

**GS Paper - 3****Environment and Biodiversity – Oct'18****Indian Plant Species In IUCN Threat Categories****In News**

Recently, scientists identified the threat status of 59 Indian plant species based on criteria used by the **International Union for Conservation of Nature (IUCN)**.

**Why Is It Important**

- Quantifying threat levels of species can be **crucial for their conservation**. For instance, funding agencies often consider the threat status of species provided in IUCN's Red List (a catalogue of the world's threatened species), to sponsor research and conservation activities to save them.
- Around **2,700 plant species** in India are at risk but very few have been assessed by the IUCN.
- To bridge this gap, experts from several institutes **prioritized 59 plant species that are at risk of “elimination” if the threat levels they face are not assessed** soon. They assigned each species a threat status based on IUCN criteria.

**Different Methods Of Classification**

- This included the extent and area of each plant's geographical range, which revealed that 10 species are critically endangered, 18 endangered, six vulnerable, five near threatened and one species each are data deficient and least concern.
- The threat levels of some plants have been altered as a result; for instance the palm *Bentinckia nicobarica* is currently listed as **endangered**; however the new study suggests it is critically endangered based on its distributional attributes (the palm is reported only from the Great Nicobar Island).
- Based on population sizes and numbers of mature individuals remaining in the wild (using field surveys that also revealed that habitat loss was a huge factor affecting many declining plant populations), the team classified 10 species as critically endangered, three as endangered and five as vulnerable. **Germination tests in the laboratory also suggest that factors such as low seed viability could have caused declines in the wild too.**
- The study initiated in 2012 to assign threat status to select plants, is published in *Current Science*. The study also generated data on 38 species that have never been assessed by the IUCN.

**The International Union for Conservation of Nature (IUCN)** is a membership Union uniquely composed of both government and civil society organisations. It provides public, private and non-governmental organisations with the knowledge and tools that enable human progress, economic development and nature conservation to take place together. Created in 1948, IUCN has evolved into the world's largest and most diverse environmental network. IUCN is the global authority on the status of the natural world and the measures needed to safeguard it.

## **Delhi's Air Quality Set To Worsen**

### **In News**

Air quality in the national capital region is likely to deteriorate as **burning of paddy stubble** by farmers in Punjab and Haryana intensifies.

### **Current Scenario**

- According to the environment ministry, fire-related incidents are 75% and 40% lower in Punjab and Haryana, respectively, so far but that may not be a reason to cheer.
- The paddy grown in summer in Punjab was sown late this year by a week, while both Punjab and Haryana witnessed unseasonal rains in end-September, which has delayed harvesting by about 10 days because of a rise in crop moisture levels. **Air quality is likely to worsen as more farmers begin harvesting.**
- The situation is however likely to be better than last year when a dust storm, **stubble burning** and **Diwali celebrations** took place around 19 October. This year, Diwali falls on 7 November.

An AQI between 0-50 is considered 'good', 51-100 'satisfactory', 101-200 'moderate', 201-300 'poor', 301-400 'very poor', and 401-500 'severe'. According to the **System of Air Quality and Weather Forecasting and Research (SAFAR)**, air quality is set to worsen, as levels of two main pollutants, PM 2.5 and PM 10, is likely to increase in the coming days.

### **Major Cause: Stubble Burning**

- Farmers in Punjab and Haryana usually burn the paddy straw after combine harvesters leave a 7-8 inch stubble on the field following harvest, and farmers have to prepare the field for planting of wheat crop in two to three weeks.
- As the straw cannot be fed to cattle, the way out is on-field management of stubble by using machines such as straw management system, mulchers, rotavators and happy seeders.
- According to the agriculture ministry, 23 mt of paddy straw is burnt in Punjab, Haryana and UP every year, shooting up carbon dioxide levels in the air by 70%, triggering respiratory problems.

### **Government Steps**

- The central and state **governments have announced 50-80% subsidy on purchase of these machineries but have seen limited success.** The machinery is very expensive despite the subsidy and manufacturers raised prices after these subsidies were announced.
- Farmer in these states are demanding a direct financial assistance of ₹200 per quintal of paddy harvested to account for straw management expenses.

The best way forward would be to provide the machines on a lease basis by government through appropriate farming community bodies.

## **Rafting Expedition "Mission Gange"**

### **In News**

- National Mission for Clean Ganga (NMCG) has partnered with Tata Steel Adventure Foundation (TSAF) to launch a month-long rafting expedition of a team of 40 members which will be led by **the first Indian woman to scale Mount Everest Ms. Bachendri Pal**.
- The expedition encompasses 8 major towns including Bijnor, Farrukhabad, Kanpur, Allahabad, Varanasi and Buxar. It will conclude in Patna in Bihar on 30<sup>th</sup> October.
- During the month-long expedition, the team will stop at all major locations and carry out cleaning drives in coordination with NMCG stakeholders like *Ganga Vichar Manch, Ganga Praharis, District Ganga Committees, local voluntary organizations and people from all walks of life*.
- Awareness campaigns will be conducted in schools to sensitize students towards Ganga cleaning. Events such as Ganga Chaupal will be conducted along the Ganga to create conversations between stakeholders.”

### **What Is Killing Gujarat's Lions**

#### **In News**

- A 26-member strong pride of the endangered Asiatic lions in Gujarat has almost been wiped out with 23 lions dying in the last 20 days and the three surviving members of the pride battling for life.
- 184 Lions have died in Gujarat since 2006. Recently the lions succumbed to the deadly infection of canine distemper virus (CDV) and tick-borne babesiosis.
- The Gir sanctuary in Gujarat is the last habitat of the Asiatic lion of which 500-600 survive.
- According to the State Forest Department, of the 23 deaths, four lions died of CDV, and 17 were killed by a tick-borne infection. The cause of death of two lions is yet to be ascertained.

#### **What Is Canine Distemper Disease**

Canine Distemper is a virus that affects a Dog's gastrointestinal, respiratory and central nervous systems as well as the conjunctival membranes of the eye.

#### **What Is Babesiosis**

Caused by Babesia, an apicomplexan parasite that infects red blood cells, transmitted by ticks. Symptoms include dullness, weakness, lethargy, inappetence, mild paresis of hind quarters.

#### **Earlier Warnings**

- Two institutes , CADRAD and and IVRI in 2011 reported a lion death in Gir due to highly infectious PPRV (Peste des Petits Ruminant Virus).
- CADRAD suggested active viral surveillance in neighbouring Gir villages for PPRV which is same type as CDV.
- In 1994, 1,000 lions at Tanzania's Serengeti National Park-a third of the lion population there - were wiped out by CDV. The virus had apparently spread through dogs

#### **Actin Plan**

1. Vaccinate Dogs in the vicinity against CDV , like in Serengeti where close to 30,000 dogs were vaccinated.
2. Tick Control measures among domesticated bovine animals, goats and sheep in Gir's vicinity.

3. A 270-member force of the Gujarat Forest Department, divided into 64 teams, has fanned out to detect diseases in the Asiatic lions of Gir. The teams will observe lions and if found ill, they will be given medical treatment.

### **The Relocation Debate**

- The current crisis has revived the debate over the relocation of the exploding lion population at Gir.
- The Gujarat government has been resisting their relocation to the Kuno Wildlife Sanctuary, also known as Palpur-Kuno, in Madhya Pradesh -- as ordered by the Supreme Court way back in 2013.
- It is taking cover behind the plea that lions would be at risk in Kuno as the sanctuary is not adhering to guidelines laid down by the International Union for Conservation of Nature (IUCN).
- Top wildlife experts, however, feel that relocating a few prides to Kuno sanctuary is critical for the long-term protection of the Asiatic lion.
- The sanctuary area of 345 sq. km is well stocked with prey species and could sustain over 50 lions -- perhaps more if the buffer area is taken into consideration.

### **Why Gujarat Says No**

- Despite the latest controversy, Gujarat has declared that the state is well-equipped to handle its lions.
- According to state wildlife officials, the 260-odd lions that migrated from Gir to the bordering areas of Bhavnagar, Amreli and Gir-Somnath have moved to forested areas on the Gir periphery. These include lion-friendly terrains like the Mitiyala Wildlife Sanctuary in Bhavnagar and Pania Wildlife Sanctuary in Amreli. There is no man animal conflict.
- Further, the government is of the opinion that Madhya Pradesh is looking at the issue from just a tourism point of view.
- Some officials in Gujarat are of the view that the lions that succumbed to CDV and BP had strayed out to the sparse jungles or non-forest areas and preyed on infected cattle and domestic animals. They prefer the creation of a suitable habitat with prey base in the areas the lions have moved to rather than a translocation to Kuno.

There is a census of lions in Gir every five years. The last census at Gir (2015) put the lion population at 523, of which 304 resided within the sanctuary and national park while the remaining number were permanently established outside Gir, spread over another 1,500 sq. km that included three smaller sanctuaries and an expanse of non-jungle area along the coastal belt. Since the last census, the lion population is estimated to have increased to nearly 575.

### **Windmills Not So Green For Wildlife**

#### **In News**

- Researchers find birds, animals moving from turbine locations to forest fringes.
- Windmills are seen as a source of green energy, but researchers say they pose a threat to wildlife in forests through collisions and noise.
- The impact of the giant structures in Karnataka was studied by researchers from **Salim Ali Centre for Ornithology and Natural History (SACON)** during a two-year project. They found

that windmills killed birds and bats in collisions, and that birds and mammals also moved away due to the noise.

- The noise levels near windmills go up to 85 decibels (dB), the equivalent of large trucks. The drone of a turbine, which operates day and night, is above 70dB. By comparison, noise in urban areas is 55 dB and even in industrial areas, is lower at 75dB. Ambient noise in forests is less than 40 dB.
- Such avoidance and movement to forest fringes might increase conflict with humans. This calls for protocols and policy guidelines before diverting forest land for wind farms.
- In Chitradurg area, perhaps the only one where three types of antelopes are found: four-horned, chinkara, and blackbuck. And all these are moving away towards fringes of forests.
- Following them are predators such as wolves and small carnivores. This is bound to increase conflict. For certain small herbivores such as hare, the predator-free patches represented safety.

### **India's First Dolphin Research Centre**

#### **In News**

Much-awaited National Dolphin Research Centre (NDRC), India's and Asia's first, would be a reality here soon.

#### **Key Highlights**

- After remaining in a limbo for nearly six years on one or the other pretext, the NDRC is likely to be set up on the banks of the Ganga river in the Patna University premises.
- It will play an important role in strengthening conservation efforts and research to save the endangered mammal.
- **A well-reputed expert on Gangetic river dolphins, R.K. Sinha**, who is currently Vice Chancellor of the Nalanda Open University, said the NDRC will prove a boon for research and conservation of dolphin.
- **Sinha, known as the Dolphin Man** for his research on Gangetic dolphins as professor in Patna University.

#### **Important Points About The Gangetic River Dolphin**

- Gangetic river dolphin is India's national aquatic animal but frequently falls prey to poachers and is sometimes killed inadvertently after being trapped in plastic fishing nets and hit by mechanized boats.
- The mammals are being killed at an alarming rate with wildlife officials saying poachers covet them for their flesh, fat and oil.
- **R K Sinha, who has been conferred a Padma Shri** for his research on dolphins, said the mammal's presence signals a healthy river ecosystem. Dolphins prefer water that is at least 5-8 feet deep. They are usually found in turbulent waters where there is enough fish for them to feed on.
- Gangetic dolphins prefer deep water with adjoining shallow water. They live in a zone where there is little or no current that helps them save energy. If they sense danger, they can go into

deep waters. The dolphins swim from the no-current zone to the edges to hunt for fish and return.

- The Vikramshila Gangetic Dolphin Sanctuary, India's only dolphin sanctuary, spread over 50 km along the Ganges, is located in Bihar's Bhagalpur district.
- Gangetic river dolphins fall under **Schedule I of the Indian Wildlife (Protection) Act** and have been declared an **endangered species** by the International Union for Conservation of Nature (IUCN).
- The Gangetic river dolphin is one of the four freshwater dolphin species in the world. The other three are found in the Yangtze river, the Indus river in Pakistan and the Amazon river.
- The Gangetic river species -- found in India, Bangladesh and Nepal -- is almost **completely blind**. It finds its way and prey using echoes -- with sound being everything for them to navigate, feed, escape danger, find mates, breed, nurse babies and play.
- The last survey was conducted in 2012 and nearly 1,500 dolphins were counted.

### **Western Ghats Is Home To The Eurasian Otter**

#### **In News**

- It has taken more than 70 years to **confirm the presence of the elusive Eurasian otter — one of the least-known of India's three otter species** — in the Western Ghats.
- Ironically, researchers found the dead otter after a vehicle ran over it near a fragmented rainforest in Tamil Nadu's Valparai.
- Scientists affiliated with the Laboratory for Conservation of Endangered Species at Hyderabad's Centre for Cellular and Molecular Biology conducted genetic analyses of its tail tissue to confirm that it was the **Eurasian otter (Lutra lutra)**.
- Though the Eurasian otter has been recorded historically from the Western Ghats (Coorg in Karnataka and Tamil Nadu's Nilgiri and Palani hill ranges), this is the first photographic and genetic confirmation of its presence here.
- While the species is widespread across Europe, northern Africa and several south Asian countries, it is not as frequently sighted as smooth-coated or small-clawed otters in India.
- **Similar physical features make it very difficult to identify otter species in the wild.** Detailed surveys and studies to ascertain this are the need of the hour.
- This paucity of information doesn't help, with otters facing multiple threats. **Otter roadkills — caused by increasing fragmentation of forests and modification of their original habitats — are becoming increasingly common now.**
- Though protected by the Wildlife Protection Act (1972), otters are often illegally poached for pelts.

### **Centre Sets 'Minimum River Flows' For The Ganga**

#### **In News**

- In a first, the Union government has mandated the minimum quantity of water — or ecological flow as it's called in scientific circles — that various stretches of the Ganga must necessarily have all through the year.
- The new norms would require hydropower projects located along the river to modify their operations so as to ensure they are in compliance.

### Key Highlights

- **The upper stretches of the Ganga — from its origins in the glaciers and until Haridwar — would have to maintain:**
  - 20% of the monthly average flow of the preceding 10-days between November and March, which is the dry season;
  - 25% of the average during the 'lean season' of October, April and May;
  - 30% of monthly average during the monsoon months of June-September.
- For the main stem of the Ganga — from Haridwar in Uttarakhand to Unnao, Uttar Pradesh — **the notification specifies minimum flow at various barrages:**
  - Bhimgoda (Haridwar) must ensure a minimum of 36 cubic metres per second (cumecs) between October-May, and 57 cumecs in the monsoon;
  - and the barrages at Bijnor, Narora and Kanpur must maintain a minimum of 24 cumecs in the non-monsoon months of October-May, and 48 cumecs during the monsoon months of June-September.
- Power projects that do not meet these norms as yet would be given three years to comply and “mini and micro projects” would be exempt from these requirements.
- The **Central Water Commission** would be the designated authority to collect relevant data and submit flow monitoring-cum-compliance reports on a quarterly basis to the NMCG.

**Environmental flows** describe the quantity, timing, and quality of **water flows** required to sustain freshwater and estuarine ecosystems and the human livelihoods and well-being that depend on these ecosystems. In the Indian context river flows required for cultural and spiritual needs assumes significance. In India, the need for environmental flows has emerged from the hundreds of large dams being planned in the Himalayan rivers for hydro power generation. The cascades of dams planned across the Lohit, Dibang River in the Brahmaputra River, the Alaknanda and Bhagirathi River in the Ganga basin and the Teesta in Sikkim for example, would end up in the rivers flowing more through tunnels and pen stocks rather than the river channel

### Prakriti

#### In News

Two Memoranda of Understanding (MoU) were signed by Indian Council of Forestry Research and Education (ICFRE), Dehradun, with Navodaya Vidyalaya Samiti (NVS) and Kendriya Vidyalaya Sangathan (KVS).

#### Objective

- The MoUs have been signed to launch the programme “**PRAKRITI**” with the objective to **promote awareness about forests and environment, to stimulate interest among the**

**students of NVS and KVS in maintaining a balanced environment** and for acquiring skills that reflect care and protection towards forests, environment and society.

- Another objective is to provide a platform to school children to learn practical skills towards judicious use of our resources and to mobilize a cadre of youth for raising a peoples' movement committed to conservation of forest and environment.

#### **About ICFRE**

- **ICFRE is an autonomous Council under the Ministry of Environment, Forest and Climate Change.**
- ICFRE, through its nine Institutes and five Centres located across the country, is guiding, promoting and coordinating forestry research, extension and education at the national level.
- Currently ICFRE is focusing on contemporary issues of national and international importance particularly in the areas of climate change, forest productivity, biodiversity conservation and skill development.

- **Navodaya Vidyalaya Samiti was established with the primary objective to provide modern quality education to talented children, predominantly from the rural areas, without regard to their family's socio-economic condition.** At present, it has 660 functional residential schools.
- Kendriya Vidyalaya Sangathan was established in 1963 to provide uninterrupted education to wards of the transferable Central Government employees. KVS established Kendriya Vidyalayas all over the country to impart quality education, promotion of national integration, adventure activities, physical education etc.

#### **UNDP Supported Project To Boost Climate Resilience**

##### **In News**

- The Government of India took an important step toward its goals for low-carbon, climate-resilient development with the approval of a US\$43 million grant from the **Green Climate Fund**.
- It will support climate resilience of millions of **people living in the coastal states of Andhra Pradesh, Maharashtra and Odisha.**

##### **About The Project**

- The new project will be supported through **the United Nations Development Programme (UNDP), and is an essential step for India in reaching its goals outlined in the Paris Agreement and 2030 Agenda for Sustainable Development.**
- These global compacts call on every nation to end poverty and hunger by 2030, and to take strong action to ensure no one is left behind in protecting vulnerable people from the extreme impacts of climate change.
- People are expected to directly benefit from livelihoods support and indirectly benefitting from improved shoreline protection.
- **In reaching the Sustainable Development Goals for gender equality and reduced inequalities,** the project is focused on providing tangible benefits for women, female-headed households, young people and the elderly, and members of Scheduled Castes and Tribes.

- **The Government of India will finance an additional US\$86.8 million toward the new project** to mainstream and accelerate the impacts of the Green Climate Fund grant.
- **To be led by the Ministry of Environment, Forest and Climate Change, with support from UNDP, the six-year project** will work with communities in **restoring ecosystems** and promoting climate-resilient livelihood options, such as the sustainable farming of mud crabs.
- **To protect life on land and below water as outlined in the 2030 Agenda, project activities will focus on the restoration and conservation of over 15,000 hectares of mangroves, coral reefs, seagrasses and saltmarshes.** Communities, including local youth, will be trained to work with scientists in monitoring ecosystem health and coastal ecology.
- The project is set to begin in early 2019 and run to the end of 2024.

**Note**

- India's coastline is expected to be among the regions most affected by climate change globally. The Bay of Bengal and the Arabian Sea are both predicted to be subject to **extreme climate variability, with the frequency and intensity of cyclones and extreme weather events projected to increase, particularly on the eastern coastline.**
- Climate change projections predict a 2°C rise in average annual temperatures across South Asia by the mid-21st century, exceeding 3°C by the late 21st century. According to a report from the World Bank, an increase in global mean surface temperatures of 2°C will make India's monsoon highly unpredictable, while a 4°C increase would result in an extremely wet monsoon (which currently has a chance of occurring only once in 100 years) occurring every 10 years by the end of the century.
- India has about **6,740 km<sup>2</sup> of mangroves**, including some of the largest mangrove forests in the world. Mangrove cover along India's coastline has decreased by 50% in some areas, largely because of human pressures, including alteration of flow of freshwater from upstream. Sea-level rise is predicted to result in further reductions
- **SDG Goal 13: Take urgent action to combat climate change and its impact.**

- **The Green Climate Fund (GCF) is a new global fund created to support the efforts of developing countries to respond to the challenge of climate change.** GCF helps developing countries limit or reduce their greenhouse gas (GHG) emissions and adapt to climate change. It seeks to promote a paradigm shift to low-emission and climate-resilient developments, taking into account the needs of nations that are particularly vulnerable to climate change impacts.
- **It was set up by the 194 countries who are parties to the United Nations Framework Convention on Climate Change (UNFCCC) in 2010**, as part of the Convention's financial mechanism. It aims to deliver equal amounts of funding to mitigation and adaptation, while being guided by the Convention's principles and provisions.
- **Timeline -**
  - **2009: The general concept for GCF is first proposed at the Conference of the Parties (COP) to the UNFCCC in Copenhagen, Denmark (COP 15).**
  - **2010: The COP in Cancun, Mexico (COP 16), decides to establish GCF.**

- **2011: GCF's Governing Instrument is adopted in Durban, South Africa (COP 17), where it is given the mandate to make "an ambitious contribution to the global efforts towards attaining the goals set by the international community to combat climate change."**
- **2013: The Fund establishes its permanent headquarters in Songdo, Republic of Korea, in December 2013.**
- **2015: The first investment decisions are taken, including both mitigation and adaptation projects, meeting the target set by the UNFCCC in advance of the Paris COP. 195 countries agree to the historic Paris Agreement, which GCF now serves as a financial mechanism of the Convention**

## **Unclogging Our Oceans**

### **In News**

The problem of **ghost gear (any fishing equipment that has been lost, discarded or abandoned in water bodies)** has grown from fishing fallout that people had not heard of to one that is now difficult to ignore.

### **Consequences Of Marine Debris**

- Between 2011 and 2018 alone, the Olive Ridley Project, a U.K. registered charity that removes ghost nets and protects sea turtles, recorded 601 sea turtles being entangled in ghost gear near the Maldives, of which 528 were Olive Ridges.
- Other casualties worldwide include whales, dolphins, sharks and even pelagic birds.
- There are still no data pertaining to the extent of prevalence of ghost gear off India's coast. And data is crucial here, for the detrimental effects of these nets also spillover into other countries and oceans.
- Ghost nets are often 'ghost fishers'. Ocean currents carry them for thousands of km across the ocean floor, ensnaring, injuring and drowning marine life and damaging live corals along the way.

### **Government Policy On Net Management**

- According to the scientists, the government is also currently preparing a national ghost net management policy.
- While that is an extremely welcome and timely move to tackle the growing ghost gear phenomenon, a larger question remains. When bigger violations, such as large vessels fishing where they are not supposed to, are not checked, would a policy on the management of ghost nets be implemented.
- But the consequences of overfishing, using nets of the smallest mesh size, and illegal fishing are far less visible, though more worrying. Entire fishing communities are affected by these actions, especially in developing countries like India where the demand for fish keeps rising.

### **Transforming Used Nets**

- In countries like Canada and Thailand, fishermen retain their used nets; these are recycled into yarn to craft socks and even carpet tiles.

- For the first time in a developing country, a gear-marking programme is being tested in Indonesia so that the trajectory of gear, if it drifts away, can be studied better.
- Outreach and education among fishing communities would be crucial along with policy-level changes.

### **Way forward**

In one instance in India, **ghost nets hauled from Kerala's Kollam have been used to pave roads**. This shows that transformation is possible, though more efforts to make the process more organised across the over 7,500 km of India's coasts, as well as inland water bodies, are the need of the hour.

## **STAPCOR – 2018**

### **In News**

- The International Conference on **Status and Protection of Coral Reefs** (STAPCOR – 2018) was held at Bangaram coral Island of Union Territory of Lakshadweep.
- **Theme: “Reef for Life”**
- A coral reef is an underwater ecosystem characterized by reef-building corals. Reefs are formed of colonies of coral polyps held together by calcium carbonate. Most coral reefs are built from stony corals, whose polyps cluster in groups.

### **Key Highlights**

- 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 first International Year Of Reef (IYOR) was designated in 1997 in response to the increasing threats on coral reefs and associated ecosystems. 2007 was designated as the second IYOR.
- 2018 has been designated as 3<sup>rd</sup> decadal International Year Of Reef.
- Lakshadweep will establish an International Atoll Research Centre, with world class infrastructures for scientific research on corals.

## **Citizen-Science Repository of Indian Mammals**

### **In News**

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)**, which is an online, peer- reviewed, freely-accessible portal.

### **About The Repository**

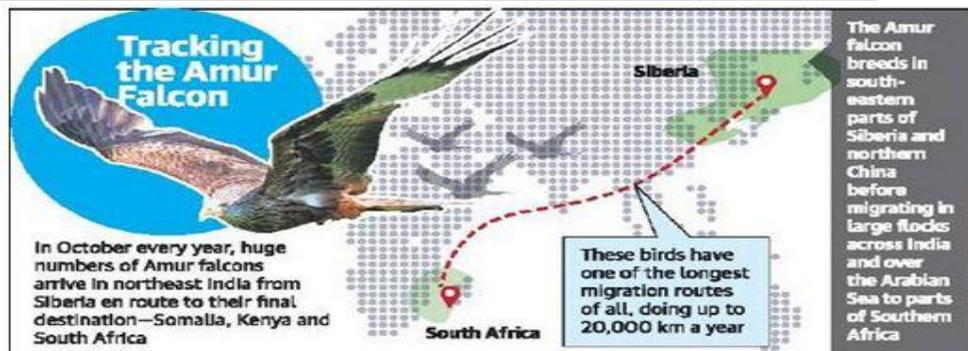
- The website provides an opportunity to any person to upload geotagged photographic observations about mammals with information on habitat age of the observed individual.

- Over time, these observations will be reviewed by subject experts and uploaded on the website.
- **The website, [www.mammalsofindia.org](http://www.mammalsofindia.org), aims to develop individual species pages for all Indian mammals with information on identification, variation, distribution, breeding and non-breeding ecology and species conservation.**
- Citizens can also **contribute** to the cause of science by sharing the picture of the animal on a specific website, providing the location of spotting. So far, there was no portal exclusively for mammals. These photographic records will help in having distribution map of mammals in the country.
- Under the project, a popular citizen-science website on butterflies of India **[www.ifoundbutterflies.org](http://www.ifoundbutterflies.org)** had got to 55,000 reference images in eight years. Under the same project websites dedicated Moths of India, Cicacds of India, Odonatas of India (dragonflies and damselflies), Reptiles of India, Amphibians of India and Birds of India are operational.
- 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.

### Siberian Visitors in Assam-Meghalaya Border

#### **In News**

- 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.



- While 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.
- 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.

#### **Common Cause**

- But these disputes are forgotten when 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 ₹25,000 for anyone caught ensnaring or killing the birds.

#### **Birdwatchers Paradise**

- **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.

The Amur falcon (*Falco amurensis*), with **Least Concerned as IUCN** status, is a small raptor of the falcon family. The raptors breed in southeastern Siberia and northern China, and migrate in millions across India and then over the Indian Ocean to southern Africa before returning to Mongolia and Siberia, making their 22,000-kilometre migratory route one of the longest amongst all avian species. The falcons eat various winged termites and other insects that destroy crops thus helping farmers.

### **CSIR Develops Less Polluting Firecrackers**

#### **In News**

- The new crackers have been developed by scientists of two national labs - Central Electrochemical Research Institute (CECRI) based in Karaikudi, Tamil Nadu and National Environmental Engineering Research Institute (NEERI) in Nagpur.
- These crackers have been named as safe water releaser (**SWAS**), **safe minimal aluminium (SAFAL)** and **safe thermite cracker (STAR)**.
- **It has 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.
- **SWAS crackers eliminates usage of (KNO<sub>3</sub>) Potassium nitrate and Sulphur** with consequent reduction in particulate matter (30-35%) SO<sub>2</sub> and NO<sub>x</sub>. It has matching sound intensity with commercial crackers in the range of 105-110 dBA.
- **STAR** eliminates usage of KNO<sub>3</sub> and S with consequent reduction in particulate matter (35-40%), SO<sub>2</sub> and NO<sub>x</sub>. 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
- **Functional prototypes of flower pots for substitution of BaNO<sub>3</sub>** (Barium nitrate) by low cost eco-friendly materials have been developed with significant reduction in particulate matter (30-35%).
- **E-crackers-** CSIR-CEERI, being an electronics laboratory, is developing safe and pollution free technology of electronic crackers (E-crackers) to meet latent social aspiration of enjoying fireworks. It includes various products like E-Ladi, E-Anar, system for E-cracker show etc. At present CSIR-CEERI is ready with the laboratory level prototype of E-Ladi.
- **E-Ladi is based on high-voltage electrostatic discharge** to generate light/sound effect. It is triggered by providing heat to the thermal switch which will give the excitement of firing the conventional cracker. The E-Ladi is also programmable to give various light/sound effect.

**Flower pot** essentially comprises of alkali nitrates, Aluminium powders of different grain sizes and in some cases the binder to enhance luminescence.

Aluminium has been used as a primary heat source and to produce flash. In order to reduce the ignition temperature and subsequently to minimize the particulate matter, **Magnesium could be a viable alternative to Aluminium.**

## **Living Planet Report Earth's Wild Animal Population Plummets 60% In 44 Years: WWF**

### **In News**

- Living The Living Planet Report 2018 has been published by the World Wide Fund for Nature (WWF).
- It is being published every two years by the WWF since 1998. It is based on the Living Planet Index and ecological footprint calculations.

### **Key Findings of WWF's Living Planet Report**

- Runaway consumption” has decimated global wildlife, triggered a mass extinction and exhausted Earth's capacity to accommodate humanity's expanding appetites.
- From 1970 to 2014, 60% of all animals with a backbone — fish, birds, amphibians, reptiles and mammals — were wiped out by human appetites and activity.
- For freshwater fauna, the decline in population over the 44 years monitored was a staggering 80%. Regionally, Latin America was hit hardest, seeing a nearly 90% loss of wildlife over the same period.
- Measured by weight, or biomass, wild animals today only account for 4% of mammals on Earth, with humans (36%) and livestock (60%) making up the rest.
- The current rate of species loss is 100 to 1,000 times higher than only a few hundred years ago.
- The index of extinction risk for five major groups — birds, mammals, amphibians, corals and an ancient family of plants called cycads — shows an accelerating slide towards oblivion.
- By definition, this means that Earth has entered a mass extinction event, only the sixth in half-a-billion years.
- So far, we have clearly breached two of these so-called planetary boundaries: species loss, and imbalances in Earth's natural cycles of nitrogen and phosphorous (mainly due to fertiliser use).
- For two others, climate and land degradation, we have one foot in the red zone. Ocean acidification and freshwater supply are not far behind. As for new chemical pollutants such as endocrine disruptors, heavy metals, and plastics, we simply do not know yet how much is too much.
- Nearly 20% of the Amazon rainforest, the world's largest, has disappeared in five decades. Tropical deforestation continues unabated, mainly to make way for soy beans, palm oil and cattle.
- Satellite data shows the pace of that degradation picked up by 20% from 2014 to 2016, compared with the previous 15 years.

- Since 1950, our species has extracted 6 billion tonnes of fish, crustaceans, clams, squids and other edible sea creatures. Despite the deployment of increasingly sophisticated fishing technologies, global catches — 80% by industrial fleets — peaked in 1996 and have been declining since.
- Coastal mangrove forests, which protect against storm surges made worse by rising seas, have also declined by up to half over the last 50 years.

### **The Great Acceleration**

- Back-to-back marine heatwaves have already wiped out up to half of the globe's shallow-water reefs, which support a quarter of all marine life.
- Even if humanity manages to cap global warming at 1.5°C (2.7°F) — mission impossible, according to some scientists — coral mortality will likely be 70 to 90%.

### **India Soil Diversity in Danger**

#### **In News**

According to the Global Soil Biodiversity Atlas prepared by the World Wide Fund for Nature, India's soil biodiversity is in grave peril.

#### **Key Highlights**

- 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.
- Soil biodiversity encompasses the presence of micro-organisms, micro-fauna (nematodes and tardigrades for example), and macro-fauna (ants, termites and earthworms).
- The two key drivers of biodiversity loss were the over exploitation of natural resources and agriculture, the WWF added in its Living Planet report.
- 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, even if per-capita consumption remained at current levels.
- A Tamil Nadu Agricultural University study that observed that while 150 million bee colonies were needed to meet the pollination requirements of about 50 million hectares of agricultural land in India, only 1.2 million colonies were present.
- 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."