

GEOGRAPHY, ECOLOGY AND BIODIVERSITY

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For CSE Preliminary Examination 2018



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- Sardar Sarovar Dam now complete
- Country's first electric bus service launched
- States to identify and manage their own wetlands henceforth
- Global Wildlife Programme 2017
- Monsoon ends with 5 % lower rainfall than average
- Tropics emit more carbon than they capture now
- Government plan recognises effect of climate change on wildlife
- Extreme rainfall in India due to warming up of Arabian Sea
- Turtle sanctuary to be setup at Allahabad
- Snow leopard sighted in Arunachal Pradesh
- 16 balsam species found in 5 years in Arunachal Pradesh
- First BIMSTEC Disaster management exercise
- Fire cracker ban in National Capital Region : A closer look at the pollutants
- Startling facts revealed as IUCN conducts assessment in waters of the Arabian Seas Region.
- Calamities displace 23 lakh every year in India : UN Report
- India to link four mountain passes
- India says NO to bottom trawling
- Melting ice affecting salinity around Greenland
- Sawfish is more threatened than tigers
- New species of large Gecko discovered
- Butterfly migration in Western Ghats
- Delhi air pollution in 2017, in Comparison with 2016
- All major ports to get Logistics Data Bank Services
- Piped Natural gas project

- India tops world in pollution deaths in 2015
- Tawny Lark: An expert mimic
- Singur: Home of butterflies of all kinds
- Centre eases norms for Sewage Treatment Plant(STPs) Mega Highway Development Project
- West Bengal government concerned as a demand for jute falls
- Urban heat islands effect seen in 89 cities across India
- China thinking over building a tunnel to deviate Brahmaputra's course
- Carbon dioxide levels grew at a record pace in 2016: WMO
- National Green Tribunal rules that environment ministry cannot override Wildlife board mandate

- Rediscovery of a rare species of dragon fly in Periyar Tiger Reserve
- New orangutan species most endangered
- Hotspots of rattan found in Western Ghats
- Conservation Reserve exclusively for Black bucks in Uttar Pradesh
- Preserving and reviving native seeds in India
- Heat source under Antarctica melting its ice sheet : NASA
- ICRISAT researchers help raise groundnut crop free of toxins
- India 6th most vulnerable to extreme climate events
- Carbon emissions set to rise by 2% this year
- National Certification System for Tissue culture raised plants
- Rosogolla GI status goes to Bengal
- Advance roll out of 'Bharat Stage VI' compliant fuel to curb pollution

- Electricity generating companies to procure stubble
- Delhi smog : Here's what you need to know
- Tiger population under threat
- Western Ghats under threat says UN report
- Tiger estimation process to be boosted by technology
- Bamboo no longer a 'tree'
- Rajasthan keen on bringing in tigers from other states
- Light pollution not to be taken lightly
- Lethal cocktail of heatwave and drought
- The 'polluters must pay' says Environment Ministry
- Uniform 'gas standards' on the cards
- Air pollution is smothering India
- Israel is new 'cool' destination for birds
- Kumbh Mela now an 'Intangible Cultural Heritage'
- Arsenic is poisoning India
- Funds meant for regenerating forests sitting idle
- Border development on Centre's radar

- New species of 'night' frog discovered
- A solution to coral bleaching ? maybe
- Blue flag certification for Indian beaches
- Oceans may soon stop breathing
- Crossing : A threat to wildlife
- Chiru cannot be captively bred
- Ozone layer recovering says NASA

- Majuli : India's shrinking island
- Thermal power in big trouble says report
- Natural grasslands of Western Ghats diminishing
- West Bengal's rivers are in a pathetic state
- An app to report roadkill
- India at a pathetic 177th position in Global Environment Performance Index
- New strategy for rejuvenation of major river water systems
- Waste Decomposer for the Development of Organic Farming

- National Adaptation Fund for Climate Change (NAFCC)
- All India Tiger Estimation 2018
- Ratification of the Minamata Convention on Mercury
- Bay of Bengal home to three new species of eel
- Drying Himalayan springs a major worry
- India State of Forest Report 2017
- Olive ridley turtles begin mass nesting
- Climate change has a significant bearing on the Himalayas
- West Bengal home to new plant species
- Chilika lake : Everything you need to know
- Penguins safe in 'danger islands'
- The Asiatic lion fights back
- India at 78th spot on Energy Transition Index (ETI)
- Draft of the new National Forest Policy
- Loktak lake in trouble
- Kadaknath chicken gets Geographical Indications tag

Geography, Ecology and Biodiversity

Orang tiger reserve: Small but crucial

What is the issue?

- Orang tiger reserve might have the smallest core among 50 nationally protected areas but boasts of being home to a high density of 28 tigers.
- The count was revealed during All India Tiger Estimation Programme carried out by National Tiger Conservation Authority of India.

About the Orang tiger reserve:

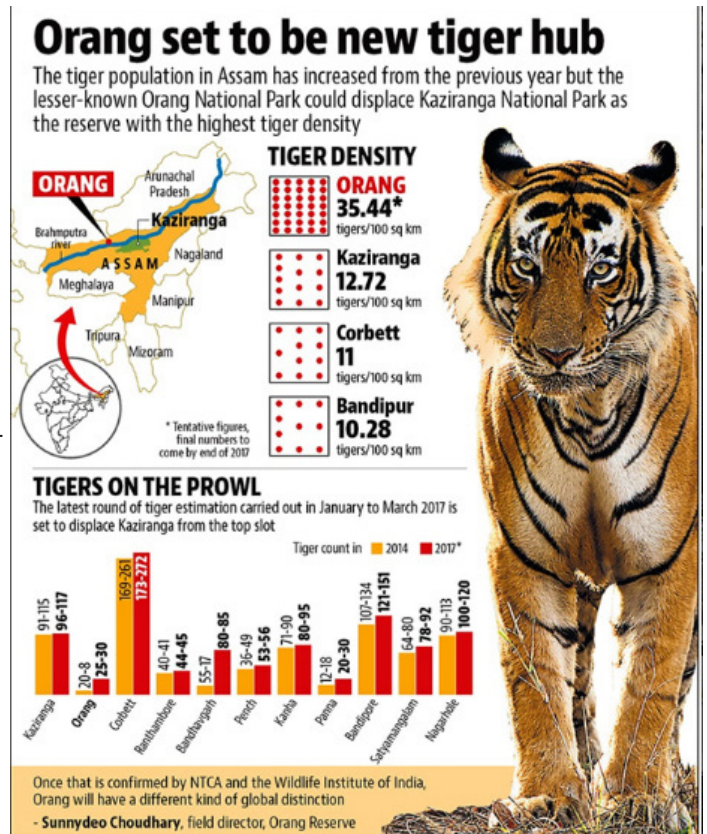
- 49th Tiger Reserve notified in India
- Having a density of 35.44 tigers per 100 sq km, Orang has the highest density nationally.
- It has the smallest core of 78.28 square kms and is located in Assam.
- Orang's buffer area is 413 sq km but the boundary between the core and the buffer is sharp and not contiguous as in other reserves of Assam.

About National Tiger Conservation Authority of India:

- The National Tiger Conservation Authority is a statutory body under the Ministry of Environment, Forests and Climate Change constituted under enabling provisions of the Wildlife (Protection) Act, 1972, as amended in 2006, for strengthening tiger conservation, as per powers and functions assigned to it under the said Act.
- The National Tiger Conservation Authority has been fulfilling its mandate within the ambit of the Wildlife (Protection) Act, 1972 for strengthening tiger conservation in the country by retaining an oversight through advisories/normative guidelines, based on appraisal of tiger status, ongoing conservation initiatives and recommendations of specially constituted Committees

Objectives of the National Tiger Conservation Authority:

- Providing statutory authority to Project Tiger so that compliance of its directives become legal.
- Fostering accountability of Center-State in management of Tiger Reserves, by providing a basis for MoU with States within our federal structure.
- Providing for an oversight by Parliament.
- Addressing livelihood interests of local people in areas surrounding Tiger Reserves



Geography, Ecology and Biodiversity

India's biodiversity up by 499 species

What is the issue?

• 313 species of animal and 186 of plants have been discovered from various areas of the country last year according to new findings by the Zoological Survey of India and Botanical Survey of India.

Organizations that carried out the research:

• Animal Discoveries 2016, New Species and Records, brought out by the Zoological Survey of India and Plant Discoveries 2016, by the Botanical Survey of India

About the findings:

- Of the new animal species, 258 are invertebrates and 55 vertebrates.
- As many as 97 species of insects, 27 of fish, 12 species of amphibians, 10 of Platyhelminthes, nine of Crustacea and six of reptiles have been discovered and described by the scientists.
- There are 61 species of moths and butterflies (order Lepidoptera) and 38 of beetles (Coleoptera).

Where were most of the discoveries made?

* Most of the discoveries were from the four biological hotspots of India

- The biological hotspots in India are The Himalayas, Western Ghats, Northeast and Andaman & Nicobar Islands
- The geographical distribution of the new plant species reveals that most discoveries were made in the Western Ghats (17%), followed by the Eastern Himalayas (15%), the Western Himalayas (13%), the Eastern Ghats (12%) and the west coast (8%)

Weaker El Nino according to Indian Meteorological Department

What is the issue?

• Indian meteorological Department has now said that it expects a weaker El Nino in place of a stronger El Nino as earlier predicted to cause rainfall.

About the El Nino phenomenon:

- It is characterized by surface waters of the equatorial Pacific warming up by more than half a degree — is known to dry up monsoon rain every six out of 10 years.
- A positive Indian Ocean Dipole (IOD) is said to buffer the impact of El Nino and contribute to better rains.
- The IOD is a swing in surface temperatures that turns the western Indian Ocean alternately warmer and then colder than the eastern part of the ocean

Question related to El Nino:

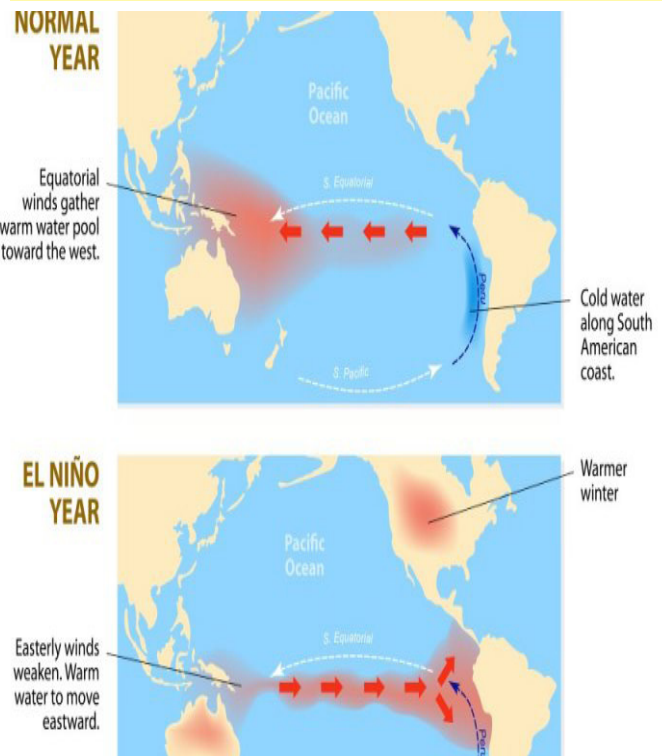
With reference to the Indian Ocean Dipole (IOD) and El Nino, consider the following statements:

1. While the El Nino causes the warming of the surface of Pacific Ocean, IOD causes warming of the Indian Ocean
2. While the El Nino always brings deficient rainfall in India, IOD always brings more rains in India

Which among the above statements is / are correct?

- a) 1 only b) 2 only
- c) Both 1 and 2 d) Neither 1 nor 2

SOLUTION: D



Geography, Ecology and Biodiversity

How the monsoon affects the Indian economy

Why are the monsoon rains important for India?

- The monsoon is the lifeline for India's farm-dependent \$2 trillion economy, as at least half the farmlands are rain-fed.
- The country gets about 70% of annual rainfall in the June-September monsoon season, making it crucial for an estimated 263 million farmers.
- About 800 million people live in villages and depend on agriculture, which accounts for about 15% of India's gross domestic product (GDP) and a failed monsoon can have a rippling effect on the country's growth and economy.
- A normal to above-normal and well-distributed monsoon boosts farm output and farmers' income, thereby increasing the demand for consumer and automotive products in rural markets.

What happens in case of a poor monsoon?

- The monsoon has a direct impact on the country's agricultural GDP. The planting of key kharif, or summer, crops like rice, sugar cane, pulses and oilseeds begins with the arrival of monsoon rains in June.
- Summer crops account for almost half of India's food output and a delayed or poor monsoon means supply issues and acceleration in food inflation, a key metric which influences Reserve Bank of India's decision on interest rates.
- A deficit monsoon could also lead to a drought-like situation, thereby affecting the rural household incomes, consumption and economic growth.
- A poor monsoon not only leads to weak demand for fast-moving consumer goods, two wheelers, tractors and rural housing sectors but also increases the imports of essential food staples and forces the government to take measures like farm loan waivers, thereby putting pressure on finances.
- A normal monsoon results in a good harvest, which in turn lifts rural incomes and boosts spending on consumer goods. It also has a positive impact on hydro power projects

Climate change may alter rainfall in the tropics

What is the issue?

- The amount of rainfall in the Earth's tropical regions will significantly increase as our planet continues to warm, a new NASA study warns.

How will climate change affect rainfall in the tropics?

- High-altitude tropical clouds trap heat in the atmosphere. If there are fewer of these clouds in the future, the tropical atmosphere will cool.
- According to the observed changes in clouds over recent decades, it appears that the atmosphere would create fewer high clouds in response to surface warming.
- This would result in increased tropical rainfall, which would warm the air to balance the cooling from high cloud shrinkage.

What is the relation between rainfall and energy release?

- When water evaporates into water vapour on the Earth's surface and rises into the atmosphere, it carries with it the heat energy that made it evaporate.
- In the cold upper atmosphere, when the water vapour condenses into liquid droplets or ice particles, it releases its heat and warms the atmosphere.

New biodiversity hotspots in Goa

- Three new sites in Goa have been identified as hotspots for protection by Birdlife International, a conservation organization.
- The inclusion of these ecological hotspots in a new book comes after systematic data collection by the Goa Bird Conservation Network (GBCN).

Geography, Ecology and Biodiversity

The recognized biodiversity areas:

- Bhagwan Mahavir Wildlife sanctuary
- Mollem National Park
- Carambolim Wetlands
- Cotigao Wildlife Sanctuary

The new entries:

- Bondla Wildlife Sanctuary
- Navelim Wetlands
- Netravali Wildlife Sanctuary

What is a biodiversity hotspot?

• A biodiversity hotspot is a biogeographic region that is both a significant reservoir of biodiversity and is threatened with destruction.

Karnataka: Tiger State of India

What is the issue?

• Tiger numbers in Karnataka have shown an increase as per the annual census which has been completed recently.

Protection for tigers in Karnataka

- Bandipur Tiger Reserve
- Bhadra Tiger Reserve
- Dandeli-Anshi Tiger Reserve
- Nagarhole Tiger Reserve
- Biligiriranga Swamy Tiger Reserve

What does the latest census say?

• The latest population estimate reinforces Bandipur and Nagarhole landscapes as having the highest tiger numbers in south India and can be ranked among the top three or four national parks in the country along with Jim Corbett, Kanha and Kaziranga.

Which body conducts the annual census of tigers in India?

- National Tiger Conservation Authority
About National Tiger Conservation Authority of India

Nature of organization:

• The National Tiger Conservation Authority is a statutory body under the Ministry of Environment, Forests and Climate Change constituted under enabling provisions of the Wildlife (Protection) Act, 1972, as amended in 2006, for strengthening tiger conservation, as per powers and functions assigned to it under the said Act.

Objectives of NTCA:

- Providing statutory authority to Project Tiger so that compliance of its directives become legal.
- Fostering accountability of Center-State in management of Tiger Reserves, by providing a basis for MoU with States within our federal structure.
- Providing for an oversight by Parliament.
- Addressing livelihood interests of local people in areas surrounding Tiger Reserves.

Functions performed by the NTCA:

- To approve the tiger conservation plan prepared by the State Government
- Evaluate and assess various aspects of sustainable ecology and disallow any ecologically unsustainable land use such as, mining, industry and other projects within the tiger reserves;
- Lay down normative standards for tourism activities and guidelines for project tiger from time to time for tiger conservation in the buffer and core area of tiger reserves and ensure their due compliance
- Provide for management focus and measures for addressing conflicts of men and wild animal and to emphasize on co-existence in forest areas outside the National Parks, sanctuaries or tiger reserve, in the working plan code;
- Provide information on protection measures including future conservation plan, estimation of population of tiger and its natural prey species, status of habitats, disease surveillance, mortality survey, patrolling, reports

Geography, Ecology and Biodiversity

- Approve, co-ordinate research and monitoring on tiger, co-predators, prey habitat, related ecological and socio-economic parameters and their evaluation;
- Ensure that the tiger reserves and areas linking one protected area or tiger reserve with another protected area or tiger reserve are not diverted for ecologically unsustainable uses, except in public interest and with the approval of the National Board for Wild Life and on the advice of the Tiger Conservation Authority;
- Facilitate and support the tiger reserve management in the State for biodiversity conservation initiatives through eco-development and people’s participation as per approved management plans and to support similar initiatives in adjoining areas consistent with the Central and State laws;
- Ensure critical support including scientific, information technology and legal support for better implementation of the tiger conservation plan;
- Facilitate on-going capacity building programme for skill development of officers and staff of tiger reserves, and
- Perform such other functions as may be necessary to carry out the purposes of this Act with regard to conservation of tigers and their habitat.

Top 5 States with Tiger Population:

	2006	2010	2014
Karnataka	290	300	406
Uttarakhand	178	227	340
Madhya Pradesh	300	257	308
Tamil Nadu	76	163	229
Maharashtra	103	169	190



Western Ghats home to ‘burrowing frogs’

What is the issue?

- Four new species of ‘burrowing frogs’ have been found in the Western Ghats.

About the discovery:

- The four new species belong to the genus *Fejervarya*, but unlike other members of the family, they possess the ability to burrow.

- Like most amphibians, they are highly sensitive to changes in the climate, and hence can be studied as environmental indicator species

Meet the frogs:

- The first of the new species, Manoharan’s Burrowing Frog (*Fejervarya manoharani*), was discovered from the Agasthyamala hills in South Kerala and is named after T.M. Manoharan, former Principal Chief Conservator of Forests, in recognition of his conservation efforts.
- The Kadar Burrowing Frog (*Fejervarya kadar*) was collected from the Vazhachal forests and named after the Kadar tribe that was in the forefront of the agitation against the Athirapilly hydel project.
- The CEPF Burrowing Frog (*Fejervarya cepfi*) was found in Amboli, a popular hill station in Maharashtra and is named after the Critical Ecosystem Partnership Fund which had contributed to the preservation of biodiversity in the Western Ghats.
- Discovered in the Parambikulam tiger reserve, the Neil Cox’s Burrowing Frog (*Fejervarya neilcoxi*) was named after Dr. Neil Cox of the International Union for Conservation of Nature who was instrumental in preparing the Red List of global amphibian species

Geography, Ecology and Biodiversity

India's atmosphere polluted to a dangerous levels'

What is the issue?

- The first-ever picture of atmospheric carbon dioxide concentration over India shows that it is way above the safety mark and in line with what has been observed in other parts of the world.
- Observations were made by Orbiting Carbon Observatory-2 (OCO-2) — a NASA satellite to monitor the environment

What is considered to be a safe in terms of CO2 concentration?

- It's generally been agreed that for every million gas molecules in the atmosphere, anything below 350 carbon dioxide molecules, is considered safe
- Concentrations above 350 molecules of CO2 per 1 million gas molecules are likely to trap enough heat to trigger extreme climate events the world over and it would become progressively harder, and costlier, to suck out the excessive

Observations that been made:

- Pockets of Madhya Pradesh, Uttar Pradesh and Himachal Pradesh saw CO2 concentrations hover much higher between 405 ppm and 410 ppm.
- Southern India and the western coast saw concentrations between 395 ppm and 400 ppm while the central and northern regions registered between 400 and 405 ppm.

Possible reasons for CO2 increase:

- Lack of a CO2 sink, point sources like forest fires or biomass burning or an urban source, and gaseous transport from neighbouring regions based on prevailing weather conditions.
- Disease outbreak also linked to this factor
- The elevated carbon dioxide levels were also linked to increasing instances of extreme rainfall and are likely to cause disease outbreaks.

USA pulls out of Paris Climate Agreement

What is the issue?

- US surprised the world when it announced that the United States would withdraw from the landmark 2015 Paris Agreement which seeks to safeguard the world from the increasingly disastrous impacts of climate change.

What is Paris Climate Agreement?

- On December 12, 2015, parties to United Nations Framework Convention on Climate Change (UNFCCC) reached the landmark Paris Climate Agreement to “combat climate change and to accelerate and intensify the actions and investments needed for a sustainable low carbon future.”

Salient features of the Paris Climate Agreement (according to UNFCCC):

- For the first time, Paris Agreement brings all countries of the world into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects.
- Paris Agreement provides for enhanced support to assist developing countries deal with climate change and adapt to global warming, charting a “new course in the global climate effort”, says UNFCCC.
- Main aim of Paris Agreement is to strengthen the global response to climate change threat. It wants to achieve that making attempts to keep a global temperature rise in 21st Century below 2 degrees Celsius above pre-industrial levels. It also aims to make efforts to limit temperature rise over 1.5 degrees Celsius.
- Paris Agreement also aims to strengthen the ability of countries to deal with climate change impact, and at “making finance flows consistent with a low GHG (Green House Gas) emissions and climate-resilient pathway.”
- Paris Agreement aims to put in place a new technology framework and enhanced capacity-building, supporting action by developing countries and the most vulnerable countries, in line with their own national objectives.
- The Agreement also provides for an enhanced transparency framework for action and support.