democratic Republic of Congo - the mountain gorilla is a subspecies of the eastern gorilla.
- It is also called the silverback gorilla since the adult male has a silvery patch of hair on its back.
- This mammal can grow up to six feet and weigh even more than 200 kg. Despite its imposing size, the gorilla is a gentle, calm and non-aggressive animal that gets aggressive only when disturbed or threatened.
- The mountain gorilla's food is predominantly vegetarian, consisting of shoots, roots, fruits, etc. But, it will also help itself to insects.
- This mammal is usually found in troops - led by an adult male and comprising younger males, females and their offspring. Young gorillas spend a lot of their time playing - much like their human counterparts!
- Though its population is said to be increasing, thanks to consistent conservation efforts, the International Union for Conservation of Nature has listed the animal as "endangered" since it continues to be threatened by habitat destruction and hunting.



### **Great Indian Bustard:**

- Context: Wildlife activists have called for enforcement of recovery plan for the country's most critically endangered bird- Great Indian Bustard. Once the contender for becoming India's national bird, the Great Indian Bustard is now facing extinction.
- Great Indian Bustard is listed in Schedule I of the Indian Wildlife (Protection) Act, 1972, in the CMS Convention and in Appendix I of CITES, as Critically Endangered on the IUCN Red List.



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- It has also been identified as one of the species for the recovery programme under the Integrated Development of Wildlife Habitats of the Ministry of Environment and Forests, Government of India.
- Project Great Indian Bustard — state of Rajasthan — identifying and fencing off bustard breeding grounds in existing protected areas as well as provide secure breeding enclosures in areas outside protected areas

### **Protected areas:**

- Desert National Park Sanctuary — Rajasthan.
- Rollapadu Wildlife Sanctuary – Andhra Pradesh.
- Karera Wildlife Sanctuary– Madhya Pradesh.

### **Extinction risk for coffee species**

- A new study has found that 60% all coffee species are at the risk of extinction from disease, climate change, and the loss of suitable space to grow coffee.
- The species at risk include Arabica, the most widely consumed coffee variety in the world.
- Arabica alone accounts for 60% of world coffee trade, and Robusta for the remaining 40%.
- Given the threat, other coffee species are likely to be required for coffee crop plant development.
- There are two optimal growing climates for Arabic coffee bean
- The subtropical regions-at high altitudes of 16-24° Rainy and dry seasons must be well defined, and altitude must be between 1800-3600 feet.
- The equatorial regions at latitudes lower than 10° and altitudes of 3600-6300 feet
- Robusta coffee is grown at much lower altitudes (sea level-3000 feet) in an area 10° North and South of the equator.
- It is much more tolerant to warm conditions than Arabica coffee.

### **Alliance to End Plastic Waste (AEPW):**

- An alliance of global companies has launched a new organisation- AEPW- to help eliminate plastic waste, especially in the ocean.
- The Alliance to End Plastic Waste (AEPW), comprising about 30 companies, pledged over \$1 billion to eliminate plastic waste across the world. They aim to invest \$1.5 billion over the next five years for the same.
- The alliance is designed as a non-profit organization. It includes companies from across North and South America, Europe, Asia, Southeast Asia, Africa as well as the Middle East are part of the Alliance.
- The aim is to develop solutions to mitigate plastic pollution and promote a circular economy by utilising used plastics.
- Member companies include those that make, use, sell, process, collect and recycle plastics, as well as chemical and plastic manufacturers, consumer goods companies, retailers, converters, and waste management companies, also called the plastics value chain. From India, Reliance Industries will advance efforts towards a sustainable future.



### **Significance:**

- Plastic waste management is a complex and serious global challenge that calls for swift action and strong leadership. The issue of plastic waste is seen and felt all over the world. It must be addressed. This new alliance is the most comprehensive effort to date to end plastic waste in the environment.





### Small Woodbrown butterfly:

- What? After a span of 120 long years, researchers in Sikkim have rediscovered the Small Woodbrown butterfly species from Bakhim in Khanchendzonga National Park.

### Key facts:

- The Small Woodbrown butterfly, scientifically known as *Lethe nicetella* is named after its brown-coloured wings patched with white round spots.
- It is amongst the smallest members of the genus *Lethe*, with wings that are up to 50 millimeters long.
- The species is endemic to the eastern Himalayas and occurs in forests lying between elevations of 1,800-2,800 metres.
- Distribution: Across the world, species of *Lethe* are found in Sunda Islands, Japan, Siberia, Himalayas and peninsular India. Of the 41 species of *Lethe* that are found in India, 32 species are reported from Sikkim alone.

### **Two new species of moss rose discovered in south India:**

- What? Two new species of moss rose discovered in south India.
- Names: *Portulaca badamica* and *Portulaca lakshminarasimhaniana*. *Portulaca badamica* is named after the site of its discovery that is, the Badami hills, while the second new species—*Portulaca lakshminarasimhaniana*—honours Pakshirajan Lakshminarashimhan, who is the head of the Botanical Survey of India, western regional circle in Pune, for his significant contribution to plant taxonomy.
- IUCN Status: *Portulaca badamica*- data deficient category and *Portulaca lakshminarasimhaniana*- critically endangered.

### **Flamingo Festival at Pulicat Lake:**

- Flamingo Festival is held every year to promote tourism in Pulicat and Nellapattu. Flamingo Festival is being organised for the past 12 years.
- Nelapattu Bird Sanctuary: It is considered one of the biggest habitat for some hundreds of pelicans and other birds. Located about 20 km north of the Pulicat Lake on the Andhra Pradesh-Tamil Nadu border, the sanctuary is spread in about 459 hectares.



### **Pulicat Lake:**

- It is the second largest brackish water lake or lagoon in India, after Chilika Lake. It straddles the border of Andhra Pradesh and Tamil Nadu states with over 96% of it in Andhra Pradesh.
- The lake encompasses the Pulicat Lake Bird Sanctuary.
- The barrier island of Sriharikota separates the lake from the Bay of Bengal and is home to the Satish Dhawan Space Centre.

- Two rivers which feed the lagoon are the Arani River at the southern tip and the Kalangi River from the northwest, in addition to some smaller streams.
- The Buckingham Canal, a navigation channel, is part of the lagoon on its western side.

### **Arunachal govt declares Pakke Hornbill Fest as 'state festival':**

- The government of Arunachal Pradesh has declared the Pakke Paga Hornbill Festival (PPHF)– the state's only conservation festival, as a "state festival".



**PAKKE  
PAGA FESTIVAL**

### **Great Indian Hornbill:**

- The great hornbill is long-lived, living for nearly 50 years in captivity. It is predominantly fruit eating, but is an opportunist and preys on small mammals, reptiles and birds.
- IUCN status: Vulnerable (uplisted from Near Threatened in 2018).
- It is also listed in Appendix I of CITES.

### **Zoological Survey of India (ZSI) Amphibian List**

- An updated list of Indian amphibians was released on the Zoological Survey of India (ZSI) website recently.
- In the updated list 19 species are being treated as critically endangered and 33 species as endangered
- The list also notes if the species are in danger, according to the International Union for Conservation of Nature (IUCN).

- The list describes 19% of amphibians as data deficient species and 39% as not assessed by the IUCN.
- The Zoological Survey of India (ZSI) was established on 1st July, 1916 to promote survey, exploration and research leading to the advancement in our knowledge of various aspects of exceptionally rich life of the erstwhile British Indian Empire.
- The survey has its genesis in the establishment of the Zoological Section of the Indian Museum at Calcutta in 1875.

### Living Fossils

- The term "living fossil" is an imperfect concept.
- The term is meant to describe an organism that has remained relatively unchanged over millions of years, or one that has no, or very few, close surviving relatives.
- The term "living fossil" was originally used by Charles Darwin to describe ancient species, like the ginkgo tree or horseshoe crab that appeared little changed over millions of years.
- The concept is an informal window into the past, a way to consider species as they may have been millions of years ago by observing their modern descendants.
- If a species does not constantly have to adapt to survive, it will have little need to change.
- The coelacanth is the most famous and widely recognized species of "living fossil".





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### **Nitrogen pollution**

- A major international research programme is being carried out to tackle the challenge that nitrogen pollution poses for environment, food security, human health and the economy in South Asia. The research programme will be carried out by South Asian Nitrogen Hub.

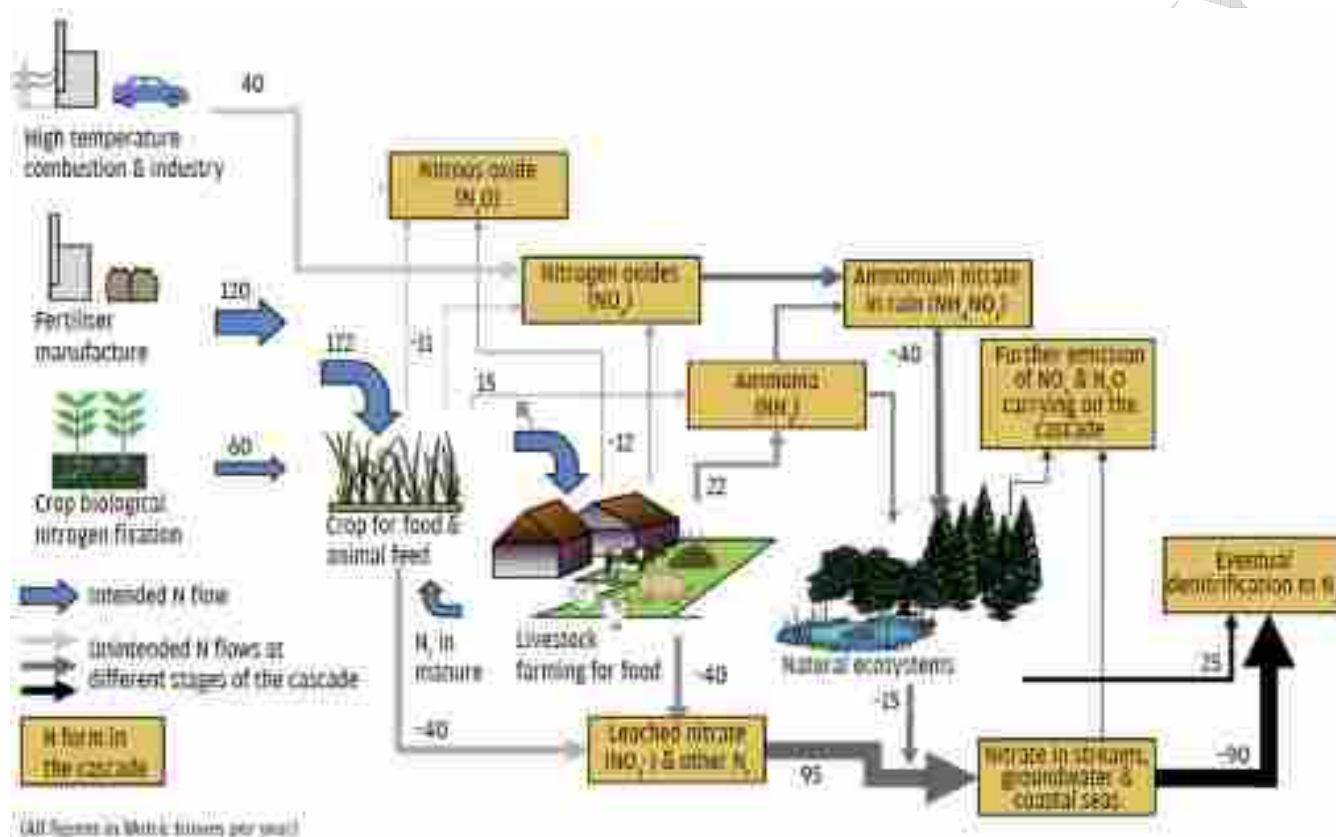
### **South Asian Nitrogen Hub:**

- The South Asian Nitrogen Hub, a partnership led by the UK's Centre for Ecology & Hydrology and comprising around 50 organisations from across the UK and South Asia, will be established with funding from UK Research and Innovation (UKRI) under its Global Challenges Research Fund (GCRF).
- The Hub is one of 12 GCRF hubs announced by the UKRI to address intractable challenges in sustainable development. The interdisciplinary hubs will work across 85 countries with governments, international agencies, partners and NGOs.
- India is a major partner with 18 Indian institutions in this project. India is the only country in South Asia that has completed its nitrogen assessment over a year ago and is already co-leading the South Asian nitrogen assessment with CEH, UK, for the UN Environment.



## Nitrogen as an essential nutrient:

- Nitrogen, which is a vital macronutrient for most plants, is the most abundant element in the atmosphere.



$\text{N}_2$  - Un-reactive d-nitrogen, forms 78% of the air we breathe

$\text{N}$  - Reactive nitrogen; fixed in soil by microbial reacts to form different compounds with various impacts

$\text{NH}_3$  - Ammonia; used for making fertilisers; can escape into the air as a pollutant

$\text{NH}_4\text{NO}_3$  - Ammonium nitrate; acts as fertiliser; when synthesised in

the atmosphere, contributes to particulate matter, water pollution and results in eutrophication

$\text{N}_2\text{O}$  - Nitrous oxide, a greenhouse gas; depletes ozone layer

$\text{NO}_x$  - Mixture of  $\text{NO}$  and  $\text{NO}_2$ ; a major air pollutant

$\text{NO}_3^-$  - Nitrate; the form in which nitrogen gets fixed in soil; can pollute water sources; forms ozone, which adds to particulate matter load

- A little over 78% of dry air on Earth is nitrogen. But atmospheric nitrogen, or di-nitrogen, is unreactive and cannot be utilised by plants directly.
- Until the beginning of the 20th century, farmers depended on a natural process called nitrogen fixation for the conversion of atmospheric nitrogen into reactive nitrogen in the soil: nitrogen-fixing bacteria like rhizobia live

symbiotically with leguminous plants, providing nitrogen to the plant and soil in the form of reactive compounds like ammonia and nitrate.

- But the natural nitrogen cycle was inadequate to feed the growing population. Scientists Fritz Haber and Carl Bosch solved this problem by producing ammonia by combining atmospheric nitrogen with hydrogen gas at high temperature and pressure—known as the Haber-Bosch process. The Green Revolution, which was instrumental in establishing food security in the developing countries in the 1960s, was driven by artificial nitrogen-fixation. Today, about half of the world's population depends on this process for its nutrition.

### **How Nitrogen turned into pollutant from nutrient how it is affecting health and environment?**

- Nitrogen is an inert gas that's necessary for life. But we're changing it into forms that are harmful, overloading the environment with it, and throwing the natural nitrogen cycle out of whack.
- Nitrogen compounds running off farmland have led to water pollution problems around the world, while nitrogen emissions from industry, agriculture and vehicles make a big contribution to air pollution.
- Over 80% of the nitrogen in soil is not utilised by humans. While over four-fifths of the nitrogen is used to feed livestock, only about six per cent reaches humans in case of non-vegetarian diet, as compared to the 20% that reaches the plate of a vegetarian.
- Nitrogen becomes a pollutant when it escapes into the environment and reacts with other organic compounds. It is either released into the atmosphere, gets dissolved in water sources such as rivers, lakes or groundwater, or remains in the soil. While it might lead to favourable growth of species that can utilise this nutrient, nitrogen as a pollutant is often detrimental to the environment and health.
- According to the World Health Organization, nitrate-contaminated drinking water can cause reduced blood function, cancer and endemic goiters. Surplus inputs of nitrogen compounds have been found to cause soil acidification. The lowering pH, as a result of the acidification, can lead to

nutrient disorders and increased toxicity in plants. It may also affect natural soil decomposition.

### **Nitrogen pollution has a significant impact on the environment:**

- It creates of harmful algal blooms and dead zones in our waterways and oceans; the algae produce toxins which are harmful to human and aquatic organisms (and indirectly affect fisheries and biodiversity in coastal areas).
- Contamination of drinking water: 10 million people in Europe are potentially exposed to drinking water with nitrate concentrations above recommended levels. This can have an adverse effect on human health.
- Food Security: Excessive nitrogen fertiliser application contributes to soil nutrient depletion. As the world needs to feed an ever growing population loss of arable land is major global problem.
- The release of Nitrous Oxide is essentially a greenhouse gas which is harmful to the environment.

### **Bandipur National Park:**

- Together with the adjoining Nagarhole National Park, Mudumalai National Park and Wayanad Wildlife Sanctuary, it is part of the Nilgiri Biosphere Reserve making it the largest protected area in southern India and largest habitat of wild elephants in south Asia.
- The park is flanked by the Kabini River in the north and the Moyar river in the south. The Nugu river runs through the park.
- The highest point in the park is on a hill called Himavad Gopalaswamy Betta.



### **Crocodylus palustris:**

- The mugger crocodile, also called marsh crocodile or broad-snouted crocodile, has come to the centre of renewed attention in Gujarat, where the Forest Department has started evacuating muggers from two ponds on the Sardar Sarovar Dam premises on the Narmada, to facilitate a seaplane service at the Statue of Unity.

### **Key facts:**

- Already extinct in Bhutan and Myanmar.
- Listed as vulnerable on the IUCN Red List since 1982.
- In India, it is protected under Schedule I of the Wildlife Protection Act, 1972.

### **CORSIA**

- Carbon Offsetting and Reduction Scheme for International Aviation (CORISA) is a global scheme to address the increase in total CO2 emissions from international aviation above 2020 levels.
- The aviation industry is committed to technology, operational and infrastructure advances to continue to reduce the sector's carbon emissions.
- On average (2021-2035), flights subject to CORSIA's offsetting requirements will account for over 600 million tons of CO2 per year.
- This makes CORSIA one of the largest carbon pricing instruments in the world in terms of greenhouse gas emissions coverage.
- CORISA is expected to complement other planned measures such as:
  - Aircraft technology evolution
  - Operational improvements
  - The greater use of sustainable aviation fuels.
- On 2018, International Civil Aviation Organization adopted the international Standards and Recommended Practices (SARPs) for CORSIA.
- The adoption of global standards for CORSIA will ensure the necessary level of uniformity in regulations which our industry needs.



### **Report on 'e-waste' by UN**

- To highlight the rising challenge posed by mountains of discarded electronics worldwide, seven UN entities have come together to launch the report- "A New Circular Vision for Electronics – Time for a Global Reboot"- at the World Economic Forum in Davos, Switzerland.
- E-waste export, though, is regulated under the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal, which has been ratified by 188 nations.

### **E-waste Coalition:**

- The report supports the work of the E-waste Coalition, which includes International Labour Organization (ILO); International Telecommunication Union (ITU); United Nations Environment Programme (UN Environment); United Nations Industrial Development Organization (UNIDO); United Nations Institute for Training and Research (UNITAR); United Nations University (UNU) and Secretariats of the Basel and Stockholm Conventions.

### **Mugger Crocodile**

- The Gujarat Forest Department has started evacuating mugger crocodile from two ponds on the Sardar Sarovar Dam premises on the Narmada.
- This evacuation is to facilitate a seaplane service at the Statue of Unity.
- The mugger crocodile is also called marsh crocodile or broad-snouted crocodile.
- It is a species (*Crocodylus palustris*) native to freshwater habitats from southern Iran and Pakistan to the Indian subcontinent and Sri Lanka.
- It is already extinct in Bhutan and Myanmar.





- So the mugger has been listed as vulnerable on the IUCN Red List since 1982.
- In India, it is protected under Schedule I of the Wildlife Protection Act, 1972.
- 
- Among the six schedules in the Act, Schedule I and part II of Schedule II provide the highest degrees of protection to listed species, with the most stringent penalties for offenders.
- Crocodiles were listed under Schedule I not to prevent their trade. Crocodiles are valued for their skin and flesh.
- In idols of the Narmada Goddess near Narmada Dam, a crocodile is her vehicle.
- Goddess Khodiyar Maa, who is worshipped by a section of Gujaratis, is also seen riding a crocodile as a symbol of her supremacy over land and water.

### Sarus crane (*Antigone antigone*)

- Vulnerable (VU) — IUCN
- State bird of Uttar Pradesh
- Largest known flocks — Keoladeo National Park
- Non-migratory crane
- Tallest of the flying birds
- Name — Sanskrit word sarasa for the “lake bird”,
- CITES Appendix II
- Habitat
- Inhabit open wet and dry grasslands, agricultural fields, marshes and pools,
- Found in parts of the
- Indian Subcontinent — India, Nepal and Pakistan
- Southeast Asia — Cambodia, extreme Southern Laos, South Vietnam, Myanmar
- Australia





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- The population of the Sarus crane, a bird distinguishable by its red upper neck and white collar, has climbed to 15,938 as per the 2018 census (summer). This is a jump of 5.2% from 2017, when there were 15,138 Sarus cranes across U.P., as per the State Forest and Wildlife department.
- Towering at 152-156 cm, over 5 feet on average, the Sarus (*Grus antigone*) is not only the tallest flying bird in the world, it is also India's only resident breeding crane, as per the Wildlife Trust of India (WTI), a leading nature conservation organisation that works with the State wildlife department.
- The International Union for Conservation of Nature (IUCN) has marked it as 'vulnerable' in its list of threatened species.
- The Sarus habitat is outside protected areas, in natural wetlands with low water depth, marshy and fallow areas and agricultural fields. They play a vital role in ecological balance by controlling the population of harmful insects and have significant cultural importance, while also being sociable. Sarus is omnivorous, feeding on fish and insects, as well as roots and plants.
- In U.P., Sarus crane is mainly found in south-west and central regions, in Mainpuri, Etawah, Aligarh, Etah, Lakhimpur Kheri, Sitapur, Shahjahanpur, Barabanki and Hardoi districts.
- Sarus cranes use rice paddies for nesting and breeding. So, it could be one of the direct reasons.
- The focus has been on involving farmers in the protection of Sarus nests, as depredation by stray dogs and egg stealing are common threats in the fields. But also electrocution due to power transmission lines in agricultural areas and poisoning.
- As per the IUCN 2016 status, the Sarus crane population is suspected to have decreased globally, owing to the loss and degradation of wetlands, as a result of drainage and conversion to agriculture, ingestion of pesticides, and the hunting of adults and collection of eggs and chicks for trade, food, medicinal purposes and to help limit damage to crops.



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### **Cultural significance**

- Considered symbols of marital fidelity
- It is believed to mate for life and pine the loss of their mates even to the point of starving to death

### **Threats**

- Loss and degradation of wetlands, as a result of drainage and conversion to agriculture
- Ingestion of pesticides
- Hunting of adults
- Collection of eggs and chicks for trade, food, medicinal purposes and, in some areas, to help prevent damage to crops

### **Antarctica's krill shift south as icy waters warm**

- Krill are shifting south towards Antarctica as the oceans warm, disrupting stocks that are eaten by penguins and whales and caught by industrial trawlers. The climate is becoming increasingly unhealthy for krill to reproduce.
- Almost 200 nations promised in 2015 under the Paris climate agreement to limit greenhouse gas emissions. Waters in the southwest Atlantic, home to most krill, have warmed 1 degree Celsius over the past 90 years, and krill are concentrating into a narrowing band towards the coast of Antarctica.
- The British Antarctic Survey (BAS) reckons krill are among the most abundant creatures on Earth with an estimated total of 780 trillion, excluding larvae and eggs. Krill are food for whales, seals, penguins and other predators.
- Krill can live for about 6 years in waters around the frozen continent.

### **Satkosia Tiger Reserve**

- Trained elephants will help ground-level forest guards patrol deep in the forest of Satkosia Tiger Reserve.
- Satkosia spreads along the magnificent gorge over the mighty river Mahanadi in Odisha.

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- The area is also a part of the Mahanadi elephant reserve.
- Satkosia is the meeting point of two bio-geographic regions of India; the Deccan Peninsula and the Eastern Ghats, contributing immense biodiversity.
- Satkosia Tiger Reserve comprises of two adjoining Sanctuaries of central Odisha named as Satkosia Gorge Sanctuary and Baisipalli Sanctuary.

### International Stock Taking Conference on Tiger Conservation:

- The 3rd Stock Taking Conference on Tiger Conservation was recently inaugurated in New Delhi. Third in a series of Stock Taking Conferences, this is the second to be held in India after 2012 and is expected to have wide-ranging discussions on the status of the Global Tiger Recovery Program (GTRP) by the 13 tiger range countries besides deliberations on combating wildlife trafficking.
- 13 Tiger range States—Bangladesh, Bhutan, Cambodia, China, India, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, Russia, Thailand, and Vietnam.
- The conference is being hosted by the National Tiger Conservation Authority, Ministry of Environment, Forest and Climate Change in close collaboration with the Global Tiger Forum which is an International, Intergovernmental Organization for conserving tigers in the world.

- Additional facts: During the St. Petersburg declaration in 2010, tiger range countries had resolved to double tiger numbers across their range by 2022.

### **Environment, Social and Governance (ESG) Fund:**

- Three former Tata Group executives in partnership with Quantum Advisors will launch a \$1 billion Environment, Social and Governance (ESG) Fund.
- The Fund will invest in Indian companies that value the environment, society and corporate governance to the core.
- The proposed equal joint venture(JV) would mobilise funds from long-term foreign investors such as pension funds, sovereign wealth funds and family offices of high net worth individuals (HNIs) who value ESG.
- The fund will aim to drive higher ESG performance in Indian corporates and it will adopt an engaged, private equity approach to public markets investing, with a focus on working with companies willing to recognize the long-term advantages of actively adopting ESG standards of excellence.
- Significance: There is pressing need for such a fund in India as there are concerns on standards of corporate governance in the country and Indian companies will need to play a central role to help achieve global climate change targets.

### **Golden langur breeding project in Assam:**

- Assam has announced the success of the Golden Langur Conservation Breeding Programme in the State. The golden langur conservation project was undertaken at the Assam State Zoo in Guwahati during the 2011-12 fiscal.
- The golden langur (Trachypithecus geei) is currently endangered.







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- Apart from a 60 square mile area in north-western Assam, small populations are found in Bhutan and Tripura.

### **Africa Centre for Climate and Sustainable Development**

- The Africa Centre for Climate and Sustainable Development was inaugurated by the Italian Prime Minister Giuseppe Conte at Rome.
- The centre has been opened by the Italian government in association with the United Nations Development Programme (UNDP) and the Food and Agricultural Organisation (FAO).

### **The important aspects of the Africa Centre for Climate and Sustainable Development are:**

- The centre's origin can be traced to a declaration endorsed by the G7 meeting of the Environment Ministers in 2017.
- The centre would facilitate coordination among the G7 and African countries on common initiatives in Africa to achieve the goals set by the Paris Agreement and the 2030 Agenda.
- The Centre would contribute towards addressing the needs of Africa by providing a platform for G7 countries to steer their cooperation to contrast environmental degradation and promote sustainable economic growth in the region.
- The centre will provide a fast-track, demand-driven mechanism for African countries to access grant resources that support policies, initiatives, and best practices on climate change, food security, and access to water, clean energy, and accelerating progress on the Sustainable Development Goals (SDGs) in Africa.
- The centre would be hosted by UNDP which would utilise its extensive country office network and programmatic hubs, and global expertise and knowledge, to enable the African countries to access the resources available through it.

### **Attaining the Sustainable Development Goals**

- Africa referred to as Dark Continent still has up to 330 million of its population living in poverty and up to 60% of unemployed Africans are young people.
- The centre will help to speed up progress and quickly resource national development priorities in the African countries to address these challenges and achieve the Sustainable Development Goals.

### **Survey of Elephants in Captivity**

- The Ministry of Environment, Forests and Climate Change has submitted the affidavit with the findings of the first Survey of Elephants in Captivity to the Supreme Court.



### **Findings of the Survey**

- The Survey was undertaken after the order of the Supreme Court which had asked the Union Government to identify elephants in captivity and whether their owners have an ownership certificate while hearing a writ petition filed by Wildlife Rescue and Rehabilitation Centre. The findings of the Survey are:
- There are 2,454 elephants in captivity across the country of which 560 are in possession with forest departments and 1,687 with private individuals.
- 664 of the total captive elephants in the country are without ownership certificate while there are 85 in zoos, 26 in circuses and 96 in temples.
- 58 per cent of all captive elephants are concentrated in two states: 905, in Assam and 518 in Kerala.
- The affidavit also points at some discrepancies in data especially from the State of Bihar.
- The Survey was ordered after the Animal Welfare Board of India failed to produce data on the number of elephants held captive.

### Animal Welfare Board of India

- The Animal Welfare Board of India was established under the Provisions of the Prevention of Cruelty to Animals Act, 1960 to oversee the implementation of the animal welfare laws in the country.
- The Board consists of 28 Members including 6 MPs (4 from Lok Sabha and 2 from Rajya Sabha). Previously based in Chennai, it is now headquartered at Ballabhgarh in Haryana.



### Wildlife Corridor

- A 10-month-old female leopard was run over by a heavy vehicle on Gurgaon-Faridabad road.
- Environmentalists have long been demanding a wildlife corridor, so that animals can cross the area without actually having to go through the vehicles.
- A wildlife corridor is an area of habitat that provides passage for wildlife across artificial obstacles.
- Artificial obstacles can be any dam, road, and railway.
- It is also known as a habitat corridor or a green corridor.
- In addition to connecting wildlife to habitats, wildlife corridors also facilitate the migration, interbreeding, and migration of animals.
- The type or design of these corridors varies depending on the animal species that are intended to use them.
- For instance, amphibian corridors are small tunnels, while fish corridors can be made of artificial torrents.
- Wildlife corridors exist to aide in the survival of animals.





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- They provide safe passage and refuge for animals in areas threatened by humans or predators.

### **Cocos Island National Park**

- Situated more than 500 km off the Pacific Coast of Central America's Costa Rica, Cocos Island National Park spreads across more than 2,000 sq.km and includes both the Island and the protected marine regions surrounding it.
- Established by Costa Rica as a National Park in 1978, this remote region is said to have inspired the popular classic "Treasure Island".
- It is made up of different kinds of land and water areas such as forested mountains, rivers, waterfalls, cliffs, beaches, bays and coral reefs, in addition to the pelagic zone.
- The pelagic environment supports and witnesses large congregations of marine species, including many that are near-threatened, vulnerable and endangered such as silky sharks, whale sharks and hammerhead sharks.
- The Park was declared a UNESCO World Heritage Site in 1997 for its rich marine biodiversity.
- While the region sees limited human presence in the form of conservation staff, scientists and tourists, illegal fishing in the waters has been of concern, despite monitoring.
- Another major threat it has faced is from invasive alien species - both plants and animals. Efforts are on to eradicate these while also watching out for new invasions.
- The Cocos cuckoo, Cocos flycatcher and Cocos finch are endemic to the Island.

### **Pelagic zone**

- Pelagic zone is the entire water column or open ocean (that's not close to the bottom or coastline). It is the world's most expansive habitat. The number of creatures and species in the zone decrease with increase in depth.

- This zone supports thousands of species in varying sizes and shapes - from plankton to whales. The distribution of marine life here depends on several factors such as nutrients, prey availability, water temperature and sunlight.
- The creatures in the pelagic zone include jellyfish, krill, many species of squids, octopuses, turtles, birds, dolphins, sharks and fish, including tuna and swordfish.
- A few creatures such as sea birds and turtles in this zone have to travel long distances between their feeding and breeding areas. This means, they are directly in the line of threat - from predators in the water or those outside of it (humans).

### Amami rabbits

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

- United Nations (UN) has released in its first ever global assessment of environmental laws.
- The world fares poorly on implementation of environmental laws and regulations despite the fact that 38 times more green laws have been framed and approved in the last four decades.
- As many as 88 countries have adopted the constitutional right to a healthy environment and more than 350 environmental courts and tribunals exist in around 50 countries. But, failure to fully implement and enforce the environmental laws is one of the greatest challenges towards mitigating climate change, reducing pollution and preventing widespread species and habitat loss.
- Other problems: Poor coordination across government agencies, weak institutional capacity, lack of access to information, corruption and stifled civic engagement are the key factors behind the poor effectiveness and implementation of environmental regulations.
- Underlining the growing resistance to environmental laws, the report also advocated on behalf of the environmental activists and whistle blowers. It said 908 people, including forest rangers, government inspectors, and local activists, were killed in 35 countries between 2002 and 2013 and 197 were killed in 2017 alone.

### **Indian scenario:**

- India serves as a perfect example to this issue. India's people and the environment have been paying the price for its lethargic and poor state of environmental governance. This is reiterated by a high-level committee set up the environment ministry in 2014. Like the Water Act, which was implemented in 1974, a number of laws and regulations have been existing for more than four decades now, but are proving to be ineffective.
- India ranked 177th out of 180 countries in the 2018 Global Environment Performance Index (EPI) rankings of the Yale University for being unable to improve its air quality, protect its biodiversity, and cut its greenhouse gas emissions. It also slipped by 36 points in 2018 from 141 in 2016.

- India has several rules and guidelines to control air pollution, but they aren't put to good use. Coal-based power plants continue to be the major source of air pollution in the country as more than 300 coal thermal power plants still violates emission standards.
- Judiciary ignored: More than two-thirds of the states/union territories in the country have neither bothered to comply with the orders passed by the Supreme Court, nor complied with the directions given by the Ministry of Environment, Forests and Climate Change (MoEF&CC). The judiciary's order failed to even curb illegal rat hole mining and miners in Meghalaya paid the price for that.

### **Goa introduces tags to protect biodiversity zones:**

- Goa State Biodiversity Board (GSBB) recently came up with a tagging system to ensure communities residing within the biodiversity zone get Access Benefit Share (ABS) from their profits.
- The tag will show that the ingredients used are sourced from the nature. Under this, the sellers are supposed to pay 0.01% of their annual profit to the GSBB and the board will then use this amount to protect the habitat from where the ingredients are.

### **Giant cavity in Antarctic glacier signals rapid decay**

- NASA scientists have discovered a gigantic cavity, almost 300 metres tall, growing at the bottom of the Thwaites Glacier in West Antarctica, indicating rapid decay of the ice sheet and acceleration in global sea levels due to climate change.

### **Black Soft shell Turtle**

- The rare turtle species are being bred in the ponds of Assam's shrines.
- India hosts 28 species of turtles, of which 20 are found in Assam.



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

### **Elephant corridors**

- Asian Elephant Alliance, an umbrella initiative by five NGOs, has come together to secure 96 out of the 101 existing corridors used by elephants across 12 States in India.
- The joint venture aims to secure the 96 remaining elephant corridors, old and new, in the next ten years.
- The alliance joined hands to raise the mammoth sum as money was the main constraint in securing the land.
- NGOs Elephant Family, International Fund for Animal Welfare, IUCN Netherlands and World Land Trust has teamed up with Wildlife Trust of India's (WTI) in the alliance.



### **What are Elephant Corridors?**

- Elephant corridors are narrow strips of land that connect two large habitats of elephants. Elephant corridors are crucial to reduce animal fatalities due to accidents and other reasons. So fragmentation of forests makes it all the more important to preserve migratory corridors.

### **Why protect elephant corridors?**

- The movement of elephants is essential to ensure that their populations are genetically viable. It also helps to regenerate forests on which other species, including tigers, depend.
- Nearly 40% of elephant reserves are vulnerable, as they are not within protected parks and sanctuaries. Also, the migration corridors have no specific legal protection.
- Forests that have turned into farms and unchecked tourism are blocking animals' paths. Animals are thus forced to seek alternative routes resulting in increased elephant-human conflict.
- Weak regulation of ecotourism is severely impacting important habitats. It particularly affects animals that have large home ranges, like elephants.

### **Gaj Yatra:**

- 'Gaj Yatra', a nationwide campaign to protect elephants, was launched on the occasion of World Elephant Day in 2017. The campaign is planned to cover 12 elephant range states. The elephant is part of India's animal heritage and the Government celebrates this day to spread awareness about the conservation of the species.
- The 15 months campaign will be led by the Wildlife Trust of India (WTI). The campaign aims to create awareness about elephant corridors to encourage free movement in their habitat.



### **Flamingo sanctuary:**

- A committee, chaired by Union Environment Minister Harsh Vardhan, has accorded wildlife clearance to the Mumbai-Ahmedabad high speed train



corridor that encroaches upon a flamingo sanctuary and the Sanjay Gandhi National Park, the home to leopards, in Mumbai.

- About Sanjay Gandhi National Park: Sanjay Gandhi National Park is spread over three districts – Palgar, Thane and Mumbai Suburb. The National Park is home to a number of endangered species of flora and fauna and harbours approximately 800 species of flowering plants, 45 species of mammals, 43 species of reptiles among others.
- Flamingo sanctuary: Western side of the Thane creek is a dedicated flamingo sanctuary. Thane Creek is home to flamingos as well as other migratory and residential bird species. It is Maharashtra's second marine sanctuary after the one at Malvan.

### **Thailand makes Siamese fighting fish national aquatic animal:**

- Siamese fighting fish is named Thailand's national aquatic animal.
- Known in the West as a betta fish, the underwater brawler is popular in home aquariums for its iridescent body and many-hued tail.



### **Siamese fighting fish**

- The Siamese fighting fish commonly known as the betta is a popular fish in the aquarium trade.
- The Siamese fighting fish is native to the Mekong basin of Thailand, Laos, Cambodia, and Vietnam and mostly found at ChaoPhraya River in Thailand.







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- The Siamese fighting fish was registered as intangible cultural heritage by the Cultural Ministry in 2013.
- The designation of Siamese fighting fish as Thailand's national aquatic animal could help boost both conservation efforts and commercial breeding.
- The IUCN status of the Siamese fighting fish is Vulnerable.
- The threats to the Siamese Fighting Fish include Human intrusions & disturbances, Natural system modifications through the construction of Dams Presence of Invasive and other problematic species, genes & diseases, Pollution due to domestic & urban wastewater, Industrial & military effluents and Agricultural & forestry effluents.
- As many as six vultures feeding on a cow carcass by a railway track were run over by a train in West Bengal's Siliguri district.

### **Loneduck**

- A lone duck named Trevor that lived on the tiny Pacific island nation of Niue has died
- Niue, a tiny speck of land, lies around 2,400 km northeast of New Zealand.
- One of the world's biggest coral islands, Niue does not have natural ponds or wetlands, so when Trevor turned up a year ago he was believed to have blown in from New Zealand with a storm. He quickly settled down in a large puddle near a road that the Niue fire service later topped up with water.

### **Flamingo sanctuary**

- During the colder times of the year, many of the Great Flamingos in Asia migrate to warmer climates.
- Great Flamingos migrate to India between the months of December to February; important flamingo migration hotspots in India are as follows
  - Maharashtra - Sewri Mudflats, Thane Creek, Bhigwan.
  - Gujarat - Flamingo City, Thol Lake, Khijadiya Bird Sanctuary, Nal Sarovar Bird Sanctuary.
  - Rajasthan - Jawai Dam, Bharatpur Bird Sanctuary.



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- Odisha - Chilika lake
- Telangana - Osman sagar lake
- Andhra Pradesh - Pulicat Lake
- Maharashtra state forest department has declared Western side of Thane creek as Flamingo sanctuary in 2012.
- The sanctuary aims to protect the flamingos and several other birds that are threatened by pollution and habitat destruction in the north-eastern Mumbai area.
- The sanctuary is a part of Sanjay Gandhi National Park, which has spread over three districts – Palgar, Thane and Mumbai Suburb.

### **Small Grants Programme (SGP):**

- The Global Environment Facility GEF Small Grants Programme (SGP) provides financial and technical support to communities and Civil Society Organizations to meet the overall objective of global environmental benefits secured through community-based initiatives and actions.
- It was launched in 1992 with 33 participating countries.
- The Program is specifically designed to mobilize bottom-up actions by empowering local civil society organizations, and poor and vulnerable communities, including women and Indigenous Peoples.

### **How it functions?**

- Through a decentralized, national-level delivery mechanism, SGP finances community-led initiatives to address global environmental issues.
- It is currently implemented by UNDP on behalf of the GEF partnership.
- The Programme funds grants up to a maximum of \$50,000. In practice, the average grant has been around \$25,000. In addition, the SGP provides a maximum of \$150,000 for strategic projects. These larger projects allow for scaling up and cover a large number of communities within a critical landscape or seascape.



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### **Significance:**

- Community-driven and civil society-led initiatives can generate environmental benefits, while supporting sustainable livelihoods, gender equality and civil society empowerment.
- These are actions needed at the local and regional level to address global environmental challenges and complement other areas where the GEF works.

### **Environmental Performance Index**

- The EPI is produced jointly by Yale and Columbia Universities in collaboration with the World Economic Forum. The index ranks countries on 24 performance indicators across several 'issue categories', each of which fit under one of two overarching objectives, namely, environmental health and eco-system vitality.
- The issue categories are air quality, water and sanitation, water resources, agriculture, forests, fisheries, biodiversity and habitat, and climate and energy.
- These metrics are meant to serve as a gauge at a national level of how close countries are to accepted environmental policy goals.
- In 2018 India ranked 177 out of 180 countries, having slipped from an already very low rank of 155 in 2014.
- The country is today among the worst performing on the environmental front and its ranking has worsened over the past five years.

### **Convention on the conservation of migratory species of wild animals(CMS)**

- The 13th Conference of Parties (COP) of the Convention on the conservation of migratory species of wild animals (CMS) is going to be hosted by India during 15th to 22nd February, 2020 at Gandhinagar in Gujarat.





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- India has been a Party to the CMS since 1983. The Conference of Parties (COP) is the decision-making organ of this convention

### **CMS:**

- In order to protect the migratory species throughout their range countries, a Convention on Conservation of Migratory Species (CMS), has been in force, under the aegis of United Nations Environment Programme.
- Also referred to as the Bonn Convention, it provides a global platform for the conservation and sustainable use of migratory animals and their habitats and brings together the States through which migratory animals pass, the Range States, and lays the legal foundation for internationally coordinated conservation measures throughout a migratory range.
- Classification of species: Under this convention, migratory species threatened with extinction are listed on Appendix I and Parties strive towards strictly protecting these animals, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them. Migratory species that need or would significantly benefit from international co-operation are listed in Appendix II of the Convention.
- CMS is only global and UN-based intergovernmental organization established exclusively for conservation and management of terrestrial, aquatic and avian migratory species throughout their range.
- The logo, mascot and the website for the 13th Conference of Parties (COP) was launched by the Union Minister for Environment, Forests and Climate Change Harsh Vardhan. The mascot for the event, Great Indian Bustard has been fondly named as 'Gibi'.

### **What are migratory species? Why protect them?**

- Migratory species are those animals that move from one habitat to another during different times of the year, due to various factors such as food, sunlight, temperature, climate, etc.
- The movement between habitats can sometimes exceed thousands of miles/kilometres for some migratory birds and mammals. A migratory route

can involve nesting and also requires the availability of habitats before and after each migration.

### Hilsa will swim up to Allahabad again

- Now, after a gap of over 40 years, the hilsa will be able to swim down the Ganga all the way up to Allahabad this monsoon.
- The migration of Hilsa till Allahabad had been possible till a barrage was built across the Ganges at Farakka in Bengal in the 70s. The barrage came with a navigation lock that blocked the free movement of Hilsas.
- This lock has now been redesigned to ensure smooth and safe migration of the hilsa shoal during the three mating seasons, particularly during monsoon.
- A navigation lock is a device that is used to raise and lower boats and ships between stretches of water on a river.
- Hilsa has a history of migrating from Bangladesh to Allahabad down the Ganga. Though it's a salt-water fish, it migrates from the Bay of Bengal to the sweet waters of the Ganges.
- "Fish often disperse widely over large areas while feeding and spawning. This hilsa migration will lead to an increase in its production in the region. This will also increase the river's biodiversity and boost the economy of local fishermen," a shipping ministry spokesperson said.
- In recent years, overall catch of hilsa has reduced as overfishing; pollution and spawning have taken their toll on fish stocks.



### Ratoon Cropping

- Ratoon cropping is a form of cultivation in which a second crop is allowed to grow from the remains of one already harvested.





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- It is also called stubble cropping as the new plants grow from the stubble of the harvested crop.
- Sugarcane, pineapple and banana are crops in which this method is practiced.
- Ratooning cannot be used endlessly as the yield and quality decrease after each cycle.
- In sugarcane, for example, two or three ratooning crops are possible, after which fresh planting has to be done.

### **Shark Bay**

- Shark Bay is the World Heritage-listed marine ecosystem situated in Australia.
- Since 2011 it has been devastated by extreme temperatures, when a brutal marine heatwave struck off Western Australia.
- According to World Heritage Advisory Committee Shark Bay is classified as the highest category of vulnerability to future climate change.
- Shark Bay hosts the world's most extensive population of Stromatolites – stump-shaped colonies of microbes that date back billions of years.

### **Forest Rights Act (FRA):**

- The act was passed in December 2006. It deals with the rights of forest-dwelling communities over land and other resources.
- The Act grants legal recognition to the rights of traditional forest dwelling communities, partially correcting the injustice caused by the forest laws.

### **Rights under the Act:**

- Title rights – Ownership to land that is being farmed by tribals or forest dwellers subject to a maximum of 4 hectares; ownership is only for land that is actually being cultivated by the concerned family, meaning that no new lands are granted.
- Use rights – to minor forest produce (also including ownership), to grazing areas, to pastoralist routes, etc.



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- Relief and development rights – to rehabilitation in case of illegal eviction or forced displacement; and to basic amenities, subject to restrictions for forest protection.
- Forest management rights – to protect forests and wildlife.

### **Eligibility:**

- Eligibility to get rights under the Act is confined to those who “primarily reside in forests” and who depend on forests and forest land for a livelihood.
- Further, either the claimant must be a member of the Scheduled Tribes scheduled in that area or must have been residing in the forest for 75 years.

### **Process of recognition of rights:**

- The Act provides that the gram sabha, or village assembly, will initially pass a resolution recommending whose rights to which resources should be recognised.
- This resolution is then screened and approved at the level of the sub-division (or taluka) and subsequently at the district level.
- The screening committees consist of three government officials (Forest, Revenue and Tribal Welfare departments) and three elected members of the local body at that level. These committees also hear appeals.

### **Golden Langur**

- The golden langur is found only in western Assam and along the adjoining Indo-Bhutan border.
- The coat of the adult golden langur ranges from cream to golden, on its flanks and chest the hairs are darker and often rust colored.
- It is one of the most endangered primate species of India
- The ‘Golden Langur Habitat Conservation’ has been taken up in Manas National Park in Assam.

### **India-Norway Marine Pollution Initiative:**

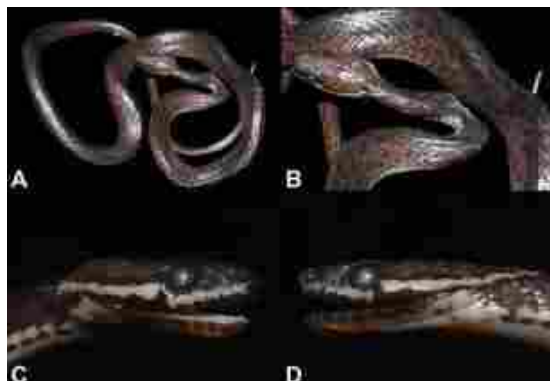
- The Initiative will combat marine pollution, which is one of the fastest growing environmental concerns.
- Both countries will share experiences, competence and collaborate on efforts to develop clean and healthy oceans.
- Both the sides will jointly collaborate for sustainable use of ocean resources and growth in the blue economy.
- Through a range of implementing partners, this initiative will seek to support local governments in implementing sustainable waste management practices, develop systems for collecting and analysing information about sources and scope of marine pollution.
- They will also work towards beach clean-up efforts, awareness raising campaigns and pilot project using plastic waste as fuel substitution for coal in cement production.

### **Bilateral efforts in this regard:**

- In January, 2019, the Indian and Norwegian governments agreed to work more closely on oceans by signing a MoU and establishing the India-Norway Ocean Dialogue during the Norwegian Prime Minister's visit to India in January.
- A joint Task Force on Blue Economy with government officials, researchers and experts as well as private sector was established to develop sustainable solutions within strategic areas of the blue economy, such as maritime and marine sector in addition to energy sector.

### **Crying Keelback nake:**

- A new species of 'crying' snake has been discovered in Lepa-Rada district of Arunachal Pradesh.
- It is a non-venomous crying keelback, whose zoological name is *Hebius lacrima*.
- 'Lacrima' means tear in Latin.
- The name for this keelback was



suggested because of a dark spot under its eyes looking like black tear.

- 13-02-2019 PB cring snake.jpg
- The snake prefers to live near streams along paddy fields.
- It was found to feed on small fish, tadpole, frogs and geckos.
- The northeast is home to some 110 global snake species.
- When 196 countries met at Sharm el-Sheik, Egypt, last November for the 14th meeting of the Conference of Parties to the Convention on Biological Diversity (CBD)

### Mysticellus franki

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





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### **National Board for Wildlife:**

- It is a “Statutory Organization” constituted under the Wildlife Protection Act, 1972.
- Its roles are “advisory” in nature and advise the Central Government on framing policies and measures for conservation of wildlife in the country.
- Primary function of the Board is to promote the conservation and development of wildlife and forests.
- It has power to review all wildlife-related matters and approve projects in and around national parks and sanctuaries.
- No alternation of boundaries in national parks and wildlife sanctuaries can be done without approval of the NBWL.
- Composition: The NBWL is chaired by the Prime Minister. It has 47 members including the Prime Minister. Among these, 19 members are ex-officio members. Other members include three Members of Parliament (two from Lok Sabha and one from Rajya Sabha), five NGOs and 10 eminent ecologists, conservationists and environmentalists.

### **World Sustainable Development Summit**

- The World Sustainable Development Summit is the annual flagship event of The Energy and Resources Institute (TERI). World Sustainable Development Summit is the sole Summit on global issues taking place in the developing world.
- The World Sustainable Development Summit provides a platform for global leaders and practitioners to discuss and deliberate over climatic issues of universal importance.
- The World Sustainable Development Summit strives to provide long-term solutions for the benefit of the global community by assembling the world's most enlightened leaders and thinkers on a single platform.
- World Sustainable Development Summit is continuing the legacy of Delhi Sustainable Development Summit (DSDS) which was initiated in 2001 with the aim of making ‘sustainable development’ a globally shared goal.





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### **The Energy and Resources Institute – TERI**

- TERI – the Tata Energy Research Institute was established by the Mr Darbari S Seth in 1974. Mr Darbari S Seth was the builder of Tata Chemicals Limited.
- He provided a decent sum for establishing TERI's corpus and provided encouragement, inspiration, and moral support to the Director and staff of the Institute without ever interfering with the operational decision-making.
- Over time from its inception, TERI has emerged as one of the world's pre-eminent think tanks and research institutions in the field of energy, climate change and sustainability.
- TERI aims to usher transitions to a cleaner and sustainable future through the conservation and efficient use of Earth's resources and innovative ways of minimizing and reusing waste.
- The Green New Deal "is a four-part programme for moving America quickly out of crisis into a secure, sustainable future".
- It takes its name from U.S. President Franklin Roosevelt's famous New Deal, a series of economic and social measures launched in the 1930s to end the Great Depression.
- The Green New Deal audaciously aspires to make sweeping changes to the environment and economy and meet all of the U.S.'s power demand from clean, renewable and zero emission energy sources by 2030, while at the same time addressing racial and economic justice.
- The U.S. Senate unanimously passed the Byrd-Hagel Resolution, according to which the U.S. ought not to be a signatory to any protocol or agreement regarding the United Nations Climate Convention that would reduce greenhouse gas emissions for Annex-1 Parties, the wealthy countries, unless developing countries were also similarly required to limit their emissions.



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### **Shift in Phenology**

- Phenology is the time of flowering, fruiting, and arrival of leaves.
- Across the world, scientists have recorded a shift in phenology in several tree species with the rising air temperatures.
- In Germany an examination of data from 1961 to 2000 showed that the phenology of fruit trees and field crops had clearly advanced as air temperatures had drastically changed since the late 1980s.
- Another study across Europe revealed that a warming in early spring (February to April) by 1 degree Celsius caused an advance in the beginning of the growing season by seven days.
- In India, Kani Kona flowers in Kerala blossomed two months ahead of Vishu.
- Vishu is the Malayalam New Year celebrated during the Mid-April.
- The 'kani konna' or the Indian laburnum is the state flower of Kerala.

### **Dolphin census**

- Annual Dolphin census was recently carried out in Odisha by the state's forest and environment department.
- The census covered important aquatic ecosystems in the state including the Chilika lake, India's largest brackish water lagoon, spread over the Puri, Khurda and Ganjam districts, the Gahirmatha Marine Sanctuary and its nearby areas within the Bhitarkanika National Park in Kendrapara district, Balasore district and the mouth of the Rushukulya River in Ganjam district.

### **Important findings:**

- Population declined from 469 in 2018 to 259 this year. The reduction in the number of dolphins compared to last year could be due to the migration of species from the Chilika Lake and other water bodies to the deep sea.
- Gahirmatha is the home of the state's largest dolphin population, having 126 animals. More dolphins were found in Gahirmatha than Chilika due to its bigger areas.
- After Gahirmatha, Chilika had the next largest population at 113, followed by the Rushukulya River in Ganjam district, with 15 dolphins and finally, Balasore, with 5 individuals.



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- The dolphin species sighted during the state-wide census included the Irrawaddy, the Bottle Nose and the Humpback.

### **Key facts:**

- Dolphins have been included in Schedule I of the Indian Wild Life (Protection) Act 1972, in Appendix I of the Convention on International Trade in Endangered Species (CITES), in Appendix II of the Convention on Migratory Species (CMS) and categorised as 'Endangered' on the International Union for the Conservation of Nature's (IUCN) Red List.

### **Kawal Tiger Reserve**

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

### **Waste to Energy (WTE) Plants**

- Waste to Energy (WTE), is a term that is used to describe various technologies that convert non-recyclable waste into usable forms of energy including heat, fuels and electricity.
- WTE can occur through a number of processes such as incineration, gasification, pyrolysis, anaerobic digestion, and landfill gas recovery.
- As per the Union Ministry of Environment and Forests, MSW generation will reach 4.5 lakh TPD by 2031 and 11.9 lakh TPD by 2050.
- Nearly half of India's waste-to-energy (WTE) plants, meant to convert non-biodegradable waste, are defunct.

- The key reasons for closure are
- The plants' inability to handle mixed solid waste
- The high cost of electricity generated by them that renders it unattractive to power companies.
- The fundamental reason for the inefficiency of WTE plants is the quality and composition of waste.
- MSW (municipal solid waste) in India has low calorific value and high moisture content.

### Kelp forest

- Climate change could lead to declines of underwater kelp forests through impacts on their micro biome.
- It was predicted that ocean warming and acidification can change microbes on the kelp surface, leading to disease and potentially putting fisheries at risk.
- Kelp Forests are underwater ecosystems formed in shallow water by the dense growth of several different species known as kelps.
- Kelps are actually extremely large brown algae, although they look like plants.
- They thrive in cold, nutrient-rich waters.
- Kelp attaches to the seafloor and eventually grows to the water's surface and relies on sunlight to generate food and energy.
- Kelps live further from the tropics than coral reefs, mangrove forests, and warm-water seagrass beds, so kelp forests do not overlap with those systems.



### **Great Indian hornbills**

- Amid a changing environment, with natural homes of birds getting depleted as natural forests make way for plantations and other such modified terrain, comes the good news of how the great Indian hornbill (*Buceros bicornis*) adapts to such change.

### **Nesting habits**

- Hornbills are secondary cavity nesters and choose cavities formed in large trees for nesting. Also they are monogamous, and the female, after copulation, seals herself in the hole until the initial breeding period of two-four months is over.
- During this time, the female and the young ones are fed by the male bird, with fruit such as figs and animal matter. So, in principle, along with other threats such as hunting, modified land use, ensuing forest fragmentation, felling of large trees with the potential for nesting, the loss of fruit bearing trees could also affect hornbill nesting habits.
- Great hornbills may adapt to habitat modification provided that their key requirements for food and nesting are fulfilled in the habitats like coffee and forest fragments.
- Among the seaweeds found in plenty, *Ulva*, *Pyropia*, *Porphyra* and *Kappaphycus* are edible and that it will be good to cultivate them in large scale, as is done in countries like Japan



### **Framework Agreement of the International Solar Alliance**

- The agreement of the International Solar Alliance was open opened for signature during the COP22 at Marrakech on November 15, 2016. The signatories of the agreement include India, France, Australia, UAE, UK and



Japan amongst others. Argentina is the 72nd country to sign the Framework Agreement of the International Solar Alliance.

### **International Solar Alliance**

- International Solar Alliance aims to provide a common platform to address the specific solar technology deployment needs of the solar resource-rich countries located between the Tropic of Cancer and the Tropic of Capricorn.
- Availability of abundance of solar energy in these countries can be utilised to generate cost-effective solar power to address the challenges of the absence of universal energy access, energy equity and affordability.
- International Solar Alliance will not duplicate the efforts that other bodies like International Renewable Energy Agency (IRENA), Renewable Energy and Energy Efficiency Partnership (REEEP), International Energy Agency (IEA), Renewable Energy Policy Network for the 21st Century (REN21), United Nations bodies, bilateral organizations which are currently engaged in. Rather it will establish networks and develop synergies with them and supplement their efforts in a sustainable and focused manner.
- International Solar Alliance is the first body that will have a secretariat in India. India plays a significant role in the alliance in terms of being a host as well as a major contributor in achieving the target of 1 TW of solar energy by 2030.
- With a target to produce 100 GW of solar energy by 2022, India would account for a tenth of ISA's goal.

### **Synthetic fibres contribute to plastic pollution**

- Polyester and other synthetic fibres such as nylon are major contributors of microplastic pollution in the environment, say researchers and suggest switching to biosynthetic fibres may help prevent this.



- Synthetic fibres are petroleum-based products, unlike natural fibres such as wool, cotton and silk, which are recyclable and biodegradable.
- Mixed fibres that contain both natural and synthetic fibres are difficult or costly to recycle. In the oceans, pieces of microscopic plastic are consumed by plants and animals and enter the human food chain through harvested fish.
- The study suggested few things to prevent this: minimising the use of synthetic fibres and switching to natural fibres such as wool, cotton, silk and linen, even though synthetic fibres are less expensive and natural fibres have other environmental costs, such as water and land-use issues; large scale use of bacteria that could aid in biodegradation of the fibres for reuse; substituting synthetic fibres with biosynthetic fibres, that are both recyclable and biodegradable; and blending synthetic fibres with natural fibres to lend them durability and make them recyclable.

### Bramble Cay melomys

- Australia officially declared a Great Barrier Reef rodent called Bramble Cay melomys extinct recently.
- A Cay is a low-lying island on a coral reef.
- It became the first mammal believed to have been killed off by human-induced climate change.
- The rodent lived solely on a tiny sand island in the Torres Strait, near the coast of Papua New Guinea.
- The species has not been seen since 2009.
- A key factor in its disappearance was repeated ocean inundation of the cay over the last decade, which had resulted in dramatic habitat loss.



- The *Melomys rubicola* is considered the Great Barrier Reef's only endemic mammal species.
- It was first discovered on the cay in 1845 by Europeans who shot the large rat for sport.
- According to International Union for Conservation of Nature (IUCN), Australia has one of world's highest rates of animal extinction.

### Great White Shark

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



### Bio Diversity Hotspot

- British environmentalist and conservationist Norman Myers coined the term "biodiversity hotspot".
- It refers to an area with a vast array of life-forms found nowhere else in the world and is threatened by various factors.
- To classify a region as a biodiversity hotspot two criteria must be met:
- It should have a minimum of 1,500 species of vascular plants found solely in that region

- It should have lost at least 70 % of its native vegetation.
- Around the world, 36 areas qualify as hotspots and they represent just 2.4% of Earth's land surface.
- India is one of the world's 17 mega-diverse countries.
- It has biodiversity hotspots in the Western Ghats, the Himalayas, the Andaman and Nicobar Islands.
- Focusing on biodiversity hotspots is the way to save the most species with the least use of time, money and effort.



Conservation International (conservation.org) defines 35 biodiversity hotspots — extraordinary places that harbor vast numbers of plant and animal species found nowhere else. All are heavily threatened by habitat loss and degradation, making their conservation crucial to protecting nature for the benefit of all life on Earth.

### **Green India Mission:**

- GIM is one of the eight missions launched under the National Action Plan on Climate Change (NAPCC).
- GIM's launch was supposed to coincide with the starting of the 12th five-year plan in 2012. But, owing to financial





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delays the mission was finally launched in 2015.

- The objective of the mission is to increase green cover to the extent of 5 million hectares (mha) and improve quality of existing green cover on another 5 mha, improve eco-system services like carbon sequestration, hydrological services and biodiversity and provisioning services like fuel, fodder, and timber and non-timber forest produces (NTFPs). It also has to increase forest-based livelihood income for about 3 million households.

### **Forest Rights Act (FRA):**

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### **Process of recognition of rights:**

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- The screening committees consist of three government officials (Forest, Revenue and Tribal Welfare departments) and three elected members of the local body at that level. These committees also hear appeals.

### **Why in news?**

- The Supreme Court has asked the governments of 17 states to evict an estimated one million tribal and other households living in forests after their claims of the right to live in forests were rejected under the Forest Rights Act.
- The court has directed the Dehradun-based Forest Survey of India to submit a satellite-image based report on the encroachments removed.

### **Super-Efficient Air Conditioning programme**

- Energy Efficiency Services Limited (EESL) has launched its Super-Efficient Air Conditioning Programme for residential and institutional consumers in the BSES area.
- Under the programme, Super-Efficient Air Conditioners are distributed. They are 40% more efficient than, but priced comparably with, the 3-star ACs currently available in the market (ISEER 3.8).
- EESL is working towards making this programme and its benefits available to all consumers across the nation with the other DISCOMs likely to partner with EESL in future.



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### **Significance and benefits of the programme:**

- Besides promoting energy efficiency, the Super-Efficient AC programme will also help to reduce the peak power demand in South and West Delhi by 22MW, enabling the two organisations to harness synergies to promote energy security and sustainability.
- The programme directly addresses the prospect of the nearly four-fold increase in energy consumption from buildings and cooling appliances in India by 2032, while also addressing goals of India's Cooling Action Plan and Hydrochlorofluorocarbon Phase out Management Plan, enabling achievement of India's targets under the Kigali and Paris Agreements.

### **Funding:**

- EESL's investment in the programme is partially supported by a grant from the Global Environment Facility (GEF).
- Further, Asian Development Bank (ADB) is providing necessary grant support and loan while United Nations Environment (UNEP) is providing technical assistance support to the Super-Efficient AC programme.

### **About GEF:**

- GEF is an independent financing mechanism that was established on the eve of the 1992 Rio Earth Summit to address global environmental issues. The GEF is an international partnership of 183 countries, international institutions, civil society organizations and the private sector.
- The World Bank serves as the GEF Trustee, administering the GEF Trust Fund.
- It is a FINANCIAL MECHANISM for five major international environmental conventions: the Minamata Convention on Mercury, the Stockholm Convention on Persistent Organic Pollutants (POPs), the United Nations Convention on Biological Diversity (UNCBD), the United Nations Convention to Combat Desertification (UNCCD) and the United Nations Framework Convention on Climate Change (UNFCCC).

### **Golden rice as a threat**

- In 1999, a group of European scientists led by Dr Ingo Potrykus tried to change traditional rice by developing genetically-engineered rice that contains beta-carotene — by inserting bacteria and daffodil and maize genes into it. This is the golden rice, called so because of the golden colour of its grains.
- The golden rice was introduced in 2000 and argued to be the panacea for world's malnutrition problem. It was claimed that the rice is bio-fortified, and is supposedly high in Vitamin A, Iron and Zinc.
- It was considered as a significant breakthrough in biotechnology, with its first field trials conducted by the agriculture centre of Louisiana State University in 2004. Later, it has been claimed that field trials were conducted in the Philippines, Taiwan and Bangladesh.



### **What's the issue?**

- Bangladesh completed the confined field testing of golden rice at the Bangladesh Rice Research Institute (BRRI), Gazipur, in early 2017. It has already allowed commercial production of BT Brinjal in the country.
- Locals fear that the introduction of golden rice will impact their traditional agriculture system.
- It is alleged that field trials were marred with controversy over the lack of transparency and credible independent safety studies. Even claims made after field trial concerns remain as on the lack of credible and independent safety studies, transparency and public participation.
- Activists fear that commercial cultivation would lead to the loss of Bangladesh's rich bio-diversity. This could further push for public acceptance of genetically-modified crops and erode our food diversity and



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our local and traditional seeds, as well as increase corporate control on our agriculture system.

### **What is a GM crop?**

- A GM or transgenic crop is a plant that has a novel combination of genetic material obtained through the use of modern biotechnology.
- For example, a GM crop can contain a gene(s) that has been artificially inserted instead of the plant acquiring it through pollination. The resulting plant is said to be “genetically modified” although in reality all crops have been “genetically modified” from their original wild state by domestication, selection, and controlled breeding over long periods of time.

### **There are some concerns as well:**

- GM food involves taking genes (DNA) from different organisms and inserting them in food crops.
- There are concerns that this ‘foreign’ DNA through Genetically Modified products may lead to risks such as toxicity, allergic reactions, and nutritional and unintended impact.
- It costs people’s health and our national food and health sovereignty.
- The Food Safety and Standards Authority of India [FSSAI], the apex food regulator, has failed to curb the illegal sales of GM food.
- Its draft regulations on GM food labelling are weak and impractical to implement.
- Lack of clarity: It is clear that the technology of genetic engineering is an evolving one and there is much, especially on its impact on human health and environment that is yet to be understood properly. The scientific community itself seems uncertain about this.
- There is also a potential for pests to evolve resistance to the toxins produced by GM crops and the risk of these toxins affecting nontarget organisms. There is also the danger of unintentionally introducing allergens and other anti-nutrition factors in foods.

### **Future for Nature Award**

- Future for Nature 2019 Award awarded by Future for Nature foundation celebrates tangible achievements in protecting wild animal and plant species.
- Reward and fund individuals for their outstanding efforts in the protection of species of wild animals and plants.
- Stimulate Award winners to sustain their dedicated work.
- Help winners to raise their profile, extend their professional network and strengthen their funding basis.
- The Award provides the winners international recognition, financial support and reinforced linkages to an international conservation network.



### **Flying bulldog**

- The world's largest bee — a giant insect roughly the size of a human thumb — has been rediscovered in a remote part of Indonesia in its first sighting in nearly 40 years.
- Despite its conspicuous size, no one had observed Wallace's giant bee — discovered in the 19th century by British naturalist Alfred Russel Wallace and nicknamed the "flying bulldog" — in the wild since 1981.
- The bee ( Megachile pluto ), which lives in the Indonesian island region of North Moluccas, makes its nest in termite mounds, using its large fang-like mandibles to collect sticky resin to protect its home from the termites.
- The IUCN Red List of Threatened Species lists the bee as "vulnerable", meaning that while its numbers are relatively solid, the remoteness of its population makes it hard to study.





### **Flamingo Count**

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



### **Phoenicopterus roseus(Greater Flamingo)**

- The greater flamingo is the most widespread and largest species of the flamingo family. It is found in Africa, on the Indian subcontinent, in the Middle East, and in southern Europe.
- IUCN status: Least concerned



### **Lesser flamingo(Phoenicoparrus minor)**

- The lesser flamingo is a species of flamingo occurring in sub-Saharan Africa, with another population in India. Birds are occasionally reported from further north, but these are generally considered vagrants.
- It was moved from the genus Phoeniconaias to Phoenicoparrus in 2014.
- IUCN status: Near threatened
- Habitat and Ecology: Marine Intertidal, Marine Neritic, Wetlands (inland), Artificial/Aquatic & Marine, Marine Coastal/Supratidal



### **Monkey Declared Vermin in Himachal Pradesh**

- Monkeys have again been declared vermin for the next one year in 11 districts' 91 tehsils and sub-tehsils of Himachal Pradesh.
- The state government had urged the centre to declare Monkeys as vermin because the animals have been adversely affecting crops and causing harm to humans.

### **Declaring animals as vermin:**

- Wildlife laws divide species into 'schedules' ranked from I to V. Schedule I members are the best protected, in theory, with severe punishments meted out to those who hunt them. Wild boars, nilgai and rhesus monkeys are Schedule II and III members — also protected, but can be hunted under specific conditions. Crows and fruit bat fall in Schedule 5, the vermin category.
- Section 11(1) A of the Wildlife Protection Act (WPA) authorizes chief wildlife warden to permit hunting of any problem wild animal only if it cannot be captured, tranquillized or trans-located.

- For wild animals in Schedule II, III or IV, chief wildlife warden or authorized officers can permit their hunting in a specified area if they have become dangerous to humans or property (including standing crops on any land).
- Section 62 of Act empowers Centre to declare wild animals other than Schedule I & II to be vermin for specified area and period.

### **Tree cover and Forest Cover**

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

<b>TOP 5 BY TREE COVER</b>	
<b>(ALL INDIA: 2.85%)</b>	
Goa	8.73%
Delhi	7.62%
Kerala	7.62%
Gujarat	4.09%
Jharkhand	3.67%
Source: India State of Forest Report 2017	
<b>TOP 5 BY FOREST COVER</b>	
<b>(ALL INDIA: 21.54%)</b>	
Lakshadweep	90.33%
Mizoram	86.27%
A&N Islands	81.73%
Arunachal	79.96%
Manipur	77.69%
Source: MoEFCC reply in Lok Sabha	

### **Arabian Desert**

- The Arabian Desert is the largest desert of Asia and covers a major portion of Arabian Peninsula.
- The largest part of the desert lies in Saudi Arabia.
- It also covers neighbouring countries such as Yemen, Oman, United Arab Emirates, Kuwait, Qatar, Iraq and Jordan
- Rub'al-Khali, which makes up the most part of this desert, is the largest continuous area of sand in the world.

- Numerous desert insects, including mosquitoes, fleas, ants, termites, beetles, locusts, spiders, butterflies and caterpillars dominate the landscape.

### Global outlook

According to the Centre's application before the Supreme Court, the scheme of the Forest Rights Act, 2006, is in tune with several international covenants

#### 1 UN Universal Declaration on Human Rights

Recognises the equal rights of the human family. India is a signatory

#### 2 UN Convention Concerning Indigenous and Tribal Populations

Seeks to protect ownership rights of populations over lands they traditionally occupy. Ratified by India

#### 3 UN Declaration on Rights of Indigenous People

Mandates to protect the rights of indigenous people to lands, territories and resources which they traditionally own, occupy and use. India is a signatory

#### 4 UN Convention on Biological Diversity

Advocates preservation of indigenous knowledge and practices. India is a party



#### 5 Rio Declaration on Environment and Development

Proclaims indigenous people have a vital role in environmental management



### Rhinos without borders

- The New Delhi Declaration adopted at the second meeting of the Asian rhino range countries that ended underscored trans-boundary collaboration among India, Nepal, and Bhutan for the conservation and protection of the greater one-horned rhino.
- There are no rhinos in Bhutan, but some from the Manas National Park in adjoining Assam or Buxa Tiger Reserve in West Bengal are known to cross over occasionally.
- The current global population of the Indian one-horned rhinoceros is 3,584. Assam's Kaziranga National Park has the bulk of 2,938 rhinos in India while Nepal 646. Once ranging from China to Bangladesh, the Javan and Sumatran rhinos are nearing extinction.
- The Sumatran rhino, the smallest of all rhino species and the only Asian rhino with two horns became extinct in the wild in Malaysia.
- There is only one found now in the Sabah island of Malaysia while Indonesia has a few. IUCN expands to International Union for Conservation of Nature.
- Kaziranga had less than 10 rhinos when it was declared a protected area for the animal in 1905.
- The plan said the single population of rhinos in Sukla-Phanta (Nepal), Valmiki Tiger Reserve (India) and Chitwan National Park (Nepal) and Dudhwa (India) is separated by the political boundary between the two countries.



### World Wildlife day

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



### Red sanders:

- Red sanders (Pterocarpus santalinus), known for its rich hue and therapeutic properties, is high in demand across Asia, particularly in China and Japan, for use in cosmetics and medicinal products as well as for making furniture, woodcraft and musical instruments.
- Its popularity can be gauged from the fact that a tonne of red sanders costs anything between Rs 50 lakh to Rs 1 crore in the international market.
- The Directorate General of Foreign Trade (DGFT), an agency of the Ministry of Commerce and Industry, has revised its export policy to permit the export of red sanders if it is obtained from cultivated land.





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### **Why the restrictions?**

- The tree is endemic to several districts in Andhra Pradesh and some parts of Tamil Nadu and Karnataka. But overexploitation prompted the Union government in the 1980s to recommend inclusion of red sanders in Appendix II of CITES, which says “trade must be controlled in order to avoid utilisation incompatible with their survival”.
- The species was listed in Appendix II of CITES in 1995, and subsequently export of red sanders was prohibited in 2004.
- In 2010, when the CITES was planning to suspend trade of red sanders obtained from India, the government submitted a Non-Detriment Finding (NDF) report saying it must be allowed to export from cultivated sources.
- So in 2012, India got an export quota on red sanders from CITES, under which the country could export 310 tonnes of red sanders obtained from “artificially propagated” sources (grown on farms) and 11,806 tonnes of wood from seized sources.