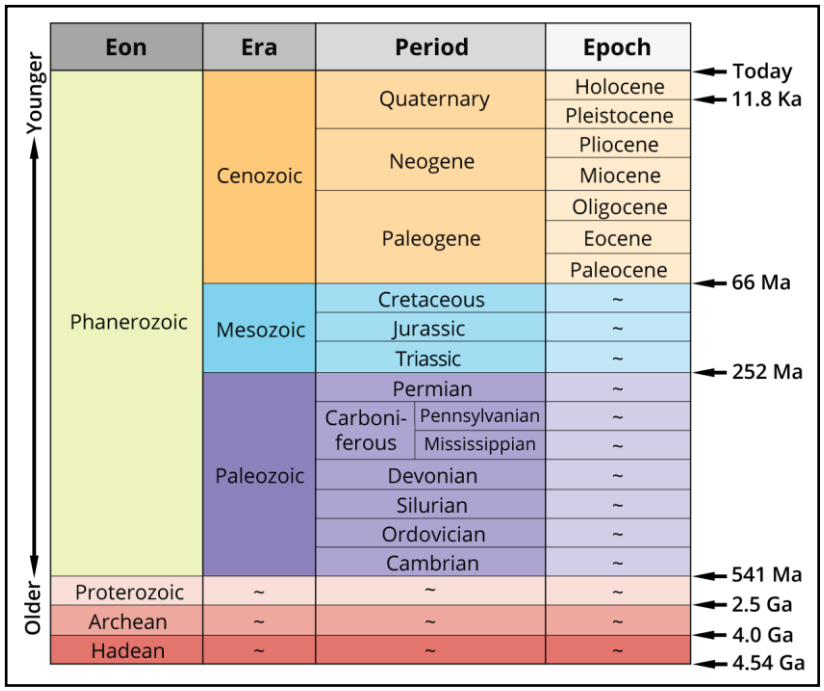
ENVIRONMENT

Shell Points for UPSC-CSE Mains'19 – Environment

1. Anthropocene Epoch

- ✓ Geological time divided into manageable packages; **Eons→ Eras→Periods→ Epochs→ Ages**
- ✓ Last time period**Quaternary**made of **Pleistocene** and the **Holocene epochs.**
- ✓ New epoch name as human has changed ecology; identify a definitive geologic marker or '**golden spike'**
- ✓ Reference point for start to be taken from one of the sources, including a **cave in northern Italy**, **corals in the Great Barrier Reef** and **a lake in China**



2. Fly Ash (FA)

- ✓ Generated as coarser non pozzolanic bottom ash from Power Plants ; ~ 230 million tonnes expected by 2025
- ✓ Hazards →LungsInflammation; damage to the brain and major body parts

Utilisation options

- ✓ Soil modifier; detoxify contaminated soil; enhances water retaining capacity and fertility; Yield enhancer
- ✓ In RCC enhances strength, durability; Can substitute up to 66% of cement dam construction
- ✓ FA based polymer products as wood substitutes; paving, building embankments and mine fills

Optimum Utilisation Efforts

- ✓ GST rate 5%; Web portal monitors generation and utilization data; ASHTRACK apphelps users
- ✓ Ash-park; awareness programmes

3. Indoor Pollution

- ✓ Women & children main victims; Most vulnerable - Infants and young children→higher resting metabolic rate; narrower airways

Sources

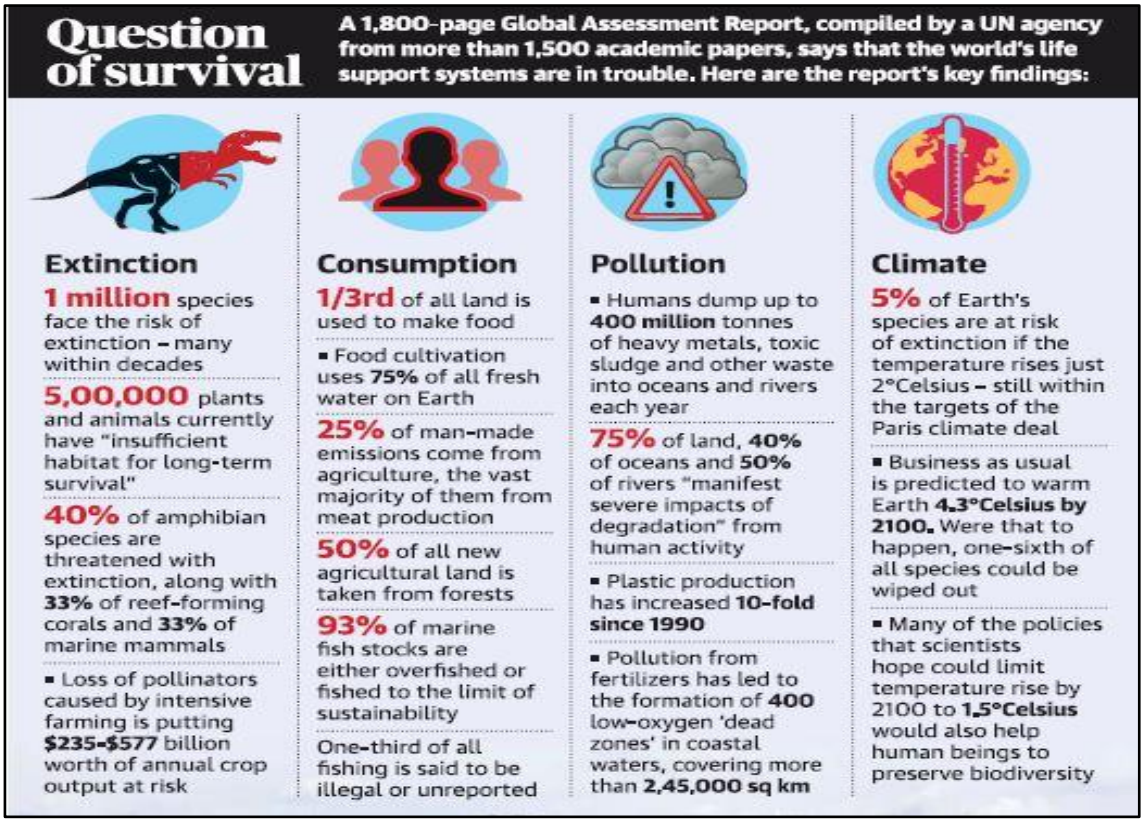
- # Open fires, combustion of biomass fuels, coal & kerosene; Gas stoves or badly installed wood-burning units;
- # Building materials→asbestos and cement, wood preservatives
- # paints, glues, resins, polishing materials, perfumes, spray propellants and cleaning agents→Volatile Organic Compounds (VOCs)
- # Formaldehyde→irritant; Suspended particulate matter; Second-hand tobacco smoke

- ✓ **Adverse health effects:** Acute(irritation; acute respiratory illness; allergy; Tracheobronchitis); Chronic (decreased lung growth; chronic obstructive lung diseases like asthma; impaired pulmonary function)
- ✓ Reduction: improved stoves; cleaner fuels; proper ventilation; Separate kitchen
- ✓ Power companies →buy agricultural waste →convert into biomass pellets

- ✓ National Clean Air Programme reorientation; Ujjawala Scheme

4. Global Assessment report on Biodiversity and Ecosystem Services

- ✓ first-ever comprehensive report→reports biodiversity threat; primarily analyses impact of economic development on nature and ecosystems.



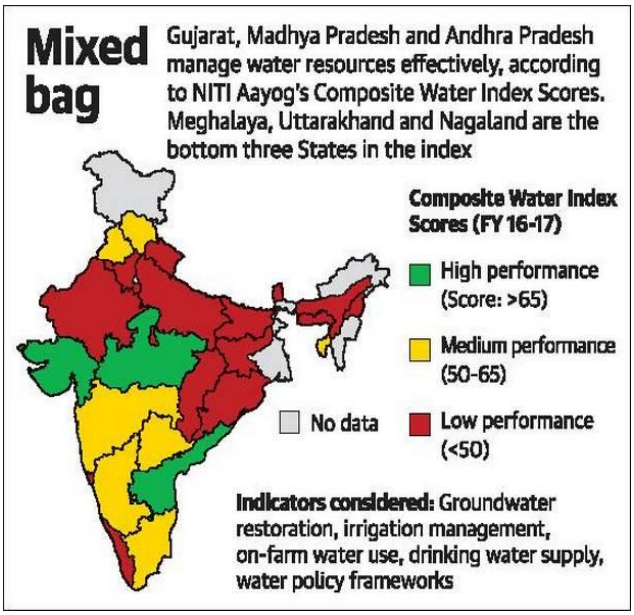
- ✓ Species extinction rate accelerating; animal and plant species under extinction threat;decline of native species in land-based habitats; marine mammals & reef-forming corals are threatened
- ✓ Reduced global land productivitydue to land degradation; global crops pollinator loss risk; increased risk of floods and hurricanes →loss of coastal habitats and protection.
- ✓ Need transformative changes, i.e. fundamental, system-wide reorganization across technological, economic and social factors, including paradigms, goals and values &common consensus & bold action by countries

5. Ecological Sanitation

- ✓ **Pit toilet** and**flush toilet**→most common sanitation technologies
- ✓ Conventional waterborne sewage systems→not solve sanitation needs of developing countries; too costly
- ✓ **Approximately 90% sewage**in developing countries' cities discharged untreated
- ✓ Pit toilets especially in densely populated areas→ severe risks of contaminating groundwater.
- ✓ The EcoSan toilet→no need of water; helpful in water scarce places or high water table places(avoid risk of groundwater contamination);
- ✓ Principle of recovery and recycling of nutrients from excreta to agri resource; pit fills→closed & sealed→switch to second pit→8-9 month organic manure composed in 1st
- ✓ Setup & instruments cost; intensive training for construction; Post-construction monitoring;
- ✓ Sustained information, education and communication work→remove social prejudice
- ✓ Pilot project-WaterAid India, Korba district→successful

6. Composite Water Management Index

- ✓ India acute water crisis75% households no drinking water on premise; 84% rural households no piped water access; 70% water contaminated; reduced water quality
- ✓ NITI Aayog report **"Composite water management index" (CWMI);** country's first comprehensive and integrated national dataset for water
- ✓ Reinforce**principle of 'competitive & cooperative federalism'**; enable innovation in water ecosystem
- ✓ 60% of states (15 out of 24) 'Low' performers (score below 50)
- ✓ Most 'Himalayan & NE states'- historically water-abundant states→lowest performers; possibly lack of water management and policy action;



- ✓ Need strong groundwater regulatory framework; Market-based interventions like impact bonds; robust participatory irrigation management measures; last-mile utilization and adequate maintenance of irrigation assets
- ✓ Reducing water **leakage in urban areas through smart technologies like sensors; treatment capacity to enable reuse of water; pricing urban water to encourage efficient use with consumption slabs**
- ✓ **World Water Development Report:** India accounts for ~ 1/4th of total groundwater extracted globally
- ✓ **The Global Water Initiative (World Economic Forum):**embed water at the center of economic growth planning; large-scale public-private coalitions in the water agenda

7. Dam Safety Bill

- ✓ Surveillance, inspection, operation, and maintenance of specified dams; institutional mechanism to ensure safety
- ✓ 75% of large dams 25+ years old; 164 dams 100+ years old; 36 dam failures in the past
- ✓ **National Committee on Dam Safety** -head→Chairperson, Central Water Commission; formulating policies and regulations -dam safety standards and prevention of dam failures & analysing causes of major dam failures
- ✓ **National Dam Safety Authority**-head→officer not below the rank of an Additional Secretary; implementing policies, resolving issues between Dam Safety Organizations, construction, design related agency accredition
- ✓ State Dam Safety Organisations (SDSOs) and State Committees on Dam Safety by the state governments
- ✓ **Dam owners' obligations:** Dam safety unit for inspection in each dam; emergency action plan; risk assessment studies regularly

8. Disaster Resilient infrastructure

- ✓ Rising population and less predictable hazard patterns- puttinginfrastructure under stress
- ✓ The Sendai Framework for Disaster Risk Reductionhighlightsimproved disaster resilience important for sustainable development
- ✓ Debate started after Mozambique, Zimbabwe and Malawi struggle to recover after the devastating Cyclone Idai.
- ✓ Stable infrastructure can minimize the number of casualities. sustain economic growth and mitigate climate change & disasters effects, secure livelihood, preserve cultural heritage

9. Earthquake Swarms

- ✓ A series of low magnitude earthquakes in a localized region over a period of time with no clear sequence of foreshocks, main quakes and aftershocks
- ✓ Theory relates it to the movement of fluid gases and liquids in the Earth's crust; seismic energy released in small amounts from certain points; hydro-seismicity due to water percolation post-monsoon or magmatic activity
- ✓ Observed in volcanic environments, hydrothermal systems, and other active geothermal areas
- ✓ Sometimes come as foreshocks to the main earthquakemuch greater in magnitude e.g.Koyna(1967)and Latur(1993) earthquakes

10. Bio fuel

- ✓ India's membership for the IEA Bioenergy TCP to bring down emissions and reduce crude imports.
- ✓ **Derived from biomass**- a cost-effective and environmentally benign alternative to fossil fuels
- ✓ **Categories- 1st generation**(Bioalcohols, Biodiesel, Vegetable oil, Bioethers, Biogas); **2nd gen**(from non-food crops i.e. cellulosic biofuels and waste biomass); **3rd gen** (from micro-organisms)**; 4th gen** (genetically engineered crops biomass using 2nd gen techniques)
- ✓ **Bio-diesel** -eco-friendlydieselfromvegetable oilsand animal fats; India is edible oils deficient so production possible withnon-edible oils (Jatropha curcas, Pongamia, Karanja)
- ✓ **Concerns**:less fuel efficiency, Cost issues, Food shortage, water use
- ✓ **National Policy on Biofuels -** categorises biofuels→Basic (1G), Advanced(2G) and 3G biofuels; Expands scope of raw material for ethanol production; allows use of surplus food grains for production of ethanol; viability gap funding scheme for 2G ethanol Bio refineries with additional tax incentives and assigned roles and responsibilities of all the concerned Ministries/Departments
- ✓ **PM-JIVAN Yojana:** Ministry of Petroleum & Natural Gas has targeted to achieve 10% blending percentage of Ethanol in petrol by 2022; to create 2G Ethanol capacity and incentivize the sector; The ethanolwill be mandatorily supplied to Oil Marketing Companies (OMCs)under EBP Programme
- ✓ **RUCO:** FSSAIlaunched RUCO (Repurpose Used Cooking Oil) to enable collection and conversion of used cooking oil to bio-diesel
- ✓ **GOBAR (Galvanizing Organic Bio-Agro Resources) DHAN scheme**:launched under Swachh Bharat Mission (Gramin); converting cattle dung and solid waste in farms to useful compost, biogas and bio-CNG

11. E-waste management

- ✓ Most Indian e-waste goes to the informal sector where improper and highly hazardous methods of extraction and handling are in practise; 10 states generate 70% of the total E-Waste, mainly from cities
- ✓ Toxic & carcinogenic; difficult to recycle in an environmentally sustainable manner
- ✓ Lot of e-waste from foreign countries comes to India, recycled by locals
- ✓ **Extended Producer Responsibility –** as per the **E-waste Management Rules, 2011**producer responsible for entire life cycle of the product; enforced by State Pollution Control Boards;
- ✓ **E-waste (Management) Rules, 2016**→components/consumables/ parts/spares of Electrical and Electronic Equipment (EEE) later **E- Waste (Management) Amendment Rules, 2018**
- ✓ **Producer Responsibility Organisation (PRO)**→responsibility for collection and channelisation of e-waste&ensure environmentally sound management

12. Bio-Medical Waste

- ✓ Cradle to grave approach to disposal→characterization, quantification, segregation, storage, transport, and treatment of BMW; 3Rs- reduce, recycle, and reuse; a legal necessity and social responsibility

- ✓ **Bio-Medical Waste Management (Amendment) Rules, 2018**-for environmentally sound management of biomedical waste
  - # Bio-medical waste generatorsto phase out chlorinated plastic bags (excluding blood bags) and gloves by March 2019; bar coding and global positioning system for handling of bio-medical waste
  - # Involvement of State Pollution Control Boards/ Pollution Control Committees&Central Pollution Control Board to review & analyse the related information
  - # Every occupiershall pre-treat the waste through disinfection or sterilization on-site as per WHO prescriptions

13. Swell Waves

- ✓ Collection of waves produced by storm winds, coveted by surfers
- ✓ Formed by combination of wind strength, wind duration and fetch; larger the height of a swell the bigger the waves it will produce when it approaches the coast
- ✓ **Swell period** is the number of seconds between successive swell crests as they pass the same stationary object
- ✓ **Swell direction** is the direction the swell is coming from, as opposed to the direction it is heading toward

14. Kerala flood

- ✓ Worst monsoon flooding in a century
- ✓ **Causes:** Rainfall of high intensity, frequency and duration; Unregulated construction & management of Dams with two rainy seasons; Deforestation of hill areas; Haphazard construction on hills, failure of embankments to check water flow; Loosening of soils due to mining, quarrying; rampant urbanisation
- ✓ **Impact:**damage to humans' lives, property and critical infrastructure; reverses the current development gains; destruction of animal habitat; Agri losses; Poor access to clean water; rise of food price
- ✓ Holistic strategy needed; checked human intervention in the Western Ghats; regulated mining and quarrying

15. Eco sensitive zones

- ✓ Within 10 kms around Protected Areas, National Parks and Wildlife Sanctuaries; in case ofsensitive areas beyond 10 km width can be included
- ✓ Sources behind declaration→**Section 3(2)(v) and 5 (1)** of **The Environment Protection Act, 1986**, however no word mentioned
- ✓ Acts undermine the ESZs in favour of developmental activities; Construction of dams, roads, urban and rural infrastructures; pressure of tourism; garbage by tourists; introduction of Exotic species; Slash and burn techniques; increasing population
- ✓ Need for Afforestation and reforestation of degraded forest; Regeneration of lost habitats

16. Industrial disasters

- ✓ **Reasons:** Low awareness; Unsafe practices; Lack of regulations & poor surveillance, safety audits, capacity building centre-state coordination
- ✓ Factories Act, 1948amended to extend the scope of risk→covering workers and premises along with general public in the vicinity
- ✓ Supreme Court defined **Absolute Liability**(1986); **The Environment (Protection) Act, 1986** has provisions for management of hazardous waste;
- ✓ **Manufacture, Storage and Import of Hazardous Substances Rules, 1989**catalogues chemicals deemed hazardous;
- ✓ **Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008**→safe storage and disposal of hazardous waste;
- ✓ **Chemical Accidents (Emergency Planning, Preparedness, and Response) Rules, 1996**→address gas leaks and similar events

- ✓ **Public Liability Insurance Act, 1991**→immediate and interim relief to disaster victims

17. Waste to Energy (WTE) plants

- ✓ Country's inability to segregate waste hampers WTE plants' working capacity
- ✓ MSW (municipal solid waste) in India has low calorific value and high moisture content
- ✓ **NITI Aayog**envisages 800 megawatt from WTE plants by 2018-19, 10 times capacity of all existing ones; **MNRE** says potential of about 1700 MW from urban waste (1500 MW from MSW and 225 MW from sewage) and about 1300 MW from industrial waste.
- ✓ Municipal and industrial solid waste into electricity and/or heat for industrial processing,
- ✓ MSW (municipal solid waste) in India has low calorific value and high moisture content; un-segregated, they also have high inert content; expensive power; most technologies are imported; lack of financial resources with Municipal Corporations/Urban Local Bodies; lack of conducive policy guidelines; widespread criticism from citizens
- ✓ Action plan on waste management Solid Waste Management (SWM) rules, 2016 with key elements of waste hierarchy as refuse, reduce, reuse, recycle and recover; segregation at source, spreading awareness, preparing an action plan for the city for waste management by adopting decentralized technologies

18. Electric vehicles

- ✓ Govt. plans to replace all the diesel and petrol vehicles with the electric vehicles by 2030 as Transport is the second largest contributor to CO2 Emission after thermal power plants
- ✓ To deal with rapid urbanisation, rising pollution, climate change and increasing oil imports
- ✓ **YS Malik Panel 15-point plan** to aid car manufacturers to shift from Internal Combustion Engine to Electric Vehicles
- ✓ **Challenges:** Upfront Cost, nascent stage R&D; missing robust data reporting; problem of Storage Equipment; Disposal of replaced Vehicles
- ✓ Initiatives National Electric Mobility Mission Plan (NEMMP); FAME Scheme; FAME 2 Scheme
- ✓ Auto industry's active participation with collaboration of battery industry with focus on domestic industry development is needed.

19. Cryosphere

- ✓ **Cryosphere** are places on Earth that are so cold that water is frozen solid andare subject to temperatures below 32°F for at least part of the year. It includes Ice and snow on landas well as in water.
- ✓ **Melting Ice Causes More Warming:** ocean and land absorb more incoming solar radiation, and then release the heat to the atmosphere, melting ice causes more warming and so more ice melts which triggers a cycle.
- ✓ **Melting Permafrost Releases Greenhouse Gas:** Global Warming is causing soils in the Polar Regionsto thaw with carbon released into the atmosphere as methane which triggers a cycle.
- ✓ **Less Ice on Land Means Sea Level Rises**Global warming has caused glaciers and ice sheets to be less stable, to move faster towards the ocean, and add more ice into the water including ice sheets of Greenland and West Antarctic.

20. Minimum EcologicalFlow for rivers

- ✓ Mandated ecological flow for various stretches of the Ganga, require hydropower projects to comply with the norms as per Union govt. Mini and micro projects-exempted
- ✓ The upper stretches of the Ganga — from its origins in the glaciers and until Haridwar — would have to maintain varied percentage of average flow during different times of year.
- ✓ For the main stem of the Ganga — from Haridwar in Uttarakhand to Unnao, Uttar Pradesh — the notification specifies minimum flow at various barrages
- ✓ Designated authority to collect relevant data and submit flow monitoring-cum-compliance reports →The Central Water Commission (CWC)

- ✓ Existing ecological flows not disclosed due to strategic reasons

21. Toxicity in rivers

- ✓ 42 Indian rivers polluted with at least two toxic heavy metals including Ganga with pollution of five heavy metals—chromium, copper, nickel, lead and iron
- ✓ **Trace elements**→lead, arsenic, copper, cadmium, mercury and nickel; nonbiodegradable , carcinogenic and tend to bioaccumulate
- ✓ Heavy metals may enter human body through food, water, air, or even skin absorption.
- ✓ Mining, Discharge of industrial effluents, Dumping of solid wastes, Agricultural practices involving toxic metals lead to contamination of surface water sources
- ✓ Health Hazards→damaged/reduced mental & central nervous functions, blood composition changes, damage to vital organs, Physical, muscular, and neurological degenerative processes, cancer, allergy risks

22. Sea level rise

- ✓ NASA study reveals that sea level hasrisen by 8 cm in the last 23 years. Forecasted that by the end of this century the water could have invaded almost a meter on the mainland
- ✓ **Causes:** Global Warming;thermal expansion; melting of Greenland and West Antarctica ice; fresh filtered water to the base of the ice sheets; Softer snowfall & delayed winters
- ✓ **Consequences:** Increased water invasion at coastal areas; wetland flooding & aquifer pollution→loss of habitat for flora and fauna; heavy rains and storms; forced migration of coastal communities; disappearance of large land areas
- ✓ Rapid implementation of the Paris Agreement on Climate Change is crucial→**Talanoa Dialogue** by Fiji

23. IPCC Special Report on Global Warming of 1.5⁰

- ✓ At current rate of emissions, the world is set to breach the global warming limit of 1.5⁰ Celsius between 2030 and 2052, presently 1.2°C warmer compared to pre-industrial levels.
- ✓ Limiting global warming to 1.5°C compared to 2°C is projected to lower the impacts on terrestrial, freshwater, and coastal ecosystems and retain more of their services to humans.
- ✓ Net-zero emissions would have to be achieved by 2050 and emissions would need to be drastically cut by at least 45 per cent by 2030; carbon budget
- ✓ World to witness greater sea level rise, increased precipitation and higher frequency of droughts and floods, hotter days and heatwaves, more intense tropical cyclones, and increased ocean acidification and salinity
- ✓ India, with large populations dependent on the agricultural and fishery sectors and vulnerable population would be highly impacted
- ✓ **Keep global warming within 1.5°C; Require a UNFCCC-plus approach; Equity is essential with** rapidly de-carbonising developed economies & low-carbon approach by developing economies; **Enhancing sinks in natural ecosystems with** Carbon Dioxide Removal (CDR) in AFLOU sector; **Acting on all fossil fuels must; rapid de-carbonisation and reducing consumption with** fossil fuel-free and efficient energy system

24. Climate change and Social Impact

- ✓ Climate Change affects a much wider range of sustainable development issues directly/indirectly with worst effect on the poor, **limiting human capabilities and reinforcing inequalities**
- ✓ **Health impacts** due to lack of clean air, safe drinking water, sufficient food and secure shelter and damage tohealth infrastructure; spread of diseases due to poverty, population displacement; increased food prices;
- ✓ Lack of access to health care services for displaced communities; damage to service-delivery infrastructures; spike in unemployment and in the deterioration of working conditions; social vulnerability due to age, gender, ethnicity, social class and caste
- ✓ Unprecedented challenge to international governance to be addressed in interlinked

manner

- ✓ Social mobilization and cooperation around climate change are critical for the formation of inclusive and transformative social policies and good governance

25. Land degradation neutrality&REDD+

- ✓ **Land degradation**accelerated due to increasing and combined pressures of agricultural and livestock production, urbanization, deforestation, and extreme weather events
- ✓ **Consequences:** higher threats of malnutrition; more water- and food-borne diseases; respiratory diseases; spread of infectious diseases
- ✓ Land Degradation Neutrality (LDN) represents a paradigm shift in land management policies and practices and requires multi-stakeholder engagement and planning across scales and sectors, supported by national-scale coordination
- ✓ UNCCD and the UN Environment Programme →2030 Agenda for Sustainable Development; LDN Target Setting Programme
- ✓ **REDD+: Reducing emissions from deforestation and forest degradation by** UNFCCC goes beyond simply deforestation and forest degradation and includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks and enables Developing countries to receive results-based payments for results-based actions

26. Ground water contamination

- ✓ Serious health effects: hepatitis and dysentery, Poisoning etc. and long term effects include cancer
- ✓ **Potential sources:** Storage Tanks ofgasoline, oil, chemicals, or other types of liquids; Improperly managed Septic Systemsnot connected to a city sewer system; Uncontrolled Hazardous Waste; Landfills seepage; Chemicals used in agriculture, businesses and homes; Road Salts; Atmospheric Contaminants

27. Compensatory afforestation

- ✓ Afforestation and regeneration activities carried out as a way of compensating for forest land diverted to non-forest purposes and is an additional plantation activity and not a diversion of part of the annual plantation programme.
- ✓ **Elements of Schemes for Compensatory Afforestation:** non-forest or degraded forest land; Delineation of proposed area;
- ✓ **Compensatory Afforestation Fund Act, 2016:** seeks to establish National Compensatory Afforestation Fund(CAF) under the Public Account of India, and a State Compensatory Afforestation Fund under the Public Account of each state.
- ✓ The National Fund will get 10% of funds collected, remaining 90% →respective State Fund; ensure safety, security and transparency in utilization of CAMPA funds which are currently kept in Nationalized Banks and managed by an ad-hoc body.
- ✓ Utilised for afforestation, regeneration of forest ecosystem, wildlife protection and infrastructure development.
- ✓ National and State Compensatory Afforestation Fund Management and Planning Authorities to manage the funds.
- ✓ NPV includes goods and services (tourism and timber); regulating services (climate change); and none-material benefits (recreation)

28. India cooling action Plan

- ✓ A long-term vision to **address the cooling requirement across sectors and lists out actions which can help reduce the cooling demand;** provide sustainable cooling and thermal comfort for all while securing environmental and socio-economic benefits for the society
- ✓ Targets: Reduce quantitatively cooling demand; refrigerant demand; cooling energy requirements; Training and certification of technicians→Skill India Mission; Recognize "cooling and related areas" →thrust area of research under National S&T Programme

- ✓ Benefits: Thermal comfort for all; Sustainable cooling; Doubling Farmers Income; Skilled workforce; Make in India; Robust R&D on alternative cooling technologies
- ✓ Cooling related to human health and productivity; Sustainable Development Goals (SDGs)

29. CO_2 in air

- ✓ NASA reports CO_2 levels in the atmosphere are highest ever in the past 400,000 years
- ✓ **Causes:**Electricity generation through fossil fuels; Transportation; Industrial manufacturing and Construction; Deforestation and crop burning
- ✓ **Effects:**
  - # Global warming;
  - # Ocean Acidification→Increased ocean temperatures and oxygen loss act concurrently with ocean acidification and constitute the 'deadly trio' of climate change pressures on the marine environment
  - # **Malnourished crops:** cause staple crops to produce smaller amounts of nutrients such as zinc, iron and protein making people zinc and protein deficient; malnutrition & food insecurity
- ✓ **Solutions:**Renewable energy for electricity generation; use of bio-fuels in transportation; construction of cities with eco-friendly materials

30. Low carbon strategy for Renewable Energy Integration

- ✓ Decreasing carbon footprint of conventional energy sources
  - # Inclusion of renewable energy sources at every stage of power production including generation, storage, transmission and distribution of electricity
  - # Build smarter cities; alternative fuel vehicles; Nuclear power; increased efficiency of industries; reduced industrial pollution using technologies like selective catalytic reduction
- ✓ Substituting conventional energy sources with renewable energy sources
  - # India working towards producing 40% of its installed electricity capacity by 2022 from non-fossil fuels which needs generating 100 GW from solar, 60 GW from wind, 10 GW from biomass and 5 GW from small hydropower by 2022
  - # Ensure smart, reliable, clean and affordable energy to over a billion people by changing the energy mix by using strong wind and solar resources, policy support, and growing investments

31. National Clean Air Programme

- ✓ Non-attainment cities: cities consistently showing poorer air quality than the National Ambient Air Quality Standards; aggravated air pollution during winters in Delhi NCR
- ✓ NCAP is a time bound national level strategy for pan India implementation national level target of 20%–30% reduction of PM2.5 and PM10 concentration by 2024; mid-term, five-year action plan, 2019-1st year & 2017-base year; Smart Cities program
- ✓ City specific action plans; Institutional Framework at Centre and State Level : sectoral working groups, national level Project Monitoring Unit, Project Implementation Unit, state level project monitoring unit, city level review committee, DM level Committee
- ✓ **Initiatives:**Augmenting Air Quality Monitoring Network; Air Quality Management Plan for 100 Non-Attainment Cities; Indoor Air Pollution Monitoring & Management; National Emission Inventory; Network of Technical Institutions; Technology Assessment Cell

32. Plastic Pollution

- ✓ **Problems:**reducedsoil fertility; clogged drains; waste management issues; hindrance in recharging of water table; Marine ecosystem disturbances
- ✓ Breaks down into micro plastics planktons and zooplanktons which enters the food chain and leads to Bioaccumulation & Bio-Magnification of toxic material
- ✓ India: 80% of total plastic produced in India is discarded; vast network of unlicensed units manufacturing low-grade plastic bags; indifference of municipal authorities to waste management
- ✓ **Recycled Plastics (Manufacture & Usage) Rules, 1999**→control the packaging of food

products in recycled plastics

- ✓ **Plastic Waste Management (Amendment) Rules 2018**→phasing out of Multilayered Plastic (MLP), minimum thickness increased to 50 microns
- ✓ eliminate single-use plastic; innovative ways to use plastic wastes; promotion of Recycling facilities; waste-to-energy plants; Plastic collection and segregation

33. COP to Basel, Rotterdam and Stockholm conventions

- ✓ The joint meetings of three conventions on chemicals and waste
- ✓ **Basel convention: COP 14**→decision to amend the convention to include unsorted, mixed and contaminated plastic waste under **PIC (Prior Informed Consent)** procedure and improve the regulation of its trans-boundary movement
- ✓ **Rotterdam Convention: COP 9**→two new chemicals (Phorate and HBCD) were added in the list for mandatory PIC procedure in international trade
- ✓ **Stockholm Convention:** COP 9→to list **"Dicofol"** in Annex A without any exemption and **PFOA**with some exemptions

34. Katowice deal

- ✓ Nearly 200 countries gathered at Katowice in Poland to adopt a set of rules to limit global warming.
- ✓ **Paris rulebook**→detailed "operating manual" needed for the Paris Agreement to enter force in 2020 including modalities, procedures and guidelines
- ✓ **1.5 C report by IPCC**→some reservations about acceptanceby USA, Russia, Saudi Arabia and Kuwait.
- ✓ **Talanoa dialogue**→Fiji; countries to consider the outcomes of the Talanoa dialogue in preparing their NDCs
- ✓ **Pre-2020 commitment**→agreement to push developed countries to ratify the Doha Amendment so that it can enter into force
- ✓ India has pledged to improve the emissions intensity of its GDP by 33 to 35 per cent by 2030 below 2005 levels; increase the share of non-fossil fuels-based electricity to 40 per cent by 2030; enhance its forest cover which will absorb 2.5 to 3 billion tonnes of carbon dioxide by 2030

35. Cyclone Fani

- ✓ Most-affected state, Odisha, kept the loss of life and numbers of affected people to a minimum with effective disaster preparedness and quick resonse.
- ✓ Indian Ocean region Cyclone naming : Eight countries in the region - Bangladesh, India, Maldives, Myanmar, Oman, Pakistan, Sri Lanka and Thailand- contribute a set of names which are assigned sequentially; Names of devastating storms usually retired at least for 10 years and later replaced with new names.
- ✓ Zero casualties policy of govt.; Relief infrastructure with clear command and control structure for disaster relief and operation protocols-also successfully used in Cyclone Phailin (2013), Cyclone Hudhud (2014); **Accuracy of early warning systems of IMD; Clear communication plan**→Repeated advise over all forms of media not to panic andclear do and don'ts; **Effective co-ordination of groups**
- ✓ According to many scientific studies, warmer oceans have intensified cyclonesresulting in formation of cyclones and since Bay of Bengal is a water body prone to cyclone, high temperature leads to aggravation in formation of cyclones.