

ENVIRONMENT

CURRENT AFFAIRS

IMPORTANT SPECIES

1. Hoolock Gibbon

- ❑ The hoolock gibbons are native to eastern Bangladesh, Northeast India and Southwest China.
- ❑ White rings around their eyes and mouths give their faces a mask-like appearance.
- ❑ Hoolock Gibbon is categorized as **vulnerable**, as per the International Union for Conservation of Nature (IUCN).
- ❑ Estimates of the eastern hoolock gibbon population in India are at 170 most found in **Assam and Arunachal Pradesh**.
- ❑ They are mainly concentrated in the Mishmi Hills, and are now commonly known as **Mishmi hills gibbons**.
- ❑ The animal is protected in **Mehao Wildlife Sanctuary** located in Lower Dibang Valley district.

2. Radio-collaring Asiatic lions

- ❑ Asiatic lions are slightly smaller than African lions.
- ❑ They used to range from Turkey, across Asia, to eastern India.
- ❑ **At present** Gir National Park and Wildlife Sanctuary is the only abode of the Asiatic lion.
- ❑ India has recorded a 29% increase in the population of Asiatic lion living in Gujarat's Gir forests, in the past five years, with their population going up from 523 in 2015 to 674 in 2020.
- ❑ Five protected areas currently exist to protect the Asian lion:
 1. Gir Sanctuary,
 2. Gir National Park
 3. Pania Sanctuary together forms the Gir Conservation Area (GCA)
 4. The other two are, Mitiyala and
 5. Girnar protected areas within dispersal distance of the Gir Conservation Area.
- ❑ The lions face the usual threats of poaching and habitat fragmentation.
- ❑ However, recent death of around two dozen lions is attributed to the deadly Canine Distemper Virus (CDV) in Dalkhaniya range of Gir forest division.
- ❑ So the Gujarat Forest Department has begun Radio-collaring Asiatic lions in a bid to study their movement patterns, territories and habitat preferences.
- ❑ Radio-collars are fitted with small radio transmitter that will beam signals to the satellites at a preset frequency and the satellites, in turn, will relay the signals to a control-room in Sasan.
- ❑ The government has set up a high-tech monitoring unit at Sasan which will serve as control-room for the collars.



- ❑ This will help the forest department in monitoring of the group's movement, research, knowing the territory of the animal and other details.

3. Olive Ridley

- ❑ The Olive Ridley sea turtle are the second smallest and most abundant of all sea turtles found in the world.
- ❑ This species of sea turtle is found in warm and tropical waters, primarily in the Pacific and Indian Oceans.
- ❑ They can also be found in the warm waters of the Atlantic Ocean.
- ❑ These turtles, are best known for their unique mass nesting called **Arribada**, where thousands of females come together on the same beach to lay eggs.
- ❑ The **Gahirmatha** marine sanctuary is the largest rookery of the Olive Ridley turtles in India.



4. Black Softshell Turtle

- ❑ The black softshell turtle or Bostami turtle is a species of freshwater turtle found in India and Bangladesh.
- ❑ It is the close relative of Indian peacock softshell turtle, but it is a distinct species.
- ❑ As of 2002, the IUCN classified the species as **Extinct in the Wild**.
- ❑ The turtle is originally native to the **lower Brahmaputra River**.

5. Asiatic Golden Cat

- ❑ The Asian golden cat is a wild cat native to the **northeastern Indian subcontinent** and Southeast Asia.
- ❑ It has been listed as Near Threatened on the IUCN Red List since 2008, and is threatened by hunting pressure and habitat loss.
- ❑ Since Southeast Asian forests are undergoing the world's fastest regional deforestation.
- ❑ It is found across eastern Nepal through north-eastern India to Indonesia.
- ❑ Recently scientists have found that Golden is no longer the only color that the elusive Asiatic golden cat can be associated with, its coat comes in five other shades.

6. Circadian Rhythm

- ❑ A circadian rhythm is a roughly 24 hour cycle in the physiological processes of living beings, which is important in determining the sleeping and feeding patterns of all animals, including human beings.
- ❑ There are clear patterns of brain wave activity, hormone production, cell regeneration and other biological activities linked to this daily cycle.
- ❑ In vertebrate animals, including humans, the master clock is a group of about 20,000 nerve cells (neurons) that form a structure called the **Supra Chiasmatic nucleus, or SCN**.
- ❑ The **SCN is located in a part of the brain called the hypothalamus** and receives direct input from the eyes.
- ❑ In mammals, in addition to the master clock present in the brain, peripheral circadian clocks too operate, which means that the cells and tissues throughout human body have their own individual clocks.
- ❑ This peripheral circadian clock can be affected by temperature changes but our master clock in the brain is resistant to temperature changes.
- ❑ **Human brain has evolved to even override the peripheral circadian clock**, so temperature changes (unless very extreme) cannot affect human body clock.

7. Cryodrakon Boreas (Cold dragon of the North Winds)

- ❑ Paleontologists have identified a new species, named it Cryodrakon boreas - a giant flying reptile.
- ❑ With a wingspan of over 10 metres, it is believed to have flown over the heads of dinosaurs.
- ❑ It could be one of the largest flying animals lived over 77 million years ago in today's western Canada.
- ❑ Its remains were discovered 30 years ago from the Dinosaur Park Formation located in Alberta.
- ❑ A new study has concluded that the remains belong to a new species, which is the first pterosaur to be discovered in Canada.
- ❑ In terms of habitat and lifestyle, it would have lived in a tropical environment, feasting on small dinosaurs and lizards.



8. Peregrine Falcon

- ❑ It is one of the world's **most common predatory birds** and has the fastest vision in the animal kingdom.
- ❑ It can register nearly 130 frames per second, where humans see up to a maximum of 50 to 60 blinks per second.
- ❑ This new discovery was published in Journal of Experimental Biology, it is the first time scientists have studied the speed of vision among birds of prey.
- ❑ The speed at which different birds of prey process visual impressions is related to their hunting needs.
- ❑ For the peregrine falcon, which hunts fast-flying birds, the ability to spot ultra-speed movements helps them detect prey sufficiently early in order to have time to react.

9. Himalayan Gold

- ❑ In the Himalayas, the reliance of local communities on the trade and collection of Himalayan Gold, **caterpillar fungus** has become extremely popular in recent decades.
- ❑ Caterpillar fungus (*Ophiocordyceps Sinensis*) is a **fungal parasite of larvae** (caterpillars) that belongs to the ghost moth.
- ❑ It has been used in traditional Tibetan and Chinese medicine as a tonic, as a therapeutic medicine for lung, liver and kidney problems.
- ❑ In the recent times, it has widely traded as an aphrodisiac (stimulating sexual desire) and a powerful tonic, often called the '**Himalayan Viagra**'.
- ❑ It is **endemic to the Tibetan Plateau**, including the **adjoining high Himalayas** (3,200-4,500 metres above sea level).
- ❑ It is locally known as **Kira Jari** (in India), Yartsagunbu (in Tibet) and Yarsagumba (in Nepal).
- ❑ It has been found in alpine meadows of Nanda Devi Biosphere Reserve, Askot Wildlife Sanctuary, Kanchendzonga Biosphere Reserve and Dehan-Debang Biosphere Reserve.
- ❑ The harvesting of fungus starts at the beginning of May and lasts till the end of June.
- ❑ It depends on factors such as weather, snow cover on the pasture and elevation of collection sites.
- ❑ **TRAFFIC**, the wildlife trade monitoring network reported that the illegal trading of it is also a significant issue.

10. Irrawaddy dolphins

- ❑ Irrawaddy dolphins can grow to a length of 2.3 m and attain a weight of 130 kg.
- ❑ This species is closely related to the killer whale, a much larger, oceanic dolphin that can grow to 8m and weigh in excess of 6 tones.
- ❑ Although the species gets its common name from the **Irrawaddy River in Myanmar**, where it also lives, it was first described in 1866 from a specimen found in the Vishakapatnam harbour in present day Andhra Pradesh on India's east coast.
- ❑ Its range extends from the Bay of Bengal to New Guinea and the Philippines.
- ❑ Besides the Irrawaddy River, it is also found in **India's Ganges River and Southeast Asia's Mekong River**.
- ❑ However, it is not a true river dolphin and prefers to live in estuaries and brackish water near coasts.
- ❑ Following the opening of the sea mouth in **Chilika** in 2002, and the consequent increase in water depth, dolphins have reportedly been recorded in more areas of the lake than before, perhaps indicating an expansion of suitable habitat.



- ❑ Irrawaddy dolphins are classified as 'Vulnerable' in the IUCN Red List of Threatened Species.
- ❑ In Chilika they can be seen singly, in pairs or as small groups of 4-6 individuals, they are slow swimmers.

11. African Cheetahs

- ❑ The cheetah is a large cat of the subfamily Felinae that occurs in North, Southern and East Africa, and a few localities in Iran.
- ❑ It inhabits a variety of mostly arid habitats like dry forests, scrub forests, and savannahs.
- ❑ The species is IUCN Red Listed as Vulnerable, as it suffered a substantial decline in its historic range in the 20th century due to habitat loss, poaching for the illegal pet trade, and conflict with humans.
- ❑ By 2016, the global cheetah population has been estimated at approximately 7,100 individuals in the wild.
- ❑ Several African countries have taken steps to improve cheetah conservation measures.
- ❑ African cheetahs are capable of accelerating up to 112 km/h (70 mph) on short distances of 100 m (330 ft), therefore they are the fastest land animal.
- ❑ Recently Supreme Court lifted its seven-year stay on a proposal to introduce African cheetahs from Namibia into the Indian habitat on an experimental basis to revive the Indian cheetah population in the **Palpur Kuno sanctuary in Madhya Pradesh**.

12. Locust

- ❑ Locusts are a collection of certain species of short-horned grasshoppers that have a swarming phase.
- ❑ These insects are usually solitary, but under certain circumstances, they become more abundant and change their behaviour and habits, becoming gregarious.
- ❑ Adult locust swarms can fly up to 150 km a day with the wind and adult insects can consume roughly their own weight in fresh food per day.
- ❑ These hoppers in small numbers or groups do not cause any economic damage to crops unless they appear in swarms.
- ❑ A very small swarm eats as much in one day as about 35,000 people, posing a devastating threat to crops and food security.
- ❑ Locusts do not attack people or animals; there is no evidence that suggests that locusts carry diseases that could harm human

Recently, Swarms of locusts have invaded vast swathes of land in India since April 11th this year.



Outbreaks of the insect attack have been reported from Gujarat, Rajasthan, Maharashtra, Madhya Pradesh, Punjab, Haryana and Uttar Pradesh.

Experts have warned of huge crop losses if the swarms are not stopped by June when the monsoons will lead to a new season of sowing rice, sugarcane, cotton and other crops.

13. Giant Tusked Elephant

- ❑ The elephant divided into many species, such as:
 1. Palaeoloxodon antiquus (in Europe),
 2. Palaeoloxodon namadicus (India),
 3. Palaeoloxodon naumanni (Japan).
- ❑ All these species are now extinct.
- ❑ For a long time, it was thought that the European species had a rather slenderly built skull roof crest, whereas Indian species was characterized by an extremely robust skull crest that extended near to the base of the trunk from the top of the skull.

14. Chinese paddlefish

- ❑ Psephurus gladius, a Chinese paddlefish living in the Yangtze River (Asia's longest river), was declared extinct.
- ❑ Psephurus gladius was about 2 to 3 meters long, and could grow longer than 7 meters.
- ❑ The fish had existed for 15 million years.
- ❑ The Chinese paddlefish had also been on the critically endangered list since 1996.
- ❑ It was the largest freshwater fish in China might have gone extinct between 2005 and 2010.
- ❑ Experts from the International Union for Conservation of Nature estimated that this unique and first-class protected fish had been extinct already.
- ❑ Two other notable Yangtze species reeves shad, a type of fish and the baiji, or Yangtze River dolphin were declared 'functionally extinct' in 2015 and 2006 respectively.

IMPORTANT INITIATIVES

15. Bamboonomics

- ❑ Ministry of Tribal Affairs launched the biggest Tribal movement, **to promote tribal enterprise through Bamboonomics**.
- ❑ It was launched for combating desertification and the climate change at COP 14 to the UNCCD.
- ❑ TRIFED introduced the 'The 4P1000 Initiative: The Tribal Perspective through Bamboonomics'.
- ❑ The **international initiative "4 per 1000"** was launched by France in 2015 at the COP 21.
- ❑ The aim of the initiative is to,
 - ❑ Demonstrate that agriculture, and in particular agricultural soils can play a crucial role where food security and climate change are concerned.
 - ❑ The ambition of the initiative is to,
 - Encourage stakeholders to transition towards a productive, highly resilient agriculture,
 - based on the appropriate management of lands and soils,
 - creating jobs and incomes hence ensuring sustainable development.

The "4 per 1000" initiative intends to increase soil organic matter and carbon sequestration through the implementation of agricultural practices adapted to local environmental, social and economic conditions, such as agro-ecology, agro-forestry, conservation agriculture or landscape management.



16. Global Solar Park

- ❑ The global solar park was inaugurated at UN headquarters by the Indian Prime Minister during the Gandhi@150 commemorative event. It is called 'Gandhi Solar Park'.
- ❑ It has 193 solar panels, each representing a member of the multilateral body.
- ❑ It is a roof-top solar park which has the capacity of 50-kilowatt hour (kWh) for each panel and the total output is 86,244 KWh.
- ❑ This equals 61 metric tonnes of carbon dioxide, 30,242 kg of coal burned, and carbon sequestered from 1,008 tree seedlings grown for 10 years.
- ❑ It was built at the cost of US \$1 million.
- ❑ India is the third largest emitter of greenhouse gases, after China and the US.
- ❑ Coal power, cattle and paddy are major sources of emission, though per capita emissions are roughly a seventh of the US and less than half the world average.
- ❑ India has pledged for a 33-35% reduction in emission intensity (emissions associated with each unit of economic output) by 2030, compared to 2005 levels in Paris agreement.
- ❑ India will host the 2nd general assembly of the International Solar Alliance, in New Delhi on the sidelines of COP-21, the UN Climate Conference.

17. New Zealand's Zero-Carbon Act

Why in news?

New Zealand's Parliament recently passed The Zero-Carbon Act, which will commit New Zealand to zero carbon emissions by 2050 or sooner.

What is the Act on?

- ❑ The Act comes as part of the country's attempts to meet its Paris climate accord commitments.
- ❑ The Act is not a separate legislation but is an amendment to the existing Climate Change Responses Act, 2002.
- ❑ The Act is titled Climate Change Response (Zero Carbon) Amendment Act.
- ❑ It provides a framework by which New Zealand will be able to develop and implement climate change policies in line with the Paris Agreement.
- ❑ The objective is to limit the temperature increase to 1.5 degree Celsius.
- ❑ According to the New Zealand government, **this is the first legislation in the world to make a legally binding commitment to living within 1.5°C of global warming.**

What are the key targets?

- ❑ The Bill presents the country's plan on how to act over the next 30 years, to safeguard its future and that of its children.
- ❑ The key aims of the Act include:
 - reducing all greenhouse gases (except methane) to net zero by 2050
 - reducing emissions of biogenic methane (produced from biological sources) up to 10% below 2017 levels by 2030 and to 24-47% below 2017 levels by 2050
 - establishing an independent Climate Change Commission
 - establishing a system of emissions budget

18. Ecoclub Programme

- ❑ Environment Education Awareness and Training (EEAT) is an established central sector scheme of the Environment Ministry since 1983-84.



- ❑ It aims to promote environmental awareness and mobilize student's participation for environment conservation.
- ❑ Under the scheme, National Green Corps (NGC) 'Ecoclub' programme was initiated in 2001-2002 with the objective to impart knowledge to school children about their immediate environment, interactions within it and the problems therein.
- ❑ It aims to inculcate proper attitude towards environment and sensitize children on issues related to environment and development.

IMPORTANT SUMMITS / MEETINGS

19. CoP 18 of the CITES

- ❑ Over 100 nations, acting within the framework of CITES, approved a proposal by India, Nepal and Bangladesh.
- ❑ It is to prohibit commercial international trade in a species of '**Otter**' native to the subcontinent and some other parts of Asia.
- ❑ The Conference also accepted a separate proposal by India, moved together with the EU, the US and the Philippines:
 1. It is for inclusion of a species of '**Gecko lizard**' for protection as a species not necessarily threatened with extinction.
 2. It is found widely in South Asia, the US, and Madagascar.
 3. To control the trade in order to avoid utilisation incompatible with their survival.
- ❑ Members voted to move the **Smooth-coated otter** (*Lutrogale perspicillata*) from CITES Appendix II to CITES Appendix I.

20. COP14 of UNCCD

- ❑ India takes over COP Presidency of UNCCD from China for next two years.
- ❑ Through hosting COP 14, India will highlight its leadership in navigating the land management agenda at global level.
- ❑ It will also provide a stage to mainstream sustainable land management in country's national development policies.
- ❑ The key outcomes of COP 14 will facilitate in delivering convergence and synergies among the existing programmes in the field of agriculture, forestry, land, water management and poverty alleviation.
- ❑ It will cater the need to achieve the SDGs and focused vision of of Doubling the Farmer's Income by 2022.
- ❑ The Conference is being attended by delegates from 197 parties comprising of,
 1. Scientists and representatives of national and local governments.
 2. Global business leaders, NGOs, gender-based organisations, youth groups, journalists, and faith and community groups.
 3. They will share their expertise and give an overview to achieve their goals at the Conference.
- ❑ The objective of the COP 14, accompanied with Committee on Science and Technology (CST 14) and Committee to Review the Implementation of the Convention (CRIC 18) is to,
 1. Discuss on various issues of land such as sustainable land management, reversing land degradation, mitigating drought.
 2. Addressing sand and dust storms, linkages with gender, tenure, etc. and
 3. To guide the Convention as global and national circumstances needs change



21. New Delhi Declaration

- ❑ The declaration was adopted by the participating countries at the 14th CoP to the UNCCD.
- ❑ It comes with an action plan to save the planet from losing more land and **to achieve SDG target of land degradation neutrality by 2030.**
- ❑ The parties expressed support for new initiatives to improve human health, well-being and to advance peace and security.
- ❑ The declaration also stated that,
 - World needs to consider land-based solutions for climate action and
 - Biodiversity conservation to achieve the long-term goals of the Paris Agreement.
 - It also special emphasis on,
 - Community-driven transformative projects,
 - That are gender-sensitive at local, national and regional levels to drive implementation.

22. Climate Action Summit 2019 - Mitigation and Adaptation

What is the issue?

- ❑ The Climate Action Summit took place at **New York** recently.
- ❑ Given the historical emphasis on mitigation, it is time to reflect on the benefits of shift from 'adaptation' to 'mitigation'.

What is Climate Action Summit?

- ❑ The UN Secretary-General, Antonio Guterres, hosted the 2019 Climate Action Summit.
- ❑ The Summit was held to **boost ambition and accelerate actions to implement the 2015 Paris Agreement on Climate Change.**
- ❑ It took place amidst one of the largest environmental protests ever and a heart-wrenching speech from Greta Thunberg.

What is the point of concern?

- ❑ The summit seems to be based on the age-old assumption that adaptation to climate change has its limits, and mitigation deserves more emphasis.
- ❑ But, large parts of the underdeveloped and the developing world might not have the wherewithal for mitigation.
- ❑ Worryingly, there is scant acknowledgement of this fact by the UN.
- ❑ So given the reality, the true need is more focus on adaptation than mitigation..

IMPORTANT ORGANIZATIONS

23. World Resources Institute (WRI)

- ❑ It is a **global research non-profit organization** which focuses on 7 areas: food, forests, water, energy, cities, climate and ocean.
- ❑ Its mission is to move human society to live in ways that protect Earth's environment.
- ❑ It partners with local and national governments, private companies, publicly held corporations, and other non-profits organisations.



24. CITES

- ❑ It is an international agreement aimed at ensuring that international trade in specimens of wild animals and plants does not threaten their survival.
- ❑ It was drafted after a resolution was adopted **at a meeting of the members of the IUCN** in 1963.
- ❑ Convention was agreed in Washington DC, therefore, sometimes referred to as the '**Washington Convention**'.
- ❑ It entered into force on July 1, 1975, and now has 183 parties.
- ❑ States and regional economic integration organisations adhere voluntarily to CITES.
- ❑ The **Convention is legally binding** on the Parties in the sense that they are committed to implementing it.
- ❑ However, it does not take the place of national laws and it provides a framework for Parties to make domestic legislation to ensure that the Convention is implemented effectively in their national jurisdictions

Water Stress

- ❑ A new data about water stress was released by the World Resources Institute (WRI).
- ❑ One-quarter of the world's population faces extremely high levels of baseline water stress.
- ❑ India is 13th among 17 countries which faces huge water stress.
- ❑ India has more than three times the population of the other 16 extremely highly stressed countries.
- ❑ Steps taken by India to mitigate water stress including,
 - Setting up the Jal Shakti Ministry.
 - Other solutions which the WRI suggested, includes more efficient irrigation,
 - conserving and restoring lakes, floodplains
 - groundwater recharge areas; and
 - collecting and storing rainwater

AGRICULTURE AND FOREST

26. HT Bt cotton – GM Cotton

- ❑ Herbicide-tolerant Bt (HT Bt) Cotton is genetically modified cotton crop.
- ❑ It is also known as BG-III cotton, an advanced version of Bt Cotton, as it takes care of weeds problem.
- ❑ Herbicide is like a poison which is used to destroy unwanted vegetation.
- ❑ They are designed to tolerate specific broad-spectrum herbicides, which kill the surrounding weeds, but leave the cultivated crop intact.
- ❑ Currently, Bt-Cotton is the only GM crop allowed to be grown in India.
- ❑ Herbicide-Tolerant Bt-cotton has unapproved genes which is not permissible in India.
- ❑ The herbicide-resistant gene in HT cotton can spread through pollen into biodiversity system leading to transformation of weeds into super weeds.
- ❑ It will threaten growth and yields of all crops in future and leads to health hazards.

27. Nutrient Based Subsidy

- ❑ Cabinet Committee on Economic Affairs (CCEA) approves NBS rates for Phosphatic and Potassic (P&K) fertilizers.



- ❑ NBS for Fertilizers is a policy under Ministry of Chemicals and Fertilizers’.
- ❑ This will ensure the availability of P&K fertilizers to the farmers on affordable price.
- ❑ Under the scheme, a fixed amount of subsidy decided on an annual basis is provided on each grade of subsidized P&K fertilizers, except for Urea.
- ❑ The scheme allows the manufacturers, marketers, and importers to fix the MRP of the Phosphatic and Potassic fertilizers at reasonable levels.
- ❑ The MRP will be decided considering the domestic and international prices of P&K fertilizers, inventory level in the country and the exchange rates.
- ❑ In India, ‘Urea’ is the only controlled fertilizer and is sold at a statutory notified uniform sale price.

28. Zero-budget Farming

- ❑ Addressing the COP14 to the UNCCD, PM mentioned that India is focusing on Zero Budget Natural Farming (ZBNF).
- ❑ ZBNF is a farming technique that seeks to bring down input costs for farmers,
 1. by encouraging them to rely upon “Natural products”
 2. rather than spending money on pesticides and fertilisers.
- ❑ The concept behind ZBNF is that over 98% of the nutrients required by crops for photosynthesis,
 1. Carbon dioxide, Nitrogen, Water and solar energy are already available free from the air, rain, and Sun.
 2. Only the remaining 1.5% to 2% nutrients need to be taken from the soil, and
 3. Convert from “non-available” to “available” form through the action of Microorganisms.
- ❑ To help the microorganisms act, farmers must apply,
 1. Jiwamrita (microbial culture)
 2. Bijamrita (seed treatment solution),
 3. Mulching (covering plants with a layer of dried straw or fallen leaves) and
 4. Waaphasa (giving water outside the plant’s canopy)
 5. to maintain the right balance of soil temperature, moisture, and air.

29. Happy Seeder (HS) and its effects on Wheat yield

- ❑ Recently, Punjab C.M faced opposition from farmers, when he said that, using Happy Seeders (HS) for direct wheat sowing leads to increased productivity, hence farmers must stop burning paddy stubble to clear the fields.
- ❑ Happy Seeder (HS) or Turbo Happy Seeder (THS) is a tractor-operated machine.
- ❑ It is developed by the Punjab Agricultural University (PAU) in collaboration with Australian Centre for International Agricultural Research (ACIAR) for **in-situ management of paddy stubble (straw)**.
- ❑ The average wheat yields a farmer gets using traditional sowing method (after burning stubble) is 19-22 quintal/acre.
- ❑ By using Happy Seeder, in the first year, the yield was 17 q/acre but after that it s increased to 19-22 q/ acre.

30. Forest-PLUS 2.0

- ❑ Union Environment Ministry and US Agency for International Development (USAID) has launched Forest- PLUS 2.0.
- ❑ It is a 5-year programme that focuses on developing tools & techniques to bolster ecosystem management and harness ecosystem services in forest landscape management.



- ❑ It is a set of pilot projects meant to enhance sustainable forest landscape management.
- ❑ Previously, Forest-PLUS was completed in 2017. Forest-PLUS 2.0 was initiated in December 2018.
- ❑ Achievements of Forest-PLUS –
 - i. Promotion of bio-briquettes in Sikkim,
 - ii. Introduction of solar heating systems in Rampur and
 - iii. Development of an agro-forestry model in Hoshangabad
- ❑ Forest-PLUS 2.0 - It comprises pilot project in 3 landscapes - Gaya in Bihar, Thiruvananthapuram in Kerala and Medak in Telangana.
- ❑ These sites were chosen for the contrast in their landscapes – Bihar (Forest deficit area), Telangana (Relatively drier area) and Kerala (Rich in Biodiversity).
- ❑ 3 Focal points of action under the programme are,
 - i. Developing tools for multiple services in forests management
 - ii. Instruments for leveraging finance & mobilising investment from the private sector
 - iii. Economic opportunities for forest-dependent people.

31. Green Credit Scheme

- ❑ The **Forest Advisory Committee**, an apex body tasked with adjudicating requests by the industry to raze forest for commercial ends, has approved a scheme that could allow “forests” to be traded as a commodity.
- ❑ If implemented, it allows the Forest Department to outsource one of its responsibilities of reforesting to non- government agencies.
- ❑ The proposed ‘Green Credit Scheme’, as it is called, allows agencies — they could be private companies, village forest communities — to identify land and begin growing plantations.
- ❑ After three years, they would be eligible to be considered as compensatory forest land if they met the Forest Department’s criteria.
- ❑ An industry needing forestland could then approach the agency and pay it for parcels of such forested land, and this would then be transferred to the Forest Department and be recorded as forestland.
- ❑ “The participating agency will be free to trade its asset, that is plantation, in parcels, with project proponents who need forest land,”
- ❑ This is not the first time that such a scheme has been mooted.
- ❑ In 2015, a ‘Green Credit Scheme’ for degraded forest land with public-private participation was recommended, but it was not approved by the Union Environment Minister, the final authority.
- ❑ Such a scheme will encourage plantation by individuals outside the traditional forest area, will help in meeting international commitments such as sustainable development goals, and nationally determined contributions.
- ❑ In the current system, industry needs to make good the loss of forest by finding appropriate non-forest land equal to that which would be razed.

32. SC voices concern over deforestation

Chief Justice of India said:

- ❑ Deforestation is so rapid that before anyone knows everything will be lost
 - ❑ Condemned humanity’s tendency to abuse natural resources for greed and profit.
 - ❑ Estimate the value of a tree, factoring in the value of the quantum of oxygen it emits in its lifetime.
- From Prelims Point of View: Deforestation



- ❑ Large-scale removal of trees from forests (or other lands) for the facilitation of human activities.
- ❑ Result in the loss of biodiversity, damage to natural habitats, disturbances in the water cycle and soil erosion.
- ❑ Contributor to climate change and global warming. Reasons:
 - ❑ Agriculture – small-scale and large scale farming
 - ❑ Logging – cutting of trees for use as raw material
 - ❑ Mining and urban expansion – clearing of forest area for the construction of infrastructure

DISASTER MANAGEMENT RELATED ISSUES

33. Floods in Krishna River

- ❑ Krishna river, the lifeline of south-western Maharashtra, has wreaked havoc in the districts it flows through.
- ❑ Large tracts of land in Satara, Sangli, Kolhapur and Pune continue to remain under water.
- ❑ Dams dot the course of Krishna and her tributaries across Maharashtra, Karnataka, Andhra Pradesh and Telangana.
- ❑ These dams are the lifeline of western Maharashtra, and are a major supporting factor for the area's sugarcane-based economy.
- ❑ **Almatti**, a major dam on Krishna, located in Karnataka, close to the Maharashtra border, controls the flow of water into the neighbouring state.
- ❑ The position of Almatti dam is unique, as this is the first dam on Krishna river after it leaves Maharashtra.

34. Bhakra Dam

- ❑ The Bhakra Beas Management Board (BBMB), manages the Bhakra Dam on Sutlej in Nangal, Punjab.
- ❑ It has been working hard to manage Sutlej's flow, and reduce the losses downstream in the recent heavy rainfall.
- ❑ Very heavy rain have resulted in the Sutlej river overflowing and wreaking havoc in around a dozen districts of Punjab.
- ❑ The reservoir height is 1,690 feet but the upper limit for water was fixed at 1,680 feet by the BBMB.
- ❑ The dam is built on Sutlej River and it is the 2nd tallest dam in Asia after Tehri dam.
- ❑ The **Gobind Lake**, an artificial lake formed on river Sutlej can have enough amount of water to flood the whole of Chandigarh, parts of Haryana, Punjab and Delhi.
- ❑ It provides for irrigation and electricity to Haryana, Rajasthan, Gujarat, and Himachal Pradesh.

35. Drought-forecasting toolbox

- ❑ Drought-forecasting toolbox was unveiled at UNCCD COP14 event.
- ❑ It aims to track, assess and deliver relevant information concerning climatic, hydrologic and water supply trends.
- ❑ It is a kind of knowledge bank that may be used by vulnerable countries, including India,
 1. To reduce drought risk, be better prepared and effectively respond to it.
- ❑ It is developed through the close partnership among,
 1. UNCCD,



2. World Meteorological Organisation (WMO),
3. Food and Agriculture Organisation (FAO) and global bodies.

36. Monsoon in Bihar

Bihar is struggling to stay afloat in the ongoing monsoon; this distress can be traced to poor infrastructure and a lack of administrative preparedness.

- ❑ Bihar has been paralysed without communications and power.
- ❑ The State government tries to drain its streets of water and critical rations are distributed by boat and helicopter.
- ❑ Many people are struggling worse in underdeveloped areas.
- ❑ This alarming outlook calls for a far-sighted national response.
- ❑ The Union Ministry of Environment, Forest and Climate Change, was given the responsibility of coordinating the efforts of other Ministries in charge of housing, urban and rural development, water management, and agriculture, as well as State governments.

37. Addressing Changing Trend in Monsoon

What is the issue?

The drastic change in the monsoon pattern in recent years calls for a holistic and quick policy response. What is the change of trend in Indian monsoon?

- ❑ The monsoon, which, since the Indian Meteorological Department started recording it, has been arriving in India by June 1 and departing by September 30 like clockwork, is no longer behaving.
- ❑ While the pattern itself has been changing for the past several years, this year perhaps saw the most severe deviations from the normal.
- ❑ After the hottest summer on record (each month of the Indian summer was the hottest ever recorded for that year), the monsoons were delayed.
- ❑ Although they hit the Kerala coast with a delay of just three days, the monsoon didn't progress much after that, leading rise to fears of drought.
- ❑ While the season total now is in excess of normal and monsoon it is set to retreat only by mid-October (the most delayed withdrawal on record).
- ❑ Large swathes of the country, particularly in the North, are in deficit, while there has been late and massively excessive rainfall in other areas, triggering floods.

38. Bushfires in Australia

Why in news?

Australia has witnessed widespread bushfires, and the country has declared a state of emergency for the state of New South Wales (NSW) along with a catastrophic fire warning.

What does the warning mean?

- ❑ When catastrophic fire warnings are put in place, residents are supposed to leave bushfire prone areas immediately.
- ❑ Across NSW, over 600 schools were shut.

Are bushfires new to Australia?

- ❑ Bushfires are a routine occurrence in the country.



- ❑ The Australian climate is hot, dry and prone to droughts.
- ❑ So, at any time of the year, some parts of Australia are prone to bushfires.
- ❑ Such fires happen when grass, branches, trees start burning in an uncontrolled manner.
- ❑ For New South Wales and Queensland, the peak risks for bushfires is during spring and early summer, which is around November-December.

What is distinct about the present bushfire season?

- ❑ The above pattern now seems to be breaking down, and bushfires are happening outside the regular places and times.
- ❑ This bushfire season is believed to be the worst and has started even before the beginning of the Southern Hemisphere summer.
- ❑ Furthermore, these bushfires are also affecting the quality of air in the areas surrounding them.
- ❑ The readings for PM 2.5 (223) and PM 10 (399) fell in the hazardous category (readings above 200) as per the Australian scale.
- ❑ On a particular day, 75 fires were ablaze; out of these, 9 were considered at the emergency level and 37 were not contained.

CLIMATE , POLLUTION AND RELATED ISSUES

39. Sulphur Dioxide Emission

- ❑ A new report by Greenpeace India shows, India is the largest emitter of sulphur dioxide in the world. The report also includes NASA's data on the largest point sources of sulphur dioxide.
- ❑ More than 15% of all the anthropogenic SO₂ hotspots are in India, as detected by the NASA OMI (Ozone Monitoring Instrument) satellite.
- ❑ Almost all of these emissions are because of coal-burning.
- ❑ The vast majority of coal-based power plants in India lack flue-gas desulphurisation technology to reduce air pollution.

40. Global Climate Strike Movement

- ❑ Students in more than 2,000 cities across the world are holding demonstrations under the #FridaysforFuture movement.
- ❑ The #FridaysforFuture movement, also known as the "Youth Strike for Climate Movement", started in August 2018.
- ❑ It was started by Swedish student "Greta Thunberg", who skipped school to protest outside parliament for more action against climate change.
- ❑ "Thunberg" called for a strike every Friday until the Swedish parliament revised its policies towards climate change.
- ❑ Gradually, students and adults from across the world started mobilising and demonstrating in front of parliaments and local city halls in their respective countries.

41. Climate change and Bananas

- ❑ A new study has found that climate change has benefited Bananas over the last several decades.
- ❑ It also predicted that the trend will reverse, with climate change eventually causing a negative impact. Bananas are recognised as the most important crop, providing food, nutrition and income for millions across the globe.



- ❑ It thrive in warmer climates and **India is the world's largest producer and consumer** of the fruit crop.
- ❑ The study found that 27 countries, accounting for 86% of the world's dessert banana production.
 1. These countries have, on an average seen increased crop yield since 1961 by 1.37 tonnes/hectare every year.
 2. It was due to the changing climate resulting in more favourable growing conditions.
- ❑ In India, data from the National Horticulture Board show broadly consistent yields in 6 years.

42. Graded Response Action Plan - Delhi

What is the issue?

- ❑ Some stricter measures to fight air pollution will come into force in Delhi's neighbourhood starting October 15 2019, as part of the Graded Response Action Plan (GRAP).

What are the recent pollution control measures?

- ❑ In 2018, the ban on using diesel generator sets was implemented only in Delhi. In the current year (2019), it is being extended to a few NCR towns.
- ❑ Notably, many areas here see regular power cuts.
- ❑ Rural areas are, however, being left out of this stringent measure because of unreliable power supply. D The measures that are coming into force will be incremental.
- ❑ As pollution rises, and it is expected to rise as winter approaches, more measures will come into play depending on the air quality.
- ❑ All these measures are part of the Graded Response Action Plan (GRAP) that has been in effect for 2 years in Delhi and the National Capital Region (NCR).

43. Post-2020 Emission Market Scenario

What is the issue?

- ❑ With market mechanisms mandated under the Paris Agreement coming into operation, the CDM's future is uncertain.
- ❑ The next climate conference to be held in Madrid in December 2019 has the challenge of deciding how markets can be deployed in the service of climate.

What is CDM?

- ❑ The Clean Development Mechanism (CDM) is a product of the Kyoto Protocol.
- ❑ It is one of the market instruments that can help industry as well as climate.
- ❑ Under the CDM, emission-reduction projects in developing countries can earn certified emission reduction credits.
- ❑ These saleable credits can be used by industrialized countries to meet a part of their emission reduction targets under the Kyoto Protocol.

How has CDM's role been?

- ❑ Along with China and Brazil, India is a leader in CDM since its inception in 2007.
- ❑ A number of small and medium projects in the field of energy efficiency and renewable energy were set up in India in the last two decades.
- ❑ Most of these owe their origin to the financing support available from CDM.



44. Smallest Annual Ozone Hole

Why in news?

An ozone hole, which builds up over the Antarctic region this time of the year, has been found to be the smallest since it was first discovered in the 1980s.

Why is ozone important?

- ❑ Ozone is, chemically, a molecule of three oxygen atoms.
- ❑ It is found mainly in the upper atmosphere, an area called stratosphere, between 10 and 50 km from the earth's surface.
- ❑ Though it is talked of as a layer, ozone is present in the atmosphere in rather low concentrations.
- ❑ Even at places where this layer is thickest, there are not more than a few molecules of ozone for every million air molecules.
- ❑ Nevertheless, they perform a very important function.
- ❑ By absorbing the harmful ultraviolet radiations from the sun, the ozone molecules eliminate a big threat to life forms on earth.
- ❑ Notably, UV rays can cause skin cancer and other diseases and deformities, in plants and animals.

What is the concern with depletion?

- ❑ During experiments in Antarctica in the early 1980s, it was noticed that during September-November, the concentration of ozone fell considerably lower to what was recorded in the 1950s.
- ❑ Studies and satellite measurements confirmed the depletion.
- ❑ Given its significance, the ozone layer's depletion was considered as grave a threat to the planet in the 1980s and 1990s as climate change is now.
- ❑ By mid-1980s, scientists narrowed down on a class of industrial chemicals like chlorofluorocarbons, or CFCs, as the likely culprits.
- ❑ So, over the years, the threat has largely dissipated.
- ❑ This is largely because the world has banned the production and consumption of most of the ozone-depleting substances.
- ❑ However, it will take another 15-45 years for the ozone layer to be fully restored.

45. UPPCB Order on Kanpur Tanneries - Pollution in Ganga

Why in news?

The Uttar Pradesh Pollution Control Board (UPPCB) has ordered tanneries in Kanpur to shut down. What is the order?

- ❑ In August 2019, UPPCB had permitted 126 tanneries to run at 50% capacity, provided they fulfilled the pollution norms.
- ❑ But, a report of the Ganga monitoring wing of the National Green Tribunal found the shortcomings in this.
- ❑ It said that effluents from tanneries, located in Kanpur's Jajmau industrial area, were being released into the river.
- ❑ As a result, tanneries have now been ordered to remain closed.

46. Vembanad Lake

- ❑ The Lake is also known as Vembanad Kayal', Vembanad Kol', Punnamada Lake' and Kochi Lake'. It is the largest in Kerala and the longest in India.



- ❑ **Nehru Trophy Boat Race** is held every year in Vembanad Lake.
- ❑ It is the Wetland of international importance, as defined by the Ramsar Convention.
- ❑ The **Kumarakom Bird Sanctuary** is located on the east coast of the lake.
- ❑ Plastic pollution is the major threat to the lake ecosystem and to the entire biodiversity,
- ❑ So, houseboats and resorts in the district have started replacing single-use plastic water bottles with glass jars and glass bottles.

47. In Kerala, 2,130 islands brought under CRZ regime

- ❑ 2,130 backwater islands of Kerala, including Maradu, have been brought under the Coastal Regulation Zone (CRZ) regime thereby imposing curbs on development activities.
- ❑ This is for the first time that the list of the Kerala islands is being drawn up.

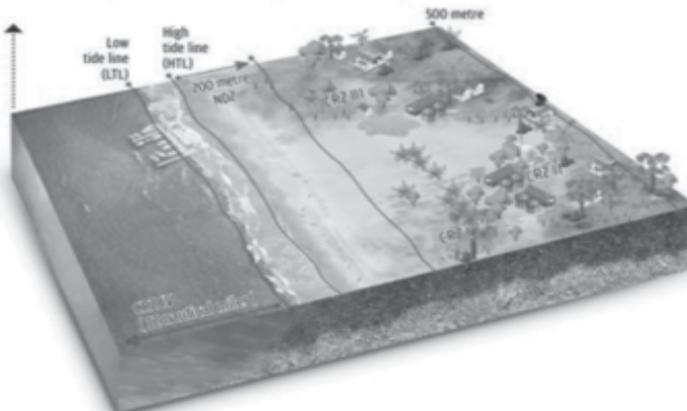
Diluted by design

Hotels, resorts and temporary tourism facilities can now be built closer to the shore; mangroves to make way for ports, harbours

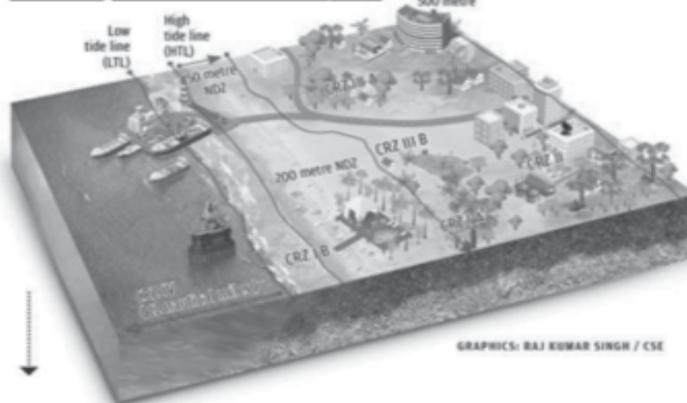
Coastal Regulation Zone Notification, 2011

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- CRZ I: Eco-sensitive and intertidal areas
- CRZ II: Areas which have been developed up to or close to the shore
- CRZ III: Areas that are relatively undisturbed and do not fall under CRZ-I or CRZ-II
- CRZ IV: Area between Low Tide Line and 12 nautical miles into the sea/ tidal influenced waterbodies
- NDZ: No development zone that extends up to 200 m from High Tide Line towards land in CRZ-III area



Coastal Regulation Zone Notification, 2018



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- CRZ I A: Eco-sensitive areas
- CRZ I B: Inter-tidal areas
- CRZ II: Areas which have been developed up to or close to the shore
- CRZ II A: CRZ-II areas, where the population density is more than 2,361 per sq km as per 2011 Census
- CRZ II B: Areas with population density of less than 2,361 per sq km, as per 2011 Census
- CRZ IV A: 12 nautical miles from the Low Tide Line towards the sea
- CRZ IV B: Tidal influenced waterbodies
- NDZ: 50 metres from High Tide Line in CRZ III A areas, 200 m from HTL in CRZ III B areas



- ❑ The list of the islands was prepared by the National Centre for Earth Science Studies Coastal Regulation Zones (CRZ)
- ❑ CRZ Notification 2018 is based on the recommendations of Shailesh Nayak committee.
- ❑ Coastal stretches of seas, bays, estuaries, creeks, rivers, and backwaters were declared as CRZs under coastal zone regulation notification in 1991. Recently in 2018 new Coastal Zone Regulation were brought.

48. Revamping Haryana's Johads - Model Ponds

Why in news?

- ❑ Haryana's Johads (**community-owned water conservation structures**) are all set for a revamp by the State government.
- ❑ The Pond and Waste Management Authority, governed by Haryana's Pond and Waste Management Authority Act is working on rehabilitation.

What is the Pond and Waste Management Authority Act?

- ❑ The objective of the Act is to establish an authority in the State-
 - i. for development, protection, rejuvenation, conservation, construction and management of pond
 - ii. for utilisation of pond water and treatment thereof
 - iii. to manage and utilise treated effluent of sewage effluent treatment plants for irrigation, thereby reducing over-exploitation of ground water
- ❑ The Authority's primary functions are:
 - i. to conduct survey and study the ponds, their boundaries and protected areas
 - ii. to analyze pond water for ascertaining its suitability for irrigation and other uses
 - iii. to take steps for regulation, control, protection, cleaning, beautification, conservation, reclamation, regeneration, restoration and construction of ponds
 - iv. to make environmental impact assessment of the ponds
 - v. to develop infrastructure (pumping machinery, channels and pipe systems for pond water utilization, sewage effluent treatment plants)

GENERAL TOPICS

49. Rare Earth Metals

- ❑ Rare Earth Elements or Rare Earth Metals are a set of 17 chemical elements in the periodic table that have similar chemical properties.
- ❑ It includes 15 lanthanides plus scandium and yttrium.
- ❑ One of the Rare Earths, promethium, is radioactive.
- ❑ Some of the applications of Rare Earth Metals are,
 - i. Cerium is used in Space shuttle components, jet engine turbines and drones
 - ii. Scandium is used in Televisions and fluorescent lamps
 - iii. Yttrium is used in drugs to treat rheumatoid arthritis and cancer
 - iv. Other applications - Technologies of consumer electronics, computers and networks, communications, clean energy, advanced transportation, healthcare, environmental mitigation, and national defence.



- ❑ China dominates the production of these elements.
- ❑ Recent Development - The United States Army has planned to fund the construction of a Rare Earths processing facility,
- ❑ This is to secure the domestic supply of minerals that are used to make military weapons and electronics.
- ❑ The decision comes after China threatened to stop exporting Rare Earth materials to the US amid the ongoing trade war between the countries.
- ❑ This will be the first financial investment by the US military into commercial-scale Rare Earths production since the Manhattan Project to build the first atomic bomb during World War II.

50. India's Deep Sea Exploration Project

- ❑ Indian scientists are preparing to set sail to a region of the Indian Ocean, off the East coast of Madagascar, where they believe are plenty of valuable minerals to pick up.
- ❑ At a point in the Indian Ocean off the coast of Madagascar, around 26° South, three mid-ocean ridges intersect, This is estimated to be a highly productive area.
- ❑ The massive deposits "can range from several thousands to 100 million tonnes.
- ❑ The sea-bed sampling that NCPOR is planning for next year will pinpoint the best areas for further exploration and mining.
- ❑ This region has been proven to contain rich deposits of polymetallic nodules that hold copper and cobalt.
- ❑ NCPOR has "identified a dozen locations", potential candidates for detailed exploration for tapping into minerals spewed by 'hydrothermal vents'.

Samudrayaan

- ❑ The machine, currently stationed at NIOT, will move on tracks, but in order they don't get mired into the seabed, the vehicle has buoys on it to keep pulling it upwards.
- ❑ This machine is a precursor to another equipment, informally christened 'Samudrayaan', which will contain a module to hold human beings.

51. Dolpin Census

- ❑ The dolphin census in Odisha coast was taken up by the Chilika Development Authority (CDA).
- ❑ According to last year's census, the Irrawaddy dolphin population in Chilika was 151, by which Chilika is considered as the highest single lagoon dolphin population in the world.
- ❑ The census was conducted using hydrophones.
- ❑ A hydrophone is a microphone designed to be used underwater for recording or listening to underwater sound.
- ❑ Most hydrophones are based on a piezoelectric transducer that generates an electric potential when subjected to a pressure change, such as a sound wave.
- ❑ A hydrophone can detect airborne sounds, but will be insensitive because it is designed to match the acoustic impedance of water, a denser fluid than air.

52. Bio-Rock

- ❑ Bio rock is the name given to the substance formed by electro accumulation of minerals dissolved in seawater on steel structures that are lowered onto the sea bed.
- ❑ The technology works by passing a small amount of electrical current through electrodes in the water.



- ❑ When a positively charged anode and negatively charged cathode are placed on the sea floor, with an electric current flowing between them, calcium ions combine with carbonate ions and adhere to the structure (cathode).
- ❑ This results in calcium carbonate formation, Coral larvae adhere to the CaCO₃ and grow quickly.
- ❑ Fragments of broken corals are tied to the bio rock structure, where they are able to grow at least four to six times faster than their actual growth as they need not spend their energy in building their own calcium carbonate skeletons.
- ❑ The Zoological Survey of India (ZSI), with help from Gujarat's forest department, is attempting for the first time a process to restore coral reefs.
- ❑ Under the plan a biorock structure or mineral accretion technology was installed one nautical mile off the **Mithapur coast in the Gulf of Kachchh**.



GS MENTORS

