

Environment Current Affairs – May 2019

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YouTube: <https://www.youtube.com/c/poormansfriend>

Newsletter: <https://www.pmfias.com/newsletters>

{Envi – Air Pollution – 19/05/01} Noise Pollution

[Economic Times](#) | 01-05-2019 | Environment > [Air Pollution](#)

- Any unwanted sound that causes annoyance, irritation and pain to the human ear is termed as noise.
- Noise is measured in **dB (decibel)** which indicates the **loudness** of the sound.
- The human ear can tolerate noise levels up to **85 dB** and anything beyond that can affect quality of life.
- Sound above 80 dB are considered as **loud**.
- Sound between 100-125 dB are termed as **uncomfortable**.
- The Central Pollution Control Board has laid down the permissible noise level in India for different areas.
- All the machines operating in an area should produce noise within the acceptable noise level.

Permissible noise level in India

Zone	Daytime (dB)	Night (dB)
Industrial Zone	75	70
Commercial Zone	65	55
Residential Zone	55	45
Silent Zone	50	40

- Silent zone includes areas that lie within 100 meters of the premises of schools, colleges, hospitals and courts.

{Envi – Air Pollution – 19/05/02} Replacing household dirty fuels with cleaner fuel

[Economic Times](#) | 02-05-2019 | Environment > [Air Pollution](#)

- India could save about 270,000 lives a year by replacing household fuels such as wood, dung, coal and kerosene with cleaner fuels like LPG, a study claims.
- In addition to generating GHGs like **carbon dioxide** and **methane**, the biomass fuels kick out chemicals and other fine particulate matter that can stick in the lungs and trigger pneumonia, lung cancer, etc.
- Household fuels are the **single biggest source of outdoor air pollution** in India.
- In 2015, India's annual air pollution level was **55 micrograms per cubic metre** of fine particulate matter.
- Levels in New Delhi often soared beyond 300 micrograms per cubic metre.
- Replacing biomass with cleaner fuels would cut India's average annual air pollution to 38 micrograms per cubic metre, just below the **National Ambient Air Quality Standard of 40 micrograms per cubic metre**.
- This is still far above the **WHO standard of 10 micrograms per cubic metre**.

Current scenario

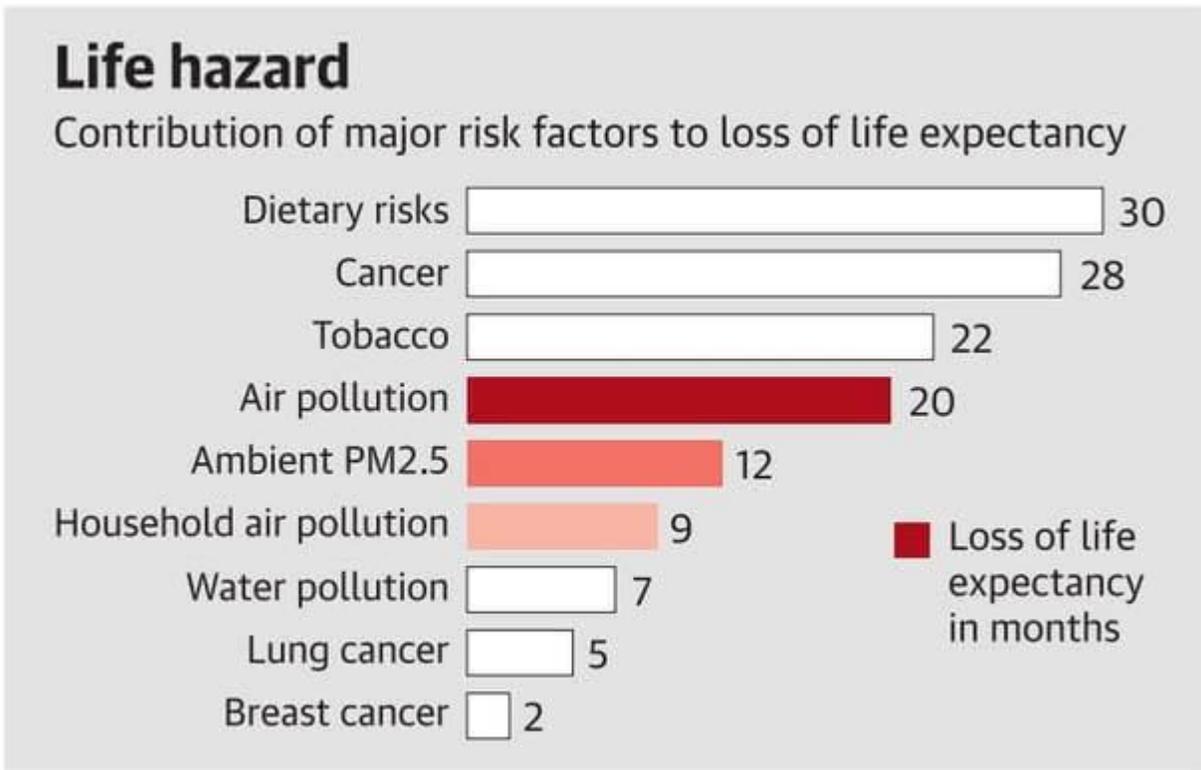
- In 2016, India instituted a national programme to distribute clean burning stoves and propane (LPG).
- LPG cylinders are now used by **89% households in India**. (56.2% on April 1, 2015)
- Northern states have the highest 99.9% LPG coverage ratio.
- Southern states together have a coverage of 99.7% while western states have 81.9%.
- Most north-eastern states have less than 80% coverage.
- The worst among major states are [Jharkhand \(65.4%\)](#), [Bihar \(67%\)](#) and [Odisha \(66.9%\)](#).
- Price of 14.2 Kg cylinders ([after Subsidy](#)): April 2015: Rs. 417.82; April 2019: Rs. 495.86.

{Envi – Air Pollution – 19/05/13} UNEP report

[Economic Times](#) | 13-05-2019 | Environment > Air Pollution

- 91% premature deaths due to air pollution in low and middle-income countries: UNEP.
- The mortality rate attributed to air pollution was highest in 'Sub-Saharan Africa' and 'Central & Southern Asia' with 187 and 170 deaths per lakh of population, respectively.
- The report notes that the relatively richer regions, on the other hand, reported comparatively lesser number of deaths. 'Australia and New Zealand' together reported only 8 deaths per one lakh of population.

- Recently the '**State of Global Air 2019**', released by the **Health Effects Institute** (an independent global health and air pollution research institute) showed that the exposure to outdoor and indoor air pollution contributed to over **1.2 million deaths in India in 2017**.



Life hazard due to major risk factors [Source and Credits](#)

{Envi – Biodiversity – 19/05/05} 1 million species at risk of extinction

[The Hindu](#) | [TOI](#) | 05-05-2019 | Environment > Biodiversity > [Biodiversity Loss](#)

Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)

- Comprises 130 member countries including India.
- Often described as the "**IPCC for biodiversity**".

Key points form the IPBES report

- Total estimated number of animal and plant species on Earth: **8 million (includes 5.5 million insect species)**.
- Up to **1 million species** threatened with extinction, many within decades.
- The threatened list includes more than **40% of amphibian species, almost 33% of reef-forming corals, and more than a third of all marine mammals**.
- Humans have severely altered 75% of land, 40% of marine environments and 50% of inland waterways.
 - ✓ 300% increase in food crop production since 1970.

- ✓ 23% land areas have seen a reduction in productivity due to land degradation.
- ✓ 50% agricultural expansion that occurred at the expense of forests.
- ✓ 100-300 million people in coastal areas are at increased risk due to loss of coastal habitat protection.
- ✓ More than 100% growth of urban areas since 1992.
- ✓ Less than 1% of total land used for mining but has significant negative impacts on environment.
- ✓ 16-21 cm rise in global average sea level since 1900.
- ✓ **100% increase since 1980** in GHG emissions, raising average global temperature by at least **0.7 degree**.
- ✓ Plastic pollution alone has increased tenfold since 1980.
- 1,000 green activists and journalists reporting on environmental issues killed between 2002 and 2013.

{Envi – Biodiversity – 19/05/10} 1 million species at risk of extinction

- [The Hindu](#) | [TOI](#) | [The Hindu Businessline](#) | 10-05-2019 | Environment > Biodiversity > [Biodiversity Loss](#)

Global Assessment Report on Biodiversity and Ecosystem Services 2019

- **UN-sponsored** Global Assessment Report on Biodiversity and Ecosystem Services 2019.
- The report is prepared by the **Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services** (IPBES), based in Bonn, Germany.
- IPBES comprises 130 member countries including India.
- IPBES is often described as the “**IPCC for biodiversity**”.

Key points form the IPBES report

- Total estimated number of animal and plant species on Earth: **8 million** (includes **5.5 million insect species**).
- Nearly a half of the natural ecosystems have already vanished due to human activities.
- Up to **1 million species threatened with extinction**, many within decades.
- The threatened list includes 40% of amphibian species, 33% of reef-forming corals, and more than a third of all marine mammals.
- Humans have severely altered 75% of land, 40% of marine environments and 50% of inland waterways.
 - ✓ 300% increase in food crop production since 1970.
 - ✓ 23% land areas have seen a reduction in productivity due to land degradation.
 - ✓ 50% agricultural expansion that occurred at the expense of forests.
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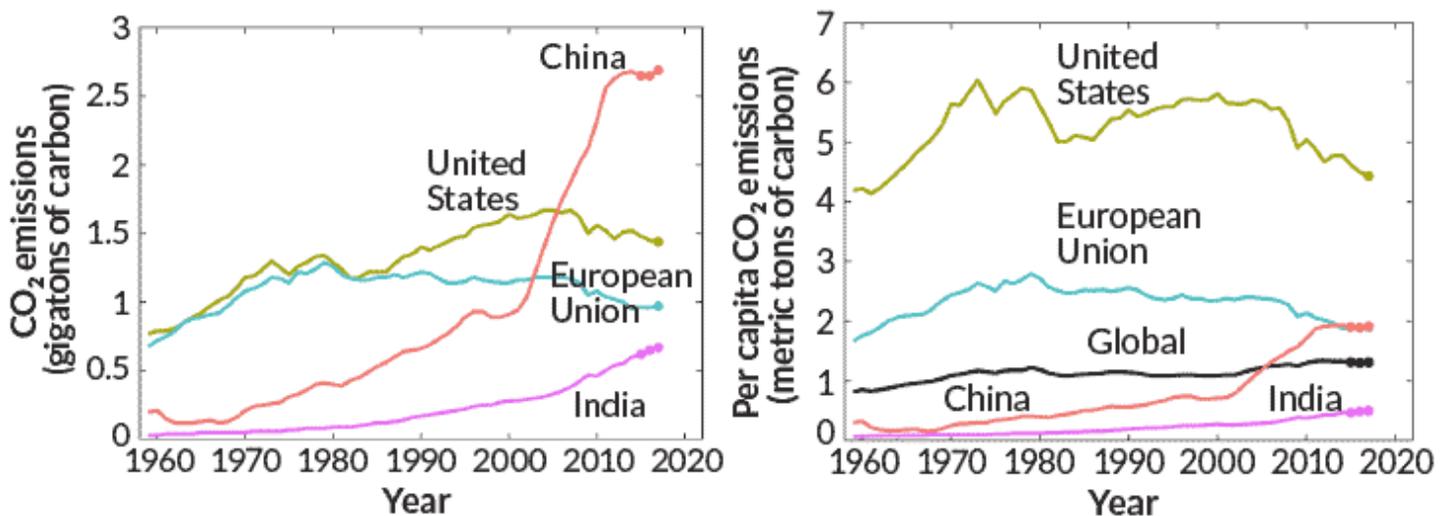
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{Envi – CC – 19/04/01} India's growing carbon emissions

[The Hindu](#) | 01-04-2019 | Environment > Climate Change | Old but very important

International Energy Agency report

- India emitted ~**2.3 billion tons** (7% of the global emissions) of CO₂ in 2018. This is a **4.8% rise** from 2017.
- Global CO₂ emissions (**33.1 billion tonnes** in 2018) rose 1.7% in 2018.
- India's per capita emissions remain less than 40% of the global average.
- India's emissions growth in 2018 was higher than that of the United States and China.



Trends in carbon dioxide emissions by country and per capita ([Source](#))

Top 5 CO₂ emitters in 2018:

1. **China** (~25%)
2. **US** (~14%)
3. **India** (~7%)
4. Russia (~5%)
5. Japan (~3.3%)

Relevance of IEA report

- **Equity among nations** is the principle of **common but differentiated responsibilities**.
- Developing countries like China and India are not doing their part.
- India's growing emissions make it hard to achieve its INDC objectives. (Chapter 8.6 – UNFCCC)
 - ⇒ **India's INDC objective** (announced in 2015): **Reduce emission intensity by 33 to 35 per cent by 2030 compared to 2005 levels.**
 - ⇒ India has also committed to having **40%** of its energy from **renewable sources by 2030** and, as part of this, install **100 GW of solar power by 2022.**
 - ⇒ It will cost India at least \$2.5trillion (₹150 trillion approx.) to implement its climate pledge.

About International Energy Agency (IEA)

- IEA is an intergovernmental organization established in the framework of the **OECD**.
- Key aspect: co-ordinate a collective response to disruptions in the supply of oil, such as the crisis of 1973/4.
- The IEA also works to ensure [reliable, affordable and clean energy](#) for its 30 member countries and beyond.
- Mission: energy security, economic development, environmental awareness and engagement worldwide.
- [Indian and China](#) are **not** its members.

{Envi – CC – 19/05/02} Cryosphere: Glaciers from heritage sites may disappear by 2100

[Economic Times](#) | Environment > [Climate Change](#) > Impact of Global Warming on Cryosphere (**Mains Topic**)

- Glaciers from almost half of natural [World Heritage sites](#) — such as the **Khumbu Glacier in the Himalayas** — may disappear completely by 2100, if emissions continue at current rate, a study warns.
- The team from the **International Union for Conservation of Nature (IUCN)** combines data from a global glacier inventory to analyse the current state of **World Heritage glaciers**.
- The study predicts glacier extinction in 21 of the 46 natural World Heritage sites with glaciers.

Cryosphere

- The areas of snow or ice, which are subject to **temperatures below 0 °C (32 °F) for at least part of the year**, compose the [cryosphere](#).
- Continental ice sheets found in Greenland and Antarctica, ice caps, glaciers, and areas of snow (Alps, Himalayas) and permafrost (Siberia), frozen parts of the ocean, rivers and lakes, etc. are all part of the cryosphere.

Role of cryosphere

- Snow and ice (have highest [albedo](#)) reflect heat from the sun ([Heat Budget](#)).
- Glaciers and high snow covered mountains supply freshwater to many parts of the world.

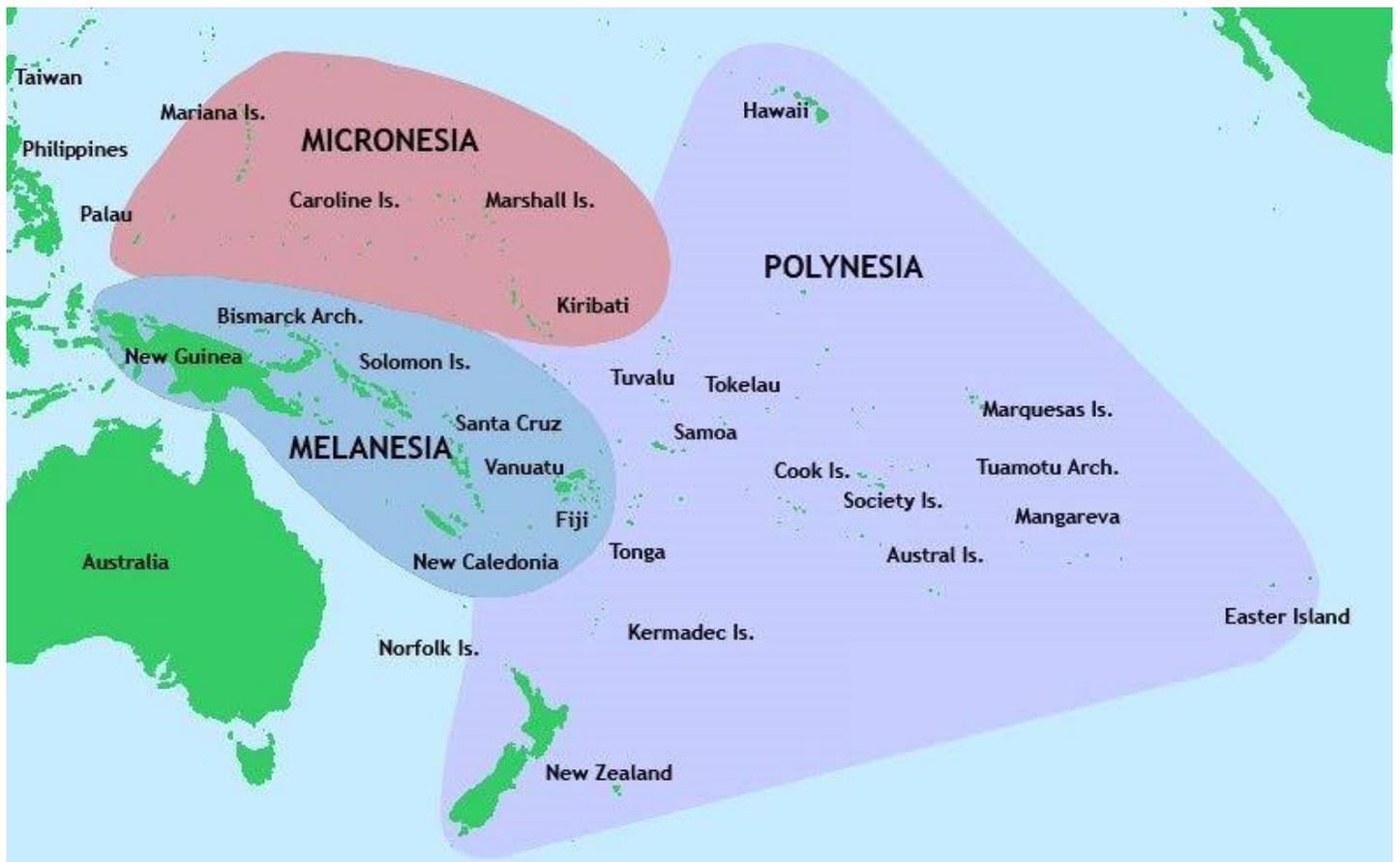
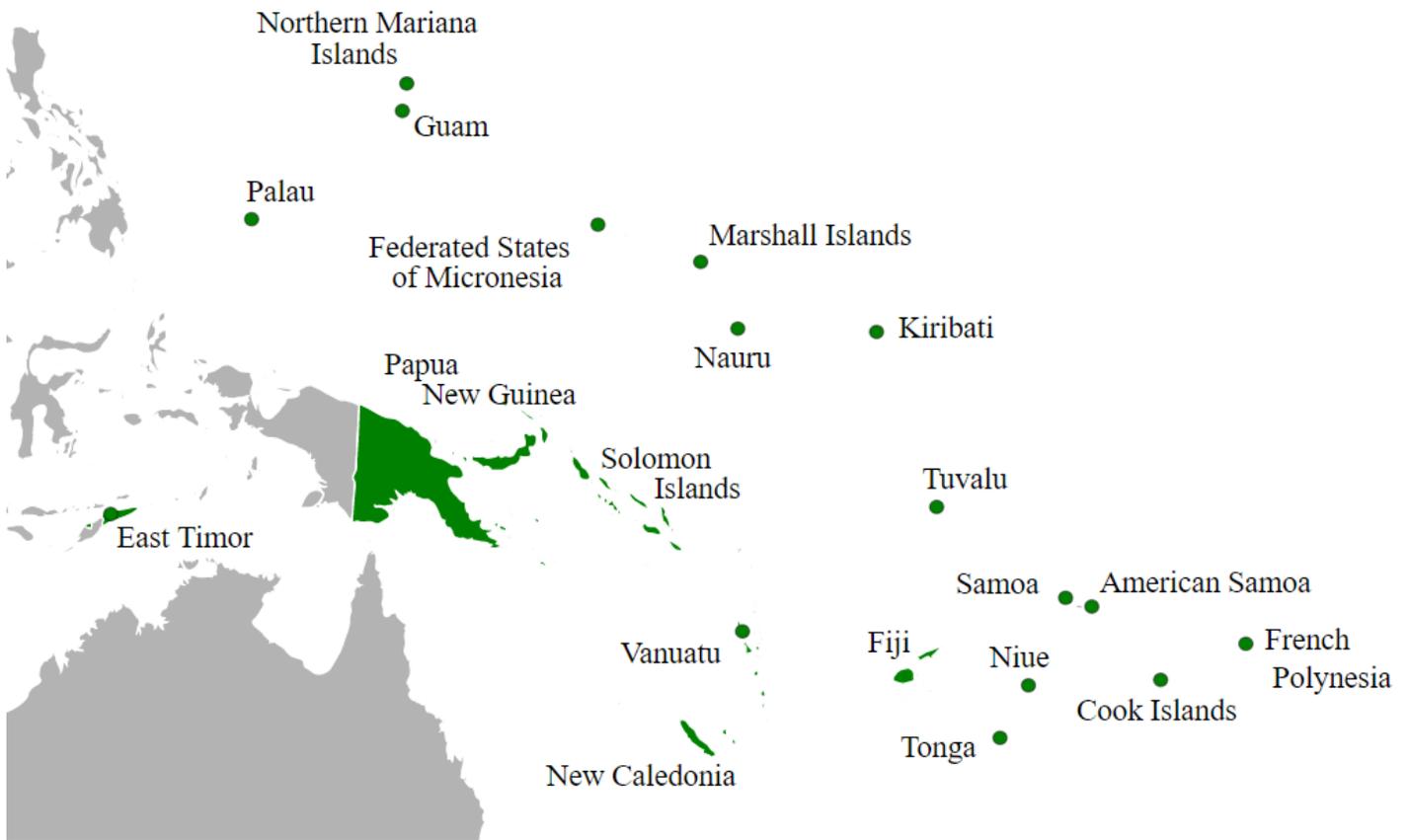
- Cryosphere is most sensitive to climate shifts and hence it acts as earth's black box (ice accumulates layer over layer. Studying the vertical ice column helps understand past global changes in climate).

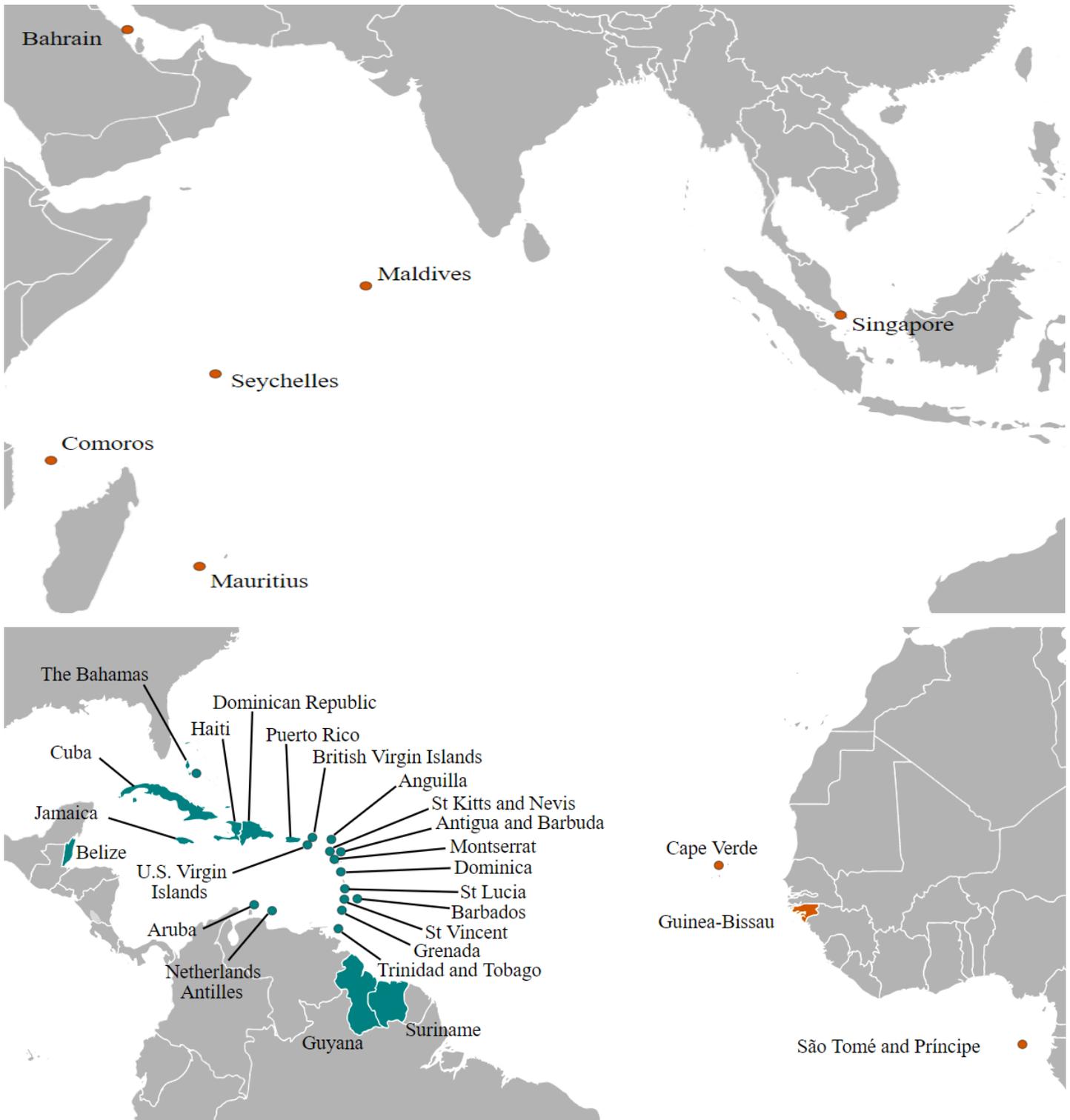
Consequences of disappearing glaciers

- Water scarcity and water wars between nations.
- Sea level rise and subsequent loss of fertile coastal lands.
- Loss of ecologically rich and important **coastal wetlands**.
- **Distress migration** of coastal inhabitants due to submergence of major coastal cities.
- Submergence of **Small Island Developing States** (first to suffer the consequences of climate change).
- Disastrous changes in major weather patterns.

Small Island Developing States (SIDS)

- Small Island Developing States (SIDS) are islands that are relatively **remote, vulnerable to environmental challenges, such as climate change**, and generally small in size. ([Marshall Islands](#) was in news in 2018)
- The SIDS were recognized as a distinct group of developing countries in June 1992, at the **UN Conference on Environment and Development (1992 Earth Summit)**.
- In 2005, World Heritage Committee adopted the UNESCO **World Heritage Programme for SIDS**.
- The [UNESCO SIDS Programme](#) develops World Heritage activities in these areas, providing support for new nominations to the list, and sustainable conservation practices for sites already inscribed.





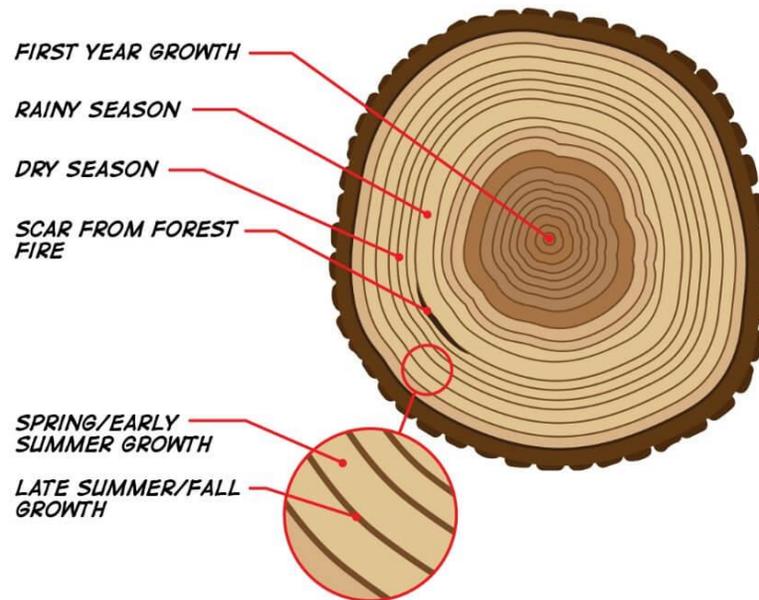
Small Island Developing States | Maps from [Wikipedia](#)

- Most of the SIDS are [coral islands](#) (Lakshadweep Islands are also coral islands) formed on shallow [atolls](#). Hence, they are highly vulnerable to sea level rise.

How scientists' study past climate changes?

Tree rings record earth's climate

- [Trees can keep a record of Earth's climate](#) (hundreds or even thousands of years).
- These rings tell us **how old the tree is**, and what the **weather** was like during each year of the tree's life.
- One light ring plus one dark ring equals one year of the tree's life.
- The light rings represent wood that grew in the early summer, while the dark rings represent wood that grew in the late summer.
- The **colour and width of tree rings** can provide snapshots of past climate conditions.
- For example, tree rings usually grow wider during wet years and they are thinner in dry years.



The colour and width of tree rings indicate past climate conditions. [Source and Credits](#)

Ice cores from cryosphere

- Ice core (a long column of ice) is extracted by drilling deeply into glaciers and ice sheets.



Ice Cores from Antarctica. [Source and Credits](#)

- Ice cores hold a record of what our planet's climate was like hundreds of thousands of years ago.
- Ice sheets and glaciers near Poles are formed from years and years of accumulating snowfall.
- Each layer of ice tells a story about what Earth was like when that layer of snow fell.
- The icy layers hold air molecules, GHGs and aerosols such as dust, ash, pollen, sea salts of that time.
- These particles provide [evidence of past global events, such as climate change, major volcanic eruptions, etc.](#)

{Envi – CC – 19/05/15} Atmospheric concentration of CO₂ has breached 415 ppm

[D2E](#) | 15-05-2019 | Environment > [Global Warming](#)

- The recent atmospheric concentration of CO₂ was found to be at **415 ppm** at Mauna Loa Observatory, Hawaii.
- The world first breached the safe levels of **350 ppm in May 1986**.
- The CO₂ concentration levels have increased every year since 1986 despite repeated commitments.

Consequences

- The world is already 1 °C warmer than the pre-industrial levels.
- India is already 2 °C warmer than the pre-industrial levels.
- India recorded eight major extreme weather events in 1992 which went up to 13 by 2016 and 15 by 2018.
- Even the recent Fani cyclone in Odisha became unpredictable because of climate change.

{Envi – CC – 19/05/22} Coral bleaching observed in Palk Bay

[The Hindu](#) | 22-05-2019 | Environment > CC > Effects > [Coral Bleaching](#)

- The **National Centre for Coastal Research (Ministry of Earth Sciences)** researchers have found an alarming pattern of bleaching in the reefs in Palk Bay (Gulf of Mannar region).
- When the temperatures rose to between 32 °C and 36 °C between March 2019 and May 2019, researchers observed a pattern of bleaching in corals, which was different at different layers within the sea.

Corals

- Corals are animals in the same class (**Cnidaria**) as **jellyfish and anemones**.
- They consist of individual polyps that get together and build reefs.
- Corals **control the level of carbon dioxide** in the water **by converting it into a limestone shell**.
- If this process does not take place, the amount of carbon dioxide in the ocean water would increase.

Coral Bleaching

- When the sea surface temperature increases beyond a tolerable limit, corals undergo bleaching.
- Bleaching is when the corals expel a certain **alga** known as **zooxanthellae**, which lives in the tissues of the coral in a **symbiotic relationship**.
- About 90% of the energy of the coral is provided by the zooxanthellae which are endowed with chlorophyll.
- They are **responsible for the yellow or reddish brown colours** of the host coral.
- When a coral bleaches, it does not die but comes pretty close to it.
- Some of the corals may survive the experience and recover once the sea surface temperature returns to normal levels.

More info: <https://www.pmfias.com/coral-bleaching-causes-zooxanthellae-ideal-conditions-for-coral-growth/>

{Envi – CC – 19/05/24} Ozone-depleting gas CFC-11

[The Hindu](#) | 24-05-2019 | Environment > Climate Change > [Ozone](#) Depleting Substances

- 40 to 60 per cent of total global **CFC-11 (Trichlorofluoromethane)** emissions are coming from China.
- CFC-11 is one of a class of compounds called **chlorofluorocarbons** that destroy atmospheric ozone.
- They are also potent **greenhouse gases**.
- Chlorofluorocarbons were outlawed for almost all uses by the 1987 **Montreal Protocol**.
- Being the signatory to the Montreal Protocol, China agreed to phase out production of CFC-11 in 2010.
- The Chinese foam manufacturers have been using CFC-11 illegally to save on the higher cost of alternatives, such as **hydrochloro-fluorocarbons** like HCFC-141b, which is to be phased out in China by 2026.
- The hole in the ozone is on the path to recovery according to the World Meteorological Organization.
- Reduction in the atmospheric concentration of CFC-11 has made the second-largest contribution to the decline in the total atmospheric concentration of ozone-depleting chlorine since the 1990s.
- But this gas still contributes one-quarter of all chlorine reaching the stratosphere.

{Envi – CC – 19/05/31} Anthropocene epoch

[The Hindu](#) | 31-05-2019 | Environment > [Climate Change](#)

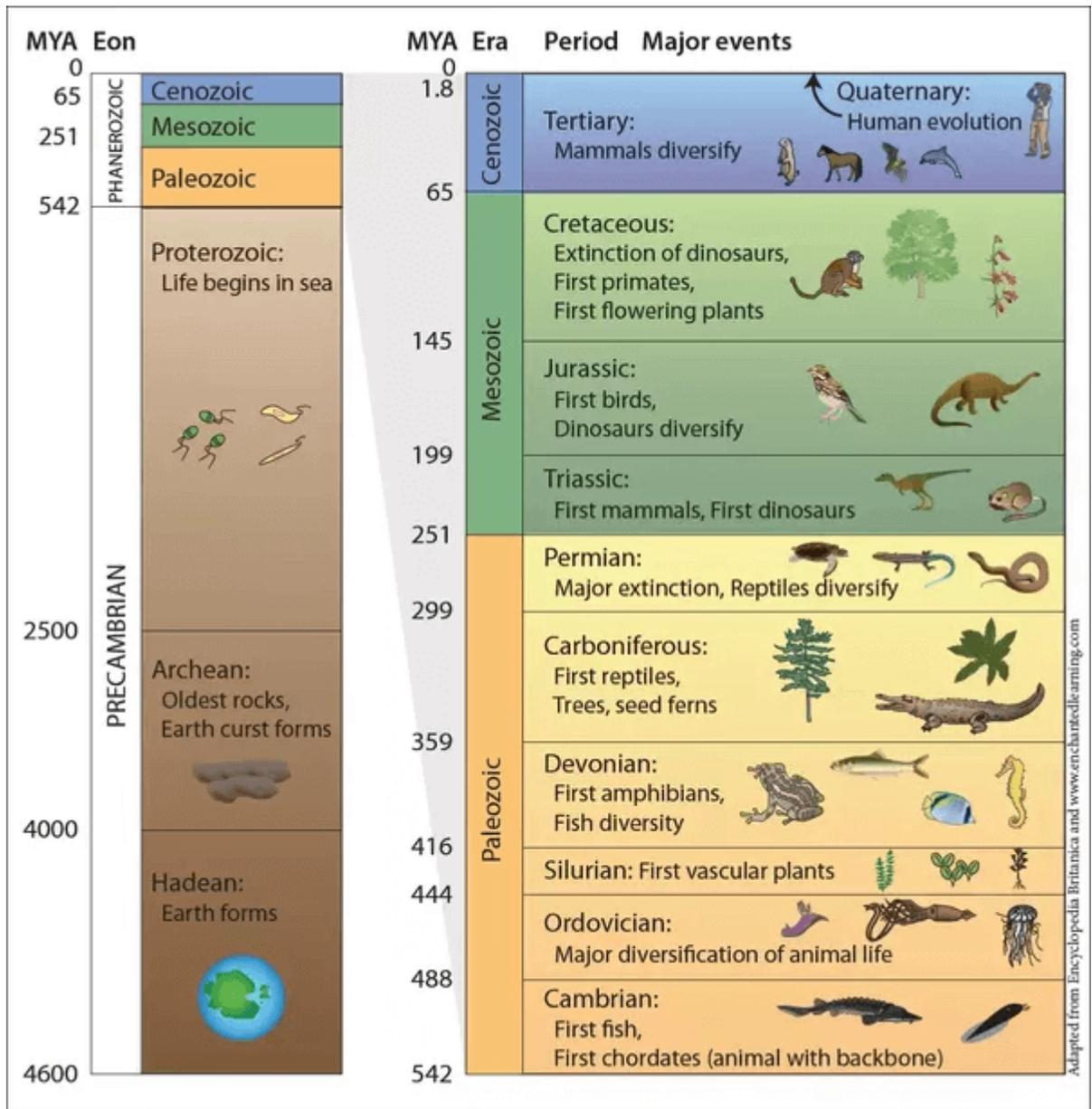
- Anthropocene Working Group (AWG) voted to recognise **Anthropocene as an epoch**.
- AWG vote is a reminder to humanity that failure to end destructive activities will irrevocably change the face of the earth and make it uninhabitable.
- Officially, humans will continue to live in the **Holocene epoch** (11,700 years ago to present) for a couple of years more before the Anthropocene epoch is finally ratified.

- It will be the first time that the beginning of an epoch would be **based on human activity (anthropogenic)** and not the consequences of changes brought about by nature.
- For instance, the start of the **Holocene epoch 11,700 years ago** marks the end of the **transition from the last glacial phase to a period of warming and a rise in sea level.**

Prelims 2018: The term “sixth mass extinction/sixth extinction” is often mentioned in the news in the context of the discussion of

- a) Widespread monoculture practices in agriculture and large-scale commercial farming with indiscriminate use of chemicals in many parts of the world that may result in the loss of good native ecosystems.
- b) Fears of a possible collision of a meteorite with the Earth in the near future in the manner it happened 65 million years ago that caused the mass extinction of many species including those of dinosaurs.
- c) Large scale cultivation of genetically modified crops in many parts of the world and promoting their cultivation in other parts of the world which may cause the disappearance of good native crop plants and the loss of food biodiversity.
- d) Mankind’s over-exploitation/misuse of natural resources, fragmentation/loss of natural habitats, destruction of ecosystems, pollution and global climate change.

The geological time scale (GTS)



- The geological time scale (GTS) divides and chronicles earth's evolutionary history into various periods from the beginning to the present based on definite events that marked a major change in earth's physical, chemical and biological features.
- The primarily defined divisions of time are **eons**. Each eon is subsequently divided into eras, which in turn are divided into periods, which are further divided into epochs.

SuperEon → Eon → Era → Period → Epoch

{Envi – CC – 19/05/31} Geoenineering to fight climate change?

D2E | 31-05-2019 | Environment > [Fighting Climate Change](#)

- The Oxford Geoengineering Programme defines geoengineering as “the deliberate large-scale intervention in the Earth’s natural systems to counteract climate change”.
- Geoengineering technologies include **managing solar radiation, removing carbon dioxide and other greenhouse gases** from the atmosphere.
- Advocates claim that it may become essential to avoid breaching the target of staying “well below” 2 degrees Celsius — as recommended in the Paris Agreement.
- Critics, by contrast, claim that geoengineering isn't realistic.

Solar Radiation Management (SRM) or Solar Geoengineering

- SRM techniques aim to reflect a small proportion of the Sun’s energy back into space.
- **Albedo enhancement:** Increasing the reflectiveness of clouds or the land surface.
- **Space reflectors:** Blocking a small proportion of sunlight before it reaches the Earth.
- **Stratospheric aerosols:** Introducing small, reflective particles into the upper atmosphere to reflect some sunlight before it reaches the surface of the Earth.

Prelims 2019: In the context of which of the following do some scientists suggest the use of cirrus cloud thinning technique and the injection of sulphate aerosol into stratosphere?

- a) Creating the artificial rains in some regions
- b) Reducing the frequency and intensity of tropical cyclones
- c) Reducing the adverse effects of solar wind on the Earth
- d) Reducing the global warming

Greenhouse Gas Removal (GGR) or Carbon Geoengineering

- GGR techniques aim to directly remove carbon dioxide or other greenhouse gases from the atmosphere.
- **Afforestation:** Engaging in a global-scale tree planting effort.
- **Biochar:** 'Charring' biomass and burying it so that its carbon is locked up in the soil.
- **Bio-energy with [carbon capture and sequestration](#):** Growing biomass, burning it to create energy and capturing and sequestering the carbon dioxide created in the process.
- **Ambient Air Capture:** Building large machines that can remove carbon dioxide directly from ambient air.
- **Ocean Fertilisation:** Adding nutrients to the ocean in selected locations to increase primary production.
- **Enhanced Weathering:** Exposing large quantities of minerals that will react with carbon dioxide in the atmosphere and storing the resulting compound in the ocean or soil.

[Source](#)

{Envi – CC Laws – 19/05/18} U.N. climate risk protocol

[The Hindu](#) | 18-05-2019 | Environment > Climate Change > International Conventions, NGOs, Laws, etc.

- **U.N. Environment Finance Initiative (UNEP FI)** made public a report that helps investors understand how to **calculate the risk companies face from climate change**.
- The report was made in line with recommendations by the Task Force on Climate-related Financial Disclosures.

Why is the report significant?

- So far there's been no specific assessment of how companies can account for climate change risks.
- UNEP FI investor guide helps large companies to plan and hedge climate change risks.
- UNEP FI investor guide helps financial institutions in providing sustainable finance (invest more in low carbon companies as they suffer from less climate change risks).

U.N. Environment Finance Initiative (UNEP FI)

- [UNEP FI](#) is a partnership between **United Nations Environment** and the **global financial sector** created in the wake of the **1992 Earth Summit**.
- The mission is to promote **sustainable finance**.
- 200+ financial institutions work with UN Environment to understand today's environmental, social and governance challenges and how they matter to finance, and how to address them.
- UNEP FI's work also includes promoting financial sector involvement in global climate negotiations.

Task Force on Climate-related Financial Disclosures (TCFD)

- TCFD is a 32-member board formed as a result of an agreement at a G20 summit in London, 2009.
- This board consisted of representatives from large financial institutions like banks, insurance companies, etc.
- The TCFD developed voluntary, climate-related financial risk disclosures for use by companies in providing information to stakeholders.

{Envi – Ecosystem – 19/05/06} Ecosystem Services by Seagrass

[D2E](#) | 06-05-2019 | Environment > Ecosystem > [Aquatic Ecosystems](#) > Marine Ecosystem

- Ecosystem services are **free benefits that humans get from functioning ecosystems**.
- Examples of Ecosystem services: climate regulation (forests, oceans that act as [carbon sink](#)), waste treatment ([wetlands and estuaries](#)), [nutrient cycling](#), food and raw materials, recreation and tourism, etc.

Seagrass

- Seagrass (they **not** grasses as the name suggests) are aquatic **flowering plants (angiosperms)**.
- The depth at which seagrass are found is limited by **turbidity** (determines the amount of light reaching the plant and hence the photosynthesis).
- Seagrasses are found in shallow salty and brackish waters in many parts of the world, from the tropics to the Arctic Circle.
- Seagrasses are considered **ecosystem engineers** (alter the ecosystem around them).
- They adapt rapidly to changing environmental conditions.

Ecosystem Services by Seagrass

- They can **store CO₂**, using their own biomass as well as by filtering out fine organic material in water.
- An acre of seagrass can store about **three times** as much carbon as an acre of rainforest.
- Globally, seagrass meadows are responsible for more than **10 per cent of carbon buried in the ocean**, even though they occupy just **0.2 per cent of the area**.
- Seagrass **produce oxygen** and are **highly productive** and support high diversity of organisms.
- The habitats act as a nursery grounds for commercially and recreationally (tourism) valued fishery species.
- They dissipate wave energy thereby **protecting vulnerable shorelines from erosion**.
- Large meadows of seagrass can help protect seawalls by adequate damping of waves.
- They **enhance water quality** by stabilizing heavy metals, pollutants, and excess nutrients,
- Historically, seagrasses were collected as fertilizer for sandy soil.
- They can trap fine sediment on the seabed and **prevent harmful algal blooms (eutrophication)**.
- Coastal lines facing threats from rising sea levels can be protected by seagrass.

Titbit: [Dugong or Sea Cow](#) (Vulnerable) is an **herbivorous marine mammal** that relies on seagrass for food.

Habitat: India seas (near shore waters of mainland India and Andaman and Nicobar Islands), Caribbean Sea, etc.

Threats faced by Seagrass

- Natural disturbances, such as grazing, storms, desiccation.
- Human disturbance: eutrophication, mechanical destruction of habitat, and overfishing.

Eutrophication

- Excessive input of nutrients (**nitrogen, phosphorus**) is directly toxic to seagrasses.
- Excessive nutrients stimulate the growth of **epiphytic and free-floating macro- and micro-algae**.
- **Macroalgae (nuisance species)** form thick unattached mats or epiphytes over seagrass leaves.

- This **increases turbidity** (loss of transparency), reducing the photosynthesis in seagrass (primary producer).
- Benthic (bottom) macroalgae have low carbon/nitrogen content, causing their decomposition to stimulate bacterial activity, leading to sediment resuspension, a further increase in water turbidity.
- Decaying seagrass leaves and algae fuels increasing **algal blooms (algae starts to dominate seagrass)**.
- [Eutrophication](#) eventually leads to anoxic conditions for the seagrass and organisms around.

{Envi – Hazardous Waste – 19/05/11} UN accord to curb export of plastic waste

[The Hindu](#) | 11-05-2019 | Environment > [Hazardous Waste](#)

- Around 180 governments agreed on a new UN accord in Geneva to regulate the export of plastic waste.
- About eight million tonnes of plastic waste ends up in the oceans each year.
- UN deal empowers developing countries to refuse dumping.
- The meeting also undertook to eliminate two toxic chemical groups — **Dicofol** and **Perfluorooctanoic Acid**, plus related compounds.

Dicofol

- Dicofol is an [organochlorine](#) pesticide that is chemically related to **DDT**.
- It has been used in a wide variety of industrial and domestic applications including **non-stick cookware** and food processing equipment, as well as carpets, paper and paints.

Perfluorooctanoic acid (PFOA)

- Perfluorooctanoic acid (PFOA) is used in the process of making Teflon (used in **non-stick cookware**).
- PFOA can stay in the environment and in the human body for long periods of time.
- PFOA is a carcinogen, a liver toxicant, a developmental toxicant, and an immune system toxicant.

Amendment to Basel Convention

- The Geneva meeting amended the 1989 [Basel Convention](#) on the control of **hazardous wastes** to **include plastic waste** in a **legally-binding framework**.
- The new amendment would empower developing countries to refuse “dumping plastic waste” by others.
- Even though the **U.S. and a few others have not signed the accord**, they cannot ship plastic waste to countries that are on board with the deal.

{Envi – Hazardous Waste – 19/05/20} Joint meetings of Basel, Rotterdam and Stockholm conventions held in Geneva

- The joint meetings of three **conventions on chemicals and waste** was held in Geneva.
 1. COP14 to [Basel Convention](#) on the Control of Transboundary Movement of Hazardous Wastes and their Disposal
 2. COP9 to [Rotterdam Convention](#) on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade
 3. COP9 to [Stockholm Convention](#) on Persistent Organic Pollutants.
- The theme of the meetings was “Clean Planet, Healthy People: Sound Management of Chemicals and Waste”.

COP14 to [Basel Convention](#)

- Amended the convention to **include plastic waste** in a **legally-binding framework**.
- The new amendment would empower developing countries to refuse “dumping plastic waste” by others (plastic waste included in the PIC (Prior Informed Consent) procedure).
- Even though the **U.S. and a few others have not signed the accord**, they cannot ship plastic waste to countries that are on board with the deal.
- India has already imposed a complete prohibition of import of solid plastic waste into the country.
- India has also made an international commitment to phase-out single-use plastic.

COP9 to [Stockholm Convention](#)

- Under the Stockholm Convention the COP decided to list “**Dicofol**” in Annex A without any exemption.
- The “**PFOA**” was also listed with some exemptions in the Annex A of the Stockholm Convention.

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COP9 to [Rotterdam Convention](#)

- Under the Rotterdam Convention, two new chemicals (**acetochlor, hexabromocyclododecane (HBCD) and phorate**) were added in the list for mandatory PIC (Prior Informed Consent) procedure in international trade.

{Envi – In News – 19/05/15}

Greta Thunberg

- Greta Thunberg is a teenage environmental activist from Sweden.
- Thunberg has spearheaded environmental protests across Europe.
- She is known for having initiated the school strike (striking every Friday) for climate movement in 2018.

Extinction Rebellion

- Extinction Rebellion is a socio-political movement which uses nonviolent resistance to protest against climate breakdown, biodiversity loss, and the risk of human extinction and ecological collapse.
- Extinction Rebellion was established in the United Kingdom in May 2018.

Ireland declares climate emergency

- Ireland's parliament has become the second after Britain's to declare a climate emergency.
- It is largely a symbolic motion and doesn't have any legal effect.

{Envi – International Conventions – 19/05/14} Global Deal for Nature

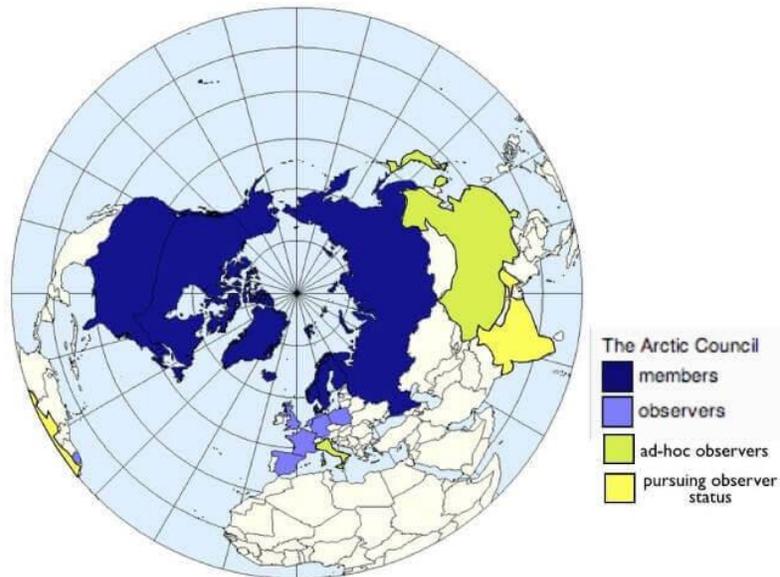
[The Hindu](#) | 14-05-2019 | Low Priority Topic

- Diverse group of scientists and ecologists from across the world have come up with a companion pact to the Paris Agreement, called: "A Global Deal for Nature: Guiding Principles, Milestones and Targets".
- 195 countries across the globe signed the Paris Agreement, some oil producing/importing countries such as **Turkey, Syria, Iran and USA** have not.
- Global Deal for Nature policy document was published in April 2019.
- Global Deal for Nature (or GDN) has five fundamental goals:
 - 1) representation of all native ecosystem types;
 - 2) maintain viable populations of all native species;
 - 3) maintain ecological functions and ecosystem services;
 - 4) maximize carbon sequestration by natural ecosystems and
 - 5) address environmental change to adapt to the impact of climate change.

{Envi – International Groups – 19/05/13} Meeting of Arctic Council

[The Hindu](#) | 13-05-2019 | Environment > International Groups

- Arctic Council is an eight-member grouping of nations that have territories in the Arctic.
- Members: **Russia, the US, Canada, Norway, Denmark, Sweden, Iceland and Finland.**



- India has been re-elected as an observer to the Arctic Council.
- India was an Observer at the Council from 2013 onwards.
- Observers are not allowed to take part in the active meetings.
- Besides India, China, also has Observer status at the Council.

Outcomes of the meeting

The council

- reaffirmed the commitment to maintain peace, stability and constructive cooperation in the Arctic.
- committed to the well-being of the Arctic's inhabitants and region's sustainable development.
- The joint statement recognised the rights of Arctic indigenous peoples.

{Envi – IUCN – 19/05/01} Himalayan black and brown bears

[The Hindu](#) | 01-05-2019 | Environment > [IUCN](#) | High-Pain Low-Gain Topic

- The Army claimed climbers that they spotted Yeti footprints (mythical creature in the Himalayas).
- Research concludes that similar claims were likely based on sightings of Himalayan black and brown bears.

Himalayan black bear / Asiatic Black Bear



Source and Credits: [Wikipedia](#)

- IUCN Red List: "[Vulnerable](#)".
- Habitat: **Himalayan forests, North East India**, South East Asia, South East China.
- Threats: Forest degradation, bamboo plantations.

Himalayan brown bear



Source and Credits: [Wikipedia](#)

- IUCN Red List: "[Least Concern](#)".
- Habitat: **Himalayas**, Central Asian Mountains.
- Threats: Climate change and melting glaciers.

{Envi – IUCN – 19/05/04} Grizzled giant squirrel

[The Hindu](#) | 07-05-2019 | Environment > [IUCN](#) | High-Pain Low-Gain Topic



Grizzled Giant Squirrel (Source and Credits: [Wikipedia](#))

- IUCN Status: [Near Threatened](#).
- It is listed under [Schedule I of the Wildlife Protection Act, 1972](#) and **Schedule (Appendix) II of CITES**.
- Habitat: Western Ghats and hills of Sri Lanka.
- Threats: habitat loss and poaching.
- Nests of grizzled giant squirrel spotted near **Pakkamalai Reserve Forests (Eastern Ghats, Tamil Nadu)**.
- In India, the species is usually known to nest only in **Western Ghats**.
- Several diverse and endangered species including the Golden Gecko ([Least Concern](#)), Bamboo Pit Viper ([Least Concern](#)) and Mouse Deer ([Least Concern](#)) have also been spotted in the Pakkamalai Reserve Forests.

{Envi – IUCN – 19/05/04} Purple frog to be crowned Kerala’s state amphibian

[Indian Express](#) | 04-05-2019 | Environment > [IUCN](#) | High-Pain Low-Gain Topic

- Purple frog IUCN status: [Endangered](#).
- The final decision to crown Purple frog as Kerala’s state amphibian will be taken by **Wildlife Advisory Board**.
- Purple frog is believed to have co-existed with dinosaurs (extinct 65 million years ago).
- It is endemic to the southern **Western Ghats (mostly Kerala)**.
- It lives its entire life in tunnels, comes out to the surface once in a year (early rains) to breed and lays eggs.
- The frog’s closest relatives were found in Seychelles (proof of the theory of [Gondwanaland](#) – amphibians can’t tolerate salinity. So, it’s a possibility that the landmass could have been connected).
- Threats: check dams submerging the perennial breeding grounds, rapid deforestation and conversion of forest land into cropland.



Purple Frog ([Source and Credits](#))

{Envi – IUCN – 19/05/15} Kharai Camel – India’s swimming camels

[Scroll.in](#) | 15-05-2019 | Environment > IUCN Red List > Endangered Species.

- India’s swimming camels are endangered by destruction of mangroves in Kutch.
- Since 2015, Kharai camels are getting protection similar to [endangered species](#).
- Kharai camels are dependent on mangroves for their food for eight months of the year.
- During monsoons, they swim to the mangrove islands in hordes.
- Kharai camels are a main source of livelihood of **Jat** and **Rabari** communities (Kutch region).



Q. What is/are unique about ‘Kharai camel’, a breed found in India? (2016)

- 1) It is capable of swimming up to three kilometres in seawater.
- 2) It survives by grazing on mangroves.
- 3) It lives in the wild and cannot be domesticated.

Select the correct answer using the code given below.

- a) 1 and 2 only
- b) 3 only
- c) 1 and 3 only

d) 1, 2 and 3

Answer: a) 1 and 2 only

{Envi – IUCN – 19/05/19} ‘Not all animals migrate by choice’ campaign

[PIB](#) | 19-05-2019 | Environment > [IUCN](#)

- ‘Not all animals migrate by choice’ campaign is launched to **raise awareness on illegal wildlife trade**.
- The campaign was launched by **Wildlife Crime Control Bureau of India** and **UN Environment**.
- The campaign is launched ahead of **International Day of Biological Diversity on May 22**.
- The campaign aims at garnering public support for the protection and conservation of wildlife, prevention of smuggling and reduction in demand for wildlife products.
- The campaign also complements worldwide action on illegal trade in wildlife through UN Environment’s global campaign, **Wild for Life**.
- **Tiger (EN), Pangolin (EN), Star Tortoise (VU) and Tokay Gecko (LC)** featured in the first phase of the campaign.
- Phase two will see more threatened species and explore other routes of trafficking.

UN Environment

- UN Environment is the leading global voice on the environment.
- It provides leadership and encourages partnership in caring for the environment by enabling nations and peoples to improve their quality of life without compromising that of future generations.
- UN Environment works with governments, the private sector, the civil society and with other UN entities and international organizations across the world.

Wildlife Crime Control Bureau

- Wildlife Crime Control Bureau is a **statutory** body established by the GOI under the MoEF, to combat organized wildlife crime in the country.
- Under Wild Life (Protection) Act, 1972, it is mandated to
 - ✓ collect and collate intelligence related to organized wildlife crime activities and to disseminate the same to State and other enforcement agencies;
 - ✓ establish a centralized wildlife crime data bank;
 - ✓ co-ordinate actions by various agencies in connection with the enforcement of the provisions of the Act;
 - ✓ assist foreign authorities and international organization concerned for wildlife crime control;

- ✓ capacity building of the wildlife crime enforcement agencies for investigation into wildlife crimes and assist State Governments to ensure success in prosecutions related to wildlife crimes; and
- ✓ advise the Government of India on issues relating to wildlife crimes.
- It also assists the Customs authorities in inspection of the consignments of flora & fauna as per the provisions of Wild Life Protection Act, CITES and EXIM Policy governing such an item.

Indian Pangolin



Indian Pangolin ([Source](#))

- IUCN Red List Status: **Endangered**
- Habitat: Indian subcontinent.
- Threats: most illegally traded wild mammal on the planet; it is trafficked for its meat and its scales are used in traditional medicines.

Star Tortoise



Indian Star Tortoise ([IUCN](#))

- IUCN Red List Status: **Vulnerable**
- Habitat: Eastern parts of India below West Bengal and Gujarat.
- Threats: traded for meat and pet trade.

Tokay Gecko



Tokay Gecko ([Wikipedia](#))

- IUCN Red List Status: [Least Concern](#)
- Habitat: North-East India and South-East Asia.
- Threats: used in traditional medicine in South East Asia and China.

{Envi – IUCN – 19/05/28} Malaysia's last male Sumatran rhino dies in captivity

[The Hindu](#) | 28-05-2019 | Environment > [IUCN](#)

- Malaysia's last male Sumatran rhinoceros has died.
- Sumatran rhino is the smallest species of rhinoceros.



Source: [Wikipedia](#)

- IUCN Red List Status: [Critically Endangered](#)

- Habitat: 30 to 80 Sumatran rhinos remain in the world, mostly on the Indonesian island of Sumatra.
- Threats: habitat loss and poaching.

{Envi – Law – 19/05/09} Coastal Regulation Zone rules

[The Hindu Businessline](#) | 09-05-2019 | Environment > National Environmental Legislation > Chapter 9.4. CRZ

Backdrop

- The SC has ordered the demolition of five apartment complexes in Kerala, for violating CRZ norms.
- Kerala Coastal Zone Management Authority (KCZMA) filed the petition.
- State government and local bodies often overlooked rules to facilitate construction in CRZ areas.
- CZMAs are often limited by existing laws. **CMZAs cannot take action but can only file cases.**
- As per environmental protection act, **delegation of power goes to principal secretary** or additional chief secretary of environment, chairman or member secretary of pollution control board and district collector.

The CRZ Rules

- CRZ Rules are made by the Union Environment Ministry.
- **Implementation is to be done by state governments** through their Coastal Zone Management Authorities.
- The states need to frame their own coastal zone management plans in accordance with the central Rules.
- CRZ Rules govern human and industrial activity close to the coastline.

Evolution of the rules

- The rules **mandated under the Environment Protection Act, 1986**, were first framed in 1991.
- In all CRZ Rules, the regulation zone has been defined as the area up to **500 m from the high-tide line**.
- Several kinds of restrictions apply, depending on criteria such as the population, the ecological sensitivity, the distance from the shore, and whether the area had been designated as a natural park or wildlife zone.
- Despite several amendments, states found the 1991 Rules to be extremely restrictive.
- The 1991 Rules also created hurdles for industrial and infrastructure projects such Navi Mumbai.

CRZ Rules in 2011

- The Centre notified fresh CRZ Rules in 2011, which addressed some concerns.
- An exemption was made for the construction of the Navi Mumbai airport.
- Projects of the Department of Atomic Energy (nuclear power plants near the coast) were exempted.

The current situation

- Environment Ministry in 2014 set up a six-member committee to give suggestions for a new set of CRZ Rules. The committee submitted its report in 2015.
- **Chennai-based National Centre for Sustainable Coastal Management** defined a **new high-tide line** along India's entire coastline to remove ambiguities.
- Separately, the Survey of India defined a **hazard line** along the coasts (for disaster management purposes).
- Based on the inputs, the Environment Ministry issued fresh CRZ Rules in 2018, which removed certain restrictions on building, streamlined the clearance process, and aimed to encourage tourism in coastal areas.

CRZ Rules 2019

- In January 2019, the government notified new CRZ Rules with the stated objectives of promoting sustainable development and conserving coastal environments.
- For the so-called CRZ-III (Rural) areas, two separate categories have been stipulated.
 1. In the densely populated rural areas (**CRZ-IIIA**) with a population density of 2,161 per sq km as per the 2011 Census, the **no-development zone is now 50 m from the high-tide level, as against the 200 m stipulated earlier.**
 2. In the **CRZ-IIIB** category (rural areas with population density below 2,161 per sq km) continue to have a no-development zone extending up to 200 m from the high-tide line.
- The new Rules have a **no-development zone of 20 m for all islands close to the mainland coast**, and for all backwater islands in the mainland.

The New CRZ rules will be covered as a separate topic in the coming weeks.

{Envi – Laws – 19/05/04} Advisory Boards for protecting wildlife

[Source](#) | GS-2: Statutory, regulatory and various quasi-judicial bodies | Environment > Laws

Wildlife Advisory Board

- Wildlife Advisory Board is a **statutory body** of the state (UT) government.
- The **Wildlife (Protection) Act, 1972** mandates the **State (UT) Government** to constitute a Wildlife Advisory Board consisting of the following members:
 1. **Minister in charge of Forest** in the **State (UT)** is the **Chairman** (Chief Secretary will be the chairman if the minister's post is vacant);
 2. two members of the State (UT) Legislature;
 3. Secretary to the State (UT) Government;

4. The Forest Officer in charge of the State Forest Department,
5. an officer to be nominated by the Director;
6. Chief Wildlife Warden;
7. Officers of the State Forest Government not exceeding five
8. such other person, not exceeding ten, who, in the opinion of the State Government, are interested in the protection of Wildlife, including the representatives of tribals not exceeding three.

Duties

- Advise the State Government in
 - ✓ **selection and administration of areas to be declared as Sanctuaries, National Parks, Closed Areas;**
 - ✓ formulation of the policy of protection and conservation of Wildlife and specified plants;
 - ✓ measures to be taken for harmonizing the needs of the tribals and other forest dwellers with the protection and conservation of wildlife; and
 - ✓ any matter that may be referred to it by the State Government.

National Board for Wild Life

[Source](#) | GS-2: Statutory, regulatory and various quasi-judicial bodies

- It is a statutory body constituted under the Wildlife Protection Act, 1972.

History of National Board for Wildlife

- Due to the rapid decline in wildlife population, the GOI had constituted an advisory body designated as the **Indian Board for Wildlife (IBWL)** in 1952.
- The Indian Board for Wildlife was chaired by the **Prime Minister**.
- The Wildlife (Protection) Act 1972 was enacted for providing special legal protection to wildlife.
- The Wildlife (Protection) Act 1972 laid special emphasis on endangered species of fauna.
- As per the **Wildlife (Protection) Amendment Act, 2002**, a provision was incorporated for the constitution of the National Board for Wildlife, replacing the Indian Board for Wildlife.

Members of National Board for Wildlife

- The National Board for Wildlife has 47 members with the **Prime Minister in the Chair**.
- The **Minister in charge of the MoEF** in GOI is the Vice-Chairperson.
- The Additional Director General of Forests (WL) & Director, Wildlife Preservation is the Member-Secretary to the Board.

- Other members include three Members of Parliament (two from Lok Sabha and one from Rajya Sabha), five NGOs and 10 eminent ecologists, conservationists and environmentalists.

Duties

- The board is advisory in nature and advises the GOI in conservation and development of wildlife and forests.
- It has power to review all wildlife-related matters and approve projects in and around national parks and sanctuaries.
- **No alternation of boundaries in national parks and wildlife sanctuaries can be done without approval of the** National Board for Wildlife.

Update this under Chapter 9 (2019 notes) > National Environmental Legislation > Biodiversity Related Laws > Wild Life (Protection) Act of 1972 and Amendment, 1982

{Envi – Laws – 19/05/11} Ecologically Sensitive Area (ESA) in Western Ghats region

[Source](#) | [Source](#) | 11-05-2019 | Environment > Biodiversity Conservation, National Legislation > EIA

- Goa has urged MoEF requesting an almost 50 per cent reduction in the total area identified as Eco-Sensitive Areas (ESA) along the Western Ghats region, under the latter's draft notification issued in 2018.
- The High Level Working Group (HLWG) of the MoEF headed by Dr Kasturirangan had recommended an area of 1,461 sq km in Goa as ESA covering 99 villages.

History

- The MoEF constituted the **Western Ghats Experts Ecology Panel (WGEEP)** in 2010 under the Chairmanship of **Prof. Madhav Gadgil**.
- The Panel submitted its report in 2011 but it was not made public immediately due to its stringent assessment of the condition of Western Ghats.
- The report suggested many radical changes that needs to be brought to conserve Western Ghats.
- The report had recommended **64% of the area** come under ESA.
- The recommendation if implemented would adversely affect mining mafia, sand mafia and local encroachers.
- Under pressure from various stakeholders, MoEF set up the **High Level Working Group (HLWG)** under the Chairmanship of **Dr. K. Kasturirangan** to study recommendations of WGEEP.
- The HLWG had diluted many recommendations of WGEEP to satisfy the interests of encroachers and mafia.
- The committee had suggested that **37% (60,000 hectares)** of the Western Ghats should be declared as ESA.

October 2018 notification

- To protect **Western Ghats (UNESCO World Natural Heritage Site)**, the MoEF has notified [~57,000 sq km of the Western Ghats](#) spread along six states as **ecologically sensitive area (ESA)**.
- The six states include **Tamil Nadu, Karnataka, Goa, Maharashtra, Kerala and Gujarat**.
- The draft notification, if it gets final clearance, **will ban activities including construction, mining, quarrying and sand mining**.
- The final notification will be issued after 60 days following the submission of objections or suggestions.
- Karnataka has objected to the notification as, "it will have an adverse effect on state's economy."
- Goa has urged reduction in the total area identified as Eco-Sensitive Areas (ESA).
- Earlier, following the recent Kerala floods, the National Green Tribunal (NGT) had restricted six states from giving environmental clearance for activities that could harm eco-sensitive areas.

{Envi – Marine Pollution – 19/05/15} Marine plastic pollution

[TOI](#) | 15-05-2019 | Environment > Pollution > [Solid Waste](#) | [Marine Pollution](#)

- Marine plastic pollution is said to cause ~\$13 billion in economic damage to marine ecosystems each year.
- Marine plastic pollution is estimated to outweigh fish by 2050.
- Plastic has been documented [even in the deepest part of the ocean](#) (Challenger Deep in Mariana Trench)
- Exposure to chemicals leaching from plastic pollution interfered with the growth, photosynthesis and oxygen production of **Prochlorococcus**, the **ocean's most abundant photosynthetic bacteria**.

Prochlorococcus

- **Prochlorococcus** are marine cyanobacteria (photosynthetic phytoplankton).
- They are the [smallest \(0.5 µm\) and the most abundant photosynthetic organisms](#).
- They produce 10 per cent of the oxygen that we breathe.

{Envi – Pollution – 19/05/01} HC seeks report on Red Category industries

[TOI](#) | 01-05-2019 | Environment > Pollution

- Central Pollution Control Board (CPCB) submitted a list of factories violating norms to Uttarakhand HC.
- Uttarakhand HC has directed the state pollution control board to inspect 'red category' industries and file a report about the measures being taken to shut these units in the hill state.

- Earlier, the HC had ordered CPCB to inspect each and every industry in the state to see whether the norms laid down under the
 - ✓ [Water \(Prevention and Control of Pollution\) Act, 1974,](#)
 - ✓ [Air \(Prevention and Control of Pollution\) Act, 1981,](#)
 - ✓ [Hazardous Wastes \(Management and Handling\) Rules, 1989 and](#)
 - ✓ [Environment \(Protection\) Rules, 1986](#) (Schedule I to VII) were being complied with or not.

Categorisation of Industries for Environmental Clearance (March 2016 PIB)

- Re-Categorisation of Industries was done in 2016 based on their pollution load.

Need for recategorization

- The old system of categorization was not reflecting the pollution load of the industries.
- 25 industrial sectors which were not critically polluting were earlier categorized as Red.
- This was creating problems in getting EC for those industries.

Pollution Index

- MoEFCC has developed the criteria of categorization of industrial sectors based on the Pollution Index which is a function of the emissions (air pollutants), effluents (water pollutants), hazardous wastes generated and consumption of resources.
- The Pollution Index PI of any industrial sector is a number from 0 to 100 and the increasing value of PI denotes the increasing degree of pollution load from the industrial sector.

MoEFCC has finalized the following category of industries

- **Red category:** Industrial Sectors having Pollution Index score of 60 and above. (60 industries)
- **Orange category:** Industrial Sectors having Pollution Index score of 41 to 59. (83 industries)
- **Green category:** Industrial Sectors having Pollution Index score of 21 to 40. (63 industries)
- **White category:** Industries with Pollution Index score including and upto 20. (36 industries)

The salient features of the 'Re-categorization' exercise are as follows:

- Newly-introduced **White category industrial sectors are practically non-polluting.**
- They will **not require Environmental Clearance (EC) and Consent to Operate.**
- White category industrial sectors have to just intimate SPCB and CPCB.
- **No Red category of industries shall normally be permitted in the ecologically fragile/protected area.**

{Envi – Pollution – 19/05/14} Electric Mobility

[The Hindu](#) | 14-05-2019 | Environment > Air Pollution > Controlling air pollution

- India has set an ambitious goal of having **30% electric vehicles by 2030**.
- In the next five years, India aims to have at least 15% of electric vehicles on the road.
- India is targeting smaller electric vehicles (costing less than ₹10 lakh).
- Three-wheelers and cars costing less than ₹10 lakh account for 4% and 12% of the vehicle population.
- Concentrating on small electric vehicles will help meet domestic demand.
- India is focusing on non-fiscal incentives such as **credits based on carbon dioxide emissions** and **efficiency**.
- Manufacturers exceeding the emission targets will be required to purchase credits from those meeting them.
- The price of the credit will be decided by the market.
- The plan is to make electric and low-emissions vehicles cheaper and the polluting vehicles expensive.
- India announced the second phase of the **Faster Adoption and Manufacturing of (Hybrid and) Electric Vehicles (FAME-2) scheme** with an outlay of ₹10,000 crore for a period of three years.
- To encourage faster adoption, incentives will be provided on purchase of an electric vehicle.

Batteries in electric vehicles

- **Lithium ion battery** are the most widely used (range is 200 and 300 km per charge).
- Lithium ion batteries used in electric vehicles **can be recycled**.
- In lithium ion batteries, **cobalt is a key component of the cathode (positive electrode)**.
- Cobalt prevents overheating of the battery thus allowing charging and discharging over many years.
- Cobalt is a by-product of mining nickel and copper.
- About 60% of the world's supply of cobalt comes from the **Democratic Republic of Congo**, the mining of which has been linked to human rights abuse including child labour.
- As battery technology evolves, the amount of cobalt used may reduce or even stop.
- Battery technology to increase driving range and energy density will continue to be the focus area.
- The most important determinant will be the **lifespan of the battery (about eight years)**.

How long will it take to charge the battery?

- Currently, batteries used in electric cars have capacities of 50 kWh (kilowatt hour).
- They can be charged overnight using the existing power supply available at home.
- Batteries used in electric vehicles can be fast-charged.
- At the charging stations batteries can be charged in 20-30 minutes.

- But **fast-charging causes overheating and degradation and reduces battery life.**

Will electric vehicles reduce carbon emission?

- As 55% electricity generation in India is primarily using coal, **net reduction in carbon emission will not be much** even if there is large-scale adoption of electric vehicles in India.
- However, electric vehicles will **help reduce pollution in cities** (14 of 20 most polluted cities are in India).

{Envi – Tiger – 19/05/08} Tiger Census

[The Hindu](#) | [The Hindu](#) | [TOI](#) | Environment > Project Tiger

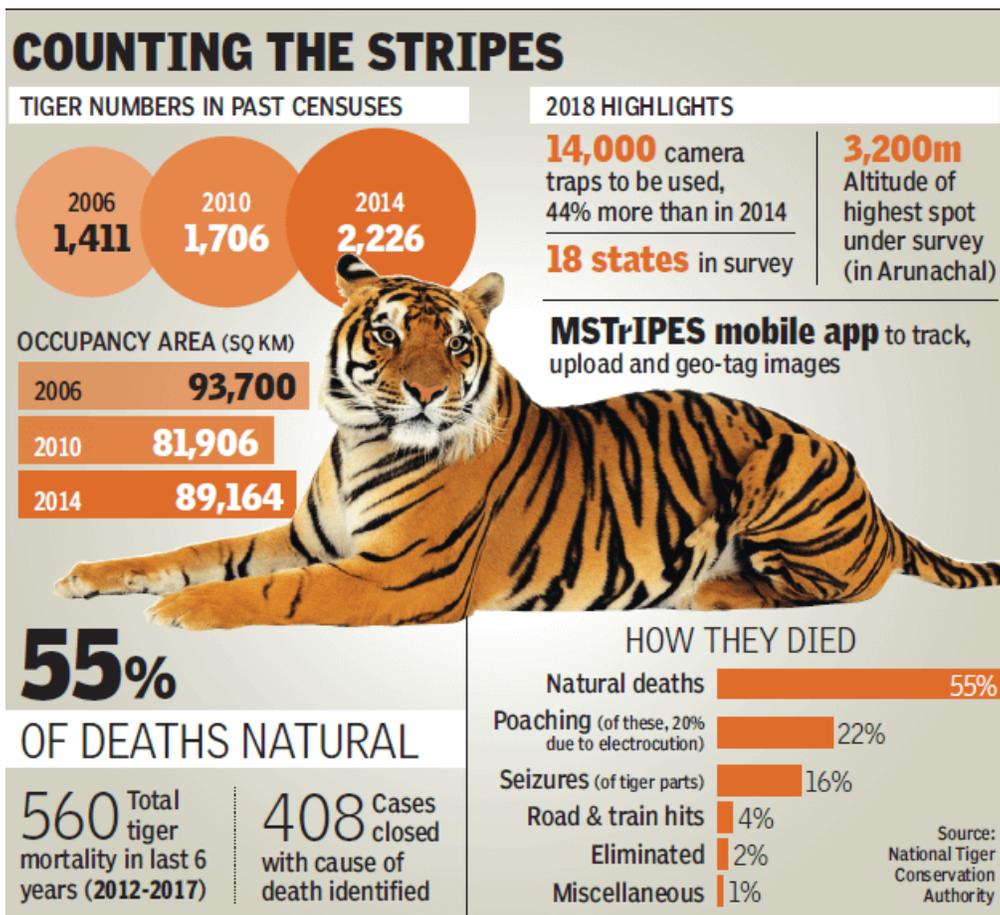
- Tiger Census Report is a **four-yearly report**.
- Carried out by **Wildlife Institute of India (WII)** and **National Tiger Conservation Authority (NTCA)**.
- The 2014 census had resulted in the first ever estimate of India's leopard population (11,000).
- 2018 tiger census report is delayed due to the inclusion of more States.

Census methodology

- **Double sampling based on ground-based surveys** and actual images captured on **camera-traps**.
- Double sampling method was introduced in 2006 after the "pugmark" surveys were found to be inaccurate.
- 2006 census concluded that all the tigers from the **Sariska reserve in Rajasthan had disappeared**.
- Serious conservation efforts after 2006 reduced poaching and led to steady increase in tiger population.

2018 census

- 2018 census is the **fourth cycle** of the tiger census based on **double sampling**.
- The first was conducted in 2006, second in 2010 and third in 2014.
- For 2018 census ground staff involved in the count will be using the **MSTripES** app.
- The app records the staff's path and helps upload **geo-tagged pictures into the central GIS database**.
- This will make the exercise speedier and more accurate.



[Source and Credits](#)

MSTrIPES – Technology in wildlife protection

- **MSTrIPES: Monitoring system for Tigers – Intensive Protection and Ecological Status.**
- It was launched across Indian tiger reserves by **NTCA** and **WII** in 2010.
- MSTrIPES is a software-based monitoring system, designed to assist wildlife protection, monitoring, and management of Protected Areas.
- Under MSTrIPES protocols, forest guards are expected to record their tracks using a **GPS**, in addition to recording observations in site-specific data sheets.
- The system consists of two components:
 - 1) field based protocols for patrolling, law enforcement, recording wildlife crimes and ecological monitoring,
 - 2) a customized software for storage, retrieval, analysis and reporting.

Advantage of MSTrIPES

- GPS-based patrolling helps in mapping patrol routes and maintaining a spatial database of patrol tracks.
- Patrol maps help the management analyse trends and patterns to improve future protection efforts.
- MSTrIPES will help identify shortcomings in patrolling efforts in real time.

- It acts as a proof of presence and patrolling of forest guards in a particular area.

Wildlife Institute of India (WII)

- Established in 1982 in Dehradun.
- Autonomous institution under the **MoEFCC**.
- Offers training program, academic courses and advisory in wildlife research and management.

India now hosts 70 per cent of the world's tiger population.

- Since the early 1900s, the global population of tigers fell from around 100,000 to fewer than 4,000.
- Indian tiger numbers had hit an all-time low of 1,411 in 2006.
- **Jim Corbett National Park (Uttarakhand)** is India's first tiger reserve.

⇒ **Wrong Statement:** In 1973, Project Tiger was launched in the Palamau Tiger Reserve (this is a wrong statement given in notes under Chapter 9.5 > Project Tiger – Tiger Conservation).

⇒ **Correct Statement:** **Project Tiger was launched in Jim Corbett National Park** of Uttarakhand in 1973.

- Tigers in the contiguous forest patches, comprising of **Mudumalai, Bandipur, Nagarhole and Wayanad tiger reserves** in the Western Ghats, have the world's **single largest tiger population** (570+).
- Wayanad Wildlife Sanctuary (WWS) holds the single largest population of the tigers ([75](#)) in the country.
- In the north-eastern landscape **Kaziranga National Park (Assam)** has the highest tiger numbers.
- Most of the habitats have reached their carrying capacity with the increase in tiger numbers.

Forests with potential of increasing tiger population

- Sanjay and Guru Ghasidas forests on the border of Madhya Pradesh and Chhattisgarh,
- Kawal and Srirailam forests in Andhra Pradesh and Telangana,
- Simlipal and Satkosia tiger reserves in Odisha,
- Manas reserve in Assam,
- Buxa reserve in West Bengal,
- Palamau reserve in Jharkhand and
- Achanakmar and Indravati tiger reserves in Chhattisgarh.

Tiger population growth in India			
State	2006	2010	2014
Shivalik Gangetic Plain			
Uttarakhand	178	227	340

Uttar Pradesh	109	118	117
Bihar	10	8	28
Central Indian Landscape and Eastern Ghats			
Andhra Pradesh & Telangana	95	72	68
Chhattisgarh	26	26	46
Madhya Pradesh	300	257	308
Maharashtra	103	169	190
Odisha	45	32	28
Rajasthan	32	36	45
Jharkhand	-	10	3
Western Ghats			
Karnataka	290	300	406
Kerala	46	71	136
Tamil Nadu	76	163	229
Goa	-	-	5
The Northeast			
Assam	70	143	167
Arunachal Pradesh	14	-	28
Mizoram	6	5	3
Northern West Bengal	10	-	3
Sundarbans	-	70	76
Total	1,411	1,706	2,226

[Source](#)

Important Observations from the table above (2014 tiger census):

1. **Karnataka (406)** has the highest tiger population.
2. **Uttarakhand (340)** and **Madhya Pradesh (308)** have the 2nd and 3rd highest tiger populations respectively.
3. Among the NE states, **Assam (167)** has the highest tiger population.
4. Tiger population **fell** in **Andhra Pradesh & Telangana, Odisha, Jharkhand** and **Mizoram**.

Region	Tiger Population (2014 Census)
--------	--------------------------------

Western Ghats	776
Central Indian Landscape and Eastern Ghats	688
Shivalik Gangetic Plain	485
The Northeast	277
India	2226

Bengal tigers may not survive climate change, UN report finds

- The sundarbans hosts the world's largest mangrove forest and is an important habitat for the Bengal tiger.
- 70 per cent of the land in the sundarbans is just a few feet above sea level.
- In 2010, a study led by the World Wide Fund for Nature projected that a sea level rise of 11 inches could [reduce the number of tigers in the Sundarbans by 96 per cent](#) within a few decades.
- Man-animal conflict: Rising sea level will bring tigers in close contact with human population.

{Envi – UNFCCC – 19/05/10} Most EU countries cut CO2 emissions last year

[Economic Times](#) | 10-05-2019 | Environment > International Conventions > UNFCCC > [Paris Agreement](#) | [INDC](#)

- Overall EU emissions from burning oil, coal and gas were 2.5 percent lower in 2018 than the previous year.
- Germany accounted for the largest share of the union's emissions last year, at 22 percent.
- **The EU has pledged to reduce its carbon emissions by 40 percent below 1990 levels by 2030.**
- The EU has vowed to lead the way in saving the Paris climate agreement since the **United States, the world's second biggest polluter** after China, **withdrew in 2017**.
- The pact aims to keep the worldwide rise in temperatures "**well below**" **2 °C from pre-industrial times**.

{Envi – Water Pollution – 19/05/11} Arsenic bioremediation using two soil bacteria

[The Hindu](#) | 11-05-2019 | Environment > Water Pollution > [Control Measures](#) > [Bioremediation](#)

Bioremediation

- Bioremediation is the **use of microorganisms (bacteria and fungi) to degrade the environmental contaminants** into less toxic forms.
- Microorganisms can be specifically designed for bioremediation using **genetic engineering techniques**.

Bioremediation of Arsenic

- Using arsenic-contaminated water for agricultural purposes can lead to increased concentration of arsenic in fruits and grains, proving toxic to humans.
- Researchers from CSIR-National Botanical Research Institute (CSIR-NBRI), **Lucknow** have shown that arsenic can be removed from contaminated soil with the help of **Bacillus flexus** and **Acinetobacter junii**.
- The researchers studied the two bacteria under different concentrations of **arsenate** and **arsenite**, the **toxic forms of heavy metal**.
- B. flexus exhibited resistance to arsenate and A. junii to arsenite.
- Both the bacteria have a special gene, which aids in **arsenic detoxification**.

The bacteria can also promote plant growth

- Both the bacteria were able to solubilise phosphorus.
- Phosphate solubilising bacteria have been reported to increase **phytoavailability** (controls the transfer of a trace element from soil to a plant) of phosphate, thus **facilitating plant growth**.
- These two bacterial strains were also found to produce siderophores and **ACC deaminase enzyme**.
- Siderophore increase the bioavailability of iron and other metal ions in polluted soil environment and ACC deaminase is a **well-known plant growth promoting enzyme**.
- These bacteria can live **symbiotically** in the roots of plants in arsenic-contaminated soils and help them uptake the required nutrients without causing toxicity.

{LOC – NP – 19/05/04} Sanjay Gandhi National Park: Last white tiger in SGNP dies

[HT](#) | 04-05-2019 | Location Based Questions (Compilation in progress. Will be uploaded on bi-monthly basis)

- 18 year old last captive white tiger of Sanjay Gandhi National Park died due to old age.
- Sanjay Gandhi National Park is in **Mumbai**.

White Tigers

- The white tiger or bleached tiger is a pigmentation variant (not a subspecies) of the Bengal tiger.
- Such a tiger has the black stripes typical of the Bengal tiger, but carries a near-white coat (due to **lack of the pigment pheomelanin** that gives tigers their characteristic orange coloured coat).
- They are reported in the wild from time to time in the Indian states of MP, Assam, WB and Bihar.

Sanjay Gandhi National Park

- Sanjay Gandhi National Park is an 87 km² protected area near Mumbai.
- It is one of the major national parks existing within a metropolis limit (most visited NP in the country).

- 2400-year-old **Kanheri caves** sculpted out of massive basalt outcrop within the park.
- The Kanheri caves served the purpose of **Buddhist** centres of education.

{LOC – NP – 19/05/07} Rajaji Tiger Reserve in Uttarakhand

[The Hindu](#) | 06-05-2019 | Location Based Questions (Compilation in progress. Will be uploaded on bi-monthly basis)

- The National Green Tribunal took stock of alleged illegal construction of a road in the ecologically sensitive Rajaji Tiger Reserve in Uttarakhand.

Rajaji National Park and Tiger Reserve

- It is located between the Shivalik ranges and the Indo-Gangetic plains in Uttarakhand.
- NP Area 820 km².
- The **Ganga and Song rivers** flow through the park.
- The NP has been named after C. Rajagopalachari (second and last Governor-General of independent India).
- Rajaji became the second tiger reserve in Uttarakhand (after **Jim Corbett NP and TR**).
- The park is at the north-western limit of distribution for both elephants and tigers in India.
- Forest type: dense broadleaved deciduous forests.
- Fauna: elephants, Bengal tiger, mountain goat, goral, Indian hare, sloth bear, Himalayan black bear, barking deer, sambhar, wild boar, rhesus macaque, Indian langur, Indian porcupine, monitor lizard, etc.